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Preface

Researching the practice of management accounting is challenging and interesting, because management accounting is a set of practices that are often loosely coupled to one another and varying across both time and space. A variety of ways of researching management accounting practice also have emerged, changed over time, and have been diffused unevenly around the world. Even management accounting terminology is neither uniform nor constant, with the term "management accounting" itself seemingly appearing in the 1930s and 1940s in America after many of the individual practices had already emerged.

Focussing on facilitating economic decision-making and the wider planning and control of organizations, the practices of management accounting have tended to have separate trajectories of development and modes of organizational functioning, thus making management accounting a loosely coupled set of fragmented practices. Costing and its various derivatives, capital and operational budgeting, internal financial (and increasingly non-financial) performance measurement, transfer pricing between the subunits of an organization, and organization-wide financial planning and control systems can all be subsumed under the mantel of management accounting, although what practices are considered to be management accounting and, indeed, what other fields management accounting is considered to be related to varies around the world. In Sweden, for instance, budgeting is considered as a component of general management rather than accounting, and certainly in Japan and in some countries of Continental Europe, cost accounting is considered as having more to do with engineering than a more narrowly conceived accounting. Indeed, cost engineering is a recognized term in Japan. However, although until now these separate management accounting practices have often been loosely coupled, developments in information systems may be requiring and enabling a much greater degree of integration with other practices in and between organizations. Costing systems are increasingly a part of enterprise-wide planning and control systems. Budgeting, in turn, is increasingly a part of strategic and operational planning, thereby becoming a component in a wider complex of systems and practices geared to organizational coordination and development. Similarly, performance measurement increasingly is being expanded to include non-financial measures and integrated with strategy. But interestingly, such trends, in turn, often stimulate the development of more ad-hoc local elaborations of these practices as employees at a variety of organizational levels seek to relate their own information needs to their local circumstances and requirements. So paradoxically, processes of integration can set into motion counter processes of disintegration and fragmentation. In this way, management accounting can take on a variety of forms and produce different information as decision contexts, organizational assumptions, and time horizons that change in time and space. More informal information flows attuned to a variety of information needs can reside alongside the structures of more centralized and standardized management accounting practices.

These developments may be part of a much more general diffusion of economic calculation throughout organizations. What might in some countries have been the preserve of the accountant is increasingly becoming a significant part of the functioning of the marketing manager, the operations manager, the research manager, those responsible for strategy, for product design, and so on. Management accounting is in the process of becoming a much more dispersed practice because in organizations today economic information and calculation appear to be permeating all of their key management processes.

Faced with such changes and developments, it is hardly surprising that there is an interest in the state of systematic knowledge in the field of management accounting and in the research processes that develop this knowledge. To satisfy that interest is the aim of the *Handbook of Management Accounting Research.*

Systematic enquiries into what is now known as management accounting have a long history, particularly in Continental Europe, but by research as we now know it is largely the product of the twentieth century, particularly the latter half of it. Key pioneering enquiries were made as part of the development of economic theories of cost accounting and controllership in Austria, Germany, and Italy in the earlier part of the twentieth century, and the school of costing associated with the London School of Economics in the 1930s was particularly influential. In the USA there were related attempts to explore the nature of cost accounting and

controllership practice from an economic perspective, not least with respect to understanding the design and functioning of costing in a regulatory context. However, it was largely with the growth of research-oriented business schools and departments of business administration in the 1960s that management accounting research received its greatest impetus.

Varying by country and changing over time, the business school and related departmental arrangements provided an interdisciplinary setting for the systematic analysis of management accounting. Economics and quantitative analysis provided the most influential initial frameworks for doing this but over time other disciplines represented in these academic settings were also drawn upon to investigate the nature and functioning of management accounting in organizations. In the USA, psychology was initially the most influential but organization theory also came to play a role. In Australia and Europe organizational and sociological approaches have been more prevalent, providing a basis for exploring ways in which management accounting relates to wider organizational designs and influences and shapes wider cultural and social forces.

After two initial chapters in Volume 1 of the *Handbook* which provide a bibliographic and a substantive review of the management accounting research literature, the next several chapters review research on management accounting practices that are motivated by or viewed from the lens of various theoretical perspectives. Detailed discussions are given in the ways in which theories from economics, history, organizational studies, psychology, and sociology have analysed and influenced management accounting research and our understanding of management accounting practices. Within economics, separate consideration is given to the influential role played by agency theoretic perspectives in recent times. Recognizing the wide array of perspectives available within organization theory, separate analyses are provided of contingency theories of management accounting and control systems and more recent attempts to understand the functioning of management accounting in organizations as a form of practice. At the sociological level, a separate discussion of critical theorizing is included.

The remainder of Volume 1 of the *Handbook* is devoted to a consideration of different research methods used in management accounting research. Detailed attention is given to qualitative and quantitative research approaches, cross-country comparative research, and interventionist research. Other chapters provide focussed discussions of analytical modelling, archival research, experimental research, and survey methods.

The chapters in Volume 2 provide insights into research on different management accounting practices. These practices include costing, such as activity-based costing, managing costs, and target costing, as well as practices related to organizational planning and control, including financial accountability, budgeting, transfer pricing, and performance measurement. Chapters in Volume 2 also review particular issues associated with the design and functioning of management accounting in the special contexts of health-care and manufacturing organizations. Although obviously far from comprehensive, these latter reviews nevertheless serve to alert us to the importance of designing and operating information systems in particular organizational contexts. Their partiality also reflects the limits of existing research in the area. There is a paucity of research which addresses the specialized needs of many important sectors of the economy including retail, the service sector, media and communications industries, and so on. A further chapter in this section of the *Handbook* addresses research issues associated with the functioning of management accounting in interorganizational contexts, an increasingly important topic now that there is a much more active management of supply chains.

Volume 2 of the *Handbook* concludes with a review of research on how management accounting practice and research varies around the world. Once again this is far from comprehensive, the gaps largely reflecting the limitations of existing research and literatures. Be that as it may, consideration is given to management accounting in many countries: China, Europe (Britain, Germanic, Nordic, and Latin), Japan, and the USA.

Taken as a whole, the two volumes of this *Handbook* identify the enormous scale and scope of management-accounting research. A great deal has been achieved. The task of researching management accounting practices nevertheless remains challenging and interesting. Many of the chapters conclude with agendas for future research. Research on management accounting practice is a moving target as its economic, organizational, and societal contexts continues to change across space and time. New sectors emerge with new information challenges. Organizational designs and strategies continue to be modified. Technical advances in information processing provide the ever new possibilities. Regulatory agencies demand different flows of information, in different ways with different timings. Management accounting practice is increasingly dynamic, with its knowledge bases changing and seemingly remaining ever incomplete. The need for research on management-accounting practices will certainly remain and continue to be challenging and interesting.

In conclusion, we would like to thank the many researchers and chapter authors who have made this *Handbook* possible. These authors have put in an enormous amount of work despite having to operate to very tight time deadlines. We would also like to thank Takamasa Fujioka for all his help in producing the manuscript. Finally, we gratefully acknowledge the support provided by Elsevier and particularly by Sammye Haigh and Mary Malin.

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Management Accounting: A Bibliographic Study

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Abstract: The 20-year period from 1981 to 2000 was a period of change for the field of management accounting. During this period new topics were investigated, new journals came into existence, and different research methods were emphasized. This chapter has two parts. The first part charts the field. To do this we split the 20-year period into two decades and then compare the kinds of topics studied, the research methods used, and the source disciplines employed across 10 journals in accounting and between decades. The second part focuses on the community of accounting scholars, analyzing citations and social network measures that reveal the links between, and influence of, individuals in management accounting research.

1. Introduction and Overview

The field of management accounting research has expanded since the early 1980s due to the emergence of new topics to investigate (Johnson & Kaplan, 1987; Kaplan, 1983, 1993; Young & Selto, 1991), the introduction of new journals focusing exclusively on publishing management accounting research, and the calls that examine management accounting phenomena from multiple disciplinary perspectives (Baiman, 1982, 1990; Cooper, 1983; Covaleski et al., 1996; Hopwood, 1978a, 1978b, 1979, 1983; Macintosh & Scapens, 1990) using multiple methods (Kaplan, 1984, 1986). Accordingly, we believe it is useful to provide an analysis of the state of the field as part of this comprehensive handbook. Specifically, we examine the state and evolution of the management accounting field in terms of the topics studied, research methods employed, and source disciplines relied on in 916 management accounting articles in 10 journals over a 20-year period (1981–2000).[1] Our approach to this examination is twofold, which we label "charting the field" and "analyzing the community."

We chart the field by showing the "market share" of management accounting as a subfield within accounting, as well as the "journal share" of each of the 10 journals in terms of the number of management accounting articles they publish. We do this for the entire 20-year period, as well as by decade (1981–1990 vs. 1991–2000) to show changes over time. We find that 28% of all accounting articles in the 10 journals during our study period are in the area of management accounting. A breakdown of the sample by decade indicates an increase in the number of management accounting articles in the last decade due to the introduction of four new journals (*BRIA*, *JMAR*, *MAR*, and *RAS*). The other journals, except *JAE*, however, published relatively fewer management accounting articles over time. In addition, the combined share of management accounting articles in four of the five most influential journals in accounting (about 29% in *CAR*, *JAE*, *JAR*, and *TAR* combined) is about the same as *AOS*'s share alone (28%). Finally, half of the management accounting articles appeared in *AOS* (28%) and *MAR* (22%).

To examine whether the expansion in the number of articles has also led to an expansion of ideas in terms of topics studied, methods applied, and/or source disciplines relied on, we categorize all 916 management accounting articles along three dimensions: topics,

[1]The 10 journals are *Accounting, Organizations and Society* (*AOS*), *Behavioral Research in Accounting* (*BRIA*), *Contemporary Accounting Research* (*CAR*), *Journal of Accounting and Economics* (*JAE*), *Journal of Accounting Literature* (*JAL*), *Journal of Accounting Research* (*JAR*), *Journal of Management Accounting Research* (*JMAR*), *Management Accounting Research* (*MAR*), *Review of Accounting Studies* (*RAS*), and *The Accounting Review* (*TAR*). We discuss the journal and article selection criteria in more detail in Section 2.1.

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methods, and source disciplines. For each of these dimensions, we again chart the field for the entire 20-year period and by decade. We also analyze topic, method, and discipline coverage by journal, and cross-tabulate topics, methods, and source disciplines.

Our data show that about 70% of the management accounting articles focus on control, 20% on cost, and 10% on a range of other topics. The most recent decade exhibited a slight change from control to cost topics, particularly those addressing cost allocation issues. The biggest changes, however, took place within the control area, with a shift in topics from budgeting and organizational control to performance measurement and evaluation. Our data also suggest that analytical, survey, and experimental methods are the dominant research methods, with about 18%, 16%, and 13% of the management accounting studies employing these methods, respectively. Frameworks that provide perspectives on management accounting issues also are published frequently, with about 20% of the management accounting studies taking this approach. As a percentage, we observe a decline in the use of frameworks and experiments in the most recent decade, and an increase in archival, case, and field research methods, with each of these three methods being used by about 10% of the studies. Finally, we find that economics is the dominant source discipline in management accounting research (43%), followed by sociology (40%) and psychology (15%). The reliance on psychology decreased in the most recent decade with a shift toward economics and sociology.

Cross-tabulations show that *AOS* and *MAR* show a greater tendency to publish case, field, and survey studies that draw on sociology compared to the other eight journals, which tend to publish more analytical, archival, and experimental studies that draw on economics. The data also reveal that the analytical method dominates economics-based management accounting research, by far, followed by the archival method as a distant second. Survey, field, and case methods dominate sociology-based research. Experiments, followed by survey methods, dominate psychology-based research. Finally, the data suggest that cost is dominated by economic thought, whereas control, while drawing mostly on sociology, also draws on economics and psychology.

We conclude our charting of the field with a discussion of several characteristics of authors, such as the extent to which they publish multiple articles in multiple journals addressing multiple topics from multiple disciplinary perspectives using multiple methods. We find that 67% of the authors published only one article across the journals in our sample. Although we do not find that authors with more than one article concentrate on publishing their work in one journal on a single topic using a single method, the data suggest that authors tend to have a source discipline concentration, however.

The second part of the paper focuses on analyzing the community of management accounting scholars. To this end, we analyze citations using several social network measures that reveal the links between, and influence of, individuals in management accounting research. We extend prior citation-based studies in accounting in several ways (Brown & Gardner, 1985a, 1985b; Brown & Huefner, 1994; McRae, 1974; Mensah et al., 2004). First, our study focuses solely on management accounting. Second, we hand collect citations for articles in five of the 10 journals that are not included in the *Social Science Citation Index* (*SSCI*), and thus, have not been analyzed previously.[2] Third, our analysis spans 20 years—a period much longer than previous studies. Finally, we merge citations with the descriptive data discussed in the first part of the study, which enables us to show the influence of not only articles and their authors, but also topics, methods, and source disciplines.

We find that the control literature draws heavily on its own area, with 84% of the citations going to other control articles. Cost not only draws more than half of its citations from the cost literature (56%), but also draws heavily (39%) on the control literature. Examining methods, we find that most articles draw on articles using a variety of methods, except analytical articles with 78% of their citations to other analytical articles. Archival articles cite analytical studies only 14% of the time, and experimental and survey-based articles cite them even less. Regarding source disciplines, we find that the economics-based literature draws heavily on itself (76%), with only few citations to sociology (12%) and psychology (6%). Articles based on psychology draw quite evenly from psychology, sociology, and economics. Sociology, like economics, tends to draw heavily on its own work (65%), and it also draws to a greater extent on economics (16%) than on psychology (8%). Thus, except for psychology, it appears that the disciplinary paradigms are fairly focused, not drawing on the insights from the accounting literature using different source disciplines.

[2]The only other citation study focused on management accounting (Mensah et al., 2004) considers management accounting articles in four journals—*AOS*, *JAE*, *JAR*, and *TAR*—primarily because of these journals' coverage by electronic databases.

We also create a matrix of the citations between the 898 authors in our database. We use this matrix, and transformations thereof, to calculate several social network measures that assess communication networks between scholars, instead of using citations merely to determine rankings of individuals, institutions, journals, or articles. Furthermore, we present directed graphs to visualize these communications among the management accounting scholars.

One finding of these various social network analyses is the existence of two quite distinct subnetworks in management accounting research—one around *AOS* and *MAR*, and the other around the eight journals edited in North America. Specifically, we find that the majority of scholars publish in either, but not both, subnetworks. Moreover, authors publishing in either subnetwork tend to cite articles within the same subnetwork more than articles in the other subnetwork. But we also find distinct networks of management accounting scholars within each subnetwork that appear to be based on topic, method, or source discipline with relatively little communications across them.

Section 2 presents the database and method we use to chart the field of management accounting in terms of topics, methods, and source disciplines. Section 3 presents the results of several citation-based network analyses to describe the community of management accounting scholars. Section 4 summarizes and concludes.

2. Charting the Field

2.1. Article Selection

We identify articles between 1981 and 2000 in 10 English-language journals that represent outlets in which management accounting research has been prominently published: *Accounting, Organizations and Society* (*AOS*), *Behavioral Research in Accounting* (*BRIA*), *Contemporary Accounting Research* (*CAR*), *Journal of Accounting and Economics* (*JAE*), *Journal of Accounting Literature* (*JAL*), *Journal of Accounting Research* (*JAR*), *Journal of Management Accounting Research* (*JMAR*), *Management Accounting Research* (*MAR*), *Review of Accounting Studies* (*RAS*), and *The Accounting Review* (*TAR*). Since *JMAR* and *MAR* focus exclusively on management accounting research, we include all articles in these two journals. For the other eight journals, we select only management accounting articles published by them.[3] We exclude articles on top executive compensation using publicly available, large-sample archival data because it is difficult to unambiguously classify research in this area as management accounting (as opposed to financial accounting) research. We also exclude research notes, book reviews, editorials, and discussion articles.

We choose the 20-year period between 1981 and 2000 primarily because many advances in the field were born or flourished during this period, such as activity-based costing (Cooper, 1987), "Japanese" management accounting (Hiromoto, 1988), "strategic" management accounting and control (Bromwich, 1990; Dent, 1990; Shank, 1989; Shank & Govindarajan, 1993), and the balanced scorecard (Kaplan & Norton, 1992), among other new topics (e.g., see Johnson & Kaplan, 1987). Finally, we collect data through the year 2000, rather than more recent years, to allow articles to have sufficient time to be digested, and cited, by the academic community.

The selection process yields 916 articles. For journals available online, we record bibliographic data by article consisting of journal name, publication year, pages, author name(s), institutional affiliation(s) at time of publication, as well as each article's reference list. For articles not available online, we record these data manually.

Table 1, Panel A, shows that about 28% of all accounting articles in the 10 journals during the entire 20-year period are management accounting. A breakdown of the sample by decade, however, indicates an increase in the number of management accounting articles published in the last decade due primarily to the introduction of four new journals: *BRIA* (started in 1989), *JMAR* (1989), *MAR* (1990), and *RAS* (1996). The other journals, except *JAE*, however, published relatively less management accounting articles over time.

Panel B shows that over the 20-year period, about half of the management accounting articles appeared in *AOS* (28%) and *MAR* (22%). Consistent with the inferences from Panel A, most journals exhibit a decrease across the two decades in their share of management accounting articles because they published fewer (*AOS*, *JAL*, *JAR*, and *TAR*) or about the same number (*CAR*) of management accounting articles, even though the absolute number of management accounting articles increased. As previously mentioned, *JAE* published a larger number of management accounting articles over the past 10 years, increasing its market share of management accounting articles (6%) beyond that of *JAR* (5%), but below that of *TAR* (9%). It is noteworthy, however, that the combined share of management accounting articles of these three

[3]Two authors classified each article's specialty area (financial, managerial, auditing, tax, systems) and flagged articles for which they failed to reach a decision. All authors then reviewed and discussed the flagged articles to achieve consensus on their specialty area classifications.

Table 1. Sample statistics.

Panel A: Management accounting "market share"	1981–2000 Articles[b] (Pct.[c])	1981–1990[a] Articles[b] (Pct.[c])	1991–2000[a] Articles[b] (Pct.[c])
Accounting Organizations and Society (AOS)	254 (39.9)	132 (42.4)	122 (37.5)
Behavioral Research in Accounting (BRIA)	35 (23.5)	6 (37.5)	29 (21.8)
Contemporary Accounting Research (CAR)	45 (12.1)	22 (15.6)	23 (10.0)
Journal of Accounting & Economics (JAE)	38 (10.4)	4 (2.9)	34 (15.1)
Journal of Accounting Literature (JAL)	28 (21.1)	18 (22.5)	10 (18.9)
Journal of Accounting Research (JAR)	70 (13.7)	43 (14.4)	27 (12.7)
Journal of Management Accounting Research (JMAR)	117 (100.0)	21 (100.0)	96 (100.0)
Management Accounting Research (MAR)	197 (100.0)	14 (100.0)	183 (100.0)
Review of Accounting Studies (RAS)	21 (33.3)	–	21 (33.3)
The Accounting Review (TAR)	111 (16.2)	60 (16.9)	51 (15.4)
Total	916 (28.4)	320 (23.3)	596 (32.2)
Panel B: "Journal share" of management accounting	Articles[b] (Pct.[d])	Articles[b] (Pct.[d])	Articles[b] (Pct.[d])
Accounting Organizations and Society (AOS)	254 (27.8)	132 (41.2)	122 (20.5)
Behavioral Research in Accounting (BRIA)	35 (3.8)	6 (1.9)	29 (4.9)
Contemporary Accounting Research (CAR)	45 (4.9)	22 (6.9)	23 (3.9)
Journal of Accounting & Economics (JAE)	38 (4.1)	4 (1.2)	34 (5.7)
Journal of Accounting Literature (JAL)	28 (3.0)	18 (5.6)	10 (1.7)
Journal of Accounting Research (JAR)	70 (7.6)	43 (13.4)	27 (4.5)
Journal of Management Accounting Research (JMAR)	117 (12.8)	21 (6.6)	96 (16.1)
Management Accounting Research (MAR)	197 (21.5)	14 (4.4)	183 (30.7)
Review of Accounting Studies (RAS)	21 (2.3)	–	21 (3.5)
The Accounting Review (TAR)	111 (12.1)	60 (18.8)	51 (8.6)
Total	916 (100.0)	320 (100.0)	596 (100.0)

[a] *AOS*, *JAE*, *JAR*, and *TAR* were established prior to the beginning of our study period (1981). All the other journals do not cover our entire study period, with the first volume of *BRIA* starting in 1989, *CAR* in 1984, *JAL* in 1982, *JMAR* in 1989, *MAR* in 1990, and *RAS* in 1996.
[b] Number of management accounting articles in each journal in each period.
[c] Percentage of management accounting articles out of the total number of articles in each journal in each period.
[d] Number of management accounting articles in each journal as a percentage of the total number of management accounting articles in each period (column percentages).

journals in the most recent decade is still smaller than *AOS's* share alone (21%).

In summary, Table 1 indicates that the growth in the number of management accounting articles over time came primarily from the introduction of new journals (*BRIA*, *JMAR*, *MAR*, *RAS*), two of which were dedicated exclusively to management accounting (*JMAR* and *MAR*). In all other established journals, except *JAE*, however, the number and share of management accounting articles decreased over time.

2.2. Article Classification

Guided by prior research (Brown & Gardner, 1985a, 1985b; Brown et al., 1987; Shields, 1997), we classify each article by topic, method, and source discipline (using the same protocol as described in footnote 3). Our classification scheme is similar to that developed by Shields (1997).[4] Most topic, method, and source discipline categorizations are self-explanatory, but when they are not, we explain them below.

2.2.1. Topics

The starting point for classifying management accounting articles on the basis of research topic is the generally accepted distinction between *cost (accounting)* and *(management) control*, allowing for other specific topics, such as accounting information systems, to be classified separately as *other*.

[4] Shields (1997) also provided a summary discussion of the content of the surveyed articles, thus focusing on the studies' results and the settings in which the results were obtained in addition to examining topics, methods, and source disciplines.

An iterative process then further divides *cost* into cost allocation, other cost accounting topics, and the study of cost practices. *Cost allocation* articles involve studies focused on the allocation of overhead and joint costs, cost driver analysis, activity-based costing, and capacity costs. *Other cost accounting topics* include, for example, the study of cost variances and the use of cost information for decision making. Finally, studies of *cost practices* deal with the emergence, development, or decline of cost systems over time or in specific places (e.g., country-specific cost accounting systems).

We also classify *control* into further subcategories: budgeting, capital budgeting, performance measurement and evaluation, organizational control, and international control. *Budgeting* includes articles focused on budget target setting, budget participation, and budget-related (dysfunctional) behaviors. *Capital budgeting* articles examine investment decisions, including resource allocation decisions and issues of opportunity, relevant, and sunk costs. *Performance measurement and evaluation* involves the study of the various aspects of performance measurement and incentive system design (such as the performance measures used for incentives), as well as their consequences for organizational behavior and performance. The *organizational control* subcategory is the least specific and includes all articles broadly related to control systems in organizations not otherwise classifiable in the other control-specific categories, such as *international control*, which deals with management control systems related to cultural differences across countries and the effect of national culture on organizational control.

Finally, we classify *other* topics into seven subcategories: accounting information system (AIS), benchmarking, (total) quality management (TQM), just-in-time (JIT), research methods, strategic management, and transfer pricing. *Benchmarking*, *TQM*, *JIT*, *research methods*, and *transfer pricing* are topics that are easily distinguishable. However, many AIS and strategic management articles are somewhat similar to organizational control (discussed above). While both AIS and organizational control examine the organizational impacts of accounting systems, AIS is different in its focus on computer-based accounting information systems instead of management control systems more broadly. *Strategic management* examines the linkage between organization strategy and management control systems. Strategic management articles thus focus on the link between management control and strategy specifically, whereas *organizational control* examines management control in organizational contexts without specifically focusing on strategy.

Table 2, Panel A, shows that approximately 70% of the management accounting articles focus on control, 20% on cost, and 10% on a range of other topics. This topical distribution is quite stable over time, except for a slight shift in the most recent decade from control to cost topics, particularly those addressing cost allocations. The biggest changes, however, are in the control area, with a shift in topics from budgeting and organizational control to performance measurement and evaluation. Other topics showing increases in journal space are transfer pricing and studies of research methods.

2.2.2. Methods

We classify articles based on nine research methods: analytical, archival, case, experiment, field, framework, review, survey, and other/multiple (which includes simulation). *Analytical*, *archival*, *experiment*, *survey*, and *simulation* are research methods that are easily distinguishable. To distinguish field from case studies, we follow Birnberg et al. (1990). *Case studies* involve the investigation of contemporary (management accounting) phenomena including people, procedures, and structures within a single organization, whereas *field studies* involve the investigation of such phenomena in two or more organizations. In other words, the main distinction between case and field studies is that the latter investigate (management accounting) phenomena thoroughly across different organizations to derive deep insights, instead of just focusing on one organization. Field studies, however, differ from *archival studies* because they employ multiple information sources including archival data, interviews, surveys, and/or observation. *Framework studies* involve the development of new conceptual frameworks providing new perspectives. They are different from *review articles* because they draw from, and combine, multiple perspectives and information sources such as empirical facts, theoretical or practical observations, prior literature (in other areas or disciplines), supplemented with the authors' own synthesis and perspectives, whereas review articles mainly review and synthesize prior literature.

Table 2, Panel B, shows that across the 20-year period, analytical, survey, and experiments are the three dominant research methods. A number of articles also develop frameworks for organizing the literature. Analytical, survey, and experimental research methods, as well as frameworks, remain dominant over time, but their use in management accounting research is decreasing (particularly the use of experiments). The use of archival, case, and field research methods, on the other

Table 2. Article classifications.

Panel A: Management accounting research topics

Research topic[a]	1981–2000 Articles (Pct.[b])	1981–1990 Articles (Pct.[b])	1991–2000 Articles (Pct.[b])
Cost			
Cost allocation	140 (15.3)	36 (11.3)	104 (17.5)
Other cost accounting topics	21 (2.3)	14 (4.4)	7 (1.2)
Cost practices	15 (1.6)	4 (1.3)	11 (1.9)
Multiple	1 (0.1)	0 (0.0)	1 (0.2)
All cost	*177 (19.3)*	*54 (16.9)*	*123 (20.6)*
Control			
Budgeting	134 (14.6)	64 (20.0)	70 (11.7)
Capital budgeting	47 (5.1)	14 (4.4)	33 (5.5)
Performance measurement and evaluation	148 (16.2)	35 (10.9)	113 (19.0)
Organizational control	296 (32.3)	119 (37.2)	177 (29.7)
International control	16 (1.8)	4 (1.3)	12 (2.0)
Multiple	3 (0.3)	1 (0.3)	2 (0.3)
All control	*644 (70.3)*	*237 (74.1)*	*407 (68.3)*
Other			
AIS	7 (0.8)	4 (1.3)	3 (0.5)
Benchmarking	2 (0.2)	0 (0.0)	2 (0.3)
Quality (TQM)	9 (1.0)	0 (0.0)	9 (1.5)
Just-in-time (JIT)	7 (0.8)	0 (0.0)	7 (1.2)
Research methods	20 (2.2)	6 (1.9)	14 (2.4)
Strategic management	15 (1.6)	7 (2.2)	8 (1.3)
Transfer pricing	31 (3.4)	9 (2.8)	22 (3.7)
Multiple	4 (0.4)	3 (0.9)	1 (0.2)
All other	*95 (10.4)*	*29 (9.1)*	*66 (11.1)*
Total	916 (100.0)	320 (100.0)	596 (100.0)

Panel B: Management accounting research methods

Research method[c]	1981–2000 Articles (Pct.[d])	1981—1990 Articles (Pct.[d])	1991–2000 Articles (Pct.[d])
Analytical	169 (18.4)	62 (19.4)	107 (18.0)
Archival	78 (8.5)	10 (3.1)	68 (11.4)
Case	78 (8.5)	16 (5.0)	62 (10.4)
Experiment	116 (12.7)	50 (15.6)	66 (11.1)
Field	91 (9.9)	23 (7.2)	68 (11.4)
Frameworks	179 (19.5)	77 (24.1)	102 (17.1)
Review	49 (5.3)	24 (7.5)	25 (4.2)
Survey	149 (16.3)	55 (17.2)	94 (15.8)
Other	7 (0.7)	3 (0.9)	4 (0.6)
Total	916 (100.0)	320 (100.0)	596 (100.0)

Panel C: Management accounting source disciplines

Source discipline[e]	1981–2000 Articles (Pct.[f])	1981–1990 Articles (Pct.[f])	1991–2000 Articles (Pct.[f])
Economics			
Economics	360 (39.3)	122 (38.1)	238 (39.9)
Economics/Psychology	13 (1.4)	4 (1.3)	9 (1.5)
Economics/Sociology	20 (2.2)	5 (1.6)	15 (2.5)
Economics/POM	3 (0.3)	2 (0.6)	1 (0.2)
All Economics	396 (*43.2*)	133 (*41.6*)	263 (*44.1*)

Table 2. (Continued)

Psychology			
Psychology	121 (13.2)	58 (18.1)	63 (10.6)
Psychology/Economics	4 (0.4)	0 (0.0)	4 (0.7)
Psychology/Sociology	15 (1.6)	3 (0.9)	12 (2.0)
All Psychology	140 (*15.3*)	61 (*19.1*)	79 (*13.3*)
Sociology			
Sociology	320 (34.9)	101 (31.6)	219 (36.7)
Sociology/Economics	19 (2.1)	9 (2.8)	10 (1.7)
Sociology/Psychology	23 (2.5)	10 (3.1)	13 (2.2)
All Sociology	*362 (39.5)*	*120 (37.5)*	*242 (40.6)*
Other			
History	4 (0.4)	1 (0.3)	3 (0.5)
POM	12 (1.3)	5 (1.6)	7 (1.2)
POM/Economics	2 (0.2)	0 (0.0)	2 (0.3)
All Other	*18 (2.0)*	*6 (1.9)*	*12 (2.0)*
Total	916 (100.0)	320 (100.0)	596 (100.0)

[a]We classify each article into one of the 15 categories. In later analyses, we reduce these to the basic splits of *Cost*, *Control*, and *Other*. Eight articles include a combination of topics, which we list as "Multiple" under the category (*Cost*, *Control*, or *Other*) where the article has its main topic emphasis.
[b]Number of management accounting articles by research topic as a percentage of the total number of management accounting articles in each period (column percentages).
[c]We classify each article into one of eight research methods. Four articles, however, employ multimethod approaches, which we report as *Other* here and in the later analyses. Only three articles in our sample use the simulation method, which we also group in the *Other* category because of the low frequency.
[d]Number of management accounting articles by research method as a percentage of the total number of management accounting articles in each period (column percentages).
[e]Articles in the database draw from five source disciplines: economics, psychology, sociology, production and operations management (POM), and history. Some articles draw from multiple source disciplines, as shown. In later analyses, we reduce the listed categories to the basic splits on *Economics*, *Psychology*, *Sociology*, *Other* (History and POM), and *Multiple*.
[f]Number of management accounting articles by source discipline as a percentage of the total number of management accounting articles in each period (column percentages).

hand, is increasing. In fact, over the two decades, each of these methods has become as prominent as experiments in management accounting. We note, however, that the increase in case/field study articles is largely attributable to the introduction of *MAR* in 1990 (with 42% of its articles being case/field studies; see Table 3, Panel B). Overall, the relatively greater use of framework, survey, analytical, and experimental methods, and the relatively lower use of archival methods perhaps signify the difficulty of gaining access to existing data of relevance to management accounting research.

2.2.3. Source Disciplines

We distinguish five source disciplines: economics, psychology, sociology, production and operations management (POM), and history. If there are multiple source disciplines, we determine the primary source discipline based on the article's focus. *Economics* includes articles relying on industrial organization, microeconomics, and agency theory. *Psychology* covers social psychology, cognitive psychology, and organizational behavior. *Sociology* includes organizational theory (e.g., contingency theory, institutional theory) and sociology. *POM* encompasses articles that focus on linear programming and process control, mostly in manufacturing settings. Finally, *history* captures articles that study the emergence and development of management accounting systems and practices at a specific time and place.

Table 2, Panel C, shows that economics (43%) is the dominant source discipline on which management accounting research relies, followed by sociology (40%) and psychology (15%). However, sociology and psychology together are used more commonly as source disciplines in management accounting than economics. We note that the reliance on psychology as a source discipline in management accounting appears to have decreased over time, whereas the reliance on economics and sociology increased. The drop in the reliance on psychology as a source discipline perhaps is linked to the decrease in the use of the experimental method observed in Panel B, which is the most commonly used method in psychology-based management accounting studies (see Table 5).

2.3. Journal Characteristics

Table 3, Panel A, tabulates research topics by journal. It suggests that 77% of the management accounting articles in *AOS* and *MAR* focus on control topics. While control topics are also the focus of the majority of the management accounting articles in the other eight journals (64%), the latter have a greater proportion of their management accounting articles focused on cost accounting topics (25%) compared to *AOS* and *MAR* (14%). Also, more than half (54%) of the 644 control-focused articles were published in just two journals—*AOS* and *MAR*.

Table 3, Panel B, reveals that case, field, framework, and survey-based research methods dominate in *AOS* and *MAR*, whereas the other journals publish more analytical, archival, and experimental methods. Analytical research finds a home primarily in *JAR*, *TAR*, *CAR*, and *RAS*. More than 90% of the management accounting articles in *RAS* are analytical studies. Almost half of the survey-based articles appear in *AOS*, with the others finding a home primarily in *MAR*, *JMAR*, and to a lesser extent in *TAR*. Almost all case- and field-based articles are in *AOS* and *MAR*, and the rest in *JMAR*. *JAE*, *TAR*, and *JMAR* publish the majority of the archival management accounting articles. Experiments have the broadest appeal across journals, with relatively good placement in *TAR*, *AOS*, *JMAR*, *JAR*, and *BRIA*. Excluding *JAL* (which focuses on publishing review articles), *CAR*, *JAR*, and *RAS* are the least balanced in terms of publishing a variety of research methods, as analytical methods have a higher than 50% share of all the management accounting articles they publish. *JAE* also has a relatively focused method coverage, since about 90% of all the management accounting articles it publishes are either analytical or archival. While *AOS*, *BRIA*, *JMAR*, *MAR*, and *TAR* have different method foci, they generally cover a broad range of methods and show at least four methods with a higher than 10% representation among the management accounting articles they publish.

Table 3, Panel C, shows that sociology as a source discipline is dominant in *AOS* and *MAR*, whereas economics is dominant in the other journals. While *AOS*, *BRIA*, *JMAR*, *MAR*, and *TAR* have different disciplinary foci, they nonetheless have a relatively broad coverage of source disciplines. *CAR*, *JAE*, *JAR*, and *RAS*, on the other hand, appear to focus on economics-based research, which represents upwards of 70% of the management accounting articles they publish. As Table 5 reveals, this also appears to be related to research method.

2.4. Article Characteristics

Table 4 cross-tabulates topics with research methods. Panel A shows that most cost articles are analytical, followed by frameworks and archival research methods. Among the control articles, frameworks, surveys, analytical methods, and experiments are the most common methods. Panel B shows that about 80% of the surveys, experiments, and field-based methods are used to examine control topics. Analytical and archival methods are more balanced in terms of their employment for both cost and control topics.

Table 5 cross-tabulates research methods with source disciplines. Panel A shows that the analytical method dominates economics-based research (45%), by far, followed by the archival method as a distant second (17%). Frameworks, survey, field, and case methods dominate sociology-based research (92% combined). Experiments dominate psychology-based management accounting research (53%), followed by the survey method (29%). Cross-tabulating in the other direction, Panel B shows that nearly all analytical research (96%) and the vast majority of archival research (80%) has an economics-based impetus, whereas about 70% of the articles that use case or field methods do so to address sociology-based research questions.

Finally, Table 6 cross-tabulates source disciplines with topics. Panel A suggests that cost is dominated by economic thought, whereas control, which draws mostly on sociology, also draws on economics and psychology. In the other direction, Panel B shows that more than, or nearly, 80% of the articles that are psychology- or sociology-based deal with control topics. Articles that have an economics-based orientation, however, also appear to be applied more frequently to address cost accounting topics. It is less probable though to see psychology- and sociology-based theories applied to cost accounting topics (about 10%).

2.5. Authoring Characteristics

Table 7 examines the authoring characteristics of our sample management accounting articles. Panel A shows that 605 of the 898 authors (67%) in our sample published one article only. Panel B shows that authors with more than one article tend to publish in multiple journals, thus indicating that there is no particular journal concentration. Panels C and D show a similar pattern with respect to topics and methods; that is, authors with more than one article tend to address different topics employing different methods. Panel E, however, indicates that authors with more than one article tend to be bound more by discipline, consistent with the observations in

Table 3. Journal characteristics.

Panel A: Management accounting research topics by journal

	Cost	Control	Other	Total
AOS	13[a] (5.1)[b]	217 (85.4)	24 (9.4)	254 (100.0)
BRIA	0 (0.0)	27 (77.1)	8 (22.9)	35 (100.0)
CAR	11 (24.4)	30 (66.7)	4 (8.9)	45 (100.0)
JAE	5 (13.2)	30 (78.9)	3 (7.9)	38 (100.0)
JAL	6 (21.4)	18 (64.3)	4 (14.3)	28 (100.0)
JAR	17 (24.3)	48 (68.6)	5 (7.1)	70 (100.0)
JMAR	36 (30.8)	61 (52.1)	20 (17.1)	117 (100.0)
MAR	49 (24.9)	130 (66.0)	18 (9.1)	197 (100.0)
RAS	5 (23.8)	11 (52.4)	5 (23.8)	21 (100.0)
TAR	35 (31.5)	72 (64.9)	4 (3.6)	111 (100.0)
AOS and *MAR*	62 (13.7)	347 (76.9)	42 (9.3)	451 (100.0)
Other eight journals	115 (24.7)	297 (63.9)	53 (11.4)	465 (100.0)
Total	177 (19.3)	644 (70.3)	95 (10.4)	916 (100.0)

Panel B: Management accounting research methods by journal

	Analytical	Archival	Case	Experiment	Field	Framework	Review	Survey	Other	Total
AOS	0 (0.0)[c]	6 (2.4)	18 (7.1)	26 (10.2)	46 (18.1)	82 (32.3)	7 (2.8)	67 (26.4)	2 (0.8)	254 (100.0)
BRIA	0 (0.0)	0 (0.0)	1 (2.9)	13 (37.1)	0 (0.0)	10 (28.6)	5 (14.3)	6 (17.1)	0 (0.0)	35 (100.0)
CAR	29 (64.4)	3 (6.7)	0 (0.0)	7 (15.6)	1 (2.2)	0 (0.0)	1 (2.2)	4 (8.9)	0 (0.0)	45 (100.0)
JAE	15 (39.5)	19 (50.0)	1 (2.6)	1 (2.6)	0 (0.0)	0 (0.0)	1 (2.6)	1 (2.6)	0 (0.0)	38 (100.0)
JAL	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	27 (96.4)	0 (0.0)	1 (3.6)	28 (100.0)
JAR	38 (54.3)	8 (11.4)	0 (0.0)	16 (22.9)	1 (1.4)	1 (1.4)	1 (1.4)	5 (7.1)	0 (0.0)	70 (100.0)
JMAR	14 (12.0)	15 (12.8)	4 (3.4)	19 (16.2)	11 (9.4)	28 (23.9)	3 (2.6)	22 (18.8)	1 (0.9)	117 (100.0)
MAR	17 (8.6)	7 (3.6)	52 (26.4)	7 (3.6)	31 (15.7)	49 (24.9)	4 (2.0)	29 (14.7)	1 (0.5)	197 (100.0)
RAS	19 (90.5)	2 (9.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	21 (100.0)
TAR	37 (33.3)	18 (16.2)	2 (1.8)	27 (24.3)	1 (0.9)	9 (8.1)	0 (0.0)	15 (13.5)	2 (1.8)	111 (100.0)
AOS and *MAR*	17 (3.8)	13 (2.9)	70 (15.5)	33 (7.3)	77 (17.1)	131 (29.0)	11 (2.4)	96 (21.3)	3 (0.7)	451 (100.0)
Other eight journals	152 (32.7)	65 (14.0)	8 (1.7)	83 (17.8)	14 (3.0)	48 (10.3)	38 (8.2)	53 (11.4)	4 (0.8)	465 (100.0)
Total	169 (18.4)	78 (8.5)	78 (8.5)	116 (12.7)	91 (9.9)	179 (19.5)	49 (5.3)	149 (16.3)	7 (0.7)	916 (100.0)

Panel C: Management accounting source disciplines by journal

	Economics	Psychology	Sociology	Other	Multiple	Total
AOS	32 (12.6)[d]	37 (14.6)	151 (59.4)	0 (0.0)	34 (13.4)	254 (100.0)
BRIA	3 (8.6)	12 (34.3)	10 (28.6)	0 (0.0)	10 (28.6)	35 (100.0)
CAR	34 (75.6)	6 (13.3)	2 (4.4)	1 (2.2)	2 (4.4)	45 (100.0)
JAE	36 (94.7)	0 (0.0)	0 (0.0)	0 (0.0)	2 (5.3)	38 (100.0)
JAL	15 (53.6)	0 (0.0)	5 (17.9)	0 (0.0)	8 (28.6)	28 (100.0)
JAR	50 (71.4)	15 (21.4)	2 (2.9)	1 (1.4)	2 (2.9)	70 (100.0)
JMAR	43 (36.8)	19 (16.2)	27 (23.1)	10 (8.5)	18 (15.4)	117 (100.0)
MAR	59 (29.9)	11 (5.6)	111 (56.3)	3 (1.5)	13 (6.6)	197 (100.0)
RAS	21 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	21 (100.0)
TAR	67 (60.4)	21 (18.9)	12 (10.8)	1 (0.9)	10 (9.0)	111 (100.0)
AOS and *MAR*	91 (20.2)	48 (10.6)	262 (58.1)	3 (0.7)	47 (10.4)	451 (100.0)
Other eight journals	269 (57.8)	73 (15.7)	58 (12.5)	13 (2.8)	52 (11.2)	465 (100.0)
Total	360 (39.3)	121 (13.2)	320 (34.9)	16 (1.7)	99 (10.8)	916 (100.0)

[a]Number of articles.
[b]Row percentages, thus indicating the coverage of topics by journal.
[c]Row percentages, thus indicating the coverage of research methods by journal.
[d]Row percentages, thus indicating the coverage of source disciplines by journal.

Table 4. Article characteristics: cross-tabulation of methods and topics.

	Cost	Control	Other	Total
Panel A: Management accounting research methods by topic				
Analytical	56[a] (31.6)[b]	96 (14.9)	17 (17.9)	169 (18.4)
Archival	27 (15.3)	49 (7.6)	2 (2.1)	78 (8.5)
Case	15 (8.5)	51 (7.9)	12 (12.6)	78 (8.5)
Experiment	15 (8.5)	92 (14.3)	9 (9.5)	116 (12.7)
Field	12 (6.8)	71 (11.0)	8 (8.4)	91 (9.9)
Frameworks	29 (16.4)	127 (19.7)	23 (24.2)	179 (19.5)
Review	6 (3.4)	32 (5.0)	11 (11.6)	49 (5.3)
Survey	14 (7.9)	123 (19.1)	12 (12.6)	149 (16.3)
Other	3 (1.7)	3 (0.5)	1 (1.1)	7 (0.7)
Total	177 (100.0)	644 (100.0)	95 (100.0)	916 (100.0)
Panel B: Management accounting research topics by method				
	Cost	Control	Other	Total
Analytical	56 (33.1)[c]	96 (56.8)	17 (10.1)	169 (100.0)
Archival	27 (34.6)	49 (62.8)	2 (2.6)	78 (100.0)
Case	15 (19.2)	51 (65.4)	12 (15.4)	78 (100.0)
Experiment	15 (12.9)	92 (79.3)	9 (7.8)	116 (100.0)
Field	12 (13.2)	71 (78.0)	8 (8.8)	91 (100.0)
Frameworks	29 (16.2)	127 (70.9)	23 (12.8)	179 (100.0)
Review	6 (12.2)	32 (65.3)	11 (22.4)	49 (100.0)
Survey	14 (9.4)	123 (82.6)	12 (8.1)	149 (100.0)
Other	3 (42.9)	3 (42.9)	1 (14.2)	7 (100.0)
Total	177 (19.3)	644 (70.3)	95 (10.4)	916 (100.0)

[a]Number of articles.
[b]Column percentages, thus indicating the coverage of research methods by topic.
[c]Row percentages, thus indicating the coverage of research topics by method.

Merchant et al. (2003). Finally, Panel F shows that most articles are single-authored (42%) or co-authored by two or three people (39% and 16%, respectively). Co-authored articles by more than three people are rare.

3. Analyzing the Community

In this section, we use citation analyses and several social network measures to analyze the links between articles in management accounting research and, hence, between the topics, methods, and source disciplines these articles encompass, as well as between the scholars whose outputs are these journal articles.

3.1. Citation Analysis

Beginning in the mid-1980s, Brown and colleagues published a number of citation-based studies looking at the relative contributions of individuals, as well as the institutions where they are trained and employed, in accounting (e.g., Brown & Gardner, 1985a, 1985b; Brown et al., 1987). These studies typically rely on the *SSCI* to count citations from articles in a limited number of indexed journals across a variety of literatures. Given our focus on the field of management accounting, we count citations within our database, including citations from articles in *BRIA*, *CAR*, *JMAR*, *MAR*, and *RAS*, which SSCI does not index.[5] Thus, although our citation approach does not extend into other literatures, it provides better coverage of the management accounting literature than prior work (e.g., Mensah et al., 2004).

With 38,863 total citations in our sample of 916 articles, a manual count of citations is not feasible. Accordingly, we develop computer programs to analyze citations to articles, and their authors, within our

[5]SSCI only recently started indexing *CAR*, beginning with the first issue of 2002 (Vol. 19).

Table 5. Article characteristics: cross-tabulation of methods and source disciplines.

Panel A: Management accounting research methods by source discipline

	Economics	Psychology	Sociology	Other	Multiple	Total
Analytical	163[a] (45.3)[b]	1 (0.8)	1 (0.3)	2 (12.5)	2 (2.0)	169 (18.4)
Archival	62 (17.2)	6 (5.0)	3 (0.9)	3 (18.8)	4 (4.0)	78 (8.5)
Case	11 (3.1)	2 (1.7)	56 (17.5)	0 (0.0)	9 (9.1)	78 (8.5)
Experiment	26 (7.2)	64 (52.9)	10 (3.1)	0 (0.0)	16 (16.2)	116 (12.7)
Field	13 (3.6)	5 (4.1)	65 (20.3)	1 (6.3)	7 (7.1)	91 (9.9)
Frameworks	40 (11.1)	6 (5.0)	103 (32.2)	8 (50.0)	22 (22.2)	179 (19.5)
Review	22 (6.1)	2 (1.7)	10 (3.1)	1 (6.3)	14 (14.1)	49 (5.3)
Survey	19 (5.3)	35 (28.9)	70 (21.9)	1 (6.3)	24 (24.2)	149 (16.3)
Other	4 (0.11)	0 (0.0)	2 (0.6)	0 (0.0)	1 (1.0)	7 (0.7)
Total	360 (100.0)	121 (100.0)	320 (100.0)	16 (100.0)	99 (100.0)	916 (100.0)

Panel B: Management accounting source disciplines by method

	Economics	Psychology	Sociology	Other	Multiple	Total
Analytical	163 (96.4)[c]	1 (0.6)	1 (0.6)	2 (1.2)	2 (1.2)	169 (100.0)
Archival	62 (79.5)	6 (7.7)	3 (3.8)	3 (3.8)	4 (5.1)	78 (100.0)
Case	11 (14.1)	2 (2.6)	56 (71.8)	0 (0.0)	9 (11.5)	78 (100.0)
Experiment	26 (22.4)	64 (55.2)	10 (8.6)	0 (0.0)	16 (13.8)	116 (100.0)
Field	13 (14.3)	5 (5.5)	65 (71.4)	1 (1.1)	7 (7.7)	91 (100.0)
Frameworks	40 (22.3)	6 (3.4)	103 (57.5)	8 (4.5)	22 (12.3)	179 (100.0)
Review	22 (44.9)	2 (4.1)	10 (20.4)	1 (2.0)	14 (28.6)	49 (100.0)
Survey	19 (12.8)	35 (23.5)	70 (47.0)	1 (0.7)	24 (16.1)	149 (100.0)
Other	4 (57.1)	0 (0.0)	2 (28.6)	0 (0.0)	1 (14.3)	7 (100.0)
Total	360 (39.3)	121 (13.2)	320 (34.9)	16 (1.7)	99 (10.8)	916 (100.0)

[a]Number of articles.
[b]Column percentages, thus indicating the coverage of research methods by source discipline.
[c]Row percentages, thus indicating the coverage of source disciplines by method.

database.[6] Merged with the descriptive data reported above, this enables us to examine the links between, and influence of, individuals, articles, topics, research methods, and source disciplines.

Table 8 examines the pattern of citations based on topics, methods, and source disciplines. Panel A takes each article's topic classification and counts the citations for each of these articles to other articles also using their topic classification. Panel A shows that the control literature draws heavily on its own stream of research, with 84% of the citations going to other control-focused articles. Cost draws more than half of its citations from the cost literature (56%), but also draws heavily (39%) on the control literature. Articles classified as "other" also draw most of their work from the control literature (56%).

Panel B examines research methods, showing that most articles draw on other streams of literature, except analytical articles with 78% of their citations to other analytical articles. Thinking of research as benefiting from multiple methods, it seems reasonable to expect that archival, experimental, survey, and other research could benefit from drawing on analytical models to derive testable hypotheses. However, the data do not support this expectation, showing that archival articles cite analytical studies only 14% of the time, and experimental and survey articles cite analytical work even less. Although these percentages appear low, they are large in comparison to the extent that analytical articles cite archival, experimental, and survey articles (6%, 1%, and 3%, respectively).

[6]This measure is subject to error. Sources of error include incorrect spelling and bad attribution (e.g., wrong year, journal). In a few cases, authors changed names (e.g., by marriage) or used different name forms (e.g., Smith-Jones vs. Smith Jones). To minimize such errors, we examined and corrected all 898 author names in our database, with particular attention paid to names with similar spelling. Catching errors in citations is more difficult, but we created a list of all author-year-journal citations and also examined these for errors.

Table 6. Article characteristics: cross-tabulation of source disciplines and topics.

Panel A: Management accounting source disciplines by topic				
	Cost	Control	Other	Total
Economics	121[a] (68.4)[b]	208 (32.3)	31 (32.6)	360 (39.3)
Psychology	13 (7.3)	103 (16.0)	5 (5.3)	121 (13.2)
Sociology	31 (17.5)	249 (38.7)	40 (42.1)	320 (34.9)
Other	5 (2.8)	8 (1.2)	3 (3.2)	16 (1.7)
Multiple	7 (4.0)	76 (11.8)	16 (16.8)	99 (10.8)
Total	177 (100.0)	644 (100.0)	95 (100.0)	916 (100.0)
Panel B: Management accounting topics by source discipline				
	Cost	Control	Other	Total
Economics	121 (33.6)[c]	208 (57.8)	31 (8.6)	360 (100.0)
Psychology	13 (10.7)	103 (85.1)	5 (4.1)	121 (100.0)
Sociology	31 (9.7)	249 (77.8)	40 (12.5)	320 (100.0)
Other	5 (31.3)	8 (50.0)	3 (18.8)	16 (100.0)
Multiple	7 (7.1)	76 (76.8)	16 (16.2)	99 (100.0)
Total	177 (19.3)	644 (70.3)	95 (10.4)	916 (100.0)

[a]Number of articles.
[b]Column percentages, thus indicating the coverage of source disciplines by topic.
[c]Row percentages, thus indicating the coverage of topics by source discipline.

Does this suggest that empirical work finds support for the analytical models, such that analytical models need no revision? Or does it suggest that these methods do not cross-fertilize? Framework articles, however, appear to have a relatively broad impact on not only studies using other methods, particularly case, field, and other framework articles, but also archival and survey studies. The data also reveal a tendency of experimental and survey research drawing on studies using like methods, in the order of 41% and 50%, respectively, but these levels of method-based self-citations are much lower than is the case for analytical research (78%). Moreover, the tendency to draw on studies that use like methods is expected because studies cite prior work for various research design choices, such as regarding survey scales developed in prior studies.

Examining source disciplines in Panel C, the economics-based literature draws heavily on itself (76%), with few citations to psychology (6%) and sociology (12%). Articles based on psychology draw quite evenly from economics, psychology, and sociology. Sociology, like economics, tends to draw heavily on its own (65%). Also noteworthy is that sociology draws to a greater extent on economics (16%) than on psychology (8%). Except for psychology, it appears that the paradigms are fairly focused, drawing relatively sparsely on the insights from other disciplines (Merchant et al., 2003).

We now turn to using citation-based measures to describe networks of management accounting scholars; that is, networks of individuals whose outputs are these journal articles (among other outputs). As a preface to the network analyses, we note that our data in Table 3 above suggests a difference between *AOS* and *MAR* and the other eight journals in terms of management accounting methods and source disciplines.[7] A closer investigation of authoring characteristics and citation patterns suggests that both groups of journals represent distinct networks of management accounting researchers. First, of the 293 authors in our database with at least two articles (Table 7, Panel A), only 101 (34%) published in both

[7]This finding is consistent with a study by Selto & Widener (2004) using a database consisting of eight overlapping journals (*AOS*, *CAR*, *JAE*, *JAR*, *JMAR*, *MAR*, *RAS*, and *TAR*) in a 5-year period (1996–2000), although the article classifications themselves, as well as the approach they use to classify them, are different from those in our study. This finding is also broadly consistent with Lowe & Locke (2005) where *AOS* and *MAR* receives higher survey-based journal quality scores as "interpretive/critical" journals than as "functionalist/positivist" journals. For *JAE*, *JAR*, *JMAR*, and *TAR*, the opposite is true. *BRIA*, *CAR*, *RAS*, and *JAL* were scored by relatively few of the surveyed academics (less than 30), making inferences about them less reliable (Lowe & Locke, 2005).

Table 7. Authoring characteristics.

Panel A: Articles

Number of articles	Authors	Pct.
1	605	67.4
2	135	15.0
3	60	6.7
4	41	4.6
5	14	1.6
6	15	1.7
7	6	0.7
8	6	0.7
9	4	0.4
10+	12	1.3
Total	898	100.0

Panel B: Journals

	Number of articles published						
Journals	1	2	3	4	5	6+	Sum
1	605	50	14	3	2	2	676
2		85	29	18	4	6	142
3			17	15	6	13	51
4				5	2	13	20
5					0	6	6
6						3	3
	605	135	60	41	14	43	898

Panel C: Topics

	Number of articles published						
Topics	1	2	3	4	5	6+	Sum
1	605	50	10	2	1	2	670
2		85	30	16	5	7	143
3			20	16	5	11	52
4				7	3	13	23
5					0	6	6
6						2	2
7						1	1
8						1	1
	605	135	60	41	14	43	898

Panel D: Methods

	Number of articles published						
Methods	1	2	3	4	5	6+	Sum
1	605	74	21	11	2	5	718
2		61	31	16	5	4	117
3			8	12	5	15	40
4				2	2	15	19
5					0	3	3
6						1	1
	605	135	60	41	14	43	898

Table 7. (Continued)

Panel E: Source Disciplines

	Number of Articles Published						
Disciplines	1	2	3	4	5	6+	Sum
1	605	89	35	18	4	11	762
2		46	18	14	4	19	101
3			7	8	4	6	25
4				1	2	7	10
	605	135	60	41	14	43	898

Panel F: Authors

Number of authors	Articles	Pct.
9	1	0.1
6	4	0.4
5	3	0.3
4	18	2.0
3	149	16.3
2	357	39.0
1	384	41.9
Total	916	100.0

groups of journals. In other words, the majority of scholars with at least two articles publish in either, but not both, groups of journals.[8] Second, the citation patterns in Table 9 suggest that authors publishing in either group of journals tend to cite articles within the same group of journals more than articles in the other group.

Selto & Widener (2004) also find evidence of journal specialization by topic, theory, method, and data sources, particularly between *AOS* and *MAR* on one hand, and journals edited in North America on the other hand. Brown et al. (1987) found that articles in *AOS* focus on different topics, use different methods, and draw on different source disciplines compared to articles in *JAR* and *TAR*. Lukka & Kasanen (1996) focus on geography (US vs. non-US) and find that journals edited in the US (*JAE*, *JAR*, and *TAR*) and outside the US (*Abacus*, *Accounting and Business Research*, and *AOS*) employ different research methods. Specifically, 80% of the articles in US-edited journals use statistical analyses, whereas many articles published in non-US-edited journals employ case and other research methods (only 43% use statistical analyses). Finally, Bricker (1988, p. 130) notes that

[8]Of the 57 authors with five or more articles (Table 7, Panel A), 21 (37%) still publish in only either of the two groups of journals.

Table 8. Article citation patterns.

Panel A: By topic

Citations *From* ↓ *To* →	Cost	Control	Other	Total
Cost	280[a] (55.6)[b]	196 (38.9)	27 (5.4)	503 (100.0)
Control	226 (6.8)	2,788 (84.0)	305 (9.2)	3,319 (100.0)
Other	57 (12.2)	261 (55.6)	151 (32.2)	469 (100.0)

Panel B: By research method

Citations *From* ↓ *To* →	Analytical	Archival	Case	Experiment	Field	Framework	Review	Survey	Other	Total
Analytical	320[c] (77.5)[d]	24 (5.8)	2 (0.5)	5 (1.2)	8 (1.9)	13 (3.1)	25 (6.1)	12 (2.9)	4 (1.0)	413 (100.0)
Archival	29 (14.2)	70 (34.3)	8 (3.9)	8 (3.9)	9 (4.4)	28 (13.7)	12 (5.9)	39 (19.1)	1 (0.5)	204 (100.0)
Case	4 (1.0)	4 (1.0)	55 (14.0)	5 (1.3)	65 (16.5)	186 (47.2)	31 (7.9)	43 (10.9)	1 (0.3)	394 (100.0)
Experiment	56 (10.6)	9 (1.7)	6 (1.1)	215 (40.9)	25 (4.8)	41 (7.8)	71 (13.5)	103 (19.6)	0 (0.0)	526 (100.0)
Field	9 (1.8)	13 (2.6)	38 (7.5)	19 (3.7)	90 (17.7)	202 (39.8)	17 (3.3)	120 (23.6)	0 (0.0)	508 (100.0)
Frameworks	40 (4.9)	35 (4.3)	70 (8.6)	43 (5.3)	105 (12.9)	362 (44.3)	51 (6.2)	106 (13.0)	5 (0.6)	817 (100.0)
Review	45 (10.0)	12 (2.7)	7 (1.6)	55 (12.3)	37 (8.3)	82 (18.3)	64 (14.3)	145 (32.4)	0 (0.0)	447 (100.0)
Survey	48 (5.1)	25 (2.6)	34 (3.6)	93 (9.8)	97 (10.3)	127 (13.4)	51 (5.4)	471 (49.8)	0 (0.0)	946 (100.0)
Other	4 (11.1)	2 (5.6)	1 (2.8)	0 (0.0)	4 (11.1)	6 (16.7)	1 (2.8)	18 (50.0)	0 (0.0)	36 (100.0)

Panel C: By source discipline

Citations *From* ↓ *To* →	Economics	Psychology	Sociology	Other	Multiple	Total
Economics	752[e] (76.1)[f]	55 (5.6)	114 (11.5)	4 (0.4)	63 (6.4)	988 (100.0)
Psychology	102 (21.2)	166 (34.5)	135 (28.1)	1 (0.2)	77 (16.0)	481 (100.0)
Sociology	321 (16.4)	158 (8.1)	1,284 (65.5)	20 (1.0)	178 (9.1)	1,961 (100.0)
Other	17 (48.6)	1 (2.9)	11 (31.4)	2 (5.7)	4 (11.4)	35 (100.0)
Multiple	207 (25.1)	147 (17.8)	344 (41.6)	3 (0.4)	125 (15.1)	826 (100.0)

[a]Number of citations.
[b]Row percentages, thus indicating the percentage citations from each topic area into itself as well as the other topic areas.
[c]Number of citations.
[d]Row percentages, thus indicating the percentage citations from each research method into itself as well as the other research methods.
[e]Number of citations.
[f]Row percentages, thus indicating the percentage citations from each source discipline into itself as well as the other source disciplines.

"journals such as *Abacus* and *Accounting, Organizations and Society*, both published outside the United States, appear to favour historical studies and articles that rely on early generations of accounting and nonaccounting literature."

Thus, findings in the prior literature as well as empirical observations in the earlier sections of this chapter suggest that our subsequent analyses would be incomplete without considering the authors publishing in *AOS* and *MAR* and those publishing in the other eight journals as separate subnetworks.

3.2. Social Network Analysis

In this section, we extend our analysis to create a citation matrix. It is a proxy for communication among authors.[9] Specifically, we create an 898-by-898 matrix of authors where each cell represents the number of citations by one author to another author. Rows (columns) indicate citing (cited) authors, with self-citations on the diagonal. Thus, cell values provide a measure of the strength of association between two individuals. The citation matrix is nonsymmetric since, for example, Smith may cite Jones whereas

[9]Other forms of communication exist, including, but not limited to conference presentations, workshops, and published working papers such as through the *Social Science Research Network* (Brown, 2005; Brown & Laksmana, 2004).

Table 9. Percentage breakdown of citations across journal subnetworks.

Citations *From* ↓ *To* →	*AOS* and *MAR*	Other eight journals	Total
AOS and *MAR*	71.4[a]	28.6	100.0
Other eight Journals	38.6	61.4	100.0

[a]Row percentages.

Jones does not cite Smith. We use transformed matrices to compute several social network measures: centrality, size, density, and inclusiveness (Monge & Contractor, 2003).[10] We reiterate that citations in this matrix represent citations within our database.[11]

3.2.1. Network Centrality

Centrality is the degree to which an individual has a predominant influence in a given network. We measure centrality by degree, or the number of direct links an individual has with others in the network. Degree consists of both *indegree* (the number of direct links *to* an individual) and *outdegree* (the number of direct links *from* an individual). To measure centrality, we dichotomize the citation matrix, where 0 indicates no citations between two individuals, and 1 indicates one or more citations. This codification thus shows that there is a relationship between two authors; it does not indicate the strength of the relationship.

Indegree for a particular author, then, is the number of individuals in the network who cite the author, and thus, is a measure of influence of the cited author.[12] Table 10 shows the centrality of the three networks that we consider, listing the 25 authors with the highest indegree in each network in descending order. Consistent with our earlier observations, we find that only four of the 25 authors in the overall network are also on both the lists of 25 authors for the two subnetworks (i.e., P. Brownell, K. A. Merchant, M. D. Shields, and S. M. Young).

Outdegree is the extent to which an individual has cited others in the network, and thus, is a measure of the degree to which one builds on the work of others in the network. For example, R. S. Kaplan has been cited by 179 of the 898 authors of management accounting (20%),[13] whereas he has cited only 32 authors in the overall network. Comparing indegree and outdegree, one can assess the symmetry of an author's influence. As a word of caution, however, a low outdegree might also result from several high-influence articles early in our sample period (such as R. S. Kaplan's 1984 article in *TAR*). Aside from this possibility, a high indegree can be interpreted as proxy of an author's ''prestige'' in the network. Wasserman & Faust (1994) define a prestigious actor (i.e., author) as ''one who is the object of extensive ties […] focusing solely on the actor as a recipient'' (p. 174). In our context, such ties are citations between authors

[10]We adjust the citation matrix for co-author citations. For example, a citation from Brownell & Merchant (1990) to another article by P. Brownell would be counted as a citation from K. A. Merchant to P. Brownell. But since P. Brownell is a co-author, it is not a citation from K. A. Merchant to P. Brownell as much as it is a citation from K. A. Merchant's co-author (P. Brownell) to his own work. Therefore, we adjust the Merchant-to-Brownell citation count for such co-author citations.

[11]Note that an author may cite other works by an individual, which are outside of the 10 journals in this study, including, among others, books, working papers, and articles in other journals. Our measure of the strength of association among authors may be biased downward, mostly affecting individuals publishing outside of the 10 accounting journals in our sample. However, to the extent that the journals in our sample represent adequate coverage of the outlets for managerial accounting research, the bias in this measure should be limited.

[12]Indegree is the number of *individuals* in a network who cite an author; it is different from citations that count the number of *articles* that cite an author. Indegree can be larger than citation count. For example, assume that only one article cites an author; then the author's citation count is 1. If that article has four co-authors, however, the author's indegree is 4. Similarly, indegree can also be smaller than citation count. Because citation counts include all citations to an author, they can include multiple citations from different articles (co)authored by the same individual. Indegree, in contrast, counts each individual that cites an author only once.

[13]R. S. Kaplan also appears in Panel C of Table 10, which focuses on the subnetwork of eight journals that are edited in North America, with an indegree of 60. Some may be tempted to subtract 60 from R. S. Kaplan's overall indegree of 179 (in Panel A) to conclude that his indegree in Panel B, which focuses on the subnetwork around *AOS* and *MAR*, should be 119, which would make him first in that subnetwork. However, R. S. Kaplan does not appear in Panel B. This is not an error. R. S. Kaplan published two articles in *AOS* and *MAR* from 1981 to 2000, and has an indegree of 25 in that subnetwork; that is, he has been cited by 25 different authors in the *AOS* and *MAR* subnetwork. In the subnetwork of eight journals that are edited in North America, Kaplan has been cited by 60 different authors in that subnetwork. Only when combining subnetworks, citations across both are counted, resulting in a total indegree of 179.

Table 10. Network centrality[a].

Panel A: All journals		
Author	Indegree	Outdegree
Kaplan R. S.	179	32
Young S. M.	156	114
Baiman S.	148	28
Brownell P.	130	22
Merchant K. A.	128	26
Shields M. D.	125	130
Govindarajan V.	121	6
Banker R. D.	105	57
Hopwood A. G.	100	27
Chow C. W.	92	86
Simons R.	92	20
Birnberg J. G.	90	57
Hirst M. K.	87	61
Chenhall R. H.	84	49
Foster G.	82	21
Datar S. M.	81	13
Cooper D. J.	75	26
Larcker D. F.	74	65
Gupta M.	72	26
Covaleski M. A.	69	56
Scapens R. W.	69	44
Gupta A. K.	69	3
Evans J. H.	68	21
Gordon L. A.	68	18
Hopper T.	66	50

Panel B: AOS and MAR		
Author	Indegree	Outdegree
Hopwood A. G.	84	25
Cooper D. J.	68	24
Govindarajan V.	68	1
Hopper T.	59	43
Berry A. J.	57	10
Merchant K. A.	55	17
Simons R.	51	8
Birnberg J. G.	50	5
Scapens R. W.	46	41
Gupta A. K.	45	1
Gordon L. A.	43	6
Young S. M.	41	25
Covaleski M. A.	40	39
Shields M. D.	39	42
Dent J. F.	39	25
Dirsmith m. W.	39	14
Roberts J.	39	10
Macintosh N. B.	38	30
Otley D. T.	38	30
Narayanan V. K.	38	2
Chenhall R. H.	37	31
Brownell P.	37	13
Harrison G. L.	33	25
Turopolec L.	33	3
Capps T.	33	2
Ferguson P.	33	2
Lowe E. A.	33	2

Panel C: Other eight journals edited in North America		
Author	Indegree	Outdegree
Baiman S.	106	15
Banker R. D.	85	44
Young S. M.	83	70
Datar S. m.	70	13
Brownell P.	66	2
Shields M. D.	62	71
Chow C. W.	61	50
Kaplan R. S.	60	19
Foster G.	59	14
Evans J. H.	57	20
Gupta M.	54	25
Waller W. S.	54	7
Merchant K. A.	48	7
Reichelstein S.	44	32
Larcker D. F.	42	51
Demski J. S.	42	40
Selto F. H.	39	29
Hirst M. K.	38	27
Penno M.	37	17
Rajan M. V.	35	26
Potter G.	35	22
Noreen E. W.	35	11
Anderson S. W.	34	16
Dye R. A.	34	8
Melumad N.	33	22
Kekre S.	33	1

[a]Twenty-five authors with highest Indegree listed in descending order. Indegree is the number of individuals in the network who cite the author. Outdegree is the number of individuals in the network cited by the author.

with the focus being on citations received from other authors; thus, indegree.

3.2.2. Other Network Characteristics

Table 11 reports measures of network size, density, and inclusiveness by journal for the overall network and both subnetworks.

Network size is the number of authors in a given network, which can be created for journals, but also for topics or across time (e.g., two separate networks for each decade of our 20-year period). Network size in our study ranges from 32 (*RAS*) to 898 authors (overall).

Network density is the number of directional links between authors [k] divided by the number of possible links [$n(n-1)$], or $k/[n(n-1)]$, where n is the number of authors, or network size (Scott, 2000). The higher the

Table 11. Journal network statistics.

Journal	Size		Density		Inclusiveness		
	Authors	Rank	%	Rank	Number[a]	%	Rank
AOS	283	1	2.35	2	267	94.3	1
BRIA	51	8	0.47	10	14	27.5	10
CAR	74	6	0.76	9	23	31.1	9
JAE	60	7	2.34	3	37	61.7	6
JAL	48	9	1.91	4	25	52.1	7
JAR	79	5	3.25	1	52	65.8	4
JMAR	185	3	1.49	5	120	64.9	5
MAR	263	2	0.89	8	189	71.9	2
RAS	32	10	1.41	6	11	34.4	8
TAR	166	4	0.93	7	119	71.7	3
AOS and *MAR*	498	2	1.31	2	444	89.2	1
Other eight journals	501	1	1.48	1	433	86.4	2
Overall	898	–	1.13	–	815	90.8	–

[a]Number of authors in a network minus the number of isolated authors.

network density, the greater the number of connections among authors (Kilduff & Tsai, 2003). Table 11 shows that the highest density is for *JAR*, followed by *AOS* and *JAE*. The lowest densities are for *CAR* and *BRIA*. The subnetwork of eight journals that are edited in North America has a higher density than the subnetwork around *AOS* and *MAR*. Compared to these two subnetworks, the overall network has a lower density, suggesting relatively few links across the two subnetworks. This provides additional evidence of two somewhat distinct research communities.

Network inclusiveness is the number of authors in a network [n] minus the number of isolated authors [i] divided by n, or $(n - i)/n$. Isolated authors have no citations from other authors and do not cite others in the network (Monge & Contractor, 2003). Inclusiveness is different from density because a network can have very few connections (low density), yet have high inclusiveness (i.e., few, or no, isolated authors).[14] Table 11 shows that *AOS* has a higher inclusiveness than the other journals, with the second highest being for *MAR* and *TAR*. *BRIA* and *CAR* have the lowest inclusiveness.

Journal networks that are dense and highly inclusive have extensive communication patterns among their contributing authors. This appears to be the case for *AOS*, *JAE*, *JAR*, and *TAR*, although *JAE* has relatively low inclusiveness and *TAR* has relatively low density. *JAE's* high density is not surprising given its focus on economics-based research (Table 3, Panel C), yet there are quite a few isolated authors publishing in *JAE*. The low density for *TAR*, we conjecture, probably reflects both research diversity and frequent editor changes that are typical of premier association-based journals. *BRIA* and *CAR* have low density and inclusiveness, suggesting that authors publishing in these journals are not primarily citing authors within these journals. Low density and isolated authors are more likely for young journals, not only because of their short history (and hence, less citations), but also because new journals' ''identities'' (research tastes) and/or reputations take time to establish. *RAS*, which is the youngest journal in our sample, however, has low inclusiveness yet medium density. This suggests that, while there are quite a few isolated authors publishing in *RAS*, the nonisolated authors are quite well connected to one another. Given that the vast majority of articles in *RAS* are analytical (Table 3, Panel B), its high density is likely due to a well-connected group of analytical researchers. *MAR* has relatively low density despite high inclusiveness. This suggests that *MAR* has few isolated authors among its diverse group of contributing authors. *JMAR* and *JAL* both have medium density and inclusiveness.

3.2.3. Directed Graphs

To visualize communication, we create a diagram where authors are represented as points (nodes) and

[14]For example, imagine a network of 10 authors. If each author cites or is being cited by only one author, the network density is at its minimum of 5.6% (5/90) with inclusiveness at its maximum of 100% [(10 – 0)/10]. On the other hand, a network with four completely connected authors and six isolated authors has a density of 13.3% (12/90) and only 40% inclusiveness [(10 – 6)/10].

communication among them as directed lines (Batagelj & Mrvar, 2002; Borgatti, 2002; Borgatti et al., 1999). An arrow pointing to an author means that the author has been cited by the individual at the origin of the line. Individuals with a large number of lines terminating at their node can be seen as influential. Individuals with many lines originating from their node can be seen as pulling together ideas from the literature. A line with arrows at both ends means that the individuals have cited one another.

Figure 1, Panel A, depicts a network for the entire dataset. To highlight major communications, we only draw the authors and links with eight or more citations among authors.[15] Of the 43 individuals shown, the diagram suggests that the central authors are S. Baiman (analytical), C. W. Chow (experimental), M. D. Shields (experimental), W. S. Waller (experimental), K. A. Merchant (field), and P. Brownell (survey), with at least three arrows pointing to their nodes. Authors with many arrows leaving from their node, on the other hand, tend to integrate the literature. These authors are C. W. Chow, M. D. Shields, S. M. Young, and M. A. Covaleski. These authors tend to have addressed multiple topics using multiple methods and/or source disciplines across their various studies.[16]

Figure 1, Panel B, shows the diagram for the subnetwork consisting of authors publishing in *AOS* and *MAR*. The diagram consists of authors who have at least four citations to or from an author in the network, revealing a network of 47 individuals. Striking here is the existence of two fairly dense networks completely separated from each other. The first subnetwork, comprising 28 individuals, has A. S. Dunk, G. L. Harrison, K. A. Merchant, M. D. Shields, Y. Kato, C. W. Chow, J. G. Birnberg, and V. Govindarajan as central authors (with at least three arrows arriving at their nodes). This network largely represents a stream of research centered on management control. M. A. Abernethy, M. D. Shields, J. L. McKinnon, C. W. Chow, and A. Wu all have more than four arrows leaving their nodes. The second subnetwork, smaller and less dense (19 authors), has D. J. Cooper, M. A. Covaleski, and J. Roberts as central authors, with at least three arrows pointing to their nodes. This network primarily represents sociology-based management accounting research.

Turning to the network around the eight journals edited in North America, the diagram in Panel C consists of authors who have at least five citations to or from an author in the network. The 40 individuals shown in Panel C suggest three subnetworks. The first cluster consists of nine individuals developing analytical models on a variety of topics. Central authors in this cluster are S. Baiman and S. Reichelstein. The second cluster of six authors primarily represents cost accounting research. This cluster includes authors like R. D. Banker and M. Gupta who have done both analytical and empirical research in this area. This cluster, however, appears to be distinct from the analytical research community in the first cluster. The third cluster primarily consists of authors researching control topics, mostly using experimental and survey methods. This cluster consists of 25 authors, with C. W. Chow, W. S. Waller, and P. Brownell as the central authors. In this subnetwork, S. M. Young and M. D. Shields integrate the cluster with six or more arrows leaving their nodes. Most striking in this diagram is the virtual absence of links across the three subnetworks. In fact, the only citations between the subnetworks are from six authors in the control subnetwork to one author, S. Baiman, in the analytical subnetwork. This is surprising since multiple methods enhance our understanding of empirical phenomena. We would expect analytical research to develop testable propositions for empirical research that subsequently updates models as empirical results are obtained. Such does not appear to be the case in the field of managerial accounting, however.

4. Summary and Commentary

In this study, we analyzed 916 management accounting articles classified by topic, method, and source discipline, as well as their citation data, in 10 journals from 1981 through 2000. The first part of our study tabulated and cross-tabulated various characteristics of

[15]Because of the large number of authors, a directed graph of all authors would be a dense maze of uninterpretable lines. The choice of eight or more citations between any two authors as a restriction is admittedly arbitrary, but decreasing the cutoff (to four, say) adds more points and lines, obscuring the key relations in a dense network of lines and points. Parsimony retains the key attributes of the network while making interpretation feasible. When we split the overall network into the two subnetworks around *AOS* and *MAR* versus the other eight journals, we are able to reduce the cutoff value to four and five citations, respectively, while maintaining visual interpretability.

[16]One might observe that R. S. Kaplan is not central in this diagram, despite having the highest indegree in our dataset (Table 10, Panel A). As mentioned above, our diagrams capture the foremost relationships among authors in the various networks. In this situation, R. S. Kaplan is not a central author, despite having the greatest influence among all authors, overall. In other words, R. S. Kaplan has broad influence but not repeated interactions with influential authors. Or, as Fig. 1, Panel A, shows, only S. M. Young has cited R. S. Kaplan more than eight times (which is the cutoff value for inclusion in this diagram). If we were able to make sense out of a graph with 898 authors, we would see R. S. Kaplan with 179 lines and his would be the densest node.

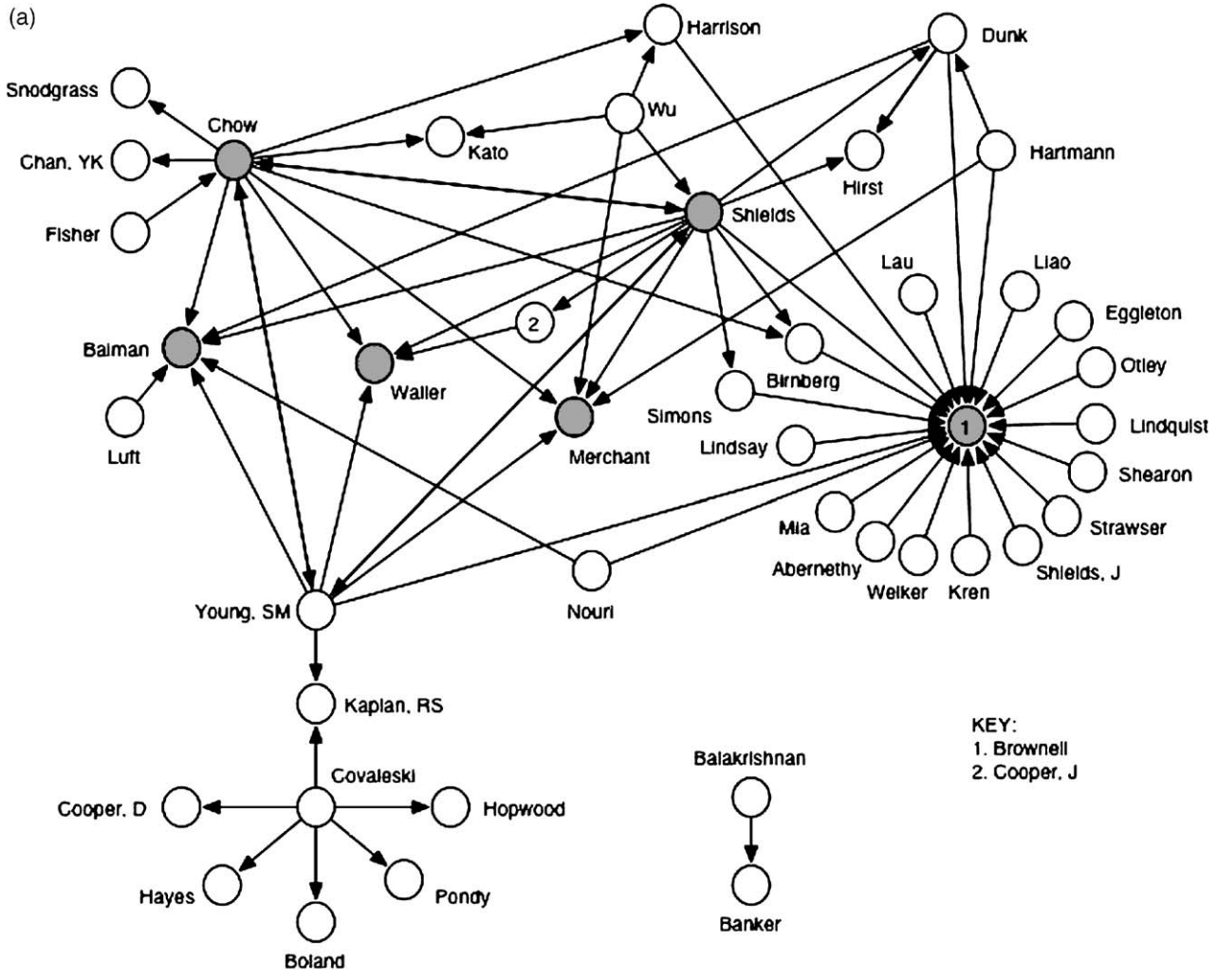


Figure 1. Panel A: All journals. Panel B: *AOS* and *MAR*. Panel C: Other eight journals edited in North America.

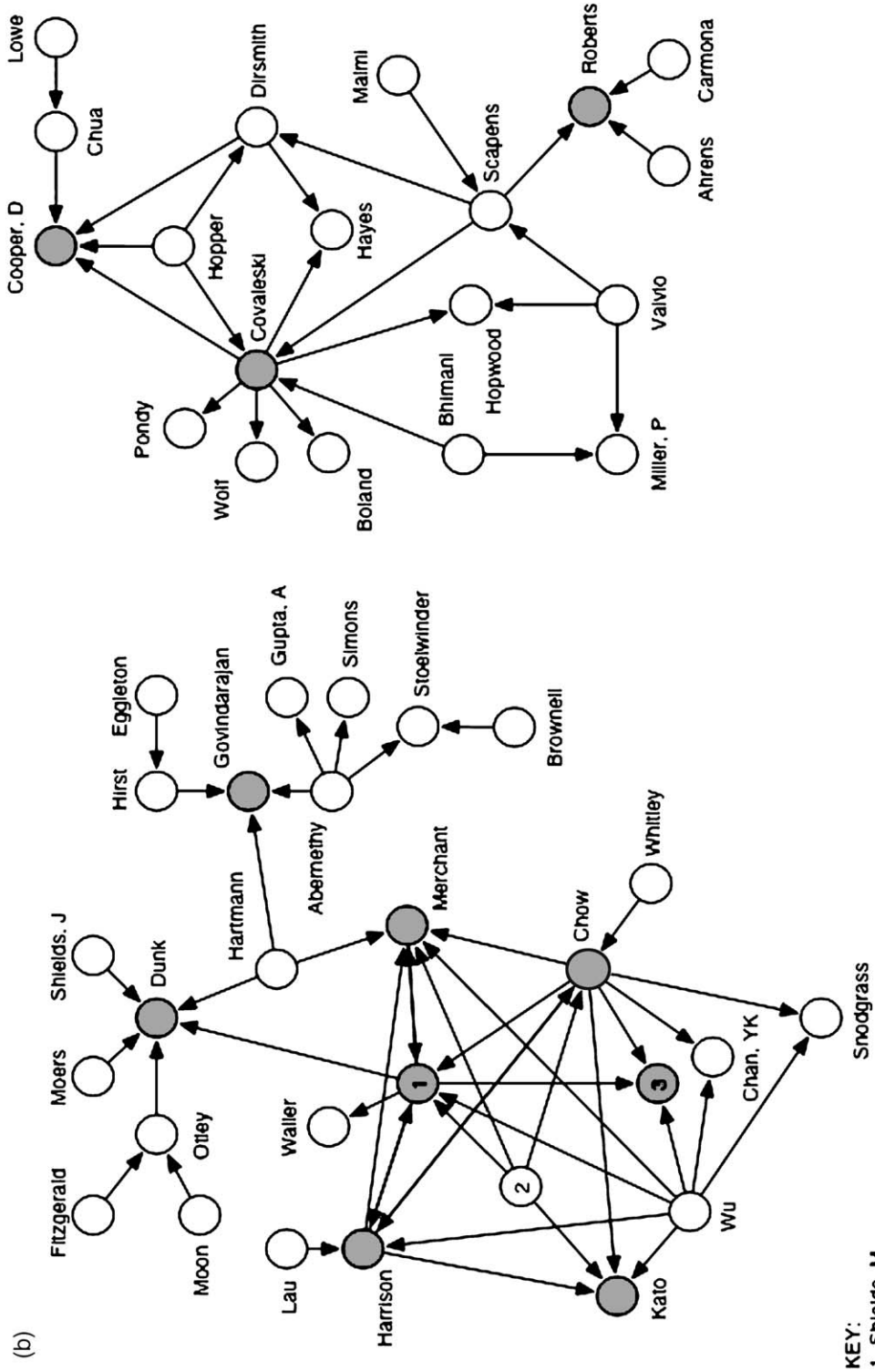


Figure 1 Continued

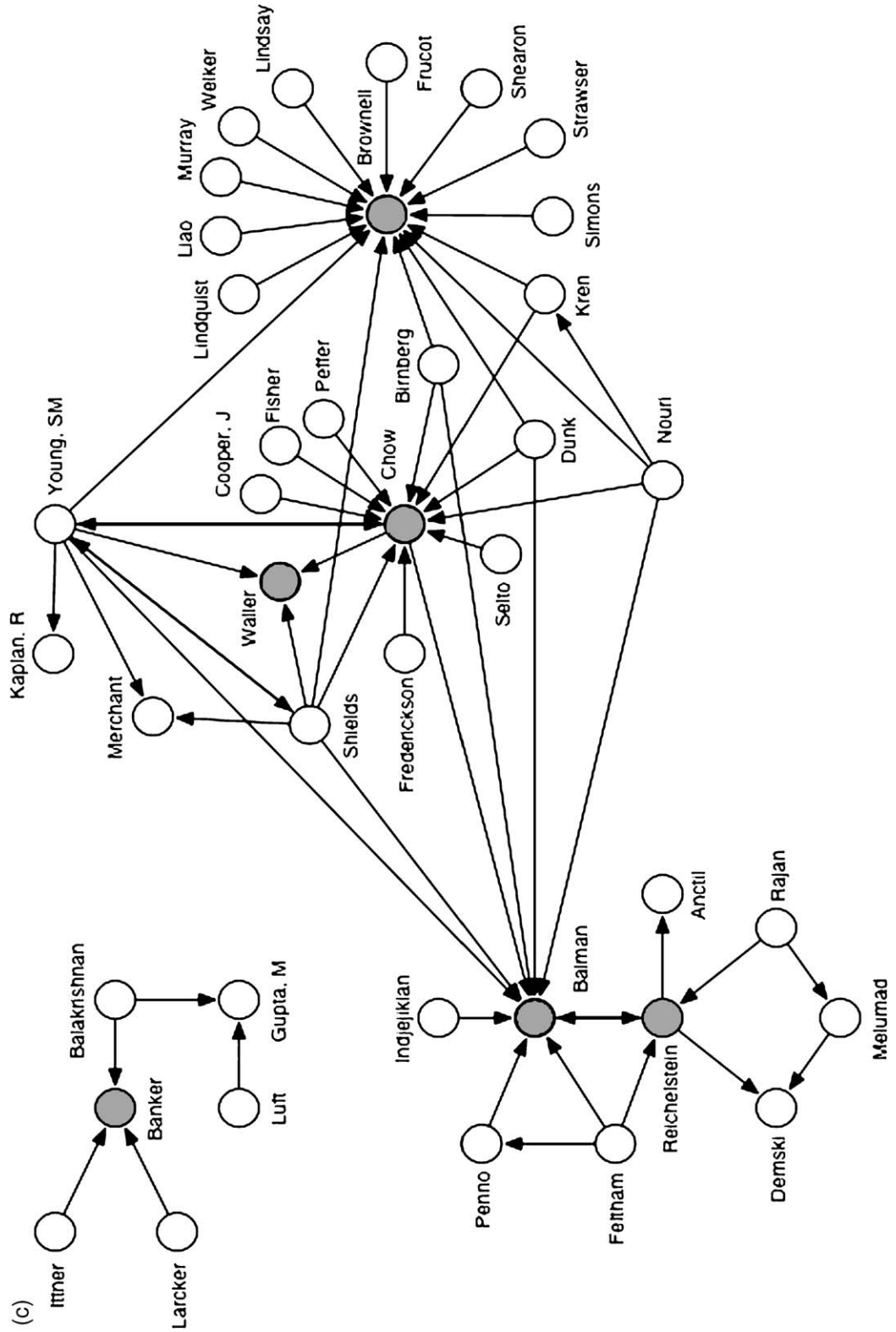


Figure 1 Continued

these articles over time. This analysis revealed a shift over time from budgeting and organizational control to performance measurement and evaluation topics. We also observed a decline in the use of experiments over time, and an increase in archival, case, and field research methods. In terms of source disciplines, the majority of management accounting research remained rooted in economics. Moreover, our analysis suggested that two journals in our sample, *AOS* and *MAR*, have a greater tendency to publish case, field, and survey studies that draw on sociology. This stands in contrast to the other eight journals, all edited in North America, which tend to publish more analytical, archival, and experimental studies that draw on economics. As a matter of fact, about half of the management accounting articles appeared in *AOS* and *MAR*.

The second part of this chapter used citation and social network analyses to examine whether the community of management accounting scholars consists of several subnetworks, with lines drawn between them based on topic, method, or source discipline. We found that control topics, analytical research, as well as economics-based articles draw heavily on their own. Moreover, social network analyses suggested the existence of two quite distinct networks in management accounting research, one centered on *AOS* and *MAR*, and the other on the eight sample journals edited in North America.

We resist the temptation to speculate about the sources of these differences between the two subnetworks. There are, however, several plausible conjectures. First, our empirical observations in this chapter are consistent with Atkinson et al. (1997, p. 80), who state that "North-American contributors hold a primarily economics-based worldview, especially as it pertains to research topics and methods. Conversely, Australian and European authors lean more toward the sociological aspects of management accounting and its role in organizations." To the extent that *AOS* and *MAR* are less North-American centric (e.g., as reflected in their editorial board membership and authorship composition) than the other eight journals,[17] the different worldviews as described by Atkinson et al. (1997) indeed reflect our observation that articles in *AOS* and *MAR* rely to a greater (lesser) extent on sociology (economics) as a source discipline compared to the other eight journals edited in North America.

Further, the differences we observe in the reliance on source disciplines and the use of research methods between the two journal subnetworks also might be a reflection of differences in doctoral training in North-America compared to the rest of the world, as some have alluded (e.g., Scapens, 2004; Shields, 1997). For instance, North-American doctoral programs in accounting tend to follow a disciplinary base primarily rooted in economics. In addition, North Americans tend to receive a great deal of training in quantitative methods with little or no training in field or case study methods. Doctoral programs outside of North America, on the other hand, do not tend to have a similar disciplinary or method focus.

Going beyond such rather broad inferences, however, we find that the two journal subnetworks are also different in their reliance on, and citations of, specific theoretical works. If *AOS* and *MAR* are more open to the viewpoint that management accounting is a "social practice" (Baxter & Chua, 2003; Hopwood, 1978a, 1978b, 1979, 1983) rather than an exclusive "economic activity," as several have claimed is the predominant view in the North-American journals (e.g., Scapens, 2004), then we should observe differences in citations to social theories and theorists, such as Foucault, Habermas, Giddens, and more recently Latour, between the two journal subnetworks. The data in Table 12 support this conjecture. Table 12 shows that the proportion of articles that cite these four theorists (Foucault, Habermas, Giddens, Latour) is 7% in *MAR* and 15% in *AOS*, whereas the proportions in the other eight journals edited in North America range from 0% (*CAR*, *JAE*, *JAR*, and *RAS*) to 2% (*TAR*), 4% (*JAL*), 5% (*JMAR*), and 6% (*BRIA*). We believe this provides evidence that the two journal networks that we identified in this study indeed are different in the worldviews on management accounting they are open to.

But we also found distinct clusters of management accounting scholars within each journal subnetwork that appear to be based on topic, method, or source discipline with relatively little communication across them. This is consistent with prior observations, and debates, of cross-disciplinary boundaries within our field (Hopwood, 2002; Luft & Shields, 2002; Lukka & Mouritsen, 2002; Merchant et al., 2003; Shields, 1997; Zimmerman, 2001).

We have noted several limitations of our analyses throughout this chapter. First, several other cuts of the

[17]Examining authorship, we find that 55% (45%) of the management accounting articles in *AOS* have at least one (no) North-American affiliated author at the time of publication. For the other journals, the breakdown in authorship of management accounting articles by geographical affiliation is 89/11 for *BRIA*, 96/4 for *CAR*, 100/0 for *JAE*, 96/4 for *JAL*, 90/10 for *JAR*, 91/9 for *JMAR*, 17/83 for *MAR*, 90/10 for *RAS*, and 95/5 for *TAR*. This indicates that the eight journals in our sample that are edited in North America are North-American centric in terms of authorship of the articles that they publish, which is not, or less, true for *AOS* and *MAR*.

Table 12. Frequency of articles that cite Foucault, Habermas, Giddens, and Latour.

	Cite	Do not cite
AOS	39 (15.4)[a]	215 (84.6)
BRIA	2 (5.7)	33 (94.3)
CAR	0 (0.0)	45 (100.0)
JAE	0 (0.0)	38 (100.0)
JAL	1 (3.6)	27 (96.4)
JAR	0 (0.0)	70 (100.0)
JMAR	6 (5.1)	111 (94.9)
MAR	14 (7.1)	183 (92.9)
RAS	0 (0.0)	21 (100.0)
TAR	2 (1.8)	109 (98.2)
AOS and *MAR*	53 (11.8)	398 (88.2)
Other eight journals	11 (2.4)	454 (97.6)
Total	64 (7.0)	852 (93.0)

[a]Row percentages, thus indicating the percentage of articles by journal that cite versus not cite the four theorists—Foucault, Habermas, Giddens, and Latour.

data are possible beyond those presented here. For example, one could examine partitions of, or networks around, long-established (e.g., *JAR*) versus young (e.g., *RAS*) journals, general (e.g., *TAR*) versus specialty (e.g., *JMAR*) journals, or economics (e.g., *JAE*) versus behavioral (e.g., *BRIA*) journals. In addition to our primary focus on charting the field, one could also use these data for a more theorized analysis of networks (e.g., Burt, 1980; Watts, 1999) and how they evolve over time. But perhaps the most important limitation is that citations are used as a proxy for communication links among authors. Other mechanisms exist for disseminating ideas among the research community. These include working papers, workshops, conference presentations, books, practitioner-oriented publications, and personal communication. We suspect, however, that the same disciplinary boundaries that we detected on the basis of citations also exist for these other forms of communications. This perhaps explains why, after all, relatively few major advances are being made in our field even when considering relatively long time periods.

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Mapping Management Accounting: Graphics and Guidelines for Theory-Consistent Empirical Research ☆

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Abstract: This chapter provides a summary graphic representation (maps) of theory-consistent evidence about the causes and effects of management accounting practices, as presented in 275 articles published in six leading journals. The maps highlight connections and disconnects in the diverse streams of management accounting literature, in terms of what has been researched, what are the direction and shape of the explanatory links proposed, and what is the level of analysis. On the basis of criteria from social-science research, we offer 17 guidelines to help future research capture natural connections, avoid artifactual connections, and develop a more complete and valid map of the causes and effects of management accounting practices.

1. Introduction

As empirical research on management accounting practice has developed in recent decades, it has employed an increasing variety of theoretical perspectives and research methods to address an increasing range of substantive questions. Separate streams of research have developed, each with its own distinctive set of questions and choices of theory and research method, and have matured sufficiently that they are the subject of reviews, each assessing the accomplishments and prospects of a stream of research (see Chapman et al., 2006). Questions that remain unanswered are how, if at all, these different streams relate to each other and how complete and valid an explanation of the causes and effects of management accounting the literature as a whole provides.

In this chapter we take an initial step toward answering these questions. We provide a graphic representation of the theory-consistent empirical management accounting research as exemplified by articles published in six leading journals. This representation summarizes the theory-consistent evidence in 275 studies in nine graphics (maps), providing a compact visual overview of these diverse streams of research.

The maps provide answers to three questions about each study:

1) *What is researched?* For example, some studies research activity-based costing (ABC) implementation, others research the weighting of nonfinancial measures in executive compensation contracts, and others research the symbolic value of accounting.
2) *What are the direction and shape of the explanatory links proposed?* For example, some studies show management accounting practice as the effect of organizational characteristics, other studies explain management accounting practice as the cause of organizational characteristics, and still others explain management accounting practice as both cause and effect (different directions of explanatory links). Some studies show that a particular management accounting practice improves performance, while others show that it improves performance up to a point and then makes it worse, or improves performance only in certain contexts or for certain kinds of individuals (different shapes of explanatory links).
3) *What is the level of analysis—individual, organizational subunit, organization, or beyond-organization?* For example, some studies show how individual attitudes explain individual behavior with respect to management accounting practice

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(an individual-level explanation), while others show how organizational structure explains management accounting practice throughout an organization (an organizational-level explanation), and others show how a combination of national culture and subunit management accounting practice explains management behavior in subunits (a cross-level explanation).

The patterns of explanatory links in the resulting maps are far from uniform and unambiguous. Large dense clusters of explanation appear around some management accounting practices and small isolated explanations around others. Explanations of a particular management accounting practice are not always consistent across or within maps. Some explanatory links that might be expected—for example, between specific individual actions and the organizational-level outcomes of such actions—are absent or ambiguous.

Problems of this kind are inherent in the study of complex systems. As Simon (1973: 23) observes, "To a Platonic mind, everything in the world is connected with everything else—and perhaps it is. Everything is connected, but some things are more connected than others. The world is a large matrix of interactions in which most of the entries are very close to zero." It is not necessarily the case, however, that dense clusters of explanation in the literature always correspond to natural phenomena that are "more connected than others" in the world; nor does the absence of connections in the literature always correspond to the connections that are naturally "very close to zero."

Some of the connections and disconnects on the maps may be artifacts of the historical development of the field. Some studies, for example, investigate causes and effects of individuals' beliefs about how much their compensation depends on performance compared to budget. Other studies investigate causes and effects of the weight on financial performance compared to a target as specified in organizations' formal incentive-compensation contracts. These two types of studies seem to be addressing very similar phenomena, but they represent different research streams, employing different social-science theories and research methods, and it is not clear to what extent we should expect explanations in these two types of studies to be the same. Should a sufficient explanation of organizations' formal incentive contracts also be a sufficient explanation of individuals' beliefs about how their compensation depends on performance compared to budget, or should we expect the explanations to differ substantially, and if so, how? Without answers to such questions, it is difficult to be sure what are the areas of genuine common ground across different streams of research, what are conflicts and inconsistencies ripe for resolution, and what are irreconcilable epistemological differences.

In order to discuss these issues, we return to the three questions that were used to create the maps: What is researched? What are the direction and shape of the explanatory links proposed? What is the level of analysis? We show how these questions have been answered in the management accounting literature and how the answers have sometimes given rise to conflicting and problematically related explanations. We also propose 17 guidelines for answering these three questions in evaluating and designing research in order to develop a more complete and valid map of theory-consistent empirical research on management accounting practice, representing natural and not artifactual connections and disconnects around and within management accounting practice.

The remainder of this chapter is organized as follows. Section 2 describes the criteria used to select the studies included on the maps and to construct the maps. Section 3 provides an overview of the maps. Section 4 presents criteria for answering question 1 (what is researched). Section 5 presents criteria for answering question 2 (what are the direction and shape of explanatory links). Section 6 presents criteria for answering question 3 (what is the level of analysis); because the answers to the three questions are not always independent of each other, these criteria include variable-identification and causal-model form issues. Section 7 discusses the issues related to the intersection of the three choices described in Sections 4–6 and the choice of explaining management accounting practice as the cause or effect of other phenomena or both. Section 8 concludes.

2. Selection of Studies and Construction of Maps

To provide answers to the three questions in Section 1, we developed a dataset of selected attributes of 275 studies and a visual representation of the studies' data in the form of the maps that appear in Appendices A–I. The selection of studies and development of the maps are described in this section.

2.1. Criteria for Selection of Studies

The studies are chosen based on the following criteria:

1. The study appears in one of the following six journals before 2002: *Accounting, Organizations and Society, Contemporary Accounting Research,*

Journal of Accounting and Economics, Journal of Accounting Research, Journal of Management Accounting Research, or The Accounting Review. These six journals provide a large and representative sample of the theory-consistent evidence on management accounting practice that is published in scholarly journals. While as a practical matter we had to limit the studies included, we believe this selection criterion allows inclusion of a wide diversity of theory-consistent empirical management accounting research published in English.

2. The study provides evidence about management accounting practice in the management of organizations, not capital markets, taxation, etc. These organizations include for-profit, not-for-profit, and government.
3. The study explains causes and/or effects of variation in management accounting practice. For example, the study explains causes of variation in organizations' use of more aggregated accounting information or individuals' use of opportunity costs in decision-making; the study explains performance differences as the effect of variation in performance-measure choice; or the study explains change (temporal variation) in production systems as both a cause and effect of management accounting change. Archival econometric studies on cost drivers provide an example of an important set of studies that are not included because they do not examine variation in observed management accounting practice but instead examine how a characteristic of operations (e.g., product complexity) affects resource use. Similarly, studies of management accountants (e.g., accountants' job satisfaction or promotion determinants) without a causal link to variation in management accounting practice are not included, nor are studies of management control without an explicit management accounting practice (e.g., use of personnel controls or operational audits not involving management accounting practice).
4. The study provides evidence consistent with the theory put forward in it. Sources of evidence include archival data (both quantitative and qualitative), field and laboratory experiments, field-based and mail surveys, and qualitative case/field studies. The consistency of evidence with theory can be demonstrated by either testing hypotheses specified *ex ante* for quantitative evidence or showing *ex ante* and/or *ex post* the explanatory value of a particular theory for qualitative evidence. Studies without clear theoretical bases are not included, nor are empirical studies that do not support the theory put forward. Although studies that do not support the theory they put forward are sometimes important in the literature, they are not included if their evidence is not unambiguously consistent with a theory.
5. If some portions of a study met the criteria above and others did not, then the portions that met the criteria are included and the portions that did not meet the criteria are omitted. For example, if a study explains causes or effects of management accounting practices and also non-management-accounting practices, then only the results related to the management accounting practices are included.

2.2. Construction of Maps

The maps are constructed in two steps. First, as explained in Section 2.2.1, we construct a graphic representation of each study that met the criteria described above. Second, we group these graphic representations into maps as explained in Section 2.2.2.

2.2.1. Constructing Graphic Representations of Individual Studies

As described in Section 1, we asked three questions about each study: First, what is researched—that is, what sets of variables did a study include? Second, what are the direction and shape of the explanatory links proposed—that is, what is the causal model? Third, where does variation in the variable of interest occur (e.g., individual, organization)—that is, what is the level of analysis? Because the terms "variable," "cause," "causal model," and "level of analysis" have been used in different ways in the literature, we clarify here how the terms are used in this chapter.

(1) Variable

The term variable has both generalized and specialized meanings. In the general sense, a variable is "… a factor whose change or difference you study" (Simon, 1969: 31).[1] It can refer to either theoretical variables (constructs) or operational variables (measures) (Kerlinger, 1986).[2] The specialized meaning arises from research method debates in sociology (Abbott, 1997; Blumer, 1956), in which "variable" denotes

[1] Kerlinger (1986: 27) provides a similar definition: variables are whatever "… constructs or properties [researchers] study."

[2] Variable labels on the maps largely follow authors' usage in designating "what the study is about." In consequence, some labels emphasize the theoretical construct more, while others emphasize the measured variable more. See section 4.1 for more detailed discussion of these differences.

a decontextualized abstraction, for which the same observable indicators are always associated with the same meaning, causes, and effects (i.e., the relation between constructs and measures is unproblematic). For example, "change in competition" would be a variable in the more specialized sense if researchers identified changes in competition as changes in the pattern of market shares (e.g., Herfindahl-index scores[3]) and expected changes in these scores always correspond to the same changes in subjective experience of competition and always to cause the same changes in behavior. In contrast, researchers who see competition as socially constructed would expect that in different settings, different meanings could be associated with the same changes in Herfindahl-index scores, resulting in different effects. In constructing and discussing the maps, we use the more general meaning of variable, that is, "what a study is about." When we refer to the subject of a study as a variable, this does not imply that the authors (or we) believe that it is independent of context and interpretation.

(2) Cause

The term cause also has both generalized and specialized meanings in different streams of social-science literature. In the more general usage, cause refers to explained relations between variables, as opposed to observed but unexplained associations. Specialized uses of the term causal explanation can imply determinism (Blalock, 1964),[4] physical-science-like causation independent of both human intentionality and evolutionary selection processes (Elster, 1983), or the treatment of abstract constructs (e.g., education, competition, bureaucracy) as actors that "…could 'do things' in the social world …" (Abbott, 1997: 1164), independent of specific human actions.[5] Hereafter, when we say that studies use causal models we retain the more general meaning (i.e., that the studies provide explanations), without implying that these explanations are, or should be, deterministic, non-intentional, or otherwise limited in scope.

(3) Causal-model form

When one variable is used to explain the causes or effects of another variable, the scope of the explanation is often restricted by specifying conditions or contexts in which the explanation is valid. The simple causal-model forms shown in Fig. 1 represent several types of restrictions that appear in the management accounting literature.

In the additive model (Fig. 1, Panel A), each independent variable (X_i) has an effect on the dependent variable (Y) that is not conditional on the value of any other X_i, and the value of X_i itself is not conditional on Y or on any other X_i.[6] In the intervening-variable model (Panel B; Asher, 1983; Davis, 1985), the effect of X_1 on Y occurs on the condition that X_1 affects X_2 and X_2 in turn affects Y.[7] However, X_2 does not affect X_1, and Y does not affect either X_i. Moreover, once the value of X_2 is determined, its effect on Y does not depend on X_1.

In interaction models (Panels C and D), *how much* X_1 affects Y is conditional on the value of X_2 and *how much* X_2 affects Y is conditional on the value of X_1 (Hartmann & Moers, 1999). However, X_1 and X_2 do not influence each other, and Y does not influence either X_i. These interaction models represent different causal relations. In the independent-variable interaction model (Panel C), each X_i has a causal influence on Y. In contrast, in the moderator-variable interaction model (Panel D) (Sharma et al., 1981), MV (the moderator variable) has no influence on Y in the absence of X_1, as well as no influence on X_1: its influence operates only by changing the effect of X_1 on Y.

In the models in Panels A–D, the value of X_1 itself is not conditional on any other variable in a model; thus, causation is unidirectional from X_1 to other variables. In Panels E and F, however, causation is bidirectional: X_1 affects X_2 *and* X_2 affects X_1. In the cyclical recursive model (Panel E) there is an identifiable time interval between the change in X_1 and the corresponding change in X_2, as well as between the change in X_2 and the corresponding change in X_1. In contrast, in the

[3]The sum of squared market shares.

[4]Cf. the description of causality in early quantitative sociology as a "… sufficient combination of necessary causes…" (Abbott, 1997: 1159), so that identifying causality would allow prediction without uncertainty.

[5]Causality has been given numerous other more specific definitions in the social sciences: for example, American sociology in the 1950s tended to restrict "causal assessment" to individual cases not general regularities, but the position reversed in the 1960s (Abbott, 1998).

[6]For convenience, we have classified studies with only one independent variable and one dependent variable as additive.

[7]If X_1 influences Y both directly *and* through X_2, the models in Panels A and B can be combined into more complex models.

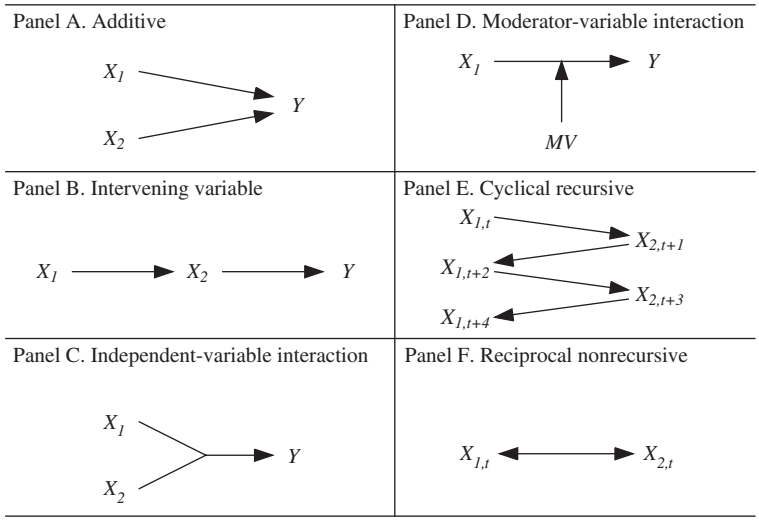


Figure 1. Causal-model forms.

reciprocal non-recursive model (Panel F) the X_is are determined simultaneously or at intervals too short for the causal influences in different directions to be distinguished empirically (Berry, 1984).

Any of the explanations represented in these causal-model forms can be further restricted by specifying linear or curvilinear relations. If the relation is linear, then a one-unit increase in X_i leads to a given change (e.g., a three-unit increase) in Y, regardless of the initial value of X_i. If the relation is curvilinear, however, then the effect of a one-unit increase in X_i is conditional on the initial value of X_i (e.g., a one-unit increase in a small X_i may lead to a three-unit increase in Y, while a one-unit increase in a large X_i may lead to a six-unit increase or a two-unit decrease in Y, depending on the shape of the curve).

(4) Level of analysis

Each variable on the maps is assigned to one of four levels of analysis: individual, subunit, organization, or beyond organization. In principle, the beyond-organization and subunit levels could be subdivided further: beyond-organization variables include characteristics of markets, states, societies, and cultures, while subunits include units of widely differing size and complexity, from interacting dyads to multidivision groups within an organization. For the sake of simplicity and consistency with related literature, however, we did not make these further subdivisions on the maps. The four levels, from individual to beyond organization, parallel the four-level structures proposed by Hopwood (1976, Fig. 1.1) and by Collins (1981) as the basis for sociological analysis.

The level of a variable is defined *at the level at which the variation of interest occurs* (Hannan, 1991; Klein et al., 1994; Kozlowski & Klein, 2000; Rousseau, 1985).[8] For example, an individual incentive system is an individual-level variable if the study examines causes and/or effects of the use of different incentive systems for different individuals, and the researcher is interested in individuals *per se*, not in individuals as proxies for subunits or organizations. The incentive system is a subunit (organization)-level variable if the study examines causes and/or effects of the use of different systems in different subunits (organizations), and the researcher's goal is to relate this variation in incentive systems to variations in technology, structure, or performance across subunits (organizations). Some studies are ambiguous with respect to level of

[8]This use of the term "levels" differs from two others that occasionally appear in the literature. First, levels of analysis are not identical to hierarchical levels. A CEO is not a higher level of analysis than a shop-floor worker: both are individuals. Second, the level of analysis of a variable is not necessarily the level where it appears to belong because it is internal to or controllable at that level. For example, environmental uncertainty, even if it is external to and uncontrollable by organizations, can be an organizational-level variable in studies that focuse on cross-organization differences in this uncertainty.

analysis and our classifications are therefore necessarily tentative (see Section 6 for further discussion on this issue).

2.2.2. Constructing Maps

Constructing the maps required two sets of conventions: one for graphic representation of individual studies, and one for grouping of individual studies into maps. We use the following conventions for graphic representation of individual studies in the maps presented in Appendices A–I. One-to-three-letter abbreviations designate the variables, and the legend for each map provides a key to the abbreviations. Some variables appear more than once on a map because they are causally linked to so many other variables that these links had to be represented in separate sets for visual clarity. The abbreviations for these variables are italicized to indicate their multiple appearances on a map.

A causal model that links variables is represented by an arrow that shows the direction of the causal influence. Different arrow types are used to identify different causal relations (e.g., positive versus negative, additive versus interactive), as described in Appendix J. Each causal link is identified by a number that references the studies that provide theory-consistent evidence on that link. Levels of analysis are indicated on each map. Some maps include causal links almost exclusively at one level; if more than one level is included, then the map is divided into vertical sectors in descending order, from beyond-organization variables at the top of the map to individual variables at the bottom.

Grouping of individual studies into maps occurred in two steps: first, studies that linked (at least some of) the same variables were grouped together, and then more and less dense areas of the resulting causal networks were identified visually as a basis for the maps. Because of the extreme diversity of ways in which management-accounting-related variables have been defined in the literature (see Section 4), the first step posed questions about when variables in different studies could be regarded as the same. Grouping similar variables under a common name would make the maps more compact and readable but also would risk loss of information or misrepresentation of the theory-consistent evidence provided by some studies, and the studies themselves often do not clearly identify similarities and differences between their variables and similar variables in other streams of research.

In general we use the variable names as they appear in the studies, but in some instances we group variables that are somewhat differently named in the studies under a common name on the maps, so long as the different names do not seem to designate theoretical differences that are important to the purpose of the studies. For example, on Map F, subordinates' misrepresentation of private information to increase their own payoffs appears as a single variable, "misrepresentation by subordinate," regardless of whether it is misrepresentation of individual skills, production costs, or signals about the favorability of the external environment. The primary goal of the Map F studies is to test specific theories about influences on misrepresentation of private information. These theories predict that misrepresentation depends on the payoffs it generates or on individual characteristics, not on the type of information misrepresented; therefore, the misrepresentations of different types of private information are combined into a single variable.[9]

In principle, given sufficient space, all of the variables and causal links could have been arrayed on a single map. This map would show some clusters with many causal links (connections) between variables and some blank spaces (disconnects) where few or no links join the distinct clusters. For clarity of presentation, we have split up the one big map into nine smaller ones, relying primarily on these blank spaces (disconnects) between clusters of links as the dividing lines. The great majority of variables that appear on any given map do not appear on any other map (453 out of the total 495 variables appear on only one map). Variables that do appear on more than one map are listed in Appendix K, for convenience in tracing possible cross-map connections. Although within-map connections are relatively dense, most maps include a few isolated links that have only limited connections to the majority of links on the map in which they appear.

[9]Map E, in contrast, provides an example of why theoretically similar variables are sometimes *not* combined. The independent variables in most of these studies are indicators of the informativeness of specific performance measures about executives' actions. For example, a long product life cycle (link 14) is used as an indicator of the low level of informativeness of financial measures and thus a predictor that organizations will instead use individual, often subjective evaluations of executives to determine incentive pay. We do not combine all of the independent variables in these studies into one variable, informativeness, because we believe one of the primary goals of these studies is to show the contexts (e.g., strategies, product characteristics, organizational structures) in which particular measures are more or less informative. Results relevant to this goal would be lost if all the independent variables in these studies were collapsed into informativeness.

Two potentially problematic decisions about where to draw the lines between maps—what to consider connected and disconnected—should be noted. First, when variables with the same name appear at different levels of analysis (e.g., performance at individual and organizational levels), we have represented them separately on the maps, thus limiting connections across levels. This is a provisional decision, based on the fact that when variables with the same name appear at different levels, it is not certain that they represent identical constructs. Sections 6 and 7 provide further discussion of issues related to defining and connecting variables at different levels of analysis.

Second, while some maps consist of a few large dense clusters of links, other maps consist of many small unconnected clusters of links. It may be less obvious with the latter type of map than the former type that the studies on a map belong together. Maps with many small unconnected clusters represent studies that share a common set of (theoretical or practical) issues but investigate them independently. The map descriptions in Section 3.2 highlight within-map similarities and across-map differences in variables.

3. Overview of Maps

The overview of the maps is presented in three parts. Section 3.1 indicates how the maps can be used to find and compare results of management accounting research. Section 3.2 introduces each of the nine maps, describing the variable choices and social-science-theory antecedents that give each map its distinctive character. Section 3.3 briefly describes the distributions of causal-model forms and levels of analysis used on the maps and highlights questions raised by the observed distributions.

3.1. Using the Maps

An examination of the maps in Appendices A–I serves two primary purposes. First, the maps provide a compact graphic summary of specific areas in the scholarly literature, enabling a rapid tracing of what has been researched, what theory-consistent evidence has been reported about any given variable, and what unanswered questions might be suggested by the existing pattern of results. As an illustration of the first purpose of the maps, consider the relations between organizations' strategy and their management accounting practice. Appendix K shows that, for example, prospector strategy appears as a variable on three maps, B, D, and E. (Other strategies appear on individual maps.) These maps show three sets of results comparing the management accounting practices of prospector and non-prospector organizations. Prospector organizations place greater weight on non-financial relative to financial performance measures in incentive compensation (Map E, link 10). Prospector organizations are also more likely than other organizations to adopt ABC (Map D, link 5). Finally, they make less use of budget-based compensation but have more difficult budget goals and make greater use of budget-based cost control and planning (Map B, links 8, 9, 12).

A comparison of these three sets of results raises interesting questions for further research. On the one hand, prospector organizations place less weight on financial measures in compensating managers, suggesting accounting is less important to prospectors. On the other hand, prospectors refine their financial measures more (ABC) and use financial measures (budgets) more extensively in planning and cost control, suggesting that accounting is more important to prospectors. These contrasting implications identify questions for further research. The cross-study difference in the role of accounting in prospector firms may be an artifact of the different research approaches in the three maps, or it may indicate different uses of information for planning and control on the one hand and for evaluating and rewarding managers on the other. If the latter is the case, then further questions arise about the existence and management of conflicts when managers are evaluated and rewarded on a different set of measures from those they use in making decisions.

The second purpose of the maps is to identify basic issues about how the different streams of research represented on different maps relate to each other. The subsections below show how different streams of research provide different answers to the three fundamental questions: What is researched (variables)? What are the direction and shape of the explanatory links proposed (causal-model forms)? What is the level of analysis?

3.2. What is Researched

The diverse array of variables that appear on the maps comes from the multiple social-science antecedents of management accounting research, as well as from the diversity of management accounting practice. Fig. 2 identifies the subject of the management accounting research assigned to each map and some of the key social-science antecedents that shape the distinctive character of each map. The introduction to each map below describes these social-science antecedents, the characteristic management accounting variables on the map and the characteristic non-accounting variables to which they are linked, and a

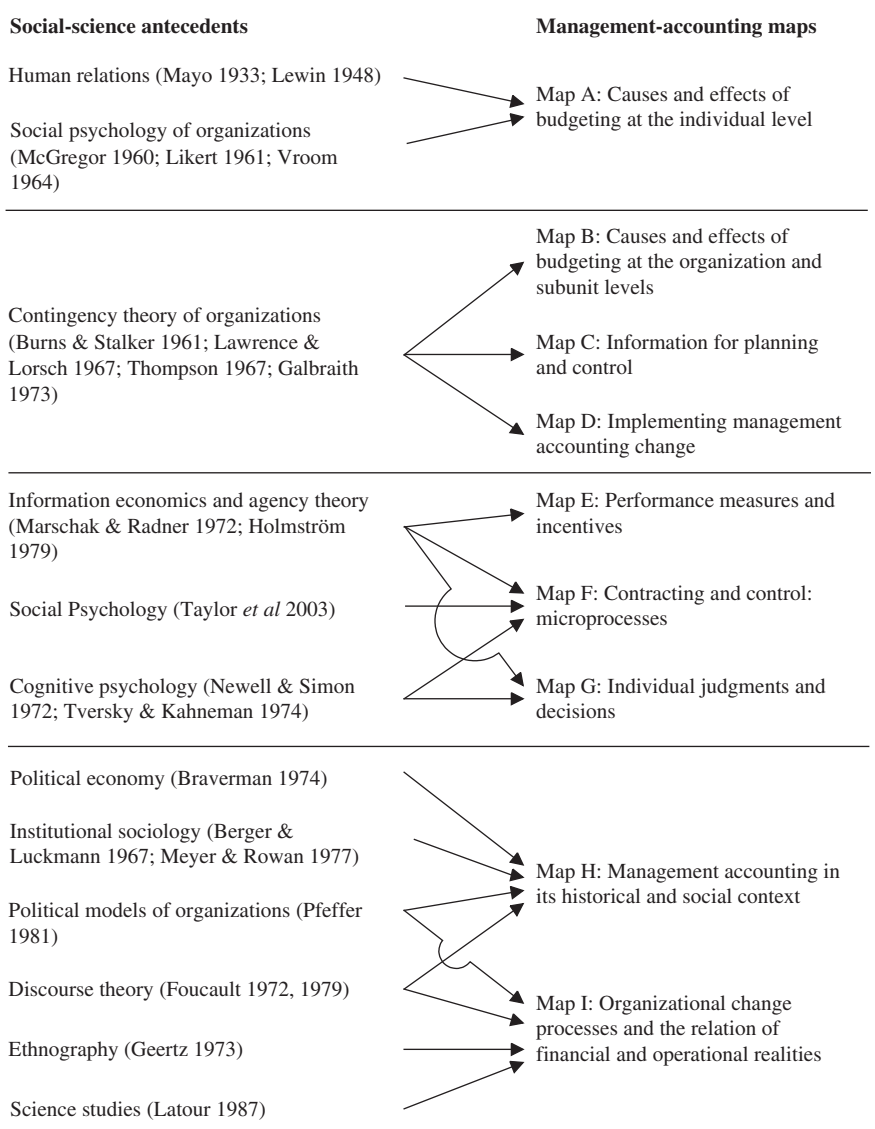


Figure 2. Genesis of theory-based empirical research in management accounting.

sample of typical results from studies on the map. Map A, which includes the earliest research represented in the chapter, is the base case; the beginning of each succeeding map's introduction highlights the key differences between the new map and the preceding maps.

3.2.1. Map A, Causes and Effects of Budgeting at the Individual Level

The studies on Map A analyze individuals' encounters with budgeting. These studies use theories from the human relations school (Lewin, 1948; Mayo, 1933), which proposes that the design of an organization's social environment influences employee performance, and theories from the social psychology of organizations (Likert, 1961; McGregor, 1960; Vroom, 1964), which link the social environment with individual motivation, stress, and satisfaction. Following these theories, the Map A studies' non-accounting variables are often individual characteristics such as attitudes (e.g., link 5), motivation (e.g., links 5, 37), stress (e.g., links 15–17, 35), and performance (e.g., links 22–27, 38–40). The management accounting variables to which they are linked on this map capture individuals' sense of personal constraint and opportunity arising from budgeting: for example, how much participation

individuals have in setting the budget (participative budgeting, e.g., links 7–8 and 33–36), how difficult their budget goals are for them to achieve (budget goal difficulty, e.g., links 5 and 40–41), and what the consequences are for them of achieving or not achieving budget goals (budget emphasis and budget-based compensation, e.g., links 3, 4, 11, 35). Typical Map A studies show that participative budgeting, task uncertainty, and budget emphasis jointly influence performance (link 24) and stress (link 15) and that participative budgeting and budget-based compensation jointly influence satisfaction (link 11).

3.2.2. Map B, Causes and Effects of Budgeting at the Organizational and Subunit Levels

Map B includes many of the budgeting variables found on Map A but uses them in a different theoretical context and relates them to a different set of non-accounting variables (e.g., technology or organizational structure rather than individual satisfaction or stress). Map B's principal social-science antecedent, the contingency theory of organizations (Burns & Stalker, 1961; Galbraith, 1973; Lawrence & Lorsch, 1967; Thompson, 1967), proposes that organizational or subunit structural characteristics such as size, technology, decentralization, and environmental uncertainty determine the management accounting practices that are the best fit for a particular organization (selection fit). Organizational or subunit performance then depends on the degree of fit between structural characteristics and management accounting practices (interaction fit).[10] Contingency theory is the source of many of the non-accounting variables on the map, such as organizational size (link 2), environmental uncertainty (links 5, 25), and technology automation (link 22). Management accounting variables are often the same budgeting variables that appear on Map A, such as participative budgeting (links 1, 2, 10, 22, 24) and budget emphasis (links 14, 22). Typical Map B studies show that organizational size, diversification, and decentralization increase participative budgeting, and that participative budgeting has a larger influence on performance in larger organizations (link 2). They also show that higher levels of participative budgeting are associated with more budget-based compensation, which in turn leads to higher organizational performance (link 10).

3.2.3. Map C, Information for Planning and Control

On Maps A and B, the management accounting variables capture the intensity of use of budgeting (e.g., how much discretion individuals have over their budgets, how much budget performance is emphasized in evaluations). On Map C, in contrast, the management accounting variables capture variation in the specific accounting information employed in subunits and organizations and variation in the detail of how and where it is employed. Uses of the management accounting information on Map C include both planning (e.g., production decisions) and control (e.g., incentive compensation).[11]

The most common theoretical base for Map C studies is the contingency theory of organizations, and the contingency-theory framework of selection fit and interaction fit is clearly visible on the map. However, many Map C studies also draw on an eclectic mix of other theoretical perspectives, such as sociology, strategy, psychology, and economics. Thus, non-accounting variables from a variety of theories appear on the map: for example, asset specificity (links 14, 16) from transaction-cost economics, environmental uncertainty (link 25) from contingency theory, and differentiation strategy (link 23) from strategy. In contrast to Maps A and B, some of the non-accounting variables and many of the management accounting variables derive more directly from practice than from social-science theory: for example, ABC (link 23), advanced management practices (links 10, 29), balanced scorecard (link 4), and benchmarking (link 23). Typical Map C studies show that more subunit interdependence increases the usefulness of more aggregated, broad-scope, integrated, and timely management accounting information (links 24–25), and that the interaction of advanced management practices and advanced manufacturing technologies increases the importance of non-financial performance measures (link 10).

3.2.4. Map D, Implementing Management Accounting Change

Map D resembles Map C in its focus on the use of specific types of information rather than the overall intensity of use of budgeting (as on Maps A and B). However, studies on Maps C and D ask different questions about these specifics. Map C studies tend to ask, "What specific management accounting practice is a good fit for a given set of organizations?" whereas Map D studies tend to ask, "How did a given set of organizations come to implement this specific management accounting practice?"

[10]See Donaldson (2001) and Van de Ven & Drazin (1985) for discussions on types of fit.

[11]The terms "planning" and "control" are used here to designate decision-making and decision-influencing uses of management accounting, in the sense of Demski & Feltham (1976).

The theoretical antecedents of Map D, and thus the non-accounting variables, are diverse. Because potential improvements in fit can be one reason why organizations implement new management accounting practices, contingency-theory variables such as environmental uncertainty, decentralization, formalization, and vertical differentiation appear on Map D (links 4, 5). Other theories, however, identify additional variables as important. Institutional sociology indicates that mechanisms such as board of directors interlocks support the transmission of new practices between organizations (link 8). Process models of organizational change focus attention on the actions of stakeholders such as top management, consultants, unions, and champions/sponsors of the new practice (links 1, 3, 11, 15, 16). The management accounting variables on Map D are largely practice-defined: ABC (links 1–7, 11–16), ISO 9000 accreditation (link 8), and a set of management accounting changes that includes overhead allocation systems, the use of quality and customer satisfaction measures, and transfer pricing (link 9). Typical Map D studies show that product diversity and competition are associated with ABC implementation at the organizational level (links 6, 7), and top management support is associated with ABC implementation at both the organizational and subunit levels (links 1, 16).

3.2.5. Map E, Performance Measures and Incentives

Studies on Maps A–D examine the use of management accounting practice for both planning and control, sometimes without clearly distinguishing the two. Map E, in contrast, examines only the latter use.

The key social-science antecedents of Map E are information economics and the economic theory of agency (Holmström, 1979). The latter theory defines optimal use of performance measures in incentive contracts on the basis of informativeness criteria. Agency theory also proposes that with imperfect information, achievable equilibria will be "second-best," allowing gaming behavior by individuals with private information. Non-accounting variables identified by this theory include organizational characteristics that affect the informativeness of accounting measures like current earnings as indicators of managers' performance, such as prospector strategy (link 10) and length of the product life cycle (link 14). They also include organizational characteristics that affect the ease of or payoffs from gaming an incentive system, such as market power (link 3). Most of the management accounting variables on Map E are either weights on performance measures in incentive contracts (links 10–13, 15–17) or indicators of distortions in management accounting information that may be caused by gaming incentive systems (links 3–7). Typical Map E studies show that the use of a prospector strategy or quality strategy is associated with more weight on non-financial relative to financial measures in executives' incentive compensation (links 10, 11), and that changes in regulation that make revenues from some products more sensitive to reported costs than others result in the shifting of reported costs to products with more cost-sensitive revenues (links 3, 4).

3.2.6. Map F, Contracting and Control: Microprocesses

On Maps A–E, the variables usually summarize the results of many actions that are not separately identified. For example, an individual's beliefs about his or her participation in setting budget goals (Map A) is usually the result of multiple events involving the individual and his or her superior (and perhaps peers), ABC implementation (Map D) is the result of many actions by many individuals, and weights on performance measures in executive compensation (Map E) are the results of multiple analyses and negotiations by the contracting parties and their advisers. Most Map F studies, in contrast, examine specific individual or small-group actions in contracting (e.g., specific offers, counteroffers, and impasses in contract negotiations).

Map F studies draw on and often contrast agency theory (Holmström, 1979) and theories from either social psychology (Taylor et al., 2003) or cognitive psychology (Tversky & Kahneman, 1974). Many of the studies on Map F use these theories to identify influences on cooperation (e.g., influences on performance in tasks that require teamwork and negotiation, links 2–9) or influences on individual truth-telling versus misrepresentation in contracting decisions (links 20, 24–32). Non-accounting variables that influence cooperation and truth-telling in these studies include information asymmetry and risk aversion from economics (links 14, 24, 28–30), social pressure (link 24) and organizational commitment (link 26) from social psychology, and second-order uncertainty (i.e., ambiguity, link 10) and gain versus loss framing of contract outcomes (links 13, 14) from cognitive psychology.

Management accounting variables in these studies include management accounting practices such as negotiated versus centrally established transfer prices (links 3, 4), different product-costing methods (link 8) and incentive-system characteristics that determine the payoffs from cooperation or misrepresentation

(links 7, 8, 20, 30, 31). Typical Map F studies show that individuals with higher performance capability choose more performance-contingent compensation, but that this effect is reduced by uncertainty in incentive pay (links 15, 16), and that while incentive systems with high payoffs for misrepresentation by the subordinate do induce such misrepresentation (link 31), the magnitude of the effect depends on the degree of information asymmetry (link 32) and the subordinate's risk aversion (link 30).

3.2.7. Map G, Individual Judgments and Decisions

Most Map G studies examine a single individual judgment or decision, while most Map F studies examine short sequences of judgments and decisions by individuals or small groups, and Maps A–E examine variables that capture many judgments and decisions by larger numbers of individuals. A Map G study, for example, examines a single judgment by individuals entering a transfer-price negotiation (link 38), rather than overall characteristics of a set of transfer-price negotiations (Map F, links 3, 4) or the transfer-pricing practice of an organization (Map C, link 16). Like Map A–D studies, however (and unlike Maps E and F), Map G studies address the use of management accounting practices for both planning and control, sometimes linking the two uses.

The theoretical underpinning of the Map G studies is the debate about individual rationality, often pitting predictions from information economics (Marschak & Radner, 1972) or agency theory (Holmström, 1979) against predictions from cognitive psychology (Newell & Simon, 1972; Tversky & Kahneman, 1974). The non-accounting variables on the map capture a variety of factors that influence individual judgments and decisions in economic or psychology theory or both: e.g., experience (links 12, 31, 48), time pressure (link 15), and role (superior versus subordinate or buyer versus seller, links 38, 43). Some management accounting variables on Map G capture characteristics of management accounting information such as the accuracy of product costs (links 1, 2), the variability of data used for a prediction (link 15), or the number of different information dimensions in a set of accounting data (link 45), which are expected to affect optimal and/or actual judgments and decisions. Other management accounting variables capture performance in variance investigation (links 22–25, 27, 30, 43), performance evaluation (links 26, 31–33), or prediction (links 15, 17–18, 46–48). Typical Map G studies show that individuals are less likely to use opportunity costs optimally in business decision-making if they have high levels of financial accounting knowledge, low levels of management accounting experience, or an intuitive cognitive style (links 11–13), and they are less likely to ignore irrelevant reported cost allocations if they have prior experience using these irrelevant costs in decisions (link 7).

3.2.8. Map H, Management Accounting in Its Historical and Social Context

While Maps A–G focus on *specific* management accounting practices such as the intensity of budgetary control or the use of specific types of information, Map H emphasizes the *general* character of management accounting practice as a system of calculation-based control through financial standards. It identifies variables associated with increased emphasis on management accounting practice, compared to alternative bases for organizing and evaluating economic activity. Thus in Map H, the management accounting variable is the use of the management accounting system as such.

The social-science antecedents of Map H include political economy (Braverman, 1974), institutional sociology (Berger & Luckmann, 1967; Meyer & Rowan, 1977), political models of organizations (Pfeffer, 1981), and discourse theory (Foucault, 1972, 1979). These theories are the source of the map's non-accounting variables, e.g., state mandates (link 8), societal conflicts and power struggles (link 1), and the discourse or individual subjectivity that is characteristic of particular societies or historical periods (links 6, 7, 11). Typical Map H studies show the effect of state support for management accounting practice through wartime economic controls and legal privileges for accountants (link 8) or the existence of a calculative discourse that makes the idea of management accounting control intelligible by the nineteenth century in a way that it might not have been earlier (links 6, 7). They also show how management accounting practice influences individuals' subjectivity and vice versa (link 11), how management accounting practice conceals political power (link 12), and how management accounting practice influences the visibility of individuals or processes (link 13).

3.2.9. Map I, Organizational Change Processes and the Relation of Financial and Operational Realities

Most studies in Maps A–C and E–G focus on static associations between management accounting practices and characteristics of individuals, subunits, organizations, and societies. In contrast, Maps D, H, and I, from different theoretical perspectives, focus on the dynamics of management accounting change. Map D shows influences on the

implementation of recent practices such as ABC, Map H shows influences on the historical rise of management accounting, and Map I shows processes of change and stabilization in organizations that help explain the role of management accounting.

Map I studies draw on a variety of social-science antecedents, including discourse theory (Foucault, 1972, 1979), ethnography (Geertz, 1973), and science studies (Latour, 1987). Following these theories, Map I studies often show management accounting practice as part of systems in which organizational structure, information technology, and production (key non-accounting variables) shift into and out of alignment with each other and with management accounting practice. A key management accounting variable on Map I is management accounting change as such: the upper part of the map (links 1–9) is a modification of Hopwood's (1987) model of management accounting change (Hopwood's model is shown in Fig. 3). In the lower part of the map (links 10–17), the focus is on the ways in which management accounting practice and other organizational features can mutually reinforce each other, either to maintain separate financial and operational realities in organizations, or to privilege the financial as the ultimate reality and to integrate and subordinate operational concerns to it. Some typical Map I studies show that the management accounting practice through which an external economic change is analyzed influences the organizational (e.g., responsibility structure, accounting control) response to the economic change (link 8), and organizational, production, information-technology and accounting (e.g., cost-system) changes influence each other (links 3–7, 9). Other studies show that operational and financial separation in the organizational structure is reinforced by the prevalence of mental models that represent the organization's activities in financial terms in some subunits and in operational terms in other subunits (link 11).

3.2.10. Summary

The introduction to the nine maps above shows that the choice of variables is a primary reason for the observed pattern of connections and disconnects in management accounting research within and between maps. Different streams of research simply focus on different variables. If these different variables represent largely unrelated constructs, then there is little reason to try to connect them. However, if these

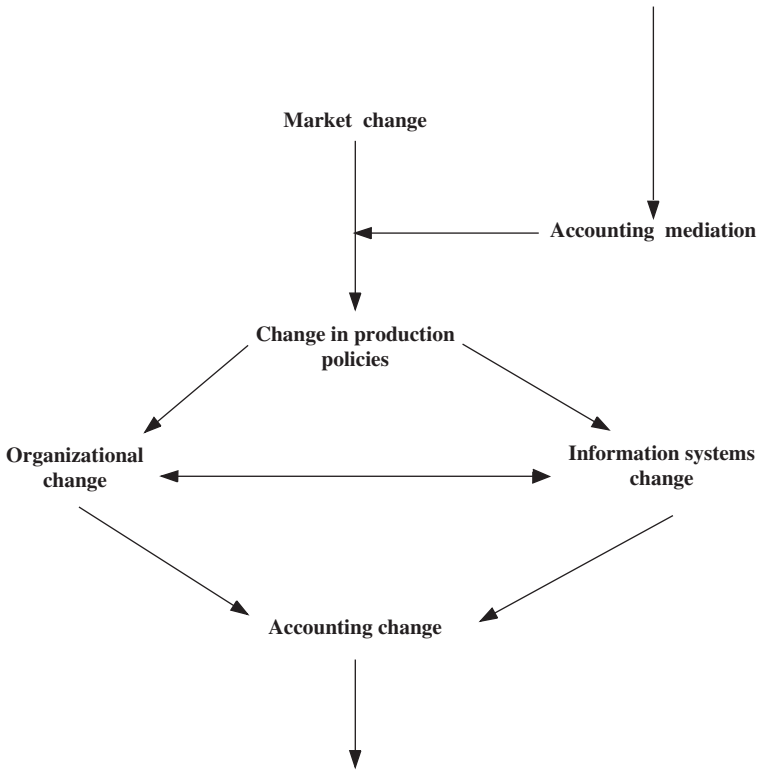


Figure 3. Hopwood (1987) model.

different variables describe the same constructs from the viewpoint of different theories that divide up and name the constructs differently, then there is more reason for research in one stream to take account of analysis and evidence produced by research in other streams. Some portion of the different variables in management accounting research falls in the latter category. However, as the following examples illustrate, understanding the relations among these variables requires resolution of questions about levels of analysis and causal-model forms.

Level-of-analysis questions arise, for example, in a comparison of Maps A and B, which share variables such as budget emphasis, budget goal difficulty, and participative budgeting. On Map A the individual-level variation in budget emphasis or participative budgeting is unexplained, while Map B shows organizational-level causes of variation in these budgeting practices. The question naturally arises whether Map B provides explanations for the unexplained variation in budgeting on Map A, and the two sets of studies could be connected into longer causal chains. It is not at all clear that this is feasible, however. Budget emphasis and participative budgeting might have different meanings, and therefore different causes and effects, at individual and organizational levels. For example, the reasons why some individuals participate more in setting their budgets than other individuals within the same organization (individual-level participation) are probably not identical to the reasons why some organizations push budget participation down to a broader range of employees than other organizations do (organizational-level participation). More detailed consideration of levels of analysis is needed to determine whether similarly named variables at different levels of analysis are actually the same variable—or if they are not identical, how they relate to each other (see Section 6).

Questions about causal-model form arise, for example, in a comparison of Maps D and I. Although (unlike Maps A and B), the variables in these two maps are not identically named, they seem to address similar phenomena: Map D is entitled ''Implementing management accounting change'' and Map I is ''Organizational change processes …'' The two maps represent management accounting change in different causal-model forms, however. Map D is the simplest of all the maps in terms of causal-model form—all the relations are unidirectional linear additive—while Map I is perhaps the most causally complex of all the maps, showing lengthy bidirectional intervening-variable relations, sometimes including interactions. It seems unlikely that both these representations of change can be equally valid if they are intended to describe the same or similar constructs.

3.3. Causal-Model Forms and Levels of Analysis

Table 1 presents the frequencies of appearance of each causal-model form and level of analysis on each map and summed across all nine maps. These frequencies are the basis for the percentages reported below, where we comment on the uneven distribution of causal-model forms and levels of analysis across maps. The unit for the frequencies is a ''link-study pair.'' A link is an arrow (causal relation) on the maps, for example, an arrow connecting organizational life cycle with the use of management accounting (Map C, link 12). If only one study provides evidence supporting the existence of this relation, then there is one link-study pair. If three studies provide evidence supporting the existence of the same relation, then there are three link-study pairs. Multiple arrows in an additive model are defined as separate links, but an interaction model with multiple variables at the tail-end of the arrow is one link, as is an intervening-variable model with multiple arrows. The maps in total include 589 link-study pairs.

Five striking features of the use of causal-model forms and levels of analysis are evident in Table 1: the rarity of curvilinear causal-model forms, the predominance of additive causal-model forms, the predominance of unidirectional causal-model forms, the predominance of single-level models (with levels unevenly distributed across maps), and the uneven distribution of models that explain the causes of management accounting (the dependent variable), models that explain its effects (the independent variable), and models that explain both. Each feature indicates an important limitation on what can be learned from the management accounting research represented on the maps. These five features and their implications are described briefly below and discussed at more length in Sections 5–7.

3.3.1. Curvilinearity

Only six of the 589 link-study pairs represent curvilinear relations. Linear models can limit understanding by failing to show when the effect of a variable can diminish, intensify, or change direction at different levels of the variable. A model without curvilinearity identifies no limit, for example, to the performance improvements that can be achieved by setting more difficult budgets or providing more performance-contingent compensation. In theory there are certainly such limits (e.g., diminishing returns in economics), and managers in practice are likely to be concerned about where the limits are.

Table 1. Descriptive statistics of link-study pairs.

Map	A-I[a]	A	B	C	D	E[a]	F	G	H	I
N	589	88	54	91	47	52	59	81	48	69
Causal-model form										
Unidirectional:										
Curvilinear: U relation	4	0	0	1	0	1	0	2	0	0
Curvilinear: inverted-U relation	2	0	0	1	0	0	0	1	0	0
Linear:										
Additive	371	45	32	64	47	43	32	62	33	13
Intervening variable	56	9	9	10	0	3	5	5	0	15
Ordinal independent-variable interaction	100	28	10	12	0	3	17	7	12	11
Ordinal moderator-variable interaction	16	3	2	3	0	2	3	3	0	0
Disordinal independent-variable interaction	8	3	1	0	0	1	2	1	0	0
Disordinal moderator-variable interaction	0	0	0	0	0	0	0	0	0	0
Bidirectional:										
Reciprocal non-recursive	17	0	0	0	0	0	0	0	3	14
Cyclical recursive	16	0	0	0	0	0	0	0	0	16
Levels										
Single	523	87	46	81	46	51	56	80	42	34
Top-down	55	1	8	10	1	1	3	1	2	28
Bottom-up	8	0	0	0	0	0	0	0	4	4
Top-down and bottom-up	3	0	0	0	0	0	0	0	0	3
Single-level										
Individual	203	87	0	4	0	1	31	80	0	0
Subunit	101	0	26	25	18	4	25	0	0	3
Organization	177	0	20	52	28	46	0	0	0	31
Beyond organization	42	0	0	0	0	0	0	0	42	0
Management accounting										
Independent variable	220	73	16	12	0	13	30	51	21	4
Dependent variable	242	5	32	70	47	37	15	21	14	1
Independent and dependent variable	127	10	6	9	0	2	14	9	13	64

[a]For columns A-I and E, the number of observations for the causal-model form subsection is one greater than *N* because the model in Banker et al. (2001) is counted twice, once as a disordinal interacting independent-variable model and once as an inverted-U relation.

3.3.2. Additivity

The majority of the link-study pairs (79%) include no interactions: that is, they include no explicit recognition that the effect of one variable depends on the presence or magnitude of other variables. Additive models can limit understanding of management accounting practice by representing its causes and effects (e.g., organizational-structure causes and performance effects) as universal rather than conditional on a context of other variables such as markets, cultures, technologies, and government regulation.

3.3.3. Unidirectionality

Causal direction on the maps is almost always one-way: 95% of link-study pairs are unidirectional. For example, the research usually represents budget goal difficulty as influencing performance but not vice versa and production technology and organizational structure as influencing management accounting practice but not vice versa. Unidirectional models can limit understanding when they make the independent variables look like levers that can be pulled without generating recoil from the other end of the lever. The unidirectional models represent a world in which managers who want to raise performance can simply raise the level of budget goal difficulty or performance-contingent compensation or increase monitoring, without generating reverse effects or resistances. These unidirectional links are occasionally called into question, both by unidirectional links in the opposite direction (e.g., the effect of budget goal difficulty on performance on Map B, link 7, and the effect of performance on budget goal difficulty on Map B, link 14) and by the relatively few bidirectional links (33 link-study pairs, all on Maps H and I).

3.3.4. Single-Level Models

Management accounting research tends to examine individuals *or* organizations *or* society but not individuals *and* organizations *and* society: 89% of

the link-study pairs are single-level. The distribution of levels is uneven across maps: Map A is almost entirely at the individual level, Maps B–E at the organization and subunit levels, Map F at the individual and subunit levels, Map G at the individual level, Map H at the beyond-organization level, and Map I mostly at the organization level. When similar variables are studied at different levels (e.g., the budgeting variables in Maps A and B, the incentive-contracting variables in Maps E and F), questions arise about the possible relations between levels. There are few cross-level models, however, and the majority of these (55 of 66 cross-level link-study pairs) are top-down. Studies on the maps thus provide some evidence about how organizations or subunits affect individuals but less about how individuals affect organizations or subunits.

Single-level models can limit understanding of management accounting practice in a variety of ways. If they are higher-level (e.g., organizational-level) models, then they often have no clearly specified causal mechanism—that is, no explicit set of individual actions and interpretations by which organization-level causes lead to organization-level effects, such as how prospector strategy leads to more difficult budgets (e.g., who does what to make this happen, and what motivation and reasoning causes them to do it?). If the models are only at the individual level, then it is not clear how they relate to higher-level effects: knowing how a single judgment is made is not the same as knowing the effect of that judgment on the interpersonal interchanges and institutional structures that constitute management accounting practices. Finally, top-down models can limit understanding by failing to address higher-level problems as they appear to managers who, as individuals trying to steer organizations, often initiate bottom-up action.

3.3.5. Management Accounting Practice as Independent or Dependent Variable

Some studies take management accounting practice as given and show its effects (management accounting practice as the independent variable only: 37% of link-study pairs), while other studies show only causes but not effects of management accounting practice (management accounting practice as the dependent variable only: 41% of link-study pairs). Moreover, explanations of causes and effects are unequally distributed across maps, with A, F, G, and H mostly explaining effects and B, C, D, and E mostly explaining causes. These characteristics limit understanding of management accounting practices in two ways. First, if management accounting practice is studied only as the independent variable or only as the dependent variable, we learn something about how management accounting practices affect non-accounting variables and vice versa, but we do not learn how various management accounting practices affect each other. Second, insofar as studies of the causes and the effects of management accounting practice appear on different maps, they also tend to identify different variables and provide different, sometimes incompatible, explanations, which make it difficult to link causes and effects of management accounting practice into valid longer chains of explanation.

In spite of the limitations noted above, linear additive unidirectional single-level models with management accounting practice as only the dependent variable or only the independent variable can provide valid understanding of management accounting practice under certain conditions. The following sections discuss the conditions under which different causal-model forms and levels of analysis are valid choices, as well as relating causal-model form and level-of-analysis choices to variable choices. The discussion is summarized in a set of guidelines that appears in Fig. 4.

4. What Variables are Researched: Guidelines 1–4

Because management accounting research uses a variety of ways of categorizing and naming the elements of management accounting practice and its environment, variables that have the same names but are studied at different levels of analysis or identified and analyzed using different theoretical perspectives can capture similar but not identical constructs. Moreover, variables with different names can capture similar but not identical constructs. In this section we describe and analyze these relations among constructs and variable names that have partially shared meanings. Identifying the meaning shared (and not shared) by management-accounting-related variables is an important part of identifying natural and artifactual connections in the research. Section 4.1 identifies three key types of partially shared meaning among variables that appear on the maps. Further discussion of one of these types is deferred until Section 6 because it involves level-of-analysis as well as variable-identification issues; the other two types are discussed in Sections 4.2 and 4.3.

4.1. Types of Partially Shared Meanings

Management accounting practice does not categorize the world in the same way as any basic social-science theory—for example, ABC and the balanced scorecard do not map one-to-one onto constructs in economics, psychology, or sociology—nor do the basic constructs

1. If a practice-defined variable is used, then clearly define the theoretical variables that explain its causes and effects —not only the theoretical variables that are of particular interestin the current study, but also others that the practice-defined variable is likely to possess.
2. If a practice-defined variable can represent multiple theoretical variables, then gather evidence that identifies their separate causes and effects.
3. If the theoretical variable of interest belongs to only a definable subset of instances of the practice-defined variable (e.g., only some ABC systems or some nonfinancial information), then state this limitation explicitly.
4. A variable definition should not include content irrelevant to the research question and theory employed or exclude relevant content.
5. If theory predicts nonlinearities in the relation examined, then consider the value of capturing nonlinearities in the study.
6. If a linear model is used for the sake of simplicity, then be explicit about the resulting limitations.
7. If the causal model proposed is additive, then indicate both the reasons for assuming there are no important intervening-variable or interaction relations and the consequences of omitting these relations if they exist.
8. If the causal model proposed is conditional, then indicate the type of conditionality (intervening versus interacting).
9. For interaction models, indicate whether the interaction is ordinal or disordinal.
10. For interaction models, indicate whether the interaction involves independent variables only or independent variables and moderator variables.
11. If unidirectional causality is assumed, then indicate the reasons for excluding bidirectionality.
12. Align the time frame of the study (length and frequency of evidence collection) and the causal interval (the time required for the cause examined in the study to have an effect).
13. Indicate whether the variable of interest varies across individuals, organizational subunits, organizations, or beyond-organization entities like markets and societies.
14. Align the level of theory(what is being explained), level of variable measurement (source of evidence), and level of data analysis (unit of data).
15. If theoretical variables at multiple levels affect the observable dependent variables, then separate the effects from multiple levels.
16. If cross-level effects are proposed, then use an interaction causal-model form, with at least one interacting (independent or moderator) variable at the level of the dependent variable.
17. If the variation of interest in a variable is variation in its value relative to a subset of other values in the sample, then use an individual-within-group-level model.

Figure 4. Guidelines for theory-consistent empirical management accounting research.

in these social-science theories map one-to-one onto each other. The use of these multiple categorizations results in three distinct types of partially shared meanings among variables on the maps.

1. Some variables are derived directly from a particular social-science theory construct (e.g., calculative discourse on Map H, performance-measure weights in incentive contracts on Map E), while others are derived from management accounting practice (e.g., ABC, the balanced scorecard on maps C–D). A practice-defined variable is likely to share meaning with one or more theory-defined variables but not to have identical meaning with any of them. (See Section 4.2.)
2. Different theories define their constructs more or less broadly, so that a variable derived from one theoretical construct captures a subset of the meaning that is included in a different theoretical construct and in a variable derived from it: for example, general usefulness of specific types of information in contingency theory versus usefulness of the information in making specific production decisions or in compensating executives in

information economics and agency theory. Different practice-based variables may also be defined more or less broadly: for example, in Map C, some studies combine practices like TQM and JIT into a single variable called advanced management practices, while other studies consider each practice separately. (See Section 4.3.)

3. Variables with the same or similar names sometimes appear at different levels of analysis, like the budgeting variables derived from different social-science theories on Maps A and B. These similarly named variables at different levels share meaning but are not necessarily identical. (See Section 6.)

4.2. Practice-Defined and Theory-Defined Variables

Practice-defined and theory-defined variables each have distinctive advantages and disadvantages. Practice-defined variables have the advantage of capturing management accounting phenomena practitioners want to understand, in practitioners' own language. Studies using these variables can thus be attractive and accessible to a broader audience than studies using theory-defined variables. On the other hand, theory-defined variables are more likely to have well-defined, stable, unitary meanings, making it possible to identify consistent cause-and-effect relations. A single practice-defined variable, in contrast, can denote multiple constructs with different causes and effects. Failure to distinguish these multiple constructs has long been seen as a disadvantage of using practice-defined variables: as Weick (1969: 23) observed, "… working within the constraints of managerial language is a severe deterrent to understanding."

Disentangling the multiple meanings of practice-defined variables such as ABC and the balanced scorecard remains a significant challenge for management accounting researchers. A given practice-defined variable can be associated with variations in communication, reward structures, symbolic value, or information characteristics such as precision or sensitivity. Failing to examine the meanings of practice-defined variables carefully can result in invalid conclusions from research for two reasons. First, the meaning of a practice-defined variable often coincides with the meaning of a particular theoretical variable only in a subset of instances and not in general. Second, a practice-defined variable is often associated (to varying degrees) with multiple theoretical variables, and it can be difficult to determine which of the theoretical variables explains the causes or effects of the practice-defined variable.

Non-financial information, for example, is a practice-defined variable; it is often identified as a leading indicator of financial performance and its causes or effects attributed to its greater timeliness in providing the performance information that financial measures provide only later. However, non-financial information *in general* is not necessarily more timely than financial information *in general*, and non-financial information can have important theoretical properties besides timeliness. Some non-financial information is more precise or sensitive than financial information or more easily understandable, or it can give greater visibility to some individuals and support different power relations in an organization. Different subsets of non-financial information have more or less of these various theoretical properties; thus, for example, the use of particular non-financial information that is not more timely than financial information but is more sensitive to managers' actions will have different causes and effects than the use of non-financial information that is more timely but less sensitive. Valid research on the causes and effects of non-financial information use depends on identifying the information as timely, precise, etc., rather than simply identifying it as non-financial.

4.2.1. Guidelines

1. If a practice-defined variable is used, then clearly define the theoretical variables that explain its causes and effects—not only the theoretical variables that are of particular interest in the current study, but also others that the practice-defined variable is likely to possess.
2. If a practice-defined variable can represent multiple theoretical variables, then gather evidence that identifies their separate causes and effects.
3. If the theoretical variable of interest belongs to only a definable subset of instances of the practice-defined variable (e.g., only some ABC systems or some non-financial information), then state this limitation explicitly.

4.3. Breadth of Definition of Variables

The breadth of both practice-defined and theory-defined variables on the maps varies: see Appendix L for examples. The research question and theory determine the valid breadth of definition. For example, environmental uncertainty can be too broadly defined a variable if only a subset of the uncertainties in the environment influence the other variables in a given study; uncertainty of bonus pay can be too narrow a definition if other uncertainties (e.g., about other components of compensation or about non-monetary payoffs) also influence the other variables studied (e.g., individuals' choice of incentive contracts or their investment and production decisions).

A variable too broadly defined relative to the underlying theory generates noise in the cause–effect relation and makes it less likely that the effects specified in the theory will be detected, even when they exist. Too broad a definition also makes it more likely that effects other than those specified in the theory will be detected and wrongly interpreted (e.g., mistaking precision effects for timeliness effects in the non-financial information example above). In contrast, a variable too narrowly defined captures only part of the proposed cause–effect relation and also makes it less likely that the effects specified in theory will be detected, even when they exist.

4.3.1. Guideline

4. A variable definition should not include content irrelevant to the research question and theory employed or exclude relevant content.

5. Causal-Model Forms: Guidelines 5–12

The following sections discuss in more detail the issues of causal-model form that were initially raised in Section 3.3: curvilinearity (Section 5.1); additive, intervening-variable, and interaction models (Section 5.2); and directionality (Section 5.3).

5.1. Curvilinearity

Much of the theory underlying empirical management accounting research predicts curvilinear relations. The contingency theory of organizations, for example, predicts curvilinear relations between organizational size or technology and some other organizational characteristics (Donaldson, 2001). Economic theory predicts curvilinear functions for individual utility and for organizational costs and profits. Some cognitive-psychology theories predict U-shaped or inverted-U response curves. These relations are rarely represented in empirical management accounting research, however: only one percent of the link-study pairs on the maps represent curvilinear relations.

Researchers often intentionally induce linearization by limiting the range of evidence collected (e.g., choosing typical cases rather than extreme cases for qualitative studies) or transforming quantitative data to meet the assumptions of linear statistical models. Although limited-range or linearized analyses of data can be consistent with theory, they represent only a portion of what many theories can in principle explain. For example, the studies of organizational size and management accounting practice on maps B, C, and E commonly omit very large and very small organizations, and the organizational size variable within the remaining sample is often linearly transformed for purposes of statistical analysis and not transformed back to the raw measure for purposes of interpretation. In consequence, we know little about management accounting practice in very small organizations, which are numerous, and in very large organizations, which are influential. Moreover, even within the middle range of organizational size, if the size variable is not back-transformed for purposes of interpretation, then erroneous conclusions can be drawn from the findings. For example, if the size effect is positive but concave over the range studied and only the results of the linearized analysis are shown, then it can be easy not to recognize the fact that at the lower end of the range, a given (raw) increase in organizational size can have a very large effect on management accounting, but at the upper end of the range the effect can be too small to be significant for practice.

Similarly for studies of performance measurement and incentives, a restriction to showing limited-range linear effects leaves important questions unanswered. For example, a number of studies on Maps D–G show that making compensation more dependent on performance increases performance. Incentive designers in practice are concerned with the exact shape of the curve: at what point do the expected costs of a further incentive increase outweigh the diminishing expected benefits? Linear-model studies, which can only say that bigger bonuses are better, do not answer this question about the shape of the curve. Understanding the shape of the curve is particularly important if the sign of the relation changes over the observed range, so that for example for low values of the independent variable the effect is positive but for high values it is negative or vice versa.

The few studies of curvilinear relations on the maps have the potential to generate unresolved inconsistencies with the linear studies. For example, link 20 on Map C shows a curvilinear relation between information asymmetry and the complexity of one part of the management accounting control system (sophistication of post-auditing in capital budgeting), while link 1 on Map B shows a linear relation between decentralization (often considered an indicator of information asymmetry) and overall management accounting control system complexity. It is not clear whether the difference in causal-model form between these two links occurs because different ranges of the variables are examined, because the relation is really curvilinear for complexity in one part of the management accounting control system but not in other parts, or because the analyses in the

different studies are more or less sensitive to curvilinearity for other reasons (e.g., how the variables are measured[12]).

5.1.1. Guidelines

5. If theory predicts nonlinearities in the relation examined, then consider the value of capturing nonlinearities in the study.
6. If a linear model is used for the sake of simplicity, then be explicit about the resulting limitations.

5.2. Additive, Intervening-Variable, and Interaction Models

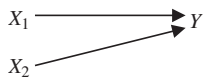
The same sets of variables sometimes appear in different linear unidirectional causal-model forms: additive, intervening-variable, and interaction.[13] In Map A, for example, the relation between participative budgeting and satisfaction is represented with several different causal-model forms: additive (link 14), intervening variable (link 13), moderator-variable interaction (link 12), and an independent-variable interaction (link 11). Most of the maps include similar instances of a set of variables linked with different causal-model forms. Identifying valid connections among variables requires understanding when these causal-model choices are and are not in conflict with each other, and when they are in conflict, understanding the consequences of using an invalid causal-model form.

Causal-model forms describe qualitative narratives as well as statistical models. For example, if one observed action in a narrative is presented as the consequence of the occurrence of two other earlier actions, then this relation can be represented in a variety of ways. Perhaps the two earlier actions and their effects are independent of each other, and neither alone has a large enough effect to result in the occurrence of the third but both together do (an additive model), or perhaps the first action causes the second, which in turn causes the third (an intervening-variable model), or perhaps the influence of the first event on the third is much larger in the presence of the second than in its absence (an interaction model). The causal-model form guides the collection of evidence in both qualitative and quantitative studies (e.g., the decision whether to search for evidence on intervening and interacting variables); it also guides the analysis of evidence, determining the statistical tests that yield valid results with quantitative data and the descriptive language that most exactly represents the observed events in a narrative.

5.2.1. Additive versus Intervening-Variable Models

An additive model that predicts $X_1 \rightarrow Y$ is not in conflict with an intervening-variable model that predicts $X_1 \rightarrow X_2 \rightarrow Y$ or $X_1 \rightarrow X_2 \rightarrow X_3 \rightarrow Y$. Examples of causal relations with and without intervening variables are on Map A, links 20 and 39 (direct path from motivation to performance and indirect path via commitment to the budget goal) and Map C, links 24–25 (direct path from subunit interdependence to usefulness of aggregated information and indirect path via decentralization). Providing evidence on how the independent variable affects the dependent variable by using an intervening-variable model is useful when results from additive models are inconsistent or when competing theories specify different causal processes.

In contrast to the example above, an additive model that predicts



is in conflict with an intervening-variable model that predicts

$$X_1 \rightarrow X_2 \rightarrow Y$$

with no separate direct link from X_1 to Y. Suppose, first, that the intervening-variable model is a valid representation of the causal relations among the variables: there is no direct relation between X_1 and Y, but X_1 strongly influences X_2, which in turn influences Y. In this case, using the additive model and regressing Y on the two independent variables can show that neither X_i has an effect on Y—a completely misleading conclusion—because the strong $X_1 \rightarrow X_2$ relation creates multicollinearity in the additive regression model. Conversely, suppose that the additive model is a valid representation of the causal relations among the variables: X_1 and X_2 are independent of each other but both independently influence Y. If the intervening-variable model with no direct $X_1 \rightarrow Y$ path is used, then the result may show no effect of X_1 on Y—because there is no effect through X_2—even though the $X_1 \rightarrow Y$ effect is strong.

[12]For example, if survey respondents treat a response scale as an ordinal scale rather than an interval scale, then the data may not capture curvilinearities.

[13]Intervening-variable and interaction models can in principle include curvilinear components, but only one of the studies represented on the maps does so (see footnote to Table 1).

5.2.2. Additive versus Interaction Models

On maps that display complex causal relations, a pattern often appears in which two variables are linked both with and without an interaction with a third variable. For example, individuals' performance capability influences their choice of performance-contingent compensation on Map F, link 16; on Map F, link 15, this effect depends on the uncertainty of incentive pay. (Similar examples can be found elsewhere on Map F, as well as on Maps, A, B, G, H, and I.) In these cases, do the interaction models such as link 15 contradict the additive models such as link 16 or can both be valid representations of the same relation?

Suppose, first, that the relation is interactive—the effect of X_1 on Y depends on the magnitude of X_2 and vice versa—and that an additive model including an $X_1 \rightarrow Y$ relation is used. (The model can also include an $X_3 \rightarrow Y$ relation, an $X_4 \rightarrow Y$ relation, and so on.) If X_2 is constant when the evidence is collected to support this additive model, then the resulting conclusion about the $X_1 \rightarrow Y$ relation is only valid at that level of X_2; the additive model is context dependent, with the level of X_2 as the relevant context. If X_2 is *not* held constant and is either omitted or included as an additive (not interacting) variable, then the detected effect of X_1 on Y is a weighted average of the different X_1 effects that occur at different levels of X_2.

How misleading it is to omit an interaction depends in part on whether the interaction is ordinal or disordinal. (These two types of interactions are represented differently on the maps; see Appendix J.) If the interaction is ordinal, then changes in X_2 change the *magnitude* but not the *sign* of the effect of X_1 on Y.[14] Thus, if the sign of the $X_1 \rightarrow Y$ relation is positive, then X_1 will increase Y at all levels of X_2, and individuals choosing more X_1 without regard for the level of X_2 will receive an increase in Y that is larger or smaller than expected but will not (on average) receive a decrease in Y. If the interaction is disordinal, however (e.g., Map F, links 8 and 26; Map G, link 1), then X_1 increases Y at some levels of X_2 and decreases it at other levels; thus, ignoring a disordinal interaction can have more unexpected effects (e.g., reducing performance when an increase in performance is expected).

[14]To limit the number of different models represented on the maps, we have included in the ordinal-interaction category studies in which X_i has a significant effect on Y at one level of X_j but has no significant effect on Y at another level of X_j, even if these relations are tested separately rather than in a single interaction test.

5.2.3. Intervening-Variable versus Interaction Models

Intervening-variable and interaction models represent two kinds of conditional relations. For example on Map C, link 6, the use of efficiency-based performance measures in manufacturing is conditional on whether manufacturing organizations pursue a flexibility strategy. The use of efficiency-based performance measures in turn influences performance (an intervening-variable model), but *how much* the efficiency measures affect performance is conditional on the organizations' flexibility strategy (an interaction model). The more flexible their manufacturing strategy, the less the organizations will use efficiency-based measures, and the less beneficial these measures will be for performance when they are used. Because the intervening-variable and interaction relations are different, using both with the same data can be problematic. If examining the link from strategy to performance-measure choice yields sufficiently strong results (i.e., most manufacturing organizations with flexibility strategies do not use efficiency-based performance measures), then there will be insufficient variation in the sample (too few flexible-strategy organizations using efficiency-based performance measures) to provide a powerful test of the interaction model. (See Section 7.2 for further discussion.)

5.2.4. Interacting Independent-Variable versus Moderator-Variable Models

These two models represent different causal relations that should be clearly described in the narrative of a qualitative study or the hypothesis motivation of a quantitative study, although the same statistical tests can be used for both in a quantitative study (e.g., ANOVA interaction tests). For example on Map B, a build strategy (link 26) is represented as a moderator variable. In such a model, a build strategy does not in itself cause higher performance than other strategies, but it does affect the impact of subjective (versus formula-based) performance evaluation on subunit performance. In contrast, on Map C (link 28), customer-focused strategy is represented as an interacting independent variable because the study assumes that customer-focused strategy causes superior new product development performance, although the magnitude of the effect depends on the use of customer information in the management accounting control system. Whether strategy has any influence on performance or only moderates the effect of other variables on performance is an important theoretical and practical question; thus, failing to distinguish between moderator and independent-variable interactions can be misleading.

5.2.5. Guidelines

7. If the causal model proposed is additive, then indicate both the reasons for assuming there are no important intervening-variable or interaction relations and the consequences of omitting these relations if they exist.
8. If the causal model proposed is conditional, then indicate the type of conditionality (intervening versus interacting).
9. For interaction models, indicate whether the interaction is ordinal or disordinal.
10. For interaction models, indicate whether the interaction involves independent variables only or independent variables and moderator variables.

5.3. Directionality

Differing choices about causal direction lead to disconnects between maps and between individual studies within or across maps. Although some of the causal relations represented on the maps seem unambiguously unidirectional, others do not. For example, strategy choice affects management accounting variables (Maps B–E), but management accounting variables also influence strategy by affecting the information available as a basis for strategy choice (Gray, 1990). Support for ABC (whether by top management, unions, or other employees) affects the success of an ABC implementation (Map D), but initial successes in the implementation process can also affect the degree of support that ABC receives (Cooper et al., 1992). Organizational characteristics such as assignment of decision responsibility affect performance evaluations (Map G), but it seems possible that performance evaluations also affect future assignments of decision responsibility.

Given these uncertainties about actual causal direction, how should causal-model direction choices be made and what are the consequences of making invalid choices? The following examples from the maps indicate that choices of directionality depend on the time length for which evidence is collected. The unidirectional studies on Maps A–G are mostly cross-sectional while the bidirectional studies on Maps H–I are mostly longitudinal, in some cases covering decades or centuries. Similarly, the different signs and causal directions given to the budget goal difficulty → performance relations on Maps A, B, and F seem to depend on whether researchers are examining a single point in time (the cross-sectional budget goal difficulty → performance links on Map A, links 23, 25 and Map B, link 7), two distinct time periods (past performance → current budget goal difficulty, on Map B, link 14), or in ratchet systems three time periods (performance → budget goal difficulty → performance, Map F, link 20).

Valid research requires alignment of answers to two questions about time length. The first question is the time frame of the study; that is, over how long a period and at what intervals within that period should evidence be collected. For example, evidence might be collected at a single point in time, at the beginning and end of five years, or at monthly intervals throughout five years. The second question is the causal interval of the relation studied; that is, how long it takes for a change in X to cause a change in Y. As the remainder of this section discusses, answers to these questions about time length determine whether a unidirectional or bidirectional model is valid, and if a bidirectional model is valid, answers to questions about time length also determine which bidirectional model—reciprocal or cyclical—is valid. When causality is bidirectional, unidirectional models can provide valid evidence in limited circumstances, with appropriate acknowledgment of their limitations. Just as a linear model can be a valid simplification of a curvilinear relation within a limited range, a unidirectional model can be a valid simplification of a bidirectional relation within a limited time frame.

A well-established way of conducting valid unidirectional empirical studies is to identify a variable that can be treated as exogenous because its response to other variables is too slow to be captured within the time frame of the study—i.e., the $Y \rightarrow X$ causal interval is longer than the study's time frame but the $X \rightarrow Y$ interval is not (James et al., 1982; Kozlowski & Klein 2000; Simon, 1973). For example, if organizational structure changes much more slowly in response to changes in management accounting practice than management accounting practice changes in response to changes in organizational structure, then organizational structure can be treated as the exogenous variable within a limited time frame because it is not significantly influenced by management accounting practice during the period under consideration. If changes in organizational structure have had time to cause changes in management accounting practice, but the changes in management accounting practice have not yet had time to cause new changes in organizational structure, then a unidirectional organizational structure → management accounting practice model can be valid (James et al., 1982).

If a researcher is interested in the slower effect (management accounting → organizational structure in this example) or if effects in both directions have similar causal intervals, then a bidirectional model is needed. A cyclical recursive model is valid if the causal interval and time frame are matched so that,

for example, evidence collected about the period *t* to *t+1* (the first interval in the study's time frame) captures the causal influence in one direction, and evidence collected about the period *t+1* to *t+2* (the second interval in the study's time frame) captures the causal influence in the other direction (e.g., the studies in the upper part of Map I). If the mutual influences of the two variables are simultaneous or if the causal intervals are shorter than the intervals at which evidence is collected, so that influences in both directions are captured by evidence gathered at *t* and *t+1*, then a reciprocal non-recursive model is valid (Asher, 1983; Berry, 1984). In the lower part of Map I, studies that show how multiple attributes of an organization (e.g., acquisition strategy, decentralization) simultaneously affect each other are represented with reciprocal non-recursive models.

Identifying the causal interval is therefore crucially important in choosing the valid causal-model form and in collecting and analyzing quantitative or qualitative evidence. In both longitudinal and cross-sectional studies, collecting evidence about an effect before its cause has had time to act fully, or after effects in the reverse causal direction have begun to occur (i.e., the proposed effect has begun to influence the proposed cause), can lead to invalid conclusions. Collecting evidence for a time frame shorter than the causal interval can yield misleading results, for example, with management accounting practice changes that generate short-term profit effects and longer-term resistance as employees eventually find ways of subverting them. Conversely, collecting evidence for a time frame that is longer than the causal interval can result in not detecting important short-term dynamics. For example, collecting evidence on an organization's management accounting practice at only two points in time, before a new practice is implemented and three years after implementation when the practice appears to be operating successfully, can give an impression of easy implementation even if costly problems occur in the intervening period.

The alignment of time frame and causal interval is important for both qualitative and quantitative studies. Identifying where a narrative begins and ends is as important as determining how long an experiment should run or how many years of archival data to collect. Additional issues arise with quantitative analysis, however, because different statistical methods are valid for causal models with different directionality and causal intervals. If the causal relation between two variables is bidirectional within the study's time frame, then the coefficient in a single-equation OLS regression relating the two variables will be biased. If bidirectional models are used, then different statistical methods are required for the two types of model: for example, two-stage least squares for reciprocal non-recursive models and a system of regressions that treat $X_{I,t}$ as a different variable from $X_{I,t+1}$ for cyclical recursive models (Asher, 1983; Berry, 1984; Kennedy, 1998; see also Ittner & Larcker, 2001).

When the causal interval and time frame for a study are aligned, a unidirectional model can be valid even when the actual relation between the constructs studied is bidirectional. However, always using the simplifying strategy of making the slower-changing variable exogenous creates artifactual disconnects in the literature as a whole. First, slower-changing variables remain unexplained: we learn about their effects but not their causes. Second, even if the effects of the slower-changing variables are large, they can be undetectable in cross-sectional studies if the variables themselves vary less in contemporaneous cross-section than across longer periods of time. For example:

- Information technology can appear a less important cause of management accounting practice in a cross-sectional study of organizations in (say) 2000 than in a longitudinal study of changes between 1950 and 2000. Once variables such as industry have been controlled for, there can be too little variation in the 2000 sample to detect much effect of information technology even if it is a very powerful cause of management accounting practice.
- Factors that explain why executive compensation is higher in some organizations than others in 2000 may not be equally successful in explaining why real executive compensation is higher in 2000 than in 1950. For example, would current relative levels of compensation have been socially acceptable in 1950? Are the institutional mechanisms for determining compensation the same in 1950 and 2000? Social norms and institutional mechanisms are relatively constant in the 2000 sample and so have no detectable effect, but a longitudinal study might show substantial effects.

Although cross-sectional variation in variables such as information technology and social norms can be increased by increasing the heterogeneity of the sample (e.g., samples including countries with more diverse social norms or industries with diverse technologies), this sampling strategy also increases the possibility of confounds between the variable of interest and other variables.

5.3.1. Guidelines

11. If unidirectional causality is assumed, then indicate the reasons for excluding bidirectionality.

12. Align the time frame of the study (length and frequency of evidence collection) and the causal interval (the time required for the cause examined in the study to have an effect).

6. Levels of Analysis: Guidelines 13–17

The following sections analyze in more detail the issues of level of analysis that were initially raised in Section 3.3. Section 6.1 introduces criteria for valid single-level studies and Section 6.2 identifies criteria for valid multi-level studies.

6.1. Single-Level Studies

As noted in Sections 3.2 and 4.1, variables with the same or very similar names are often studied at different levels of analysis, and it is not clear whether the meanings of the variables at different levels are identical. This problem occurs elsewhere in the social sciences, as well as in management accounting research; for example:

> Is worker participation an individual-level phenomenon, describing the influence an individual exerts in unit decisions? Or is worker participation at the unit level, describing a set of formal structures and work practices (for example, quality circles) characteristic of units, not individuals? (Kozlowski & Klein, 2000: 27)

Similarly, subunit manager performance can be an individual-level variable if it captures performance differences among different managers in the same or similar subunits, or it can be a subunit-level variable if it captures performance differences among the same or similar managers assigned to subunits that differ with respect to characteristics such as technology or budget practices.

If the study is intended to examine causes and effects at a single level of analysis only, then care needs to be taken to insure that these causes and effects are not confounded with causes and effects at other levels. These confounds are particularly hazardous when variables at different levels have the same name but have different causes and effects at different levels of analysis: in such cases, a theory explaining a variable at one level might not provide a valid basis for a study of the variable with the same name at another level. For example, the reasons why uncertainty varies across industries (e.g., cross-industry variation in competition or technology) can be different from the reasons why uncertainty varies across individual managers within an industry or organization (e.g., individuals' knowledge).

In order to provide valid theory-consistent evidence, the following choices must be aligned (Hannan, 1991; Klein et al., 1994, 1999; Kozlowski & Klein, 2000; Rousseau, 1985):

- Level of theory: what is being explained?
- Level of variable measurement: what is the source of evidence?
- Level of data analysis:[15] what is treated as an independent datum for purposes of analysis—an individual observation, a group mean, etc.?

If a study does not align these three choices of level, then a valid theory might not be supported or an invalid theory can appear to be supported because the variable measurement and data analysis do not provide evidence on the chosen theory (Klein et al., 1994).

At any level of analysis, evidence can be gathered *from* individuals: that is, individuals can be the source of the evidence. If the theory is at a higher level than the individual level, then various actions can be taken in collecting and analyzing evidence to insure that the levels of variable measurement and data analysis are aligned with the level of theory. For example, if the variation of interest is at the organizational level, then evidence collection (e.g., interview or survey questions) should be designed to capture organizational, not uniquely individual, characteristics. Qualitative responses from one individual in an organization should be evaluated in comparison to others. Quantitative responses from multiple individuals in an organization can be averaged to remove individual-level "noise," thus using the level of data analysis to insure that the level of variable measurement (individual) does not result in conclusions out of alignment with the level of theory (organizational).

The effective sample size depends on a study's level of analysis (Klein et al., 1994; Rousseau, 1985). Consider, for example, 40 organizations in four industries with 4,000 employees. If the use of management accounting practice varies systematically across individuals within organizations and the theory employed in the study explains these differences across individuals, then management accounting practice is an individual-level variable and the available sample size is 4,000. If the use of management accounting practice varies systematically across organizations and the theory employed in the study explains these differences across organizations, then management accounting practice is an organizational-level variable and the sample size is 40. If the use of management accounting practice varies systematically across industries and the theory employed in the study explains these differences

[15]Level of data analysis is also called unit of analysis.

across industries, then management accounting practice is a beyond-organization (industry) variable and the sample size is 4.

6.2. Multiple Levels of Analysis

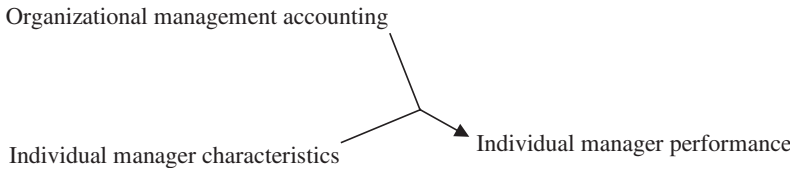
Much of the evidence collected on management accounting practice (e.g., organizational performance) results from causes at multiple levels (e.g., individual, subunit, organization, beyond-organization). The observable measure that is available for a variable is therefore often an aggregate of theoretical effects at multiple levels. Researchers then depend on data analysis to distinguish effects at different levels, either because they are interested in more than one level or because they want to separate the effect at the level that interests them from the effects at other levels. Consider, for example, subunit managers' performance as indicated either by a subjective evaluation or by the profits of the subunits they manage. Subunit-manager performance can include an industry-level effect (performance common to all organizations or subunits in the industry due to industry-wide conditions) and an organizational-level effect (performance common to all managers in an organization due to the organization's strategy, size, structure, market position, etc.), as well as a subunit-level effect and an individual-level effect. Subjective evaluations can attempt, with varying success, to partial out some of these effects (e.g., to eliminate industry-wide effects from an individual manager's evaluation through a subjective comparison of the subunit to others in the same industry), but the variable measure can still include effects from levels other than the one addressed by the theory employed in the study.

Effects on performance at different levels are sometimes additive. If the multi-level effects are additive, then the model is not *cross*-level by our definition: a variable theoretically defined at one level does not affect a variable theoretically defined at another level, although it can add noise to the measurement of variables at other levels. For example, no arrows cross levels in the model below:

Industry market structure → Industry component of manager's performance
Organizational strategy → Organizational component of manager's performance
Subunit budget → Subunit component of manager's performance
Individual skill → Individual component of manager's performance

In statistical analysis, nested or hierarchical models including variables at multiple levels can be used to partial out additive effects at different levels—either to remove noise if some levels are not of interest to the theory being used, or to identify the multiple-level effects separately if the theory is intended to explain variation at multiple levels (Bryk & Raudenbush, 1992; Kreft & De Leeuw, 1998).[16]

Valid cross-level models, unlike a multi-level additive model where no arrows cross levels, must be interactive (Klein et al., 1994), as shown in Fig. 5, Panel A, and the example below:



In this example, organizational management accounting that provides the same information to all individual managers can explain variation in individual-level performance only if there is some difference in individual managers (e.g., knowledge, preferences)

[16]Hierarchical linear modeling is limited in that it requires the dependent variable to be measured at the lowest level of interest to the researcher, although independent variables can be at higher levels. Latent variable structural equation modeling can be used, however, for multilevel models with independent variables at lower levels and dependent variables measured at higher levels (MacKenzie, 2001).

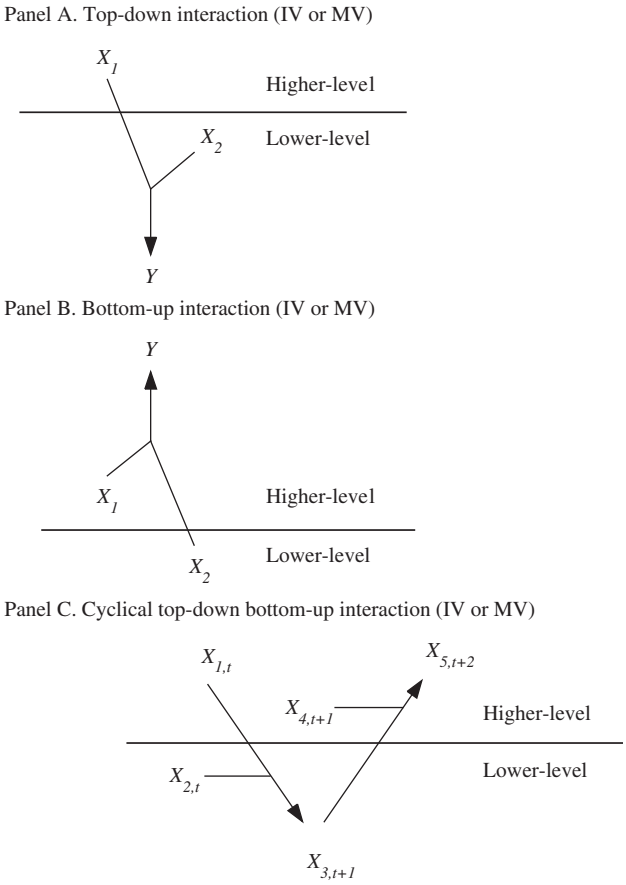


Figure 5. Cross-level interaction models.

that causes them to respond differently to the same organizational management accounting. In contrast, a cross-level theoretical model of the following form is invalid because uniformity in the cause cannot explain variation in the effect (Klein et al., 1994):

Organizational level	Organizational management accounting that is identical for all individual managers
	↓
Individual level	Individual managers' performance

Qualitative studies can make clear through exactness of language, as quantitative studies do through statistical data analysis, whether differences across individuals or differences across organizations (or subunits or higher-level entities such as markets or societies) are the focus of theoretical interest in the study. In studies addressing multiple levels, they can also make clear whether they are describing multi-level additive relations or cross-level interactions.

Some interactive top-down models appear on the maps (e.g., Map E, link 1; Map F, links 19, 33; Map G, link 1; Map H, link 10; Map I, links 1, 8). Other management accounting studies, however, include language that implies cross-level non-interactive models, like the example above in which organizational management accounting causes individual performance. In these studies, it may be that the dependent variable of interest is actually at the same level as the independent variable (in the hypothetical example above, the dependent variable would be the

organizational-level component of individual managers' performance). Concerns arise about the validity of the research design in these studies, however. If the level of theoretical interest for the dependent variable is the organizational level, then multiple individuals within the organization do not constitute independent observations. If, on the other hand, observations of individual managers (one per organization) are being used as proxies to collect evidence on organizational effects, then the issue of construct validity arises.[17]

Some of the link-study pairs we have classified as single-level (especially individual-level) could arguably be cross-level: for example, the effects of participative budgeting and budget-based compensation on individual performance on Map A or the effects of incentives on individual performance on Maps F and G. Contracting and participative budgeting by definition requires the involvement of more than one individual, which would appear to make them higher-level variables.

With these concerns in mind, we have classified the Map A studies as being at the individual level because they focus on individuals' constraints and opportunities arising from participation in budgeting, budget goal difficulty, etc., which are likely to vary across individuals in any given subunit or organization. In addition, the studies on Map A often use responses from multiple individuals within the same subunit or organization as independent observations. Subunit- or organizational-level effects are not typically partialled out, however, and there can be some doubt as to how much of the causes and effects captured are individual and how much are higher-level.

Similar reasoning determines the identification of levels of analysis in the incentive-contracting experiments on Map F. In this map, subunit-level incentive-contracting variables capture variation across small groups of individuals, such as bargaining pairs or superior–subordinate pairs. In these studies, the variation of interest is variation in how a pair of subjects respond together to the experimental condition. In other Map F studies, however, values of incentive-contracting variables are assigned to individuals (rather than to pairs or larger groups) by the experimenter, and the variation of interest is variation in individuals' response to the experimental condition. In these studies, we have identified the variables as being at the individual level.

Like valid top-down cross-level models, valid bottom-up models also are interaction-form models with at least one of the interacting variables (independent or moderator) at the level of the dependent variable (Fig. 5, Panel B). Whether specified conditions in an organization or society lead to a particular effect depends on individual action (the bottom-up interacting variable; e.g., Map H, link 6). Similarly, how individual actions affect higher-level variables (e.g., by changing organizational structures or subunit management accounting) depends in part on higher-level variables such as the existing organizational designs. Top-down models are more common in the organizational literature than bottom-up models—not necessarily because most causation is top-down but because top-down causal intervals are shorter. For example, individuals often react to changes in organizations more quickly than organizations react to changes in individuals (Kozlowski & Klein, 2000). If organizations influence individuals *and* vice versa, then causation is bidirectional, but if researchers want to simplify by using unidirectional models, then they need to choose the direction with the shorter causal interval (see Section 5.3), which will often be the top-down direction.

In the cross-level examples above, different variables (e.g., management accounting, performance) appear at higher and lower levels. A special kind of multi-level model, individual-within-group-level, that has not appeared in the management accounting literature, but arguably should, is one in which the higher-level variable is the *group* value of one of the lower-level (individual) variables (Klein et al., 1994; Kozlowski & Klein, 2000). Consider a contingency theory that predicts organizational performance will increase with improved fit of the organization's management accounting practice and production technology. A single-level study would relate fit and performance across organizations, perhaps with dummy variables for industry to eliminate performance effects from this source. However, an organization's performance can depend not only on the absolute fit between its management accounting practice and technology, but also on its fit compared to its competitors' fit. In this model the important point for an organization's performance is whether its fit is better or worse than that of its direct competitors, not whether it is better or worse than that of all organizations in the sample.

If this comparison to competitors drives performance, then regressing organizational performance on management accounting practice in a variety of markets—performing the analysis at an organizational level—could show no relation between management accounting practice and performance, even though *within* each market the relation is strong.

[17]Construct validity is the extent to which a variable captures all of and only the meaning of a construct.

Including dummy variables for markets is unlikely to solve the problem because these variables will only control for differences in average profitability across markets (e.g., the difference between profitability in the market for microchips and the market for groceries), not differences in average use of a management accounting practice. Two markets with similar average profitability could have different average use of a potentially beneficial management accounting practice. Thus, a given level of use of this practice could be relatively low and therefore performance-decreasing in one market, while exactly the same level of use could be relatively high and therefore performance-increasing in a different market.

6.2.1. Guidelines

13. Indicate whether the variable of interest varies across individuals, organizational subunits, organizations, or beyond-organization entities such as markets and societies.
14. Align the level of theory (what is being explained), level of variable measurement (source of evidence), and level of data analysis (unit of data).
15. If independent variables at multiple levels affect the observed dependent variables, then separate the effects from multiple levels.
16. If cross-level effects are proposed, then use an interaction causal-model form, with at least one interacting (independent or moderator) variable at the level of the dependent variable.
17. If the variation of interest in a variable is variation in its value relative to a subset of other values in the sample, then use an individual-within-group-level model.

7. Management Accounting as Independent and Dependent Variable

Most studies on the maps explain only the causes of management accounting or only its effects (i.e., management accounting is only the dependent variable or only the independent variable) (Table 1, Section 3.2). Section 7.1 introduces the issue of linking explanations of a variable's causes and explanations of its effects to create valid and more complete causal chains; it shows how these causal chains depend on the choices of variables, causal-model form, and levels of analysis discussed in Sections 4–6. Section 7.2 summarizes the conflicting views of different research streams on the feasibility of providing valid evidence on both explanations of the causes of management accounting practice and explanations of its effects on performance. Section 7.3 argues that knowing the length of a causal interval is key to choosing among these conflicting views and that identifying events within the causal interval will help to determine its length. Section 7.4 analyzes linking attribute and event variables to create more complete and valid models of the causes and effects of management accounting practice, and Section 7.5 describes current theoretical constraints on creating such models.

7.1. Linking a Variable's Causes and Effects

Quantitative studies typically examine one or two links in a causal chain (e.g., X_1 and X_2 cause Y) without examining the preceding or following links (the causes of the X_is and the effects of Y), and typically a management accounting practice is either X_i (the cause) or Y (the effect) but not both. Some qualitative studies examine longer causal chains, for example, the multiple bidirectional causal links shown on Map I. When some studies explain only the causes of management accounting practice while others explain only its effects, questions can arise about whether the explanations of cause are consistent with the explanations of effect. The ABC studies on the maps provide an example, showing how issues of variable identification, causal-model form, and levels of analysis affect the validity and completeness of explanations of ABC's causes and effects.

Map D shows explanations of the causes of ABC implementation. These explanations often identify contexts in which ABC is assumed to be more successful or useful (e.g., higher competition, product diversity) and predict that ABC is more likely to be implemented in these contexts.[18] Thus, in these studies explanations of the causes of ABC are based on assumptions about ABC's performance effects. If the assumptions about performance effects used to explain causes are correct, and if valid studies of the performance effects of ABC can be conducted (see Section 7.3), then causal-model forms should be consistent across studies of ABC's causes and studies of its effects. For example, suppose that higher competition causes more implementation of ABC, and this effect is not conditional on the level or type of competition or on other contextual variables

[18]Note that many but not all explanations of the causes of management accounting practices are based on assumptions about performance effects. The discussion in this section applies only to explanations that assume management accounting practices are adopted because of their performance effects.

(a positive additive linear relation, Map D, link 7). An explanation of performance effects consistent with this explanation of cause would be that ABC implementation has larger positive effects on performance in organizations facing higher competition, and this effect is not conditional on the level or type of competition or on other contextual variables (i.e., the explanation of performance effects has a positive additive linear form like the explanation of cause).

Studies of the causes and effects of ABC on the maps sometimes appear to have inconsistent causal-model forms. For example, Map D (link 7) shows that ABC is more likely to be implemented when competition is higher (a positive linear additive effect); Map G (link 1) shows that more accurate product costing increases profits under one kind of competition and decreases profits under another kind of competition (a disordinal interaction effect). Although studies of the causes of ABC on Map D often are based on assumptions of positive linear effects of ABC on performance, at least in some contexts, studies of the performance effects of ABC or similar variables do not show positive linear effects (e.g., the disordinal interaction effect of ABC on Map F, link 8; the curvilinear and negative effects of information quantity and dimensionality, which may be characteristics of ABC, on Map G, links 34, 35, 45).

Three explanations are possible for these causal-model form differences between cause and effect explanations. The first possible explanation is differences across studies in the meaning of similar variables. In this case, the assumptions about the performance effects of ABC that cause ABC implementation on Map D are correct but the actual performance effects of the variables on Maps F–G differ, because ABC on Map D means something different from ABC on Map F (link 8) and different from accuracy of product costs or quantity/dimensionality of information on Map G (links 1, 34, 35, 45). The second possible explanation is differences across studies in the levels of analysis. In this case also, the assumptions about the performance effects of ABC that cause ABC implementation on Map D are correct but there are systematic differences between the actual performance effects of ABC at different levels of analysis. For example, at the individual level, individuals might perform poorly in processing increased quantities of information (Map G, link 45), but at higher levels these effects might be mitigated through group information processing, market competition, etc. The third possible explanation is that the assumptions about performance effects of a management accounting practice that explain its causes are not correct. For example, it might be that ABC is assumed to be useful in all kinds of increased competition (Map D, link 7) and is therefore implemented more when some kind of competition is higher, but in fact it is not more useful in all kinds of competition (Map G, link 1). This third explanation is controversial. Economics-based research often excludes it, because it assumes that organizations systematically use a management accounting practice that is not optimal for them (e.g., they implement ABC under conditions in which ABC does not maximize performance) (Ittner & Larcker, 2001). The following subsection describes the positions taken on this controversial issue by different streams of management accounting research.

7.2. Causes, Effects, and Equilibrium

Because of their theoretical antecedents, different streams of management accounting research take different positions on the validity of the third explanation above. The psychology-based research on Maps A, F, and G and the sociology-based research on Maps H and I assume that explanations of the causes of management accounting practice and explanations of its performance effects can differ. This research assumes that management accounting practice can be adopted for reasons other than performance maximization (e.g., because of its symbolic value, Map H, links 2–3). This research also assumes that even when the goal is performance maximization, systematic judgment and decision errors can result in the use of a management accounting practice in ways that do not maximize performance (e.g., Map G, links 11, 21, 31). The economics-based research on Map E and the contingency-theory-based research on Maps B–D make different assumptions, which constrain the explanations of cause and effect that can be researched. The constraints imposed by these two theoretical perspectives are discussed in turn below.

Economics-based research depends heavily on assumptions of equilibrium. In this research stream, explanations of the use of a management accounting practice are explanations of why it is an equilibrium solution to an economic problem. If a management accounting practice is an equilibrium solution, then it is possible to provide non-experimental evidence for explanations of its causes but not for explanations of its performance effects. Researching performance effects requires a comparison of organizations that perform differently because some are using the management accounting practice that is optimal for them and some are not. In equilibrium, all organizations are using the management accounting practice

that is optimal for them. Thus, given the assumption of equilibrium, the relevant comparison is impossible to make because there is no variation in performance explained by optimal versus suboptimal management accounting practices (see Ittner & Larcker, 2001 for a discussion of this argument).

The contingency theory of organizations, like economics, assumes that organizations tend to use the management accounting practices that are best for them (i.e., the management accounting practices that fit). Unlike economics, however, contingency theory assumes that misfit also occurs in some organizations for extended periods (Donaldson, 1996). Under this assumption, it is possible to provide non-experimental evidence on the performance effects of management accounting practices (interaction fit) as well as on its causes (selection fit). However, these explanations of cause and effect cannot always be researched in the same settings.

Selection-fit predictions will be supported only if most organizations for which the management accounting practice is a good fit (as defined by the theory) have adopted it and most organizations for which the practice is not a good fit have not adopted it. If the results of these studies of cause are strong enough, then studying effects becomes impossible because there are too few organizations in misfit: there is not enough variation in performance due to the fit of the management accounting practice to provide a powerful test. *Both* selection and interaction fit can be examined only under one of the two following conditions. First, researchers must find a point in time at which a majority of organizations have achieved fit, thus providing valid evidence about selection fit, but a sufficiently large number of organizations remain that have not achieved fit, thus providing valid evidence about interaction fit. Second, interaction fit can be tested when only a moderate number of organizations have achieved fit, and selection fit can be tested afterward. In order for either of these situations to occur, some organizations must move from misfit to fit more slowly than others.

The differences summarized above between economics- and contingency theory-based streams of research depend on assumptions about equilibrium: whether it exists in the social systems that include management accounting practice, and if so, how rapidly these systems return to equilibrium after being disturbed. The validity of these assumptions is largely unknown, however. Research in the social and natural sciences indicates that the dynamics of some complex natural systems (even when driven by the adaptive, evolutionary forces that are often represented as generating economic equilibria) can cause cyclical or chaotic dynamics rather than equilibria (Richardson, 1991).[19] In complex natural systems, the length of the causal intervals within a system determines whether the system's behavior is equilibrium, cyclical, or chaotic (Stewart, 1989).

The longer causal intervals that drive cyclical or chaotic dynamics in biological or physical systems often exist because the non-human actors in these systems cannot foresee the consequences of their actions and alter their behavior to stabilize the systems (Richardson, 1991). Thus, it is sometimes argued that chaotic and cyclical dynamics will not occur in social and economic systems: because humans can foresee the consequences of their actions; they can prevent the maladaptations that cause chaotic or cyclical behavior. For example, the theory of rational expectations in economics (Muth, 1961) is intended to support predictions of equilibrium in markets and refute predictions of cyclical dynamics. Whether such unbiased foresight generally is prevalent remains an open question.

Moreover, subsequent arguments have been made that cyclical and chaotic dynamics emerge even *with* rational expectations, when there is a lag in the formation of expectations (a question of causal interval in individual judgments) or if supply and demand curves are curvilinear (a question of causal-model form) (Rosser, 1996: 203). Multiperson experiments have supported the prediction that time lags and curvilinearities, together with combinations of direct and indirect (intervening-variable) causal effects, generate cyclical and other non-equilibrium outcome patterns in laboratory economies (Diehl & Sterman, 1995; Sterman, 1989a, 1989b). Finally, the competition and learning processes that often are invoked to justify equilibrium assumptions in the absence of constant rational expectations (e.g., Alchian, 1950; Fudenberg & Levine, 1998) are not yet well understood: archival, experimental, and simulation research suggests that these processes sometimes result in optimizing equilibria and sometimes do not (Carroll & Hannan, 2000; Fudenberg & Levine, 1998).

Section 5 argues that knowing the length of a causal interval is important in choosing valid causal models (e.g., unidirectional, reciprocal non-recursive, cyclical recursive). The analysis above indicates that

[19]The behavior of these complex natural systems has been represented by sets of nonlinear differential equations, like those used in systems-dynamics modeling of business situations (Ashton, 1976b; Richardson, 1991: 36–38; Sterman et al., 1997).

knowing the length of the causal interval also is important in understanding major differences among research streams in management accounting and assessing the likelihood that a theory will predict well in a particular setting: a theory that assumes a system is always in equilibrium will have limited explanatory power for a system that is mostly out of equilibrium and vice versa. The following subsection therefore discusses bases for understanding the length of causal intervals around and within management accounting practice.

7.3. Causal Intervals, Attributes, and Events

Causal intervals appear to vary considerably, although current evidence is limited. Lanen & Larcker (1992) (Map E, link 1) show electric utilities changing their incentive compensation in response to regulation changes within a year of the regulation change. In Banker et al. (2000) (Map E, link 28), performance responds to an incentive change within months. On the other hand, other studies provide evidence of much longer causal intervals—for example, Anderson's (1995) description of the seven-year history of ABC implementation at General Motors (Map D, links 1, 3, 4, 7) and Miller & O'Leary's (1994, 1997) description of Caterpillar's ten-year transition to modern manufacturing (Map I, links 1, 3–7, 9). Consistent with these longer causal intervals, contingency-theory research provides evidence that organizations move from strategy-structure misfit toward fit, but that most organizations take at least ten years to change their structure (Donaldson, 2001). Thus, some change involving management accounting practice is rapid but some is not. If the causal interval for the relation being investigated is not known, then the validity of the research is in question.

Although the existing management accounting literature provides some evidence on the length of causal intervals, it does not appear to provide much theoretical basis for understanding why there is variation in the length of causal intervals. Abbott's (1992) distinction between attribute and event variables is helpful in understanding this issue.[20] Some variables on the maps are examples of events: a single decision whether to investigate a cost variance (Map G, links 22–25) or a single act of misrepresenting private information during participative budgeting (Map F, links 20, 24–32). Other variables on the maps are examples of attributes: decentralization as an attribute of organizations (Map B, link 2), symbolic value as an attribute of management accounting information (Map H, links 2, 3), and attitude toward the job as an attribute of individuals (Map A, links 28, 29).

The questions about causal-interval length raised above often are questions about the time required for a change in one attribute to result in a change in another attribute: for example, the time required for a change in environmental uncertainty to result in a change in the timeliness of management accounting information, and the time required for a change in the timeliness of management accounting information to result in a change in organizational or subunit performance. Thus to say that environmental uncertainty causes the timeliness of management accounting information is "… a quick way of summarizing many narratives in which [environmental uncertainty] accounts for [timeliness]." (Abbott, 1992: 431).[21] These narratives consist of sets of events, which provide the causal mechanism by which attributes come into existence and change (Hedström & Swedberg, 1998). For example, individuals notice a change in uncertainty, make various judgments about it, and agree or fail to agree on whether it is occurring, whether it calls for action, and if so what action. If there is sufficient agreement on making a change to a management accounting practice, then additional specific events must occur for the change to happen and affect performance (e.g., particular individuals must purchase and install new software, other individuals must change the way they do their jobs).

The causal interval will be longer when the causal mechanism includes more events and/or the events are more time-consuming (e.g., if the event is production of one unit, then it takes longer to produce one airplane than to produce one pair of socks). The link between any given pair of attributes will not always be composed of the same set of events: there is likely to be more than one way in which management accounting practice changes in response to changes in uncertainty, for example. But the sets of events that can link two particular attributes are probably not infinite in number and not equally likely, and understanding such events is likely to add to our understanding of the causal relations among the attributes.

[20] Abbott (1992), using the narrower definition of variables cited in Section 2.2, identifies attributes but not events as variables. Using the broader definition of variables as what researchers study, we label both attributes and events as variables.

[21] The original example in Abbott (1992) uses education and occupational achievement as the attributes.

7.4. Linking Attributes and Events

Some streams of research focus more on attributes (e.g., contingency-theory studies linking organizational structure to management accounting characteristics) while others focus more on events (e.g., sociology-based narrative studies, psychology-based studies explaining individual judgments or decisions). Connecting these streams to understand the causal links between attributes and events would be helpful in creating more complete explanations of management accounting practices' causes and effects, because events can explain the links between attributes and attributes can explain the links between events.[22]

Understanding the events that create the causal link between attributes supports more valid research about the attribute linkages because it helps to specify their causal intervals. Understanding these events can also help in assessing the plausibility of competing explanations of causal links between attributes because the sequence of events assumed by one explanation might be less likely to occur than the sequence of events assumed by another explanation. Conversely, attributes help to explain why one event follows another and thus to explain patterns of similarity among events. For example, an individual might refuse an offer in a compensation-contract negotiation (the offer and the refusal are two events) because he or she is risk-averse (an attribute of the individual). Similarly, attributes of management accounting practices or production systems or the individuals involved with them might explain why management accounting practice change and production change (events) occur in a pattern of repeated mutual adjustments rather than one large-scale completed change in production unidirectionally causing one large-scale change in management accounting practice.

Events as well as attributes can be defined at either the individual level or higher levels. Consider, for example, the events linking organizational-level environmental uncertainty to organizational-level management accounting practice. If all (or virtually all) the relevant individuals in an organization observe and assess environmental uncertainty in the same way and all decide on and implement the same management accounting practice in response, then these events would be at the organizational rather than the individual level by the definition employed in this chapter, since there is no individual variation of interest. If, however, different individuals in an organization observe and assess environmental uncertainty differently and take different actions in deciding on and implementing a management accounting practice, these events are at the individual level. In the latter case, the interaction of the organizational-level attribute (environmental uncertainty) with the individual-level events or attributes produces further individual-level events (a top-down interaction relation between attributes and events). How these individual-level events result in a change in organizational-level management accounting practice is conditional on other organizational-level attributes (e.g., technology, structures of communication and authority in the organization) or organizational-level events (e.g., mass layoffs, mergers) (a bottom-up interaction relation between attributes and events).

The causal chain in the environmental uncertainty → management accounting practice example begins and ends with attributes, but causal chains can also begin and/or end with events (cf. Map C, link 5, which begins with an event, management buyout, and ends with an attribute, increased reliance on the management accounting system). A higher-level event can interact with individual-level attributes to cause individual-level events, which then interact with an organizational-level attribute to cause a new organizational-level event. The choice of beginning and ending points of causal chains depends on the research question and the theory used to address it.

The cross-level causal relations described in the examples above are illustrated in Fig. 5, Panel C. More variables, more levels, and more points in time could be included, but at a minimum each cross-level link in a model must include an interacting variable at the level of the dependent variable in that link, as explained in Section 6.2. Unless individual-level and higher-level variations have no effects on each other, versions of this model offer more complete explanations of the causes and effects of a management accounting practice than the other models shown in Figs. 1 and 5. We do not suggest that this is the best model for every (or perhaps any) individual study, but rather that the literature as a whole would ideally provide an understanding of management accounting practice consistent with this causal-model form.

Two constraints presently limit the creation of such an understanding. First, although the studies

[22]Some philosophical approaches to the social sciences do not ascribe causality to attributes while other approaches do not ascribe causality to events (Abbott 1992, 1998). In this chapter we use the term causal to describe the full range of explanations employed in management accounting research, which uses both attributes and events to explain other attributes and events.

shown on the maps include both attribute and event variables at multiple levels, the variables of one type or at one level often belong to different causal chains than the variables of another type or at another level. Second, the different theories used in management accounting research address limited parts of a complete cross-level model of management accounting practice. None of these theories addresses all parts of such a model equally successfully, and combining multiple theories can be problematic because of the theories' incompatible assumptions. These two constraints are discussed in more detail in the following subsection.

7.5. Theoretical Constraints

7.5.1. Variables in Different Causal Chains

The individual-level events that appear on the maps often do not fit clearly into causal chains linking the higher-level attributes and events that appear on the same or other maps. For example, Maps B–E link higher-level attributes such as strategy, management accounting practice and performance, and Map I links higher-level events such as economic, organizational and management accounting change. Some set of individual-level events and attributes presumably helps to explain each of these higher-level links, but they may not be the individual-level events and attributes represented, for example, on Maps F and G, the use of opportunity costs, decisions to investigate cost variances, and risk aversion.

Similar issues arise within levels of analysis: for example, the studies of individual or subunit budget-negotiation events, an attribute on Map F, could in principle help to explain the relations among budgeting attributes on Map A. However, the variables on Maps A and F are often defined by different theories, and it is not clear whether they belong in the same causal chain. For example, a subordinate's act of misrepresenting private information in participative budgeting, as shown on Map F, is an event variable in economics (agency theory and bargaining-game theory) caused by attribute variables such as information asymmetry and risk aversion. It is not clear without further theoretical development, however, how these causal links from Map F would form part of many of the causal chains linking social-psychology variables on Map A (e.g., the links from budget goal difficulty and budget emphasis to performance). Disconnects between variables across maps—not only whether they are events or attributes, but also which particular events and attributes are studied—depend in part on the theoretical antecedents of these maps, which have guided research toward different specific questions.

7.5.2. Theories

Different theories employed in management accounting research address different parts of a model of management accounting practice that is based on the model shown in Fig. 5, Panel C. Psychology theories provide explanations primarily at the individual level and the small subunit level (e.g., groups of two or three individuals), including both attributes and events. In principle these theories can provide a basis for top-down models by explaining differential individual-level events resulting from higher-level attributes (e.g., Map F, link 19), but these theories do not provide a basis for bottom-up models showing how individual-level events (e.g., judgments, decisions) or attributes (e.g., attitudes) cause either higher-level attributes such as characteristics of organizations and markets or higher-level events such as organizational or societal change.

The contingency theory of organizations tends to explain attributes by other attributes at the organizational and subunit (e.g., department) levels but does not include individual-level events. In contingency theory, "… little scope is seen for choice or human volition. … There is thus the absence of an analysis at the level of the human actors, … their beliefs, ideals, values, interest, power, and tactics." (Donaldson, 1996: 63–64). Contingency theory thus provides a basis for models that link attributes above the individual level but not for models of the relations between these attributes and individual-level events.

The economic theories employed in management accounting research provide explanations at both the individual level and higher levels. They also posit specific causal mechanisms by which higher-level attributes or events such as environmental uncertainty and competition, interacting with individual-level attributes such as preferences, cause individual-level events; these in turn, interacting with higher-level variables, cause other higher-level attributes or events (e.g., Milgrom & Roberts, 1992).[23] Thus, economic theories claim to address the individual level, higher levels of analysis, and the causal mechanisms of cross-level linkage, in a way that psychology and contingency theories do not. A principal limitation of using economic theories as a basis for complete cross-level models, however, is that existing economic theories often do not predict well at individual and small subunit (e.g., dyad, team) levels of analysis. Many of the Map F and G studies test predictions from economics against predictions

[23]For example, Abbott (1992) describes game theory as a way of modeling narratives that links events and attributes.

from cognitive psychology and usually support the latter because economic theories' stringent assumptions of rationality and limited preferences (e.g., wealth and leisure only in agency models) seem to reduce their predictive validity for lower-level events.[24]

The sociology theories employed in management accounting research often focus on beyond-organization variables, both attributes of societies (e.g., discourse, symbolic values) and events that occur similarly across a whole society (e.g., capital-labor conflict, resistance to management accounting). In some instances they also highlight organizational and individual differences as causes or effects of difference in the effects of beyond-organization variables (Map H, links 6, 10). Thus, sociology theories provide more explanation for the beyond-organization level of a complete model of management accounting than psychology and contingency theories do; they also provide some limited cross-level links. Some sociology theories focus on events while others focus on attributes, and linking events and attributes remain problematic (Abbott, 1992, 2001).

Each of the common theoretical perspectives for management accounting research supports only portions of a complete cross-level bidirectional interaction model, relating attributes and/or events. While it is not surprising that we do not have a "theory of everything" in the social sciences, it is important to note that the absence of a more complete understanding of the causes and effects of management accounting practice has implications for the conduct of more limited studies. When researchers use a unidirectional linear additive model to test a limited range of the causes or effects of a management accounting practice, they are making assumptions about the form and content of a more complete model. For example, if they test the effects of a particular management accounting practice on performance, then they are assuming that the causal interval by which the management accounting practice affects performance is shorter than the causal interval by which the performance affects the management accounting practice (Section 5.3). They are also assuming that the causal interval by which changes in the environment affect the management accounting practice is different for different organizations, so that some organizations that should be using the management accounting practice in the current environment are not doing so and are therefore performing less well (Section 7.2). These assumptions about the length of causal intervals (if they are not purely arbitrary) are based on assumptions about the set of events that occur between a change in one attribute and a change in another attribute or between the two events being studied.

[24]Why the predictions are better supported at higher levels of analysis remains an open question: differences in predictive ability across levels can in part be artifacts of the research methods employed at different levels of analysis and in part be the results of how lower-level events combine to cause higher-level variables (e.g., different judgment errors canceling each other out) (Berg et al., 1995; Luft, 1997).

8. Conclusion

We have described three ways of identifying valid connections and disconnects among the multiple streams of theory-consistent empirical research on management accounting practice: identifying variables with partially shared meanings (Section 4), identifying conflicts among different causal-model forms linking similar variables (Section 5), and identifying relations among variables at different levels of analysis (Sections 6). Dealing with all three issues simultaneously is required for a complete and valid explanation of management accounting and its effects, as shown in Fig. 5, Panel C.

Higher-level attributes such as organizational decentralization and market competition influence individual-level events such as the evaluation of a subordinate or the decision about whether or how to use management accounting information—the top-down segment of the model. But these higher-level attributes are caused by individuals' enacting or reproducing them through specific events (cf. Giddens, 1976)—the bottom-up segment of the model. Thus, top-down and bottom-up causations are inseparable from each other. As Douglas (1986: 43) observes:

> The entrenching of an idea is a social process . . . Conversely, the entrenching of an institution is essentially an intellectual process as much as an economic and political one . . . Half of our task is to demonstrate this [individual] cognitive process at the foundation of the social order. The other half of our task is to demonstrate that the individual's most elementary cognitive process depends on social institutions.

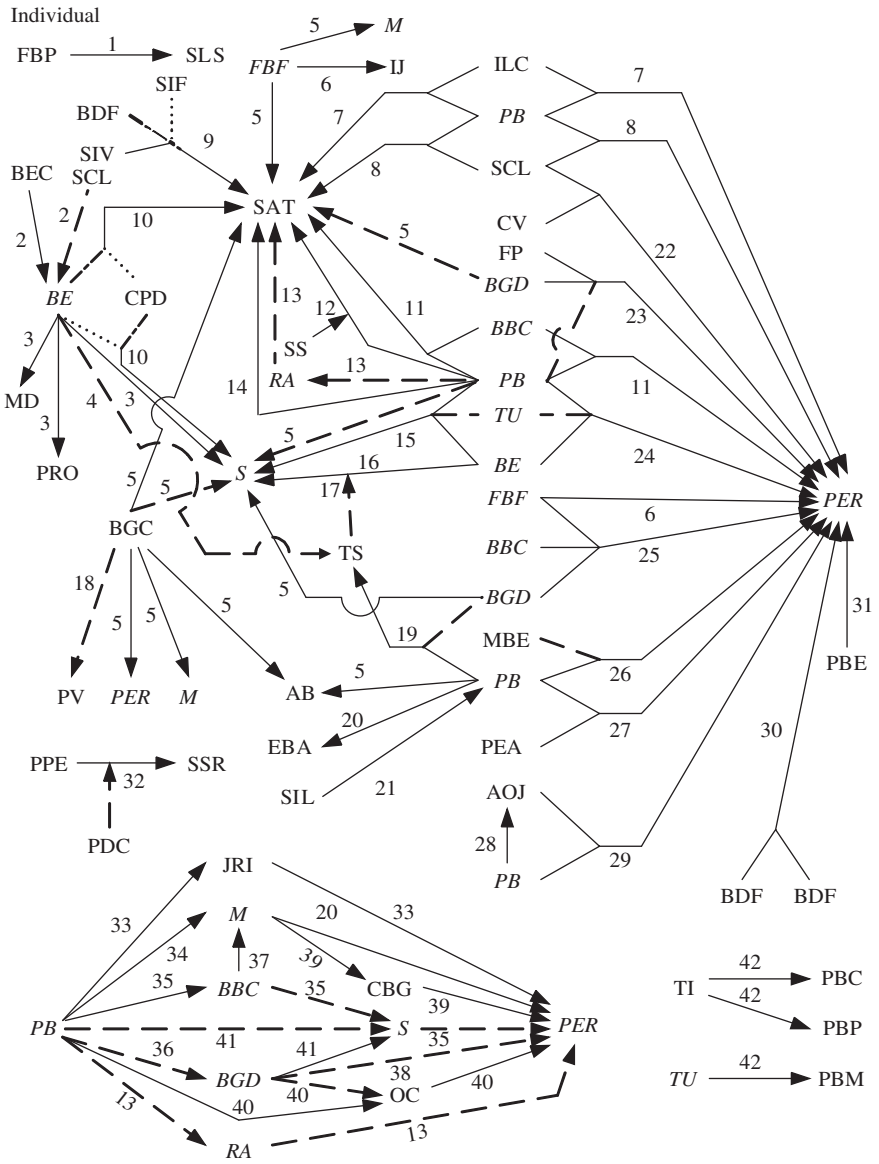
If cross-level models are necessary for a complete and valid explanation of the causes and effects of management accounting, then causal-model form is important. Consider a top-down segment of such a model in which organizational-level management accounting practice affects an individual's decision. If management accounting practice has the same effect on all individuals, then there would be no need

to consider individuals *per se* in management accounting research. But the same management accounting practice often has different effects on different individuals. Some variation across individuals must cause this differential effect: thus, as noted in Section 7, the organizational-level variable (in this case, management accounting) must interact with an individual-level variable (e.g., knowledge, risk preferences) to produce individual-level effects. Similarly with bottom-up models: the effects of individual-level differences on higher-level attribute variables depend on other higher-level variables that determine how different individual-level events are combined with each other.

As described in Sections 5 and 7, understanding causation, especially bidirectional causation, requires knowledge of causal intervals (i.e., the length of time from cause to effect). This in turn requires an understanding of the sets of events that explain the links between attributes or other events. In effect, this is the kind of explanation represented in Fig. 5, Panel C, in which the interaction of higher-level and individual-level attributes and/or event variables cause individual-level events, and the way these diverse events interact with existing higher-level variables to cause new higher-level attribute and/or event variables.

The research summarized in this chapter does not yet provide a complete and valid explanation of management accounting practice and its causes and effects. We hope that the nine graphics in the Appendices and the 17 guidelines summarized in Fig. 4 will aid researchers in building complete and valid explanations by creating individual studies that can be clearly related to the more complete explanation (Fig. 5, Panel C), in terms of variables, causal-model forms, and levels of analysis. Such studies would help to identify more of the natural connections and eliminate artifactual connections among constructs within and across the diverse streams of theory-consistent management accounting research.

Appendix A. Causes and effects of budgeting at the individual level



Variable identification

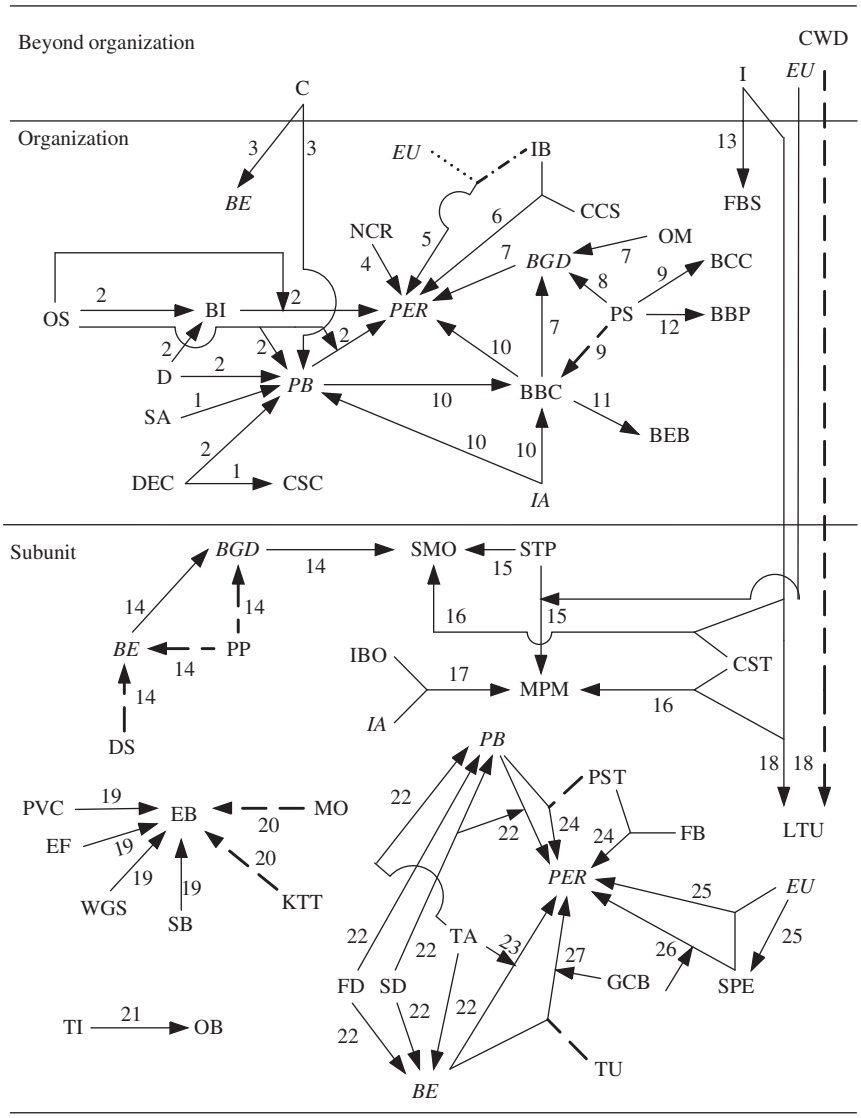
AB	Attitude that budget is useful
AOJ	Attitude toward organization and job
BBC	Budget-based compensation
BGD	Budget goal difficulty
BDF	Budget-difficulty fairness
BE	Budget emphasis by a superior in evaluating a subordinate
BEC	Budget emphasis by superior's superior in evaluating a subordinate (contagion)
BGC	Budget goal clarity
BPF	Budget-process fairness

CBG	Commitment to the budget goal
CPD	Collectivistic/power-distance national culture (beyond-organization level variable)
CV	Controllability of budget variances used for determining rewards
EBA	Expectation that budget will be achieved
FBF	Frequency of budget feedback
FBP	Felt budget pressure by superior
FP	Fixed pay
IJ	Interest in job
ILC	Subordinate's internal locus of control
JRI	Job relevant information
M	Motivation
MBE	Management-by-exception
MD	Manipulation of data
OC	Organizational commitment
PB	Participative budgeting
PBC	Use of participative budgeting to coordinate task interdependence
PBE	Explanation given for why participation did not lead to budget subordinate proposed
PBM	Use of participative budgeting to increase subordinates' motivation
PBP	Use of participative budgeting for planning and goal setting
PDC	Power-distance culture
PEA	Performance evaluation criteria agreement
PER	Performance
PPE	Participative performance evaluation
PRO	Poor relations with superiors and peers
PV	Variance in performance
RA	Role ambiguity
S	Stress
SAT	Satisfaction
SCL	Superior's considerate leadership style
SIF	Subordinate influence on budget
SIL	Superior's internal locus of control
SIV	Subordinate involvement during budgeting
SLS	Superior's initiating structure leadership style
SS	Superior-subordinate authoritarianism consistency [subunit-level variable]
SSR	Superior-subordinate good relationship
TI	Task interdependence
TS	Trust in superior
TU	Task uncertainty

Prior research

1. DeCoster & Fertakis (1968)
2. Hopwood (1974); Rahman & McCosh (1976)
3. Hopwood (1972)
4. Otley (1978)
5. Kenis (1979)
6. Cook (1967)
7. Brownell (1981, 1982a); Frucot & Shearon (1991)
8. Brownell (1983a)
9. Lindquist (1995)
10. Harrison (1993)
11. Cherrington & Cherrington (1973)
12. Chenhall (1986)
13. Chenhall & Brownell (1988)
14. Kenis (1979); Milani (1975)
15. Brownell & Hirst (1986); PB × BE: Harrison (1992)
16. Hopwood (1972); Kenis (1979)
17. Ross (1994)
18. Hirst & Yetton (1999)
19. Magner et al. (1995)
20. Brownell & McInnes (1986)
21. Licata et al. (1986)
22. Ansari (1976)
23. Tiller (1983)
24. Brownell & Dunk (1991); Lau et al. (1995); PB × BE: Brownell (1982b); Dunk (1989); PB × TU: Brownell (1985); Mia (1989); BE × TU: Abernethy & Brownell (1997)
25. Rockness (1977); BGD × F: Hirst & Lowy (1990)
26. Brownell (1983b)
27. Dunk (1990)
28. Milani (1975)
29. Mia (1988)
30. Libby (2001)
31. Libby (1999)
32. O'Connor (1995)
33. Kren (1992)
34. Kenis (1979); Kren (1990); Searfoss (1976)
35. Shields et al. (2000)
36. Nouri & Parker (1998); Shields et al. (2000)
37. Kren (1990); Searfoss (1976)
38. Kenis (1979); Nouri & Parker (1998)
39. Kren (1990)
40. Nouri & Parker (1998)
41. Kenis (1979); Shields et al. (2000)
42. Shields & Shields (1998)

Appendix B. Causes and effects of budgeting at the organization and subunit levels



Variable identification

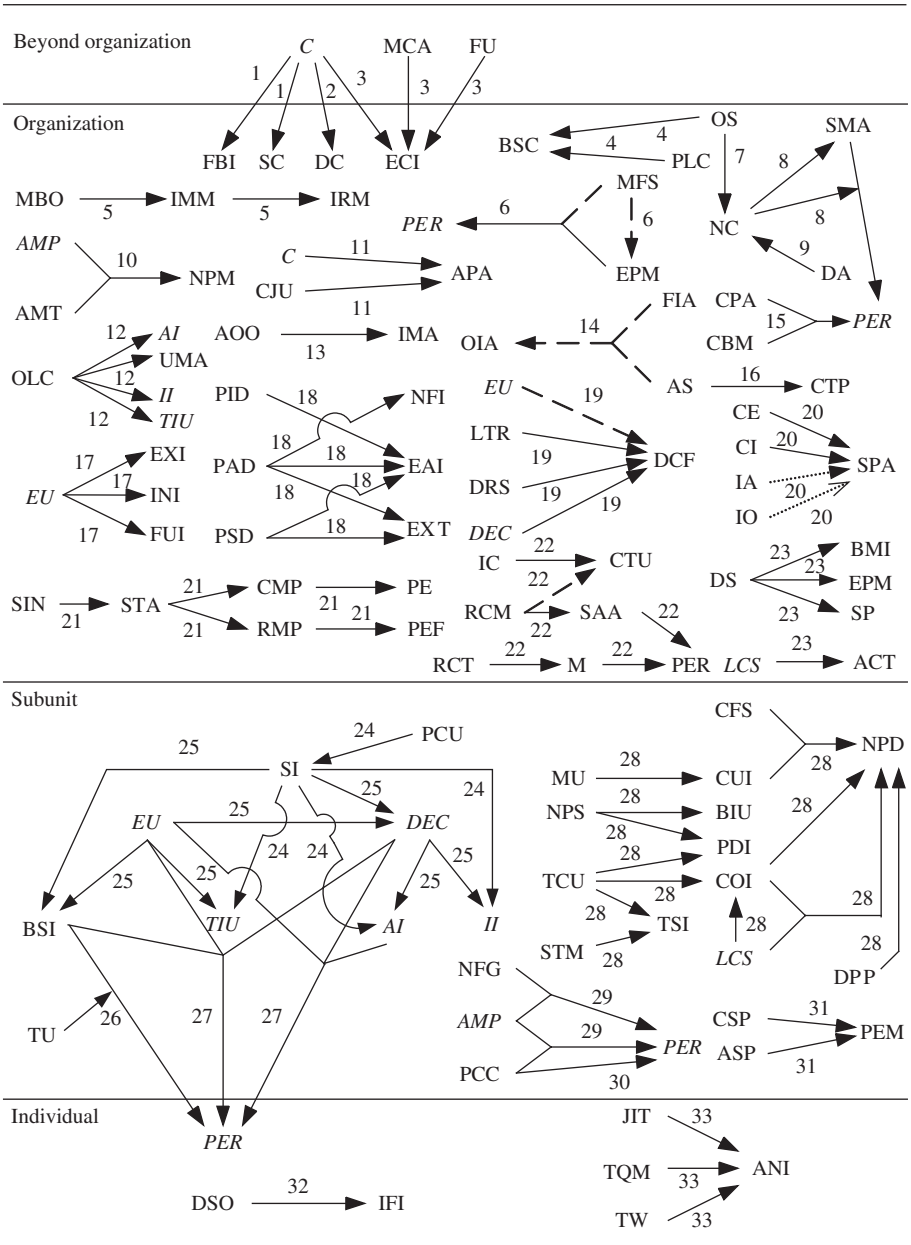
BBC	Budget-based compensation
BBP	Budget-based planning
BCC	Budget-based cost control
BGD	Budget goal difficulty
BE	Budget emphasis by a superior in evaluating a subordinate
BEB	Budget estimate bias
BI	Budget importance
BS	Build strategy
C	Competition
CCS	Change in competitive strategy
CSC	Control system complexity
CST	Control system tightness
CWD	Confucian work dynamism
D	Diversification
DEC	Decentralization

DS	Differentiation strategy
EB	Importance of expenditure budget for management control
EF	External funding
EU	Environmental uncertainty
FB	Flexible budget
FBS	Formality of budget system
FD	Functional differentiation
GCB	Goal congruent behavioral orientation
I	Individualism
IA	Information asymmetry within organization
IB	Interactive use of budgets
IBO	Importance of dealing with budget overruns
KTT	Knowledge of task transformation process
LTU	Long-term incentive use
MO	Measurability of output
MPM	Manipulate performance measure
NCR	Number of potential causes of budget variances recorded in the accounting system
OB	Use of operating budgets for management control
OM	Outcome monitoring
OS	Organizational size
PB	Participative budgeting
PER	Performance
PP	Past performance
PS	Prospector strategy
PST	Product standardization
PVC	Planning versus control decision
SA	Structure of activities
SB	Size of budget
SD	Size of department
SMO	Short-term managerial orientation
SPE	Subjective versus formula approach to performance evaluation
STP	Short-term profit pressure
TA	Technology automation
TI	Task interdependence
TU	Task uncertainty
WGS	Work-group size

Prior research

1. Bruns & Waterhouse (1975)
2. Merchant (1981)
3. Anderson & Lanen (1999)
4. Emsley (2000)
5. Chapman (1998)
6. Abernethy & Brownell (1999)
7. Simons (1988)
8. Simons (1987, 1988)
9. Simons (1987)
10. Shields & Young (1993)
11. Walker & Johnson (1999)
12. Collins et al. (1997)
13. Birnberg & Snodgrass (1988)
14. Van der Stede (2000)
15. Merchant (1990)
16. Chow et al. (1996)
17. Merchant (1985)
18. Merchant et al. (1995)
19. Rockness & Shields (1988)
20. Rockness & Shields (1984)
21. Macintosh & Daft (1987)
22. Merchant (1984)
23. Dunk (1992)
24. Brownell & Merchant (1990)
25. Govindarajan (1984)
26. Govindarajan & Gupta (1985)
27. Abernethy & Stoelwinder (1991)

Appendix C. Information for planning and control



Variable identification

ACT Activity-based accounting and management
AI Usefulness of aggregated information
AMP Advanced manufacturing practices
AMT Advanced manufacturing technologies
ANI Availability of non-financial information to workers
AOO Acquisition by another organization

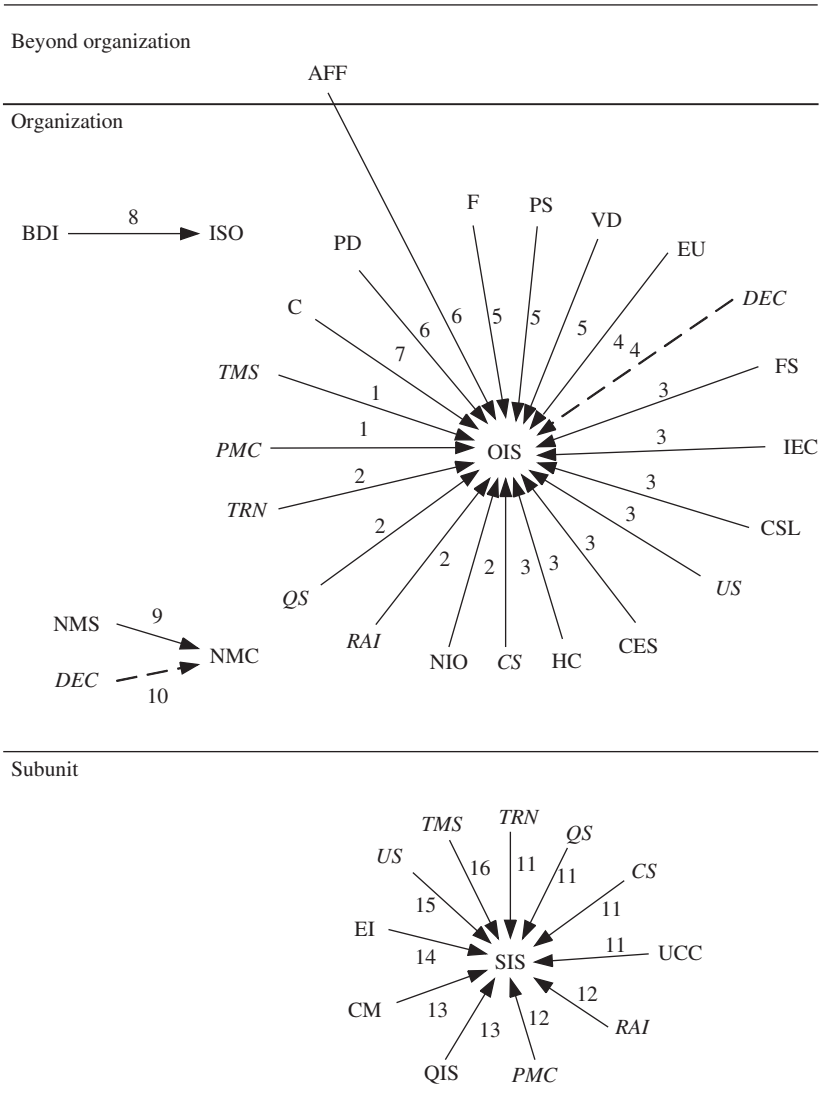
APA	Adoption by Chinese organization of joint-venture partner's management accounting
AS	Asset specificity
ASP	Achievement of sales or profit target, controlling for the level of sales or profit
BIU	Use of budget information in management control system
BMI	Benchmark information
BSC	Balanced-scorecard use
BSI	Usefulness of broad scope information
C	Competition
CBM	Capital budgeting monitoring system
CE	Capital expenditures
CFS	Customer-focused strategy
CI	Capital intensity
CJU	Chinese organizations' joint-venture partner is a U.S. organization versus non-US organization
COI	Use of cost information in the management control system
CMP	Clinical-management performance measures
CPA	Capital asset abandonment/sale
CSP	Controllable portion of sales and profits
CTP	Cost-based transfer pricing
CTU	Conflict and tension among balanced-scorecard users
CUI	Use of customer information in the management control system
DA	Diverse activities within organization
DC	Use of disaggregated cost information
DCF	Effectiveness of discounted cash flow model for capital budgeting decisions
DEC	Decentralization
DPP	Detailed project planning
DRS	Discounted cash flow-based reward system
DS	Differentiation strategy
DSO	Type of decision is more strategic and less operational
EAI	Usefulness of *ex ante* relative to *ex post* information
ECI	Use of elaborate cost information
EPM	Efficiency-based performance measure
EU	Environmental uncertainty
EXI	Usefulness of external, historical information
EXT	Usefulness of external relative to internal information
FBI	Use of flexible-budget information
FIA	Frequency of internal audit
FU	Funding uncertainty
FUI	Usefulness of future, internal information
IA	Information asymmetry within organization
IC	Ineffective communication about balanced-scorecard measures
IFI	Importance of financial information for decision-making
II	Usefulness of integrated information
IMA	Increased importance of management accounting practices
IMM	Improved matching of management accounting with contextual variables
INI	Usefulness of internal, non-financial information
IO	Inside ownership
IRM	Increased reliance on management accounting system
JIT	Just in time
LCS	Low-cost/price strategy
LTR	Long-term reward
M	Motivation
MBO	Management buyout
MCA	Mandated government cost-accounting system
MFS	Manufacturing flexibility strategy
MU	Market uncertainty
NC	Need for internal coordination
NFG	Existence of quantified non-financial goals
NFI	Usefulness of non-financial relative to financial information
NPD	New product development performance
NPM	Importance of non-financial performance measures
NPS	New product development project scope
OIA	Outsourcing of internal audit
OLC	Organizational life cycle (growth and revival stages versus other stages)
OS	Organizational size

PAD	Alternative development phase of strategic capital budgeting decisions
PCU	Product customization
PCC	Performance-contingent compensation
PDI	Use of product design information in the management control system
PEM	Positive performance evaluation of the manager
PE	Performance effectiveness
PEF	Performance efficiency
PER	Performance
PID	Identification phase of strategic capital budgeting decisions
PLC	Products are in early (versus late) stages of life cycle
PSD	Project selection phase of strategic capital budgeting decisions
RCM	Reliable, comprehensive, causally linked set of measures in balanced scorecard
RCT	Rewards based on controllable, challenging balanced-scorecard targets
RMP	Resource management performance measures
SAA	Strategic alignment of action of balanced-scorecard users
SC	Use of standard cost information
SI	Subunit interdependencies
SIN	Service innovation
SMA	Sophisticated management accounting
SP	Strategic planning techniques
SPA	Sophistication of postauditing of capital budgeting investments
STA	Structural autonomy
STM	Time-to-market strategy
TCU	Technological uncertainty
TIU	Usefulness of timely information
TQM	Total quality management
TSI	Use of time schedule information in the management control system
TU	Task uncertainty
TW	Teamwork
UMA	Use of management accounting information

Prior research

1. Khandwalla (1972)
2. Anderson & Lanen (1999)
3. Geiger & Ittner (1996)
4. Hoque & James (2000)
5. Jones (1992)
6. Abernethy & Lillis (1995)
7. Flesher & Flesher (1979)
8. Flesher & Flesher (1979); Johnson (1981, 1983)
9. Johnson (1981, 1983)
10. Perera et al. (1997)
11. Firth (1996)
12. Moores & Yuen (2001)
13. Jones (1985)
14. Widener & Selto (1999)
15. Smith (1993)
16. Colbert & Spicer (1995)
17. Gordon & Narayanan (1984)
18. Larcker (1981)
19. Haka (1987)
20. Gordon & Smith (1992)
21. Abernethy & Lillis (2001)
22. Malini & Selto (2001)
23. Chenhall & Langfield-Smith (1998)
24. Bouwens & Abernethy (2000)
25. Chenhall & Morris (1986)
26. Chong (1996); Mia & Chenhall (1994)
27. Gul & Chia (1994)
28. Davila (2000)
29. Sim & Killough (1998)
30. Young et al. (1988)
31. Ghosh & Lusch (2000)
32. Covaleski et al. (1987)
33. Banker et al. (1993)

Appendix D. Implementing management accounting change



Variable identification

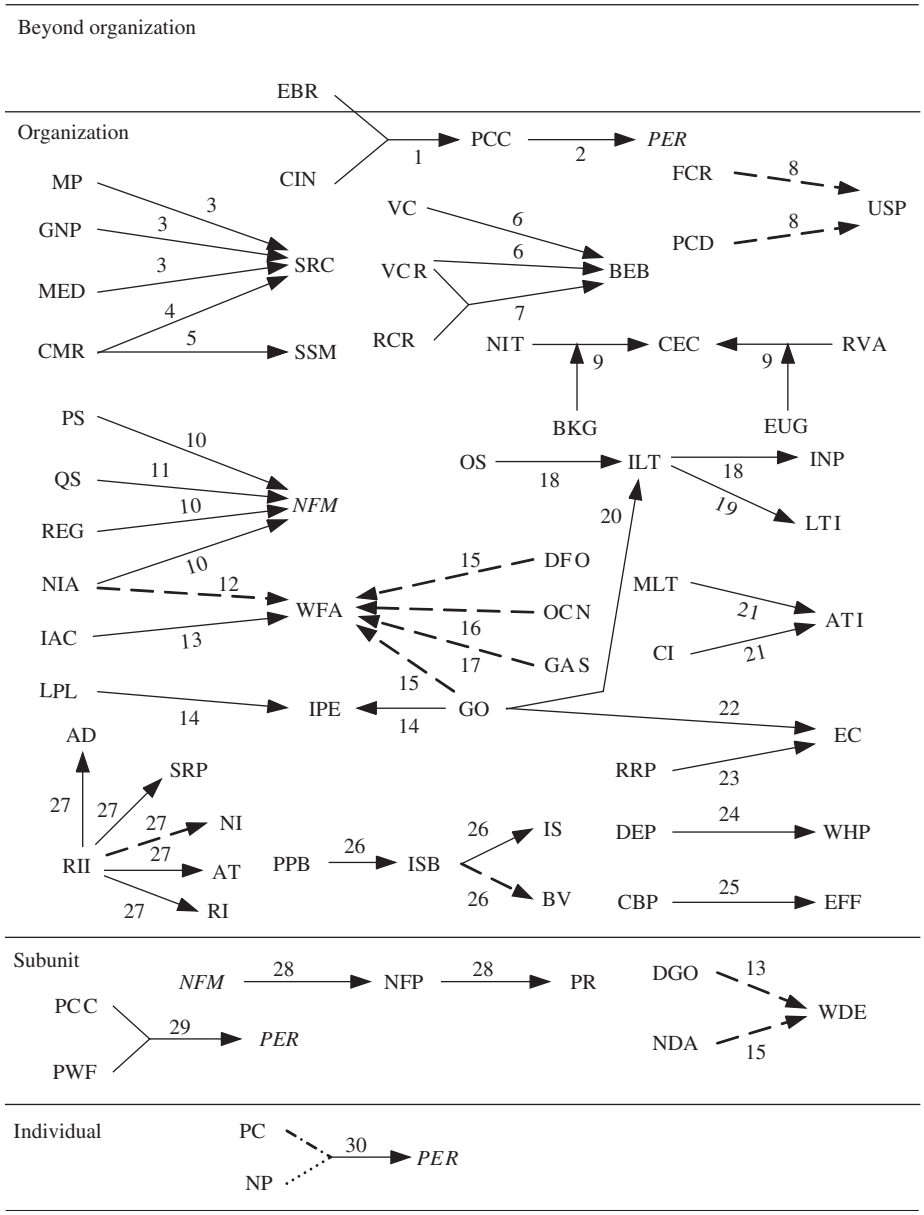
AFF	ABC as fad and fashion
BDI	Board of directors' interlock: director of focal organization is the director of an ISO-accredited organization
C	Competition
CES	Compatibility with existing cost system
CM	Complexity of manufacturing
CS	Champion/sponsor
CSL	Consultants
DEC	Decentralization
EI	Employee involvement
EU	Environmental uncertainty
F	Formalization
FS	Functional specialization
HC	Horizontal communication
IEC	Improvement over the existing cost system

ISO	Focal organization becomes ISO accredited
NIO	Non-accounting ownership/involvement
NMC	Number of changes in management accounting systems
NMS	Number of management accounting systems
OIS	Organizational implementation/adoption or success/satisfaction with ABC and/or activity-based management
PD	Product diversity
PMC	Linkage to performance evaluation and compensation
PS	Prospector strategy
QIS	Quality of non-cost information systems
QS	Quality strategy
RAI	Resource adequacy for implementation
SIS	Subunit implementation/adoption or success/satisfaction with ABC and/or activity-based management
TRN	Training in ABC
TMS	Top management support
UCC	Use of the control system for continuous improvement
US	Union support
VD	Vertical differentiation

Prior research

1. Anderson (1995); Shields (1995)
2. Shields (1995)
3. Anderson (1995)
4. Anderson (1995)
5. Gosselin (1997)
6. Malmi (1999)
7. Anderson (1995); Malmi (1999)
8. Chua & Petty (1999)
9. Libby & Waterhouse (1996)
10. Williams & Seaman (2001)
11. Foster & Swenson (1997)
12. Anderson & Young (1999); Foster & Swenson (1997); McGowan & Klammer (1997)
13. Anderson & Young (1999); Krumwiede (1998)
14. McGowan & Klammer (1997)
15. Anderson & Young (1999)
16. Anderson & Young (1999); Foster & Swenson (1997); Krumwiede (1998); McGowan & Klammer (1997)

Appendix E. Performance measures and incentives



Variable identification

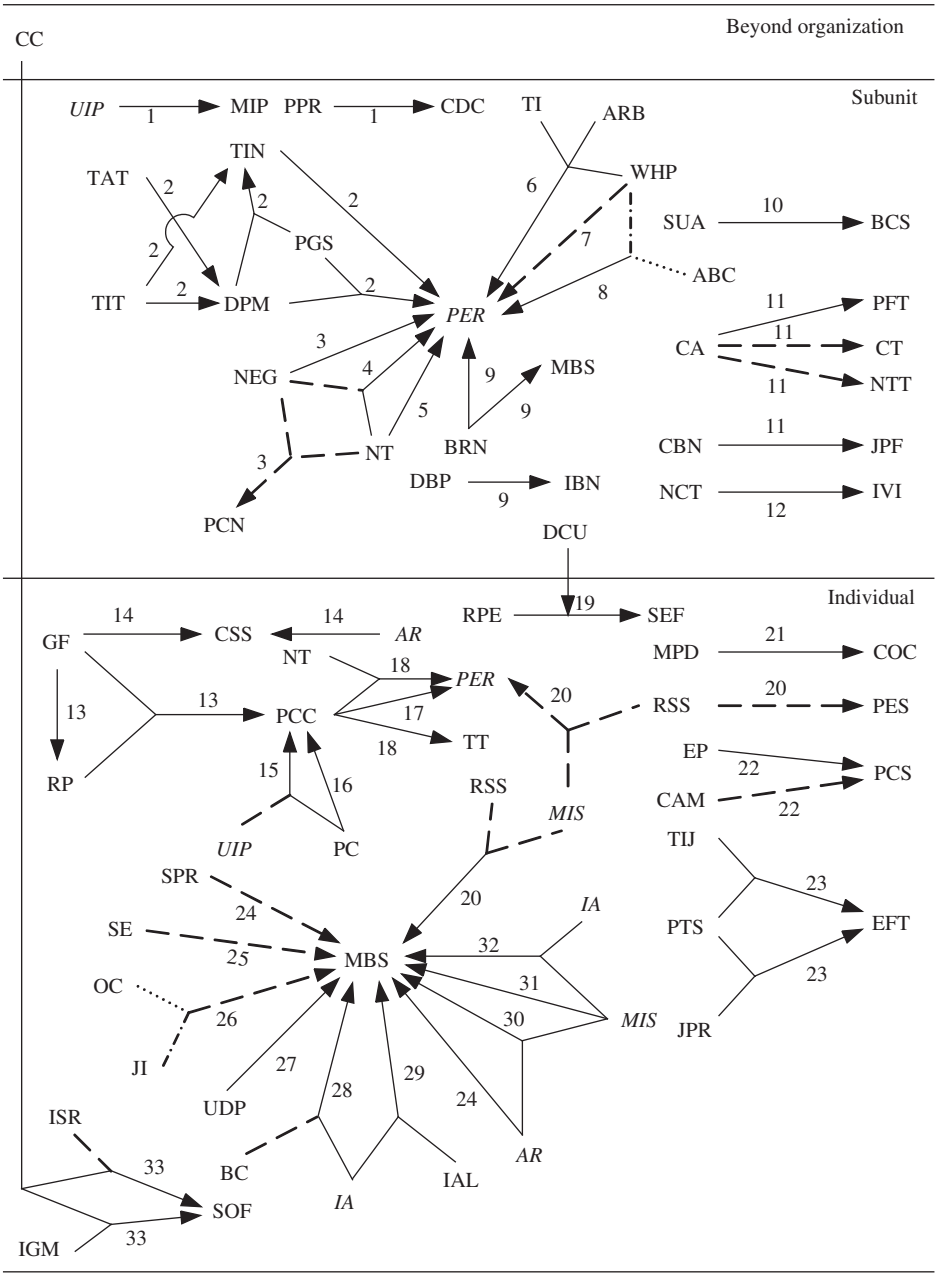
AD	Asset disposition
AT	Asset turnover
ATI	After-tax income (versus pretax) as the basis of executive compensation
BEB	Budget estimate bias
BKG	Banking versus other industries
BV	Bonus volatility
CBP	Competition- and cost-based pricing for government services
CEC	Change in executive compensation

CI	Capital intensity
CIN	Current inefficiency of the organization
CMR	Change in cost-sensitivity of revenues due to regulatory change
DEP	Dependence of other business units' performance on focal unit
DFO	Dependence of focal business unit's performance on other units
DGO	Divisional growth opportunities
EBR	Adoption of efficiency-based regulation
EC	Executive compensation
EFF	Efficiency performance
EUG	Electric utility industry after 1980 and grocery industry versus other industries
FCR	Frequency of cost reporting to physicians
GAS	Growth in assets and sales
GNP	Government or non-profit hospital (motivation to shift costs to provide more charity care)
GO	Growth opportunities
IAC	Informativeness of accounting earnings for organizational value
ILT	Incentive based on long-term measures
INP	Innovation performance
IPE	Weight on individual performance evaluation (versus financial measures such as earnings) in incentive compensation
IS	Income smoothing
ISB	Internal (past performance) versus external (peer performance) standard for bonus
LPL	Length of product life cycle
LTI	Long-term investment
MED	Percent of Medicaid patients (revenue shortfall, motivation to shift costs)
MLT	Degree to which the organization is multinational
MP	Market power (ability to shift costs)
NDA	Noise in the divisional accounting measures
NFM	Weight on non-financial, relative to financial, performance measures in incentive compensation
NFP	Non-financial performance
NI	New investment
NIA	Noise in organizational accounting measures
NIT	Change in net interest income/total assets
NP	Number of time periods since the incentive system was implemented
OCN	Ownership concentration
OS	Organizational size
PC	Performance capability
PCD	Provision of comparison data (i.e., other physicians' costs)
PCC	Performance-contingent compensation
PER	Performance
PPB	Prior performance is a better estimate of current performance than is peer performance
PR	Profit
PS	Prospector strategy
PWF	Percentage of workforce (permanent versus temporary)
QS	Quality strategy
RCR	Regulation constraining revenues
REG	Regulation potentially responsive to non-financial measures
RI	Residual income
RII	Residual-income-based (versus earnings-based) incentive
RRP	Relative ROA performance compared to industry
RVA	Change in revenue/assets
SRC	Shifting of reported costs to products with more cost-sensitive revenues
SRP	Share repurchases
SSM	Shift to providing services with more cost-sensitive revenues
USP	Unnecessary services ordered by physicians
VC	Volume change providing incentive to bias
VCR	Variable cost ratio relative to allowable ratio
WDE	Weight on division earnings in compensation
WFA	Weight on organizational accounting numbers in compensation
WHP	Weight on higher-level (e.g., group) performance in lower-level (e.g., individual) compensation

Prior research

1. Lanen & Larcker (1992)
2. Enis (1993)
3. Eldenburg & Soderstrom (1996)
4. Cavalluzzo et al. (1998); Eldenburg & Kallapur (1997)
5. Eldenburg & Kallapur (1997)
6. Blanchard et al. (1986)
7. Eldenburg & Soderstrom (1996)
8. Eldenburg (1994)
9. Ely (1991)
10. Ittner et al. (1997)
11. Ittner & Larcker (1995); Ittner et al. (1997)
12. Lambert & Larcker (1987)
13. Sloan (1993)
14. Bushman et al. (1996)
15. Keating (1997)
16. Ke et al. (1999)
17. Lambert & Larcker (1987)
18. Holthausen et al. (1995)
19. Cooper & Selto (1991); Larcker (1983)
20. Bizjak et al. (1993)
21. Newman (1989)
22. Gaver & Gaver (1993)
23. Antle & Smith (1986)
24. Bushman et al. (1995); Keating (1997)
25. Cavalluzzo et al. (1998)
26. Murphy (2001)
27. Wallace (1997)
28. Banker et al. (2000)
29. Banker et al. (1996)
30. Banker et al. (2001)

Appendix F. Contracting and control: microprocesses



Variable identification

ABC ABC (versus volume-based allocation) cost information
AR Aversion to risk
ARB Arbitration available
BC Budgetary constraints on investment proposals
BCS Bargaining costs of accounting-based contracts

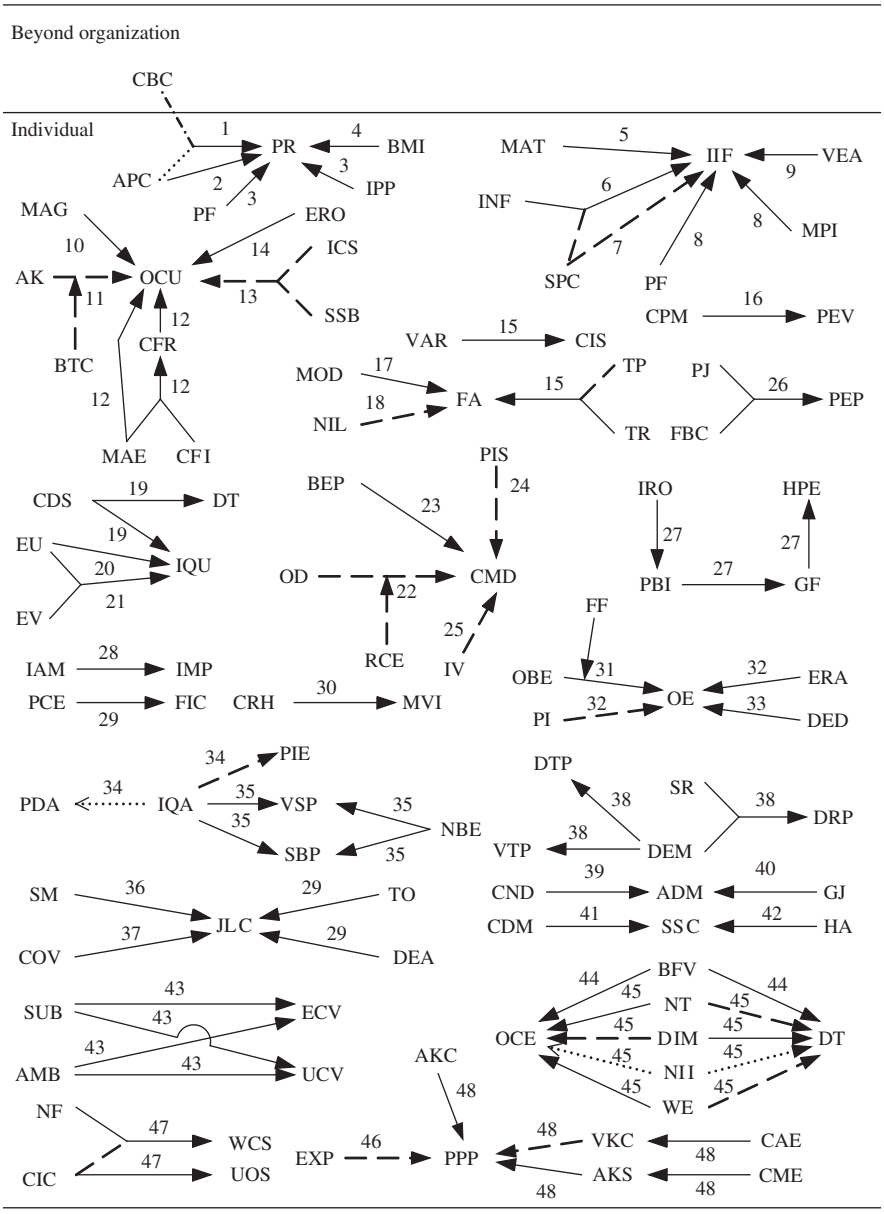
BRN	Budget as the result of successful negotiation (versus imposed without negotiation or after an impasse)
CA	Complementary sourcing and compensation arrangements
CAM	Control system allows agent to misrepresent (independent of payoff effects)
CBN	Competitive (versus cooperative) behavior in negotiation
CC	Chinese culture
CDC	Change of contract design by superior to imitate more successful contracts
COC	Choice of optimal contract
CSS	Choice of safe standard (low mean, low risk payoff)
CT	Conflict in transfer-price negotiations
DCU	Degree of common uncertainty among comparison groups
DBP	Difference between budget proposals of superior and subordinate in the initial negotiation
DPM	Diversity of team performance measures
EFT	Effort
EP	Expected payoff to principal
GF	Gain (versus loss) framing of outcomes
IA	Information asymmetry within organization
IAL	Information asymmetry between labor market and manager
IBN	Impasse in budget negotiation
IGM	In-group (versus out-group) membership
ISR	Information sharing reveals negative information about sharer
IVI	Income uncertainty of investments chosen by managers
JI	Job involvement
JPF	Joint profit from negotiated transfer price
JPR	Joint (versus individual) piece rate
MBS	Misrepresentation by subordinate
MIP	Magnitude of incentive pay
MIS	Misrepresentation-inducing incentive system
MPD	Magnitude of payoff difference between optimal and alternative contracts
NCT	Number of competitors in tournament incentive
NEG	Negotiated (versus centrally established) transfer prices
NT	Number of trials
NTT	Negotiation time for transfer price
OC	Organizational commitment
PC	Performance capability
PCC	Performance-contingent compensation
PCS	Principal's choice of control system
PCN	Perceived conflict
PER	Performance
PES	Performance in excess of the standard
PFT	Perceived fairness of the transfer price
PGS	Participation in goal setting
PPR	Poor profit performance
PTS	Performance of team members more separable
RP	Remembered performance
RPE	Relative performance evaluation
RSS	Ratchet system for standard setting
SE	Self-esteem
SEF	Subordinate effort
SOF	Sharing of information
SPR	Social pressure not to misrepresent expected budget performance
SUA	Second-order uncertainty in accounting information
TAT	Time spent in intradepartmental teams
TI	Task interdependence
TIJ	Tournament (versus individual or joint piece-rate)
TIN	Team (versus individual) incentives
TIT	Time spent in interdepartmental teams
TT	Time spent on task
UDP	Unequal division of payoffs between superior and subordinate
UIP	Uncertainty of incentive pay
WHP	Weight on higher-level (e.g., group) performance in lower-level (e.g., individual) compensation

Prior research

1. Shields & Waller (1988)
2. Scott & Tiessen (1999)
3. Ghosh (1994)
4. DeJong et al. (1989)
5. Chow et al. (1991b)
6. Greenberg et al. (1994); TI × WHP: Chow et al. (1991b)

7. Chalos & Haka (1990)
8. Drake et al. (1999)
9. Fisher et al. (2000)
10. Haka et al. (2000)
11. Ghosh (2000)
12. Sayre et al. (1998)
13. Luft (1994)
14. Kim (1992)
15. Waller & Chow (1985)
16. Chow (1983); Shields & Waller (1988)
17. Bailey et al. (1998)
18. Sprinkle (2000)
19. Frederickson (1992)
20. Chow et al. (1991a)
21. Kirby (1992)
22. Evans et al. (1994)
23. Rankin & Sayre (2000)
24. Young (1985)
25. Belkaoui (1985/1986)
26. Nouri (1994)
27. Evans et al. (2001)
28. Kachelmeier et al. (1994)
29. Harrell & Harrison (1994)
30. Waller (1988)
31. Baiman & Lewis (1989); Chow et al. (1994); Waller & Bishop (1990)
32. Chow et al. (1988)
33. Chow et al. (2000)

Appendix G. Individual judgments and decisions



Variable identification

ADM	Accurate use of the decision-maker's policy by the information evaluator
AMB	Ambiguity of outcomes (combination of positive and negative)
AK	Accounting knowledge
AKC	Activity-based cost knowledge content
AKS	Activity knowledge structure
APC	Accurate product costs
BEP	Bet elicitation procedure with incentives (versus direct question about probabilities)

BMI	Benchmark information
BFV	Budget forecast and variance are required, in addition to a production decision
BTC	Business (versus personal) task context
CAE	Cost-accounting practice experience
CBC	Cournot (versus Bertrand) competition
CIC	Chosen (versus imposed) cost system
CDM	Conservative (versus Bayesian) decision-maker
CDS	Complex decision style
CFI	Cash flow (versus earnings) format of information
CFR	Cash flow (versus earnings) analysis of investment
CIS	Confidence interval size
CMD	Cost-minimizing variance investigation decision
CME	Cost-management practice experience
CPM	Common (versus division-specific) performance measures
CND	Consistency of the decision-maker
COV	Covariation of cause and effect
CRH	Compensation system rewards higher threshold for variance investigation
DEA	Disconfirming evidence for alternative causes
DED	Evaluator disagrees *ex ante* with the evaluatee's decision
DEM	Difference between equal-profit transfer price and market price
DIM	Number of different dimensions of information
DRP	Difference between the predicted reservation price and the market price
DT	Decision time
DTP	Difference between predicted transfer price and market price
ECV	External (versus internal) causes attributed in explaining variances
ERA	Evaluatee is responsible for anticipating outcome
ERO	Explicit reporting of opportunity costs (versus inference from demand and profit)
EU	Environmental uncertainty
EV	Economic value of information
EXP	Expensing (versus capitalization) of intangibles
FA	Forecast accuracy
FBC	Feedback is consistent with stated policy
FIC	Frequency with which evidence type is chosen
FF	Frequency of feedback
GF	Gain (versus loss) framing of outcomes
GJ	Group (versus individual) judgment [subunit level]
HA	High anchor for sample-size choice
HPE	Higher performance evaluation for investigating than for not investigating the variance
IAM	Intolerance of ambiguity
ICS	Intuitive cognitive style
IIF	Decision-maker ignores irrelevant reported cost allocations
IMP	Rated importance of information
INF	Information about relevance of cost data
IPP	Information about production processes
IQA	Information quantity available
IQU	Information quantity used
IRO	Investigation reveals out-of-control process
IVR	Increasing (versus decreasing) variation in outcomes
JLC	Judged likelihood of cause of variance
MAE	Management accounting experience
MAG	Magnitude (versus existence only) of the opportunity costs reported
MAT	Materiality
MOD	Model-based judgment replaces subjective judgment
MPI	Market price information
MVI	Magnitude of variance required to trigger an investigation
NBE	Number of business units evaluated
NF	Negative feedback about the usefulness of cost system
NII	Number of information items
NIL	Noise in reports due to lag
NT	Number of trials

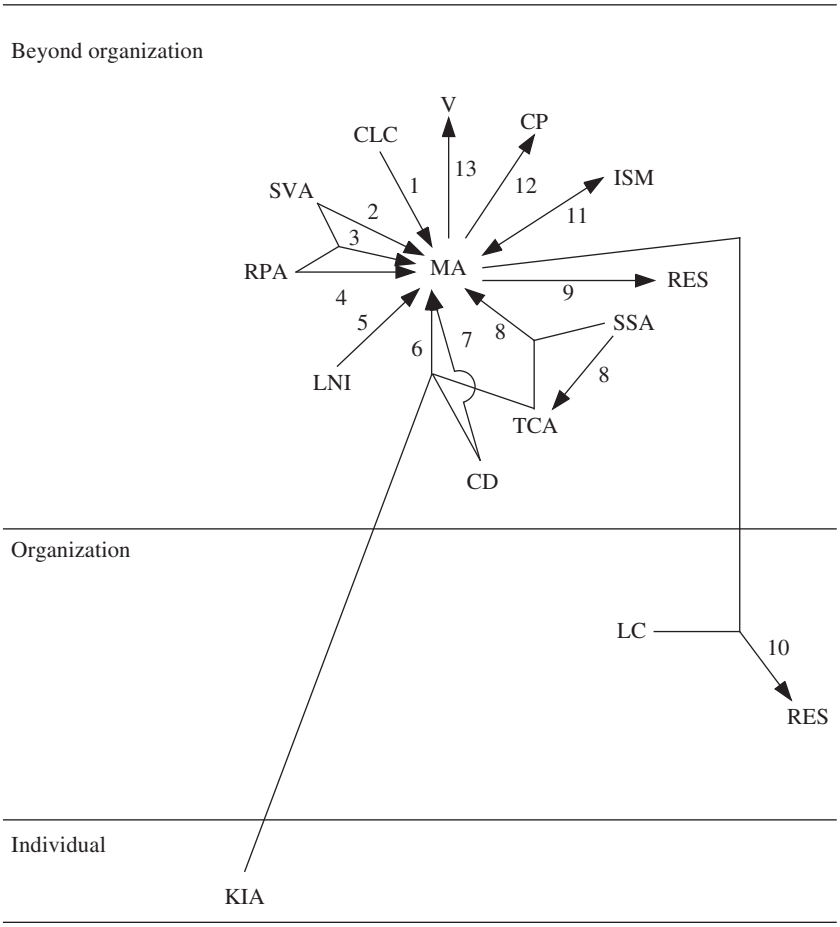
OBE	Evaluator has experience with outcome-based evaluation
OCE	Optimizing choice of expenditure
OCU	Opportunity costs are used in making a decision
OD	Overlap of distributions of in-control and out-of-control
OE	Effect of outcome on performance evaluation
PBI	Perceived benefit of an investigation
PCE	Positive confirming evidence (versus negative confirming or disconfirming)
PDA	Performance-cause diagnosis accuracy
PEP	Performance evaluation is consistent with policy
PEV	Weight on measure in performance evaluation
PI	Evaluator has prior involvement with evaluatee's decision
PIE	Percentage of available items examined
PIS	Prior experience with inappropriate standard
PF	Profit feedback
PJ	Policy for judgment is explicitly provided
PPP	Profit-prediction performance
PR	Profit
RCE	Relative cost of Type II versus Type I errors
SSB	Sponsorship bias
SBP	Information search by performance measures (versus by responsibility centers)
SM	Size match between cause and effect
SPC	Specific experience in which different costs were relevant than in the present task
SR	Seller's (versus buyer's) role
SSC	Sample size chosen
SUB	Subordinate (versus superior) role
TO	Temporal order of evidence is cause before effect
TP	Time pressure
TR	Trended (versus randomly alternating) data provided as the basis for prediction
UCV	Unstable (versus stable) causes attributed in explaining variances
UOS	Usefulness rating of own versus alternative cost system
VAR	Variability in data used for prediction
VEA	Variety of experience with alternative accounting methods
VKC	Volume-based cost knowledge content
VSP	Variance in individual search patterns
VTP	Variance in transfer-price predictions
WCS	Willingness to change cost system
WE	Work experience

Prior research

1. Callahan & Gabriel (1998)
2. Gupta & King (1997)
3. Briers et al. (1999); Gupta & King (1997)
4. Briers et al. (1999)
5. Haka et al. (1986)
6. Dyckman et al. (1982)
7. Ashton (1976a); Moon (1990)
8. Waller et al. (1999)
9. Barnes & Webb (1986)
10. Friedman & Neumann (1980)
11. Vera-Muñoz (1998)
12. Vera-Muñoz et al. (2001)
13. Chenhall & Morris (1991)
14. Hoskin (1983)
15. Eggleton (1982)
16. Lipe & Salterio (2000)
17. Ashton (1984)
18. Mock (1969)
19. Driver & Mock (1975)
20. San Miguel (1976)
21. Dilla (1989)
22. Brown (1981)
23. Eger & Dickhaut (1982)
24. Chang & Birnberg (1977)
25. Brown (1983)
26. Harrell (1977)
27. Lipe (1993)
28. Dermer (1973)
29. Brown (1985)
30. Magee & Dickhaut (1978)
31. Frederickson et al. (1999)
32. Brown & Solomon (1987)
33. Brown & Solomon (1993)
34. Shields (1983)
35. Shields (1980)
36. Brown (1987)

37. Brown (1985, 1987)
38. Luft & Libby (1997)
39. Ashton (1981)
40. Uecker (1982)
41. Uecker (1978)
42. Uecker (1980)
43. Shields et al. (1981)
44. Mock (1973)
45. Iselin (1988)
46. Luft & Shields (2001)
47. Jermias (2001)
48. Dearman & Shields (2001)

Appendix H. Management accounting in its historical and social context



Variable identification

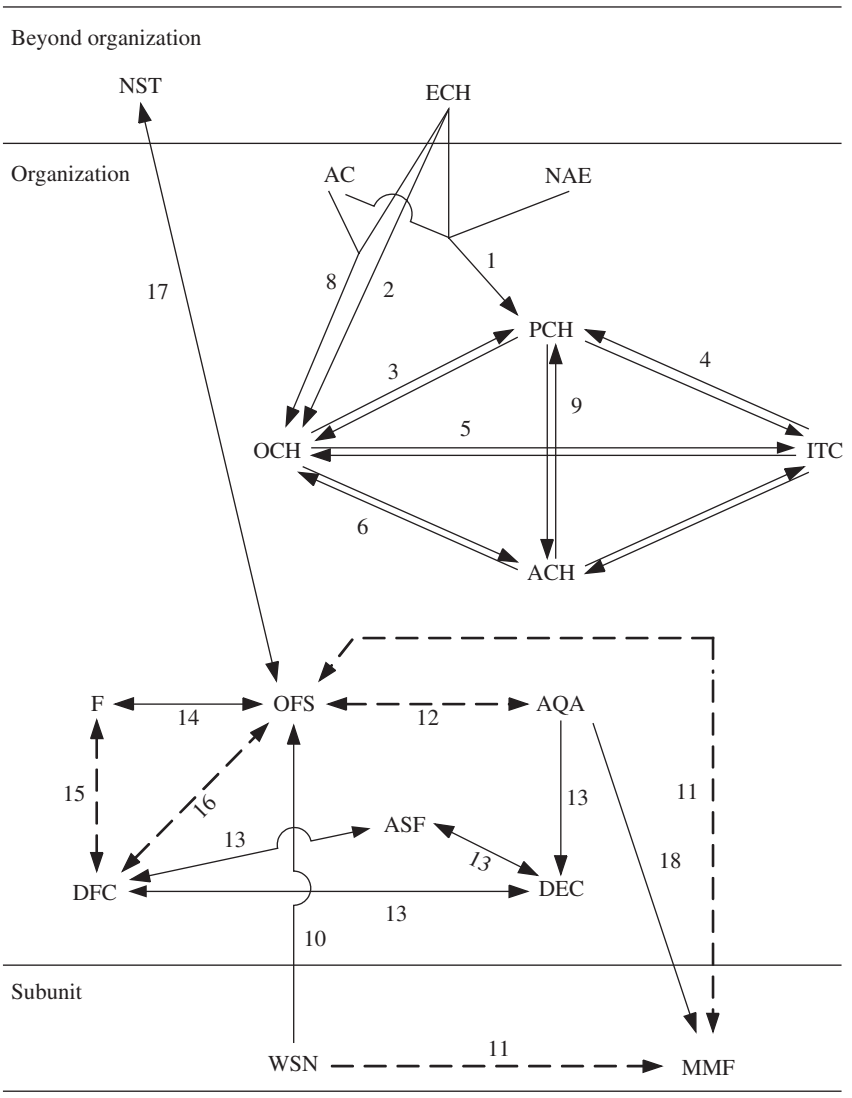
CD	Calculative discourse
CLC	Control of labor by capital
CP	Concealment of political (power, resource allocation) issues
ISM	Individual subjectivity is responsive to management accounting
KIA	Key individuals' actions supporting management accounting
LC	Local circumstances affecting resistance to management accounting
LNI	Limitations of non-accounting information (e.g., memory failure, need for public verifiable knowledge)
MA	Management accounting and control system development and use
RES	Resistance to management accounting control systems and their effects

RPA Resource pressure and resource allocation problems
SSA State support for accounting (e.g., wartime economic controls, legal privileges for accountants)
SVA Symbolic value of management accounting
TCA Technical (management accounting) capability is available
V Visibility of what is accounted for

Prior research

1. Bougen (1989); Bougen et al. (1990); Hopper & Armstrong (1991); Knights & Collinson (1987)
2. Ansari & Euske (1987); Czarniawska-Joerges & Jacobsson (1989)
3. Boland & Pondy (1983); Covaleski & Dirsmith (1988); Nahapiet (1988)
4. Coombs (1987); Czarniawska-Joerges (1988)
5. Preston (1986)
6. Bhimani (1993); Bougen (1989); Oakes & Miranti (1996); KIA × TCA: Euske & Riccaboni (1999)
7. Hoskin & Macve (1988); Miller & O'Leary (1987); Walsh & Stewart (1993)
8. Armstrong (1987); Carmona et al. (1997); Loft (1986)
9. Bhimani (1993); Bougen (1989); Carmona et al. (1997); Coombs (1987); Hopper & Armstrong (1991)
10. Bougen et al. (1990); Oakes & Covaleski (1994)
11. Bhimani (1994); Hoskin & Macve (1988); Miller & O'Leary (1987)
12. Chwastiak (2001); Colignon & Covaleski (1988); Covaleski & Dirsmith (1986, 1988); Frances & Garnsey (1996); Nahapiet (1988); Preston et al. (1997)
13. Chwastiak (2001); Hoskin & Macve (1988); Miller & O'Leary (1987), Nahapiet (1988); Preston (1992); Walsh & Stewart (1993)

Appendix I. Organizational change processes and the relation of financial and operational realities



Variable identification

AC	Accounting through which environmental change is analyzed
ACH	Accounting change (e.g., costing systems)
AQA	Availability and quality of accounting information
ASF	Acquisition strategy based on financial performance
DEC	Decentralization
DFC	Dominance of financial reality
ECH	Environmental change (market pressure, reduced government funding)
F	Formalization
ITC	Information technology change
MMF	Mental model/expertise puts operational issues in financial terms (versus non-integrated

	financial and operational expertise)
NAE	Non-accounting expertise
NST	National style favoring technical specialization (Germany) versus lay and commercial views (UK)
OCH	Organizational change (responsibility structure, accounting control, etc.)
OFS	Operational and financial separation in the organizational structure
PCH	Production change
WSN	Work socialization and experience does not integrate financial and non-financial information

Prior research

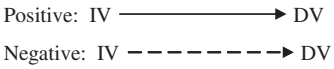
1. AC × ECH × NAE: Miller & O'Leary (1994); AC × ECH: Carmona et al. (1997); Hopwood (1987)
2. Abernethy & Chua (1996); Czarniawska-Joerges (1988); Den Hertog & Wielinga (1992)
3. Hopwood (1987)*; Miller & O'Leary (1994, 1997); Mouritsen (1999); Preston (1992)
4. Hopwood (1987)*; Miller & O'Leary (1994)
5. Den Hertog & Wielinga (1992); Hopwood (1987)*; Miller & O'Leary (1994)
6. Abernethy & Chua (1996); Briers & Chua (2001); Chua (1995); Covaleski & Dirsmith (1988); Euske & Riccaboni (1999); Hopwood (1987); Miller & O'Leary (1994, 1997); Mouritsen (1999); Nahapiet (1988); Ogden (1995); Preston (1992); Preston et al. (1992)
7. Briers & Chua (2001); Hopwood (1987); Miller & O'Leary (1994)
8. Briers & Chua (2001); Preston et al. (1992); Covaleski & Dirsmith (1988); Dent (1991); Hänninen (1995); Nahapiet (1988); Ogden (1995); Preston (1992)
9. Briers & Chua (2001); Carmona et al. (1997); Miller & O'Leary (1994, 1997); Mouritsen (1999); Preston (1992); Walsh & Stewart (1993)
10. Ahrens (1997); Berry et al. (1985); Covaleski & Dirsmith (1983); Llewellyn (1998)
11. Ahrens (1997); Berry et al. (1985); Llewellyn (1998)
12. Berry et al. (1985); Dent (1991)
13. Roberts (1990)
14. Ahrens (1997); Covaleski & Dirsmith (1983) (FRM → OFS only)
15. Ahrens (1997)
16. Ahrens (1996, 1997); Dent (1991)
17. Ahrens (1996)
18. Ahrens (1997); Berry et al. (1985)

*The links marked with asterisks are described as being unidirectional: PCH → OCH, PCH → ITC, OCH → ACH, ITC → ACH.

Appendix J: Map notation

The causal-model forms in the maps are denoted as follows:

1. Unidirectional linear additive relations between an independent variable (IV) and a dependent variable (DV) can have a positive or negative sign:

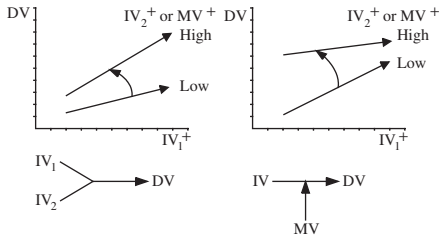


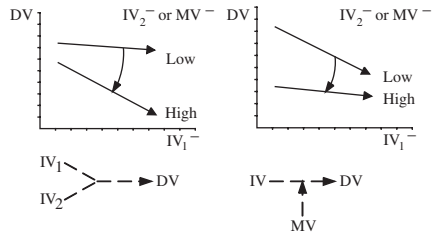
2. Intervening-variable models have an intervening variable (IVV) between the independent and dependent variables. Signs of the relations can be positive or negative.



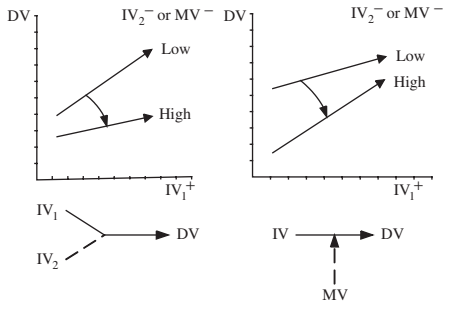
3. Interactions, whether involving independent variables or independent and moderator variables (MV) vary depending on their forms and signs. For example, two-variable interactions may be ordinal (monotonic) or disordinal (non-monotonic). MV interactions have a "T" shape and IV interactions have a "Y" shape. (See Section 5.2 for discussion of MVs and interacting IVs.) In principle, curvilinear and bidirectional relations may interact, but there are few instances of curvilinear interactions in the maps; therefore, all components of the interactions are shown in the illustrations below as linear and unidirectional.
   A. Ordinal interactions: The magnitude but not the sign of the IV_1-DV relation is affected by the level of IV_2 or MV (the magnitude may be as low as zero) and the IV_2-DV relation is affected by the level of IV_1. The eight forms of two-way ordinal interactions vary by whether the signs of the two IVs or IV and MV are common or mixed. For both common and mixed sign interactions, IV_2 or MV can either accentuate or attenuate the effect of IV_1 on Y, as shown in the interaction plots below. For parsimony, a single representation is provided for each pair of interaction plots. For example, either of the two plots can be represented by the first "Y" arrow if it is an independent-variable interaction or by the first "T" arrow if it is a moderator-variable interaction. See the studies in question for more exact representations.

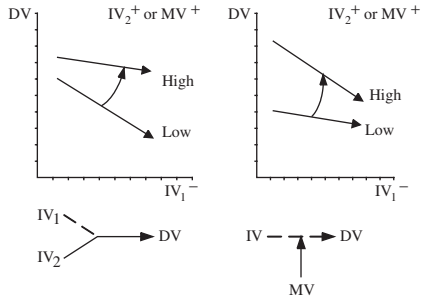
COMMON-SIGN INTERACTIONS:



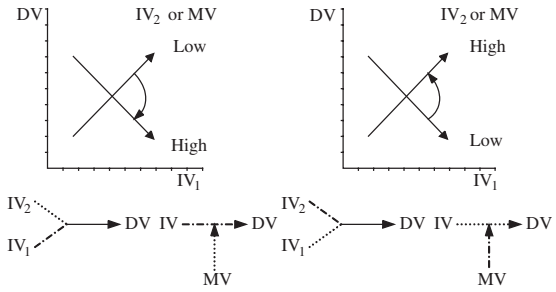


MIXED-SIGN INTERACTIONS:





   B. Disordinal interactions: The sign of the IV_1-DV relation depends on the level of IV_2 or MV and the sign of the IV_2-DV relation depends on the level of IV_1or MV.



On the maps, the disordinal interactions are drawn such that IV_1 is the lower (left) independent variable and IV_2 is the upper (right) independent variable.

C. There are only a few three-way interactions on the maps. These interactions can have a larger variety of forms than two-way interactions, and the maps do not attempt to represent their exact forms. If all arrows in a three-way interaction are solid lines, then all IVs have non-negative effects on the DV. If a three-way interaction has both solid- and broken-line arrows, then the IVs have mixed-sign effects on the DV. See the studies in question for more exact representations.

4. Unidirectional nonlinear relations are quadratic:
   U relations (convex): IV ⋯⋯► DV
   Inverted-U relations (concave): IV ——► DV
5. Bidirectional relations can have positive and/or negative signs. In reciprocal nonrecursive models, the bidirectional causation is simultaneous. In cyclical recursive models, a detectable time interval separates the effect of X_1 on X_2 from the effect of X_2 on X_1.
   Reciprocal nonrecursive: X_1 ⟷ X_2
   Cyclical recursive: X_1 ⇄ X_2
6. Where "high" and "low" levels of a variable are not clear from the variable name, the low level is in parentheses in the variable identification list.

Appendix K. Variables that appear on more than one map

Name	Description	Appendix
BBC	Budget-based compensation	A, B
BGD	Budget goal difficulty	A, B
BE	Budget emphasis by a superior in evaluating a subordinate	A, B
BEB	Budget estimate bias	B, E
BMI	Benchmark information	C, G
C	Competition	B, C, D
CI	Capital intensity	C, E
DEC	Decentralization	B, C, D, I
DS	Differentiation strategy	B, C
EU	Environmental uncertainty	B, C, D, G
F	Formalization	D, I
GF	Gain (versus loss) framing of outcomes	F, G
IA	Information asymmetry within organization	B, C, F
M	Motivation	A, C
NT	Number of trials	F, G
OC	Organizational commitment	A, F
OS	Organizational size	B, C, E
PB	Participative budgeting	A, B
PC	Performance capability	E, F
PCC	Performance-contingent compensation	C, E, F
PER	Performance	A, B, C, E, F
PR	Profit	E, G
PS	Prospector strategy	B, D, E
QS	Quality strategy	D, E
TI	Task interdependence	A, B, F
TU	Task uncertainty	A, B, C
WHP	Weight on higher-level (e.g., group) performance in lower-level (e.g., individual) compensation	E, F

Appendix L. Variables with partially shared meanings: examples

Non-financial information variables. Eight variables in the maps represent the use of non-financial information as compared to financial information:

– Usefulness of internal, non-financial information (Map C, link 17).
– Usefulness of non-financial relative to financial information (Map C, link 18).

- Usefulness of broad scope information. (The studies shown in Map C, links 25–27 define narrow-scope information as including only financial, internally focused, and historical measures, while broad scope information includes non-financial, externally focused, and future-oriented measures as well (Chenhall & Morris, 1986).)
- Importance of non-financial performance measures (Map C, link 10).
- Availability of non-financial information to workers (Map C, link 33).
- Existence of quantified non-financial goals (Map C, link 29).
- Weight on non-financial performance measures in incentive compensation (Map E, links 10–11, 28).
- Diversity of team performance measures (Map F, link 2). Achieving high scores on the diversity measure used in this study requires a mix of financial and non-financial performance.

Uncertainty variables include the following:

- Environmental uncertainty (Map B, links 5, 25; Map C, links 17, 19, 25; Map D, link 4; Map G, links 20–21).
- Task uncertainty (Map B, link 27).
- Funding uncertainty (Map C, link 3).
- Uncertainty of incentive pay (Map F, links 1, 15).
- Income uncertainty of investment chosen by managers (Map F, link 12).

In addition, information accuracy and informativeness variables such as accurate product costs (Map G, links 1, 2), noise in organizational accounting information (Map E, links 10, 12), or informativeness of accounting earnings for organizational value (Map E, link 13) capture specific uncertainties. For example, the less accurate reported product costs are as follows: the greater the uncertainty about actual resource use by a particular product and the greater the uncertainty about profits resulting from decisions based on reported product costs.

Interdependence variables include the following:

- Task interdependence (Map A, link 42; Map B, link 21; Map F, link 6).
- Subunit interdependencies (Map C, links 24–25).
- Weight on higher-level performance (e.g., firm, team) in lower-level (e.g., division, individual) compensation (Map F, links 6–8).
- Tournament versus individual piece rate versus joint piece rate compensation (Map F, link 23).
- Dependence of other business units' performance on actions of the focal unit (Map E, link 24).
- Dependence of the focal unit's performance on actions of other units (Map E, link 15).

Information asymmetry variables include information asymmetry measured or manipulated relatively directly (Map B, links 10, 17; Map C, link 20; Map F, links 28–29, 31–32) and variables that can be interpreted as proxies for information asymmetry such as size of an organization or subunit (Map B, links 2, 22; Map C, links 4, 7), decentralization or diversification (Map B, links 1–2; Map C, links 19, 25), and absence of inside ownership or ownership concentration (Map C, link 20; Map E, link 16).

Performance variables appear in most maps (A, B, C, E, F, G) but at multiple levels (individual, subunit, organization) and with various degrees of inclusiveness—for example, subunit performance in new product development (Map C, link 28) versus overall subunit performance (Map C, links 29–30, and Maps B, E, and F).

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Theorizing Practice in Management Accounting Research

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Abstract: This chapter presents an overview of a diverse set of studies that have sought to explore the social, organisational, and cultural specificity of management accounting whilst at the same time theorising the regularities of the management accounting phenomenon. We draw on practice theorising to identify common interests in the wide-ranging interpretive management accounting literature. We discuss in particular the approach and contribution of studies seeking to theorise practice in terms of governmentality, actor networks, systems of accountability, and situated functionality.

1. Introduction

This chapter presents an overview of a diverse set of studies that have sought to explore the social, organisational, and cultural specificity of management accounting whilst at the same time theorising the regularities of the management accounting phenomenon. Those studies might be defined as combining an interest in management accounting as microaction with the macroinfluences that structure its functioning, had it not been for an overwhelming concern to avoid making just those distinctions between micro- and macro-'levels'. Rather, a key theoretical objective of those studies has been to conceive of the orderly properties of the social arrangements around accounting as a direct outcome of activity.

This is a theoretical objective shared with what has been referred to as 'practice theory' in social research more generally. Practice theorists have been united by a shared concern over the neglect of action in social theory. Most have reflected on the ways in which action relates to aspects of what Ortner (1984) called 'the system', be it primarily political, economic, cultural, or technological. They have tended to assume that action and the system condition each other in processes that give rise to varying degrees of social order (e.g. Bourdieu, 1977; Giddens, 1984). Neither does an objective technical system determine activity, nor can social phenomena be explained simply through the aggregation of individual actions.

Practice theorising is very much concerned with the uses that specific actors seek to make of systems, avoiding 'hero sociology' as much as an undue emphasis of system constraints. Theorising management accounting practice is about understanding how people in organisations make specific uses of widely available accounting solutions, how such solutions come to be at their disposal, and how their use might change existing accountings and give rise to new accounting solutions that others can use. It is about the changing possibilities for uses of accounting, often explored through the detailed study of specific instances of such uses.

The reintroduction of questions of choice into discussions of constraint has led various exponents of the practice turn in social theory to acknowledge a normative dimension of practice (Schatzki et al., 2001; Swidler, 1986). Barnes (2001), for example, regarded practices as '[…] socially recognized forms of activity, done on the basis of what members learn from others, and capable of being done well or badly, correctly or incorrectly' (p. 18). Practices are about the understandings and traditions of social groups as well as their aspirations and pressing problems. 'Accounts of order and agreement that refer to practice presume not passive actors but active members, members who reconstitute the system of shared practices by drawing upon it as a set of shared resources…' (Barnes, 2001).

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2. Contextualising the Local in Management Accounting Research

Many contemporary and historical studies of accounting have pointed to the diverse ways in which social order has been structured through activities involving accounting, describing many social phenomena that hinged on specific accountings. Those studies have furthered our understanding of the constitutive powers of accounting in relation to organisations and society. They have also become a popular research topic for interpretive accounting research (Hopwood & Miller, 1994). In the endeavour to shed light on the particular meanings of (and uses for) accounting in specific locales, interpretive studies have, in some form or other, sought to explore the ways in which

> […] the social, or the environment, as it were, passes through accounting. Conversely, accounting ramifies, extends and shapes the social (Burchell et al., 1985, p. 385)

Few interpretive studies have treated the accounting phenomenon studied in a particular locale as isolated from its wider social context. In the endeavour to shed light on the particular meanings of (and uses for) accounting in specific locales, most interpretive studies have, in some form or other, sought to explore possible relationships between the local and its context. This has given rise to a diverse literature whose richness of theorising in both historical and field studies has been seen as cause for celebration (e.g. Baxter & Chua, 2003).

A central understanding of this literature is that accounting cannot be understood simply with reference to its supposed functional properties because it is implicated in the shaping of its own context. Interpretive theorists have shown that organisational objectives, which from a functionalist point of view should determine the uses of accounting, are rarely clear-cut and that they frequently follow, not precede, calculation (Cohen et al., 1972; March, 1987). Accounting and organisational objectives are interdependent in the sense that objectives are influenced by the knowledge of potential accountings (Swieringa & Weick, 1987). Moreover, objectives may be continuously reformulated in the light of new information and revised calculations (Den Hertog, 1978; Hedberg & Jönsson, 1978; Preston et al., 1992).

The cumulative effect of such interpretive studies of accounting has been to establish that the uses of accounting are characterised by flexibility and variability (Dent, 1986) and that accounting systems frequently give rise to unintended consequences (Burchell et al., 1980; Den Hertog, 1978; Hedberg et al., 1976). However, sometimes this flexibility has seemed to render any actual uses of accounting systems almost accidental. Central to this perception was the insight that organisational actors retain some degree of choice between strategic objectives and specific solutions (Child, 1972). They can draw on the multiple conceptualisations of accounting and its uses that circulate in organisations (Ahrens & Chapman, 2002; Boland & Pondy, 1983; Chua, 1995; Mouritsen, 1999). Besides being used for the deliberation of future alternatives, accounting is a vital resource for making sense of past decisions and the present to which they have led (Ansari & Euske, 1987; Brunsson, 1990). It is as much implicated in decision making as in processes of organisational learning, bargaining, and rationalisation (Burchell et al., 1980). Accounting thus lends itself to multiple political uses (Bariff & Galbraith, 1978; Markus & Pfeffer, 1983; Wildavsky, 1978).

The political significance of accounting has been one of the first and most thoroughly researched topics in interpretive studies of accounting practices. Focused on accounting as first and foremost organisational, this group of studies did perhaps show least concern with the nature of relationship between the organisational accounting practices and their wider social and institutional contexts. It did, however, give support to the idea that accounting can be loosely coupled with organisational processes and thus lent credibility to neo-institutional accounting research that distinguished the symbolic from the functional roles of accounting. In that sense, it began to theorise the relationship between organisational accounting practices and their social context but did so in a way that separated the context from what was regarded as the more immediate concerns of practical organisational functioning. Moreover, it suggested that through processes of organisational micropolitics accounting could itself spawn idiosyncratic forms of institutionalisation (Ansari & Euske, 1987; Covaleski & Dirsmith, 1991).

Political perspectives on accounting have shed light on the dependence of accounting systems and their functioning on organisational action. Focusing on the malleability of accounting systems, they have not sought to conceptualise the orderly properties of the social arrangements around accounting as a direct outcome of activity. In the following sections, we will focus on four groups of accounting studies that have sought to do so, thereby variously contributing to our understanding of accounting as practice.

2.1. Governmentality and Programmatic Action

Studies of governmentality have developed a complex notion of the practice of accounting arising from a

historical understanding of the disciplinary powers of systematic bodies of knowledge. Broadly speaking, they have sought to delineate the conditions under which accounting became institutionalised in ways that produced specific systematic effects on the constitution and functioning of organisations and states, and thus define what might historically qualify as accounting practices (e.g. Hoskin & Macve, 1988, 1986; Miller & O'Leary, 1987; Miller & Rose, 1990). In doing so, this literature has moved from the implication of accounting in organisational politics and sense making, which has been an important concern of many studies of accounting and organisational process, to the constitution of organisational process itself. Accounting has been seen to have permeated the fabric of organisations and social institutions, not just as a technology to be used in any way, but

> […] always intrinsically linked to a particular strategic or programmatic ambition […] to increase efficiency, to promote economic growth, to encourage responsibility, to improve decision making, to enhance competitiveness (Miller, 2001, p. 394).

Miller's insistence on accounting's inbuilt programmatic ambition in many of his works has helped to establish, in the accounting literature, the significance of what Goodwin (1994) called a structure of intentionality. Discussing about a standard colour scheme used by archaeologists to classify earth colour, Goodwin observed that

> of all the possible ways that the earth could be looked at, the perceptual work of students using this form is focused on determining the exact color of a minute sample of dirt. They engage in active cognitive work, but the parameters of that work have been established by the system that is organizing their perception. Insofar as the coding scheme establishes an orientation toward the world, it constitutes a structure of intentionality whose proper locus is not an isolated, Cartesian mind but a much larger organizational system, one that is characteristically mediated through mundane bureaucratic documents such as forms (Goodwin, 1994, p. 609).

More generally, charts, maps, and other schemes can powerfully structure the cognitive practices of social groups, as can accounting. Accounting rules and categories bias social perception (Cooper, 1980), and the insistence on the structure of intentionality enshrined in accounting convention can obstruct the search for regulatory solutions (Young, 1996).

Miller's work on the programmatic character of accounting has sought to emphasise the highly specific ways in which structures of intentionality can, through 'temporary assemblages' of people, accountings, ideas, buildings, material flows, etc., come to be contextualised in particular cases. Rooted in an analysis of the organisational functions of accounting, the governmentality literature, more generally, has opened a particular vista on accounting's broader social significance beyond the organisation; for example, through histories that relate the emergence of accounting to the spread of novel forms of writing, indexing, and grading (Hoskin & Macve, 1986) or more general political efforts at standardising different spheres of social life (Miller & O'Leary, 1987; Radcliffe, 1998).

Studying in this way, the conditions under which 'accounting was made practical' (Miller & O'Leary, 1990) has avoided the cumbersome distinction between macrostructures and microaction by focusing on particular instances in which accounting was implicated in the production of social order. But it has also avoided inquiring into the detailed practices through which accounting is mobilised by organisational members. The practice notion of governmentality has primarily been concerned with the putative origins of action, that is, its generic 'strategic or programmatic ambition' (Miller, 2001, p. 394), and not action itself:

> […] new calculative practices alter the capacities of agents, organizations, and the connections between them […] As a technology of power, management accounting is thus a mode of action that does not act directly and immediately on others. Instead, it acts upon the actions of others, and presupposes the freedom to act in one way or another. The agent who is acted upon thus remains an agent faced with a whole field of possible responses and reactions (Miller, 2001, pp. 379–380).

On the whole, the practice approach of governmentality studies did not foreground the ways in which accountants and non-accountants alike conceive of and conduct their everyday tasks with reference to accounting and, in one way or another, seek to advance their particular plans through accounting. Practices that would be thus infused with accounting shine only occasionally through the disciplinary histories, for example, when Hermann Haupt, graduate of West Point and newly appointed engineer at the Pennsylvania Railroad, changed freight pricing with the help of novel analyses of fixed and variable costs (Hoskin & Macve, 1988, p. 61). Miller's (2001) notion of practice, in particular, has steered him away from addressing in detail the uses and functionings of accounting in specific situations. For instance, Miller & O'Leary's (1994) study of a new manufacturing initiative at Caterpillar Inc. conceived of accounting

practices at the level of designing accounting policies, mainly for investment decision making and building accounting information systems. The relationship between accounting and organisational processes was discussed only to the extent to which it 'rendered them operable'. How, or even whether, accounting was mobilised in any particular organisational activity was not discussed. Accounting remained a potential. More generally, all organisational practices were described as successive designs of policies, systems, and architectures that 'sought to act upon' organisational members who were mere users of systems and occupants of spaces and whose activities were never described.

To relegate practical activity with and through accounting to a secondary class of events whose 'modes' are determined by the general historical conditions of the formation of specific accounting constellations (Burchell et al., 1985) is a particular case of top-down history. With the emphasis on the 'temporary assemblages' of systems of accounting and other controls, agents can be left with 'the freedom to act in one way or another' because that freedom is regarded as inconsequential, not something on which the academic inquiry into the functioning of accounting should concentrate. Interactions between discourses and practices are thus stylised as orchestrations whose potential is determined by successive accounting systems designs. A more detailed concern with the activities of agents might shed more light on the reasons why, and the processes through which—from among many possible programmes, discourses, policies, etc.—some end up in temporary assemblages with particular accountings.

To trace the causes of organisational effects to specific uses of management accounting and performance measurement is notoriously difficult. Ogden (1997) provides an interesting example of a governmentality study that was motivated by Miller & Rose's (1990) theory but was nevertheless concerned with specific behavioural and organisational consequences of selected aspects of performance measurement system design. Ogden (1997) discussed different performance measurement system blueprints in a number of private water companies that were formed after the UK public service water boards were dissolved. Based on interviews with senior management, he described different implications of the new water companies' internalisation of performance measurements that sprang from regulatory requirements. Those implications were delineated at a general business level and reflected overall strategic deliberations rather than the management of particular regions or projects within the water companies.

In contrast, Vaivio's (1999) study of a UK cleaning products and service company explored the details of managerial intention and the concrete uses of management accounting and performance measurement information in the management of individual products and customers even though he theorised his study as a contribution to governmentality. It is perhaps best read as a borderline governmentality case study because it foregrounded the initial effects and subsequent malleability of disciplinary control and, unlike Ogden (1997) for example, was much less concerned with the sources of disciplinary power. In stretching the governmentality framework it provides a useful illustration of its potential.

2.2. Practice as Networks of Activity

The assembly of accounting designs and systems has been of keen interest to another large group of management accounting studies drawing on actor network theory (ANT) and, particularly, the work of Latour and his collaborators. Not so much a theory as a post-humanist ontology to overcome puzzles of social theory—such as the duality of agency and structure, for example—ANT sought to replace notions of social structures, entities, levels, etc. with the concept of heterogeneous networks of humans and non-humans[1] (Latour, 1987, 1996a; Law & Hassard, 1999). The networks of ANT are not the structures of traditional sociology. They are not to be confused with the social networks in which humans liaise and 'network' (Latour, 1996b, p. 373), nor do they exhibit the distance-denying instantaneousness of the world-wide web that gives immediate access to discrete pieces of information (Latour, 1999, p. 15). ANT networks come into existence through the circulation or travel of actants, 'something that acts or to which activity is granted by others' (Latour, 1996b, p. 373). These heterogeneous networks deform or transform the travellers in the process. Actants make up networks, but through processes of transformation the networks also give actants 'actantiality', that is, '[…] provide actants with actions, with their subjectivity, with their intentionality, with their morality' (Latour, 1999, p. 18).

Herein lies an important point of contact between ANT and governmentality research in accounting. Governmentality's built-in programmatic ambitions of accounting, and the freedom of human actors to draw on them, can be traced as the fabrication of accounting into an actant, made up of humans,

[1]Computer system architecture (Dechow & Mouritsen, 2005) or ABC costing systems (Briers & Chua, 2001) for example.

accounting rules, reports, computers, etc. ultimately lending accounting actantiality. For ANT, only those people, things, and networks are worthy of study that leave an imprint, that possess actor-like qualities.

However, ANT emerged out of highly specific intellectual concerns. Latour appears to have primarily been concerned not with action as such but the delineation of the networks that would allow him to trace action.

> It is a *method* to describe the deployment of associations like semiotics; it is a method to describe the generative path of any narration. […] In itself ANT is *not* a theory of action, no more than cartography is a theory of the shape of coast lines […] (Latour, 1996b, p. 373–374, italics in original).

A stream of studies of budgeting in various national health systems has drawn on ANT as a means to explore exactly such generative paths. Preston et al. (1992) and Bloomfield et al. (1992), for example, studied the introduction and emergence of responsibility accounting in the UK hospital sector. Their choice of research settings allowed them a particular advantage in following Latour's exhortation 'to arrive before the technology is fixed, known and unproblematic' (Preston et al., 1992, p. 564). Likewise Chua (1995) emphasised the potential contributions of a study of 'the making up of "new" accounting numbers' (p. 115) in her study of the fabrication of a hospital case—mix costing and accounting. As with earlier studies, such as Pinch et al. (1989) and Preston et al. (1992), her study emphasised the significance of processes of enrolment and rhetoric (see also Mouritsen, 1999).

Latourian analyses have highlighted the changing and fragile nature of management accounting systems, but not in the same manner as the early studies of the political and symbolic roles of accounting that emphasised the variability and unintended consequences of accounting did. The notion of unintended consequences presumes that accounting systems also possess intended consequences, which in turn allows the study of 'loose coupling' between formal objectives that assume 'symbolic' qualities and everyday action (Berry et al., 1985; Ezzamel & Bourn, 1990). In contrast, ANT was a project meant to redress the privileging of formal objectives. Formal objectives too were only a network effect, a fabrication. They were not believed to have powerful implications independent of the details of their fabrication because ANT does not privilege any network locations a priori.

Law attributed this to a fear of the 'perils of managerialism' (Law, 1991, p. 13) or hero sociology. ANT's 'principle of symmetry' (Latour, 1996b) seeks to treat the powerful—for example, managers and accounting system designers—as network members and effects, just like anyone (and anything) else, so as to precisely trace the origins and makeup of their fallible powers. We agree that powerful organisational members inhabit the same field of practices. Their preferences are shaped by this field. They are not 'outside the network'.

A challenge for ANT in relation to the study of management control (at least in commercial organisations) is that in a management context those who are designing, reading, and interpreting management control systems are in fact a priori privileged. For example, Quattrone & Hopper (2005) reported on a Japanese head office that insisted on maintaining their preferred accounting configuration when introducing an enterprise resource planning (ERP) system, despite the ERP system's technological imperatives for change. Management may not win all their games all the time, but they are nonetheless more central to bigger and more resourceful networks. Also, their networks and powers possess special qualities.

> Though they *are* quantitatively different, they are not *only* quantitatively different, at least some of the time. Which means, if we concentrate […] on this alone, we are liable to miss out on some of the ways in which quantity is (reversibly) transmuted into quality. Or, to put it differently, we will miss out on the ways in which the great distributions are laid down and sustained (Law, 1991, p. 14, italics in original).

In principle, ANT might discuss the 'great distributions', Law's shorthand for social structures, through much comparative tracing of networks between organisational and extra-organisational, human and non-human allies. In practice, accounting researchers have sometimes restrained the deconstructive impulse of ANT. Mouritsen (1999) researched the network of the relationships between customers, subcontractors, workers, and products through BusinessPrint's existing management hierarchy, following the leads of the different *managers'* priorities and problems (not those of the workers, machines, or products), unearthing how *their* different capabilities, interests, and objectives gave rise to the conflicting notions of management control and specifically their different concepts of flexibility. Even though the attempts of the CEO of BusinessPrint to turn overheads into direct costs through outsourcing '[…] quickly spiralled away from [an immediate concern with] indirect costs into areas such as marketing, production, new technology, productivity, and political risk' (Mouritsen, 1999, p.

47), this did not, as Law (1991) suspected, invalidate his power or thwart his subsequent efforts to assume greater control. Even though management is not omnipotent, the distributions of power tend to be sufficiently skewed to begin management control research with management strategies and hierarchies, and then see their effects ripple through diverse organisational and extra-organisational processes and artefacts all the way back to the strategists and their ongoing attempts at control.

ANT has made an important contribution to the theorising of practice in management accounting. It has shown the significance of actors, action, and inscriptions in the fabrication of social order. However, its approach to the study of management control has been distinctively deconstructive, in the sense that the intellectual effort has been devoted to untangling the processes of 'inscription' and 'fabrication'—what is fabricated, the fabrications themselves, is treated as something of a side effect, a moment of temporary stability that is of little interest in itself. In this, we see another parallel with governmentality research in accounting, which tends to be more interested in the programmatic potential of accounting than the temporary assemblages of which it actually becomes part.

In the more recent management control literature, we see studies inspired by ANT rather than straightforward applications of it. For example, Briers & Chua (2001) developed important contributions to our understanding of ABC through an intellectual bricolage. They enriched the flat ontology of ANT, as set out by Latour, with the concept of the boundary object (Star & Greisemer, 1989). They advanced our insights into ABC, yet their approach was strictly antithetical to Latour's notion of ANT. The concept of the boundary object allowed traction on notions of intent and interaction in their study. Analysed as a 'visionary boundary object' that brings together actors, more than an actant in its own right, the ABC system allowed for the rendering of individual actors' motivations by providing a context through which these can be seen to interact and affect the shape of the emerging networks. Dechow & Mouritsen (2005) developed this line of reasoning on boundary objects through their discussion of ERPs as providing 'trading zones' in which organisational actors negotiate the ways in which a new ERP relates to the existing reporting practices.

2.3. Accounting Systems and Systems of Accountability

A third strand of theorising practice in the management accounting literature has evolved around notions of accountability. Accountability has served as a distinctive concept for conceiving the orderly properties of the social as arising from action. Focusing on the systematic relationships between accounting systems and systems of accountability, Roberts & Scapens (1985) suggested replacing the functionalist and systems theoretical notions of accounting systems with the concept of '[…] systems [that] should be analysed as institutionalised forms of interdependent social practices' (p. 446). Of particular interest to them was the potential to understand management control systems as offering means to disembed personal and face-to-face notions of accountability, stretching them across time and space. Accounting can thus come to be seen as a force that spawns anonymous forms of control. The contribution of such theorising to our understanding of management control has been debated extensively in the accounting literature (Boland, 1996; Macintosh, 1994; Macintosh & Scapens, 1990; Roberts & Scapens, 1985; Scapens & Macintosh, 1996). More recently, it has also motivated a growing number of field studies.

Roberts (1990) was one of the first to pursue those issues in a field study. Studying the takeover of an ailing manufacturing company by an acquisitive British financial conglomerate, he focused on hierarchical communication and interaction. The head-office management of the conglomerate sought to make the managers of the manufacturing subsidiary feel accountable to greater demands for profits even though the strategy chosen to achieve them threatened the very same managers' jobs. Roberts saw the conglomerate's solution to this problem in their '[…] style of routine accountability that emphasises trust and autonomy' (p. 118). Comparing their role under the centralised bureaucratic regime practised before the conglomerate's takeover, factory managers, for example, commented favourably on their newly found autonomy in decision making. The financial strictures in which they were required to exercise this autonomy were, however, very real. They were explained to the subsidiary's management in annual conferences. These provided an opportunity for face-to-face communication that proved central to the development of a shared understanding around the new strategy, through which managers throughout the conglomerate came to be held accountable to the ever more stretching financial targets.

Roberts (1990) explained the complex dynamics of stability and change, control and autonomy that he found in the conglomerate and its new subsidiary with reference to Anthony Giddens's work. Analytically, Giddens distinguished three elements of the production of forms of interaction: all interaction involves (attempted) communication, moral relations,

and the operation of power. The modalities whereby these are 'brought off' in interaction by participating actors can also be treated as the means whereby social order is reconstituted (Giddens, 1993, p. 133).

Giddens's ideas on the relationship between individual action and the production, reproduction, and regulation of social order have subsequently informed other management accounting field studies. For example, Ahrens & Chapman (2002) emphasised the importance of day-to-day contests of accountability in a UK restaurant chain. Like Roberts (1990), they observed little objection to ideas of economic efficiency in their case. In their detailed analysis of the day-to-day interactions between restaurant managers and their staff and line managers, they explored the complex ways in which managers traded off various sources of legitimacy in the context of highly asymmetric power relations between the head office and the restaurant managers.

Seal et al. (2004) sought to

> 'put Giddens into action' (Whittington, 1992) by developing a new theoretical approach to supply-chain analysis that combines institutional effects with strategic conduct (p. 75).

Their analysis of the case of Dextron contributed to our understanding of accountability by discussing ways of distinguishing between behaviours driven by trust and those forced by power, an issue that had previously been difficult to resolve in the supply-chain literature.

Giddens's thought has been influential in the study of the relationships between accounting systems and systems of accountability. However, other theorists have also been useful in shedding light on these relationships. Inspired by the work in particular of Geertz (1973, 1983), Dent (1991) studied a railway company in which changes in accounting systems and systems of accountability led to widespread changes in its social fabric. Informed by an understanding of culture as a 'broad constellation of interpretive structures', his study explores the gradual demise of a traditional 'railway culture'.

> This was to change during the 1980s. Government policy became stringent.[2] Social objectives ceased to be a legitimate criterion for government support. The government sought to impose harsh economic disciplines in all areas of public and private endeavor. [The railway company] found itself in a malign, resource-constrained environment (Dent, 1986, p. 28).

[2]Given the relative timing of the two studies, it is interesting to hypothesise what changes might have faced the National Coal Board described in Berry et al. (1985).

Even though it has been noted that 'Dent's research, in particular, emphasises that accounting change can be unremarkable from a technical point of view' (Baxter & Chua, 2003, p. 106), his study demonstrated the significance of the introduction of new forms of calculation into a diverse range of decisions previously subject to very different forms of analysis, noticeably those employed by railway engineers. Dent's study highlights more than simply the introduction of a new terminology of 'the bottom line'. In describing the significance of the shift away from contribution accounting towards full costing, Dent emphasised that

> [t]he significant point is that these measures were introduced, manually at first, and that they were fundamental to the emergence of the new culture (Dent, 1991, p. 718).

Dent documented changing organisational practices through what he described as a series of contests between competing visions of the railway through which new calculative practices became centrally implicated in a cascade of subsequent changes. Dent identified key events through which Business Managers sought to redefine the basis for interpreting experiences. Through new forms of calculation

> […] Business Managers gained contexts to interact with others. In these contexts, they recast dialogue and debate from a railway language of operations and engineering to their business language of markets and profits (p. 724).

Over time, judgements of the appropriateness of day-to-day activity were decoupled from the engineering hierarchy of old, and were instead channelled through the new processes of long-run planning, capital-expenditure approvals, and budgeting, thereby establishing the influence of the newly appointed commercial managers on daily activity.

Echoing the findings of Dent (1991), but adopting structuration theory as a sensitising device, Conrad (2005) provides a good example of developing individual strands of accountability research with reference to different social theorists' works. Conrad (2005) highlighted the central implication of the new calculative practice of ABC in the permeation of ideals of 'cost-consciousness' into every-day decisions based on a detailed analysis of structures of signification, legitimation, and domination through three phases of transformation of a public utility, British Gas. Whilst noting that these three are not neatly delineated chronologically, the Pre-privatisation, Early privatisation, and Mature privatisation phases

were characterised by distinctive sets of structures of signification, legitimation, and domination.

Moreover, the themes of competing hierarchies and distinct forms of expertise found in Roberts (1990) and Dent (1991) were also prominent in the studies of accounting and accountability in the public sector, notably health care; again, informed by diverse social theories. For example, Pinch et al. (1989) drew on the ideas of ANT and the social study of science and technology, Llewellyn (1998) on notions of professional ideologies and the boundary work of professionals, and Kurunmäki (1999) and Oakes et al. (1998) on Bourdieu's notion of fields and social capital. Their conclusions emphasised variously how accounting encroached on public service ethics and compromised professional judgement, or how it could contribute to a better understanding of the economics of professional service delivery to initiate better uses of resources. As a group, the field studies of accounting systems and systems of accountability characterise accounting practice as a stream of activity that draws on (and rebuilds) accounting and other organisational and social institutions.

2.4. Management Accounting Practice as Situated Functionality

A fourth group of studies of management accounting practices is delineated by our reading of what constitutes an unrealised potential of practice theory for management accounting research and, in particular, field studies. We want to begin an outline of this potential with reference to a short paper by Hopwood (1989) that sought to circumscribe the practical character of accounting by articulating a vision of the study of accounting practices as finely graded, highly specific contingencies in the minds of organisational members who seek to put them to use for their specific priorities. He emphasised the context of dependency of practice as well as its normative character from the practitioners' point of view.

In three short case studies, Hopwood sought to illustrate

> […] a deep interpenetration between the technical practices of accounting, the meanings and significances that are attributed to them and the other organisational practices and processes in which they are embedded (Hopwood, 1989).

Mindful of the objectives and concerns of senior accountants and managers, and the ways in which they had been shaped by the existing accounting information systems, Hopwood sought to characterise the implication of accounting in the operational processes of particular organisations. His case descriptions sought to articulate a particular kind of fit between accounting, operations, and strategic priorities. Unlike the fit between generic strategic postures and general accounting system characteristics found in the contingency literature (p. 27), Hopwood sought to convey the practical understandings borne out by the organisational members' sense that their accountings illuminate key aspects of their operations, such that they are enabled (Ahrens & Chapman, 2004) evaluate and intervene. In short, Hopwood articulated a notion of situated functionality.

Like Barnes's (2001) notion of practice, Hopwood's (1989) concept of accounting in action had a distinctive normative element. Organisational members develop and judge the shared understandings of accounting and organisational process, on which they base their managerial efforts, by organisational outcomes. Similarly, Hopwood's (1987) study of the historical layers of accounting systems to understand the complex relationships between accounting and organisational priorities over time acknowledged the significance of managerial agency. Of the myriad organisational narratives available, he focused on those that, through the visibilities accorded them through accounting, had been deemed organisationally significant by organisational participants, mostly at the intersection of organisational strategy, key processes of organisational competitiveness, and accounting information systems. Hopwood (1987) was thus not only drawing on the insights of the studies of the political uses of accounting but also relating them to the perceived usefulness of accounting systems for the achievement of business objectives.

An earlier example of a sociologically informed study of the role of accounting systems in the emergence of business objectives is Bower's (1970) book on the resource allocation process for four specific investment projects in four business units of a large US chemicals company. Bower explored the interlacing of political, commercial, and technical uses of accounting in four divisions of one large company from a managerial perspective. How do financial analysis techniques get used in large companies and what are the possibilities of their use? He showed in great detail how different business environments and strategies, the business units' and the corporation's formal organisation and policies (including their accounting and capital budgeting systems), and individual organisational members' values, desires, feelings, and judgements of the strategic, commercial, technical, and political potential of projects affected their evolution and eventual acceptance or rejection.

> While the evidence reveals the relative unimportance of a particular technique of financial analysis and limited usefulness of the [theoretical] financial model, it also indicates that management can control the investment process (Bower, 1970, p. 279).

The organisational work of contextualising the projects in ways that disposed other organisational members favourably towards them lay at the heart of preparing a successful investment proposal. Bower ended his book with a call for a 'conditional theory of organization' (p. 318) to explain the scope of managers in influencing structural aspects of organisations in particular contexts.

Similar to Bower's (1970) or Hopwood's (1989) attempts at rolling accounting information systems and organisational contexts and motives into a holistic account of complex organisational action, Jönsson & Grönlund (1988) concentrated on the evolution and subsequent solution of organisational problems in relation to cost information in a Swedish factory for vehicle components. The particular context in which Jönsson & Grönlund studied the uses of cost information led them to a somewhat pessimistic evaluation of the usefulness of the cost information prepared for routine reports. Instead, they showed the ways in which changing local problems drove the tailoring of local information sets that were discarded after the problem was regarded as solved.

Kalthoff (2005) studied the decision-making practices of banks while granting loans to corporate clients. He drew on Heidegger's philosophy of technology to understand the social role of risk calculations and, particularly, the implication of humans in technology. Whilst recognising contesting interpretations of Heidegger's work (see also Dreyfus, 2001), Kalthoff saw in Heidegger's later writing 'a dissatisfaction with anthropological and instrumental writings on technology' (p. 72) and sought to explore the usefulness of his philosophy for the study of organisational practices. Heidegger argued that '[…] modern technology constitutes the social world in the sense that it shows how to deal with objects and organizes an effective ordering of resources […] [A]ccording to Heidegger there is a tendency to establish a technological understanding of being as the only legitimate form of understanding' (Kalthoff, 2005, p. 73). To work with rational technologies means to pursue one's specific objectives knowing that one must put one's case to appeal to the chains of calculation that are performed in different locations following a specific techno-logic.

This idea has specific implications for individual agencies. It emphasises the individual's relationships with others who are working on related chains of calculation. Kalthoff (2005), through his detailed analysis of discussions surrounding risk calculations between credit-control staff in the German head office and loan officers in a Polish branch, sought to unpack the role that calculations and calculative inscriptions such as balance sheets played in the constitution of organisations and, particularly, organisational intent. His study thereby aimed to shift the notion of calculation away from '[…] ''calculating something'', to ''calculating with something'''(p. 71). Arguing that organisational practices are forcefully ordered by the design of technologies, he pulled back from a non-realist account (see also Dreyfus, 2001).

Kalthoff's (2005) paper was, however, limited to discursive practices. A view of management accounting as organisational practice more generally informed Ahrens & Chapman's (2005; in press) analyses of management control in a restaurant chain. Here the ambition was to theorise day-to-day organisational activity with reference to the technical properties of accounting calculation and the normative aspects of a specific organisational setting. The ways in which the corporate strategic agenda was constituted by specific financial, customer service, and operational practices constituted the focus of the analysis.

The notion of strategy as organisational practice highlights the dynamics between formal power and the resistance of those who are to be co-opted into an organisational strategy (de Certeau, 1988). Informed by these ideas the ambition was

> not to appeal to a stereotype of grass-roots resistance to top-down strategies but to open up for detailed investigation the spectrum of possible local responses and accommodations to central strategies, many of which may be spurred on by strategic ignorance of local circumstances and, conversely, local ignorance of central strategic priorities. Rather then see tactics as nested snugly within layers of overarching strategies, a practice view would emphasise the potential innovations of skilful situated actors and their subsequent impact on organisational strategy (Ahrens & Chapman, 2005, p. 109)

Their interest in practice theory emphasised a concern with the moment of action in which the actor is showing a certain knack, an immediate familiarity with the situation and the possibilities that it presents. For Bourdieu, the 'sens pratique' shows itself for example in the timing of action to convey urgency, commitment, loyalty, distance, etc., in just the right measures (Bourdieu, 1992).

Compared to the actor's unspoken mastery of certain situations, explicit decision rules seem unwieldy and, very often, unrealistic. At the individual level, expert actors tend not to articulate explicit decision rules and 'apply' them to situations like a novice would (Dreyfus & Dreyfus, 1988). Experienced drivers, for example, understand traffic situations holistically and act immediately. There is, literally, 'no time to think'. Novice drivers who get caught up in chains of reasoning lose control of the situation and crash. Novice management accountants tend to lack the ability to think through organisational situations with the conceptual schemes that they studied during their training (Ahrens & Chapman, 2000). The usefulness of those schemes for practice only becomes apparent through experience. Ahrens & Chapman (in press) explored this through the notion of situated functionality, drawing on (Schatzki, 2005) to explore the nature of management control as practiced by senior managers, those involved in the development of the chain-wide menu, and those running restaurants on a day-to-day basis. In these various settings, we see the ways in which normative ends, projects, emotions (which Schatzki refers to as teleoaffective structures) are both drawn on and constituted in the course of ongoing situated activities (which Schatzki refers to as practice arrangement bundles). Rejecting simple notions of repeated activity, the object of the theoretical analysis is to understand the ordered nature of these diverse activities, recognising their status as collectively meaningful despite their fluidity and diversity.

3. Conclusions

In social theory discussions across a variety of fields, recent years have seen a growing preoccupation with theorising practice as a development from earlier preoccupations with structure, systems, meaning, lifeworld, events, and actions. In this chapter, we have sought to briefly delineate the central preoccupations of this 'turn in contemporary theory' (Schatzki et al., 2001) and have used these as a means of understanding the cumulative insights of a wide range of studies in management accounting. Our categorisation of practice studies in management accounting into governmentality, ANT, accountability, and situated functionality has served to highlight some key shared research objectives and theoretical stances.

The four sets of studies we have reviewed in this chapter share with practice theory more generally a concern for understanding how volition is conditioned by the aspects of 'the system' as well as extant action, and especially routines. They emphasise different features of practice. Studies of Governmentality have tended to concentrate on the origins and present outlines of discursive structures within which diverse accounting activities can unfold. ANT studies have highlighted the constructed nature of accounting as one among many administrative technologies and its potential to be just as easily deconstructed and forgotten. Studies of Accountability emphasised possibilities for the discharge of accountability in day-to-day action. Emerging studies of Situated Functionality highlight accounting's normative capabilities for structuring different organisational members' activities, which, in turn, affect its normative potential. Management control as a practice is thus much more than its blueprints (e.g. accounting manuals, budget rules, and expenditure authorisations). It unfolds its potential through the ways in which various actors draw on it as a shared resource.

Even though it is often not easy to determine what bearing the diverse purposes of organisations have on the activities of their members, practice research would suggest that management control practices are central to organising those purposes because they help to bring about connections between the diverse activities of organisational members. Unlike the communities of practice literature, which has shed light on the development of specific spheres of activities within organisations (e.g. Lave & Wenger, 1991; Orr, 1996), studies that theorise management control as practice seek to understand a wider and more complex field of organising practices.

This has implications for our understanding of the relationship between control and strategy. Practices do not map neatly onto strategic plans because saying and doing are fundamentally different activities (Bloch, 1991). The notion of strategy implementation is often misleading in this respect (Ahrens & Chapman, 2005), as is being recognised in discussions of strategy as practice (Whittington, 2006).

Likewise, the practice literature highlights some problematic assumptions that underlie contemporary discussions of the spread of innovative management accounting practices. In the case of the 'transfer' of best practices from organisations to the academic literature, a familiar tale is that of the field researcher stumbling over an innovative practice that she merely documents to aid its dissemination amongst practitioners and academics (Kaplan, 1994) 'We just had to recognise a valid solution when it appeared' (Kaplan, 1998, p. 98). Such tales are misleading insofar as they appeal to readily articulated, distinct practices 'out there in the field'. In reality, the discursive boundaries of innovative practices tend to be blurred. The key to understanding practices lies in the careful tracing of their constitutive activities.

For practice theorists, social order is real in the sense that activities belong to practices and that practices and material arrangements can be identified as sustaining or changing one another. However, governmentality, ANT, accountability, and situated functionality research have shown that social order is much more complex than the simple reproduction of action or values. Instead, social order arises from actors' ongoing efforts at developing their actions with reference to wider understandings, rules, and engagements. Actors may want their actions to blend in or stand out depending on their judgement of what the situation calls for. Practices are thus constituted by 'tangle[s] of samenesses and similarities' (Schatzki, 2001, p. 42). The connection between fellow practitioners and their practices cannot be mechanical, relying simply on repeated activity; what has sometimes been referred to as routines. Rather, practices depend on the intended, meaningful relatedness between activities with respect to outcomes, clients, practitioners, techniques, resources, strategies, institutions, etc.

When understandings, rules, objectives, and values are understood as acting upon actors, the diversity of organisational responses to control is often cast in terms of resistance. Management control systems are certainly used in efforts at securing the interests of remote managers or shareholders, but the real difficulty for management control practice lies in determining what activities can support such ends, how such activities are to be brought about throughout the organisation, and how such activities can help recast organisational ends. Practice theory is not blind to conflict but it does not cast it in terms of control and resistance. As such the key question for management control theory is not how to constrain individuals and overcome resistance. Rather, it needs to bring into focus the possibilities of management control systems as a resource for action. Practice theory emphasises the role of actors in drawing upon the rules, procedures, ideals, targets, etc. of management control practice because interests and conflicts are not given. They are discursive and practical resources that actors manipulate skilfully to signal interests, motivations, and achievements. Practice research emphasises the ways in which those motivations come to be constructed through the daily effort of individuals engaging with each other and management control systems.

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Psychology Theory in Management Accounting Research

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Abstract: This chapter provides an introduction to psychology theories that have proven useful in management accounting research. Each theory is presented and discussed in the context of selected management accounting research that has used the theory. Because it is impossible to present a complete description and analysis of each theory, this chapter includes references to the psychology literature to guide researchers who want to learn more about any particular theory. This chapter concludes by summarizing what has been learned from psychology theory-based research on management accounting practices and identifying common themes in this literature.

1. Introduction

Psychology is the science of the human mind[1] (e.g., attitudes, cognition, motivation) and behavior (actions, communications). Although other social science theories frequently used in management accounting research also aim to explain and predict behavior, psychology differs from them in focusing on individual rather than organizational and social behavior and on subjective phenomena such as mental representations rather than objective phenomena such as market prices and quantities or organizational size and technology. The psychology theories presented in this chapter assume that behavior depends on individuals' mental representations, which can differ in important ways from objective indicators of the individuals' environment or welfare.[2] "The cognitive representation … acts as *the effective environment* which arouses motives and emotions, and guides overt behavior toward its target or goal." (Baldwin, 1969: 326, emphasis added). Thus, the effect of a particular type of management accounting practice on individuals' behavior can depend not only on how objectively informative the practice is about factors that affect the individuals' welfare, but also how understandable the practice is (i.e., how well the individuals can form usable mental representations of it and connect it to their other mental representations), and how it stimulates the individuals' attention, cognition, and/or motivation.

Psychology theory has been used to study management accounting practice for over 50 years, beginning with Argyris (1952, 1953) who relied on concepts from human relations[3] and group dynamics to investigate how the social context of budgeting (e.g., superior–subordinate dyads, group dynamics

[1]While many definitions of psychology include the study of animals, in addition to the human mind and behavior, only psychology theories about human behavior are included in this chapter.

[2]All of the psychology theories presented in this chapter are in the cognitive orientation, in which mental processes and states are assumed to mediate between stimuli (e.g., management accounting) and behavior. In contrast, other psychology theories are based on the behaviorism (stimulus-response) orientation, in which behavior is assumed to be a reflexive (automatic or pre-programmed) response to stimuli without cognitive mediation (Shaw and Costanzo 1982).

[3]Human relations research developed during the late 1920s and early 1930s and investigated psychology in work organizations. It focused on workers' morale, motivation, productivity, and satisfaction as well as group processes, leadership, power, and organizational change. Human relations subsequently became what is today called industrial and organizational psychology.

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among subordinates) influences employees' minds and behavior, in particular, their motivation and interpersonal relations. Argyris highlighted how important motivation and social psychology issues are to management accounting practice. Other influential early research further highlighted the importance of psychology theory in explaining and predicting the effects of management accounting practices. In particular, Stedry (1960) uses concepts from a motivation theory to investigate the effects of budget goal difficulty on individual performance, and Hopwood (1972) uses concepts from social psychology theory to study how superiors' use of accounting information to evaluate subordinates influences subordinates' stress and relations with other employees.

In the 1970s, management accounting research began to use cognitive psychology theory to study how and how well individuals subjectively process accounting information to make planning and control judgments and decisions. This research began with Barefield's (1972) examination of how the aggregation and redundancy of cost variances influence cost-variance judgments and Mock et al.'s (1972) investigation of how accounting feedback interacts with individuals' cognitive style to influence operating decisions. Since then, much research has used psychology theory to explain and predict how management accounting practices such as budgeting and performance evaluation and their organizational context influence individuals' minds and behavior, in particular, decisions, judgments, satisfaction, and stress.

While psychology includes many fields, management accounting research primarily relies on theories from three subfields—cognitive, motivation, and social psychology. Cognitive psychology is the study of psychological processes that influence human thinking, including attention, knowledge, judgments, decisions, and learning. Motivation psychology investigates four psychological processes that influence behavior—the arousal, direction, intensity, and persistence of effort. Social psychology is concerned with how other people influence individuals' minds and behavior, and includes understanding people (social cognition, attribution, person impression), attitudes and social influence, and social interaction and relationships.

What has been learned from the use of cognitive, motivation, and social psychology theories about the effects of management accounting practices can be summarized under the headings of motivation and information effects.

- The *motivational effects* of management accounting practices depend not only on how these practices influence objectively measured outcomes and rewards but also how they influence individuals' mental representations of outcomes and rewards through psychological processes and states like goal setting, level of aspiration, stress, and fairness beliefs. For example, a difficult budget goal motivates increased performance if it is set *before* individuals choose aspiration levels, because it tends to influence their choice; but the same difficult budget goal does not motivate increased performance if it is set *after* individuals choose (typically lower) aspiration levels, because they mentally represent it as inconsistent with their choice and thus as unacceptable or unreasonable (Stedry, 1960).
- The *informational effects* of management accounting practices depend not only on the information that these practices provide but also how boundedly rational individuals use heuristics to search and process this information, how the management accounting practices influence the choice and use of these heuristics, and how the management accounting practices influence the way individuals form and use mental representations of their organizations and environment. For example, capitalizing versus expensing intangibles influences how accurately individuals judge the relation between intangibles expenditures and profit from internal reports, because it influences their allocation of attention: when intangibles are expensed, individuals allocate more attention to current-profit effects and are therefore less accurate in judging longer-term effects (Luft & Shields, 2001).

This chapter is intended to be an introduction to psychology theories that have proven useful in management accounting research. Each theory is presented and analyzed in the context of selected management accounting research that has used the theory. Because it is impossible to present a complete description and analysis of each theory, this chapter includes references to the psychology literature to guide researchers who want to learn more about any particular theory.

The remainder of this chapter is organized into five sections. The next section provides an overview of psychology theory-based research on management accounting practices. The following three sections introduce cognitive, motivation, and social psychology theories that have been used to inform management accounting research. The final section concludes with a summary of what has been learned from the use of psychology theory in management accounting research.

2. Overview

This section provides a selective overview of how psychology theory is used in research on management accounting practices. It first describes three strategies used in psychology-based research for characterizing the effects of management accounting practices on the human mind and behavior. Then it describes three causal-model forms for representing the relations between management accounting practices and their causes or effects. Finally, it provides a brief introduction to the following three sections on psychology theory.

2.1. Effects of Management Accounting

Psychology theory can be used to explain both the causes and effects of management accounting practices. However, the research questions in almost all of the extant research that uses psychology theory are about the *effects* of management accounting practices on individuals' minds and behavior (e.g., the effects of budget goal difficulty on motivation). In contrast, much less research investigates the effects of the human mind and behavior on management accounting practices (e.g., the effects of heuristic judgment processes on budget goal difficulty). The three research strategies below are described in terms of the modal approach, that is, ways of researching the effects of management accounting practices on individuals' minds and behavior; but the same strategies could also be used to research the effects of individuals' minds and behavior on management accounting practices.

Researchers have used three strategies for characterizing the effects of management accounting practices on individuals' minds and behavior: different effects, better effects, and optimal effects. The different-effects research strategy uses psychology theory to explain and predict *differences* in mental processes and states and behavior due to differences in management accounting practices. Important limitations of this strategy are that it does not provide information about which management accounting is better or whether the better alternative is optimal with respect to some desired outcome. For example, Shields et al. (1981) use attribution theory to predict and find evidence that individuals attribute the same reported performance by a subordinate to different causes, depending on whether they assume the role of superiors or subordinates. While it can be important to know that such differences would be predicted and are observed, Shields et al.'s research design does not provide information on whether the attributions of the subordinates or superiors are better or whether either set of attributions is optimal.

The better-effects research strategy uses psychology theory (and possibly non-psychology theories) to explain and predict which of two or more management accounting practices results in *better* mental processes, states, and/or behavior according to a chosen criterion. For example, Briers et al. (1999) predict and find that providing individuals with benchmark feedback results in higher profits than not providing this feedback. Their theory does not allow them to determine whether the profit realized with benchmark feedback is the optimal level of profit, and it is possible that another type of feedback would have resulted in even better performance.

The optimal-effects research strategy explains and predicts the degree to which management accounting practices support *optimal* mental processes and states (e.g., optimal probability revision) and behavior (e.g., utility maximizing effort choices or information purchases). Optimal-effects research usually refers to a non-psychology theory, typically from economics, operations research, or statistics, to identify what is optimal and to estimate the expected loss (e.g., decrease in expected profit) from deviating from the optimum strategy or amount. For example, Lewis et al. (1983) use a laboratory experiment to identify heuristic cognitive processes individuals use to make variance investigation decisions. This study then uses simulation analysis to estimate the opportunity cost of using a heuristic process compared to a Bayesian model. While research designed to provide evidence on optimal effects has the potential to provide more information about the effects of management accounting practices, an important limitation on researching optimal effects is that for many management accounting tasks a credible optimizing model is not available. This is particularly the case in multi-period, multi-person settings. Thus, in researching many management accounting practices, researchers must conduct research that is intended to provide evidence on better or different effects of management accounting practices without being able to compare these effects to an optimum.

2.2. Causal-Model Form

Expected relations between constructs in a theory are frequently represented as a causal-model form with constructs operationalized as variables. Most of the causal models used in management accounting research are unidirectional: that is, if they represent budget goal difficulty as influencing performance, they assume that performance does not also influence budget goal difficulty. Most of the causal models also are linear: that is, the effect of the independent variable on the dependent variable is not conditional on

the level of the independent variable. (See Luft & Shields (2006) for further discussion of causal-model forms.) For any of the three effect types identified above (different, better, or optimal effects), researchers can represent the unidirectional causal relations that produce these effects in three ways, which imply three different causal-model forms: additive, interaction, and intervening-variable models.

Additive models assume that the effect of a particular management accounting variable (e.g., participative budgeting, budget-based incentives) can be understood in isolation from other management accounting variables and other factors that might influence individuals' minds and behavior. (That is, they assume that the existence and magnitude of the effect is not conditional on the level of any other independent variable.) Although the psychology theory employed might specify a sequence of mental processes that produce the effects of management accounting variables on individuals' minds and behavior, additive models typically support tests of only the beginning and end of the sequence (e.g., management accounting and performance), not the intervening mental states and processes.

Interaction and intervening-variable models provide additional complexity in representing the effects of management accounting variables. Interaction models represent the effects of specific management accounting variables as dependent on the presence or levels of other variables. That is, the influence of an independent variable (e.g., budget-based incentives) on the dependent variable (e.g., performance) is conditional on the level of another independent variable or a moderator variable (e.g., task uncertainty, employees' attitudes).[4] Intervening-variable models test psychology theory in more detail by explicitly representing and measuring at least some of the mental variables in the causal chain that leads from management accounting variables to their effects (e.g., participation influences performance by providing task-relevant information or by increasing motivation).

The relevant causal-model form depends on the theory (or theories) employed, the setting in which the theory is tested, and the interests of researchers and their audience. For example, the number of intervening or interaction variables included in a causal model depends partly on the length and detail of the causal-relation chain and the number of interacting variables specified by the relevant theory, partly on the measurability of the variables (not all mental states and processes can be satisfactorily measured), and partly on the focus of the specific research study. Early research in this area has often simply investigated *whether* a management accounting variable affects performance (additive models), and mixed results of early studies have led researchers to investigate the *conditions under which* the management accounting variable affects performance (interaction models) and the *process by which* it affects performance (intervening-variable models).

2.3. Cognitive, Motivation, and Social Psychology Theories

The distinction among cognitive, motivation, and social psychology theories that is used to organize the next three sections is based in part on convention and convenience. The three subfields are not mutually exclusive: theories that are conventionally classified in different subfields often share similar assumptions, and a given theory can sometimes be employed in more than one subfield. For example, theories in all three subfields rely (at least implicitly) on the assumption of bounded rationality, that is, the assumption that individuals intend to behave rationally but often do not behave perfectly rationally because of their limited cognitive processing capacity. As an example of a theory that can be employed in multiple subfields, cognitive dissonance theory addresses cognitive phenomena (how individuals respond to cognitions that are mutually inconsistent), motivation phenomena (how inconsistent cognitions stimulate actions to avoid or eliminate them), and social phenomena (how aversion to inconsistent cognitions influences interpersonal relations and attitudes toward others).

The next three sections introduce psychology theories in the three subfields that have generated significant management accounting research. There is a description of each theory and exemplar management accounting literature that uses the theory. Theories are presented in the order that they have been used in research on management accounting. Motivation theories are presented first, social psychology theories next, and cognitive psychology theories, the most recently used, are presented last.

3. Motivation Theories

This section provides a review of seven motivation theories that have been used to underpin almost all of the psychology theory-based research on management accounting practices. For the most part, these theories address different aspects of motivation and thus do not directly conflict or compete with each

[4]See Luft and Shields (2006) for a discussion on types of interaction effects.

other. Reviews of these and other motivation theories are in Donovan (2001), Kanfer (1990), Latham & Pinder (2005), Mitchell & Daniels (2003), Pinder (1998), and Weiner (1989).

Motivation, especially work-related motivation, usually is conceptualized as consisting of several psychological processes that influence behavior (Kanfer, 1990; Mitchell & Daniels, 2003; Pinder, 1998). These processes include:

- arousal—the stimulation or initiation of energy (effort) to act, which is caused by (depending on the theory) unfilled needs and drives (innate motivation), rewards and reinforcements (external motivation), or cognitions and intentions (e.g., motivation from deliberately set goals);[5]
- direction—where energy or effort is directed;
- intensity—the amount of effort expended per unit of time; and
- persistence—the duration of time that effort is expended.

The assumptions that underpin motivation theories vary across theories (Mitchell & Daniels, 2003; Weiner, 1989). Almost all psychology theories of motivation used in management accounting research stem from Lewin's field theory (Weiner, 1989), which introduced concepts that are important to motivation research on management accounting, such as goals, level of aspiration, motivational force, valence (i.e., value or utility), and expectancy. Field theory assumes that when individuals experience tension due to a need or intention that has not been satisfied (e.g., not yet achieving a budget goal), they activate the goal of reducing the tension and take action to do so, perhaps by changing the direction, intensity, and/or persistence of their effort. Achieving the goal then reduces tension. This is consistent with the hedonism and homeostasis assumptions of psychoanalytic and drive theories of motivation, which influenced the development of field theory in the 1930s (Weiner, 1989).

The assumption of hedonism is that people are assumed to have as primary goals in life maximizing pleasure and minimizing pain. The assumption of homeostasis is that people try to remain in a state of internal equilibrium and are motivated to return to their state of equilibrium when it is disturbed. Unsatisfied needs and intentions are assumed to be motivating because they create unpleasant states of tension and disequilibrium.

[5]Arousal as used here is the initiation of effort, not the intensity of effort as in arousal theory (Weiner 1989).

In addition to homeostasis and hedonism, some cognitively oriented motivation theories assume that individuals prefer cognitive consistency or cognitive mastery of their environment. Cognitive consistency means individuals' mental states (e.g., attitudes, beliefs, preferences) fit together harmoniously or at least do not conflict. "The inconsistent relation among cognitions is referred to [in various psychology theories] as cognitive imbalance … asymmetry … incongruence … and dissonance." (Shaw & Costanzo, 1982: 198; see also Deutsch & Krauss, 1965). When mental states conflict, individuals are assumed to experience unpleasant mental tension, which causes stress. This motivates them to reduce their stress by changing mental state(s) to create cognitive consistency. The assumption of cognitive mastery of the environment is that people want to understand the causes of their own and others' behavior in order to explain and predict behavior in their environment, even if this understanding is painful rather than pleasant (Weiner, 1989).

3.1. Level of Aspiration Theory

Level of aspiration theory assumes, first, that people are motivated by a desire to experience feelings of success and avoid feelings of failure, and second, that, "Perception of success and failure involves subjective, rather than objective levels of attainment." (Weiner, 1989: 169). Feelings of success or failure are then strongly influenced by whether the individual's performance reaches his or her level of aspiration, which is defined as, "… the level of future performance in a task which an individual, knowing his level of past performance in that task, explicitly undertakes to reach." (Frank, 1935: 119). Thus, the same level of performance, with the same objective consequences, can be subjectively experienced as a success or failure depending on whether it is higher or lower than the individual's ex ante level of aspiration.

Psychology research in the 1940s and 1950s identified two factors influencing individuals' levels of aspiration. First is the valence or attractiveness of the possible outcomes of the task. Valences are positive for successful outcomes and negative for failures; the valence for a given task varies in magnitude with the importance of the task and its consequences, as well as the individuals' disposition (e.g., some individuals fear failure more than others). In addition, the valence is dependent on the difficulty of the task. Other things equal, success at a difficult task is more attractive than success at an easy task. The second factor influencing levels of aspiration is the probability of success or failure (referred to as "potency" in the early literature). The lower likelihood of success tends

to offset the higher attractiveness of success in more difficult tasks, but does not do so completely. Thus, individuals often set moderately (not extremely) difficult goals for themselves, even though they are less likely to reach these goals than to reach easier goals.

Psychology research has often focused on past experience as a determinant of individuals' levels of aspiration: typically, feelings of success lead them to revise their probabilities of future success upward and set higher levels of aspiration in the future, while feelings of failure lead them to set lower levels of aspiration. In organizational settings, however, management accounting practices can be another important influence on individuals' levels of aspiration, and thus on performance. For example, if individuals internalize their budget goals and regard achieving these goals as a matter of personal success or failure, then they will be more motivated to achieve the goals. It is an important question whether budgeting can directly influence individuals' levels of aspiration, or must adjust to individuals' aspiration levels that are set by other means. Because individuals strive to achieve their levels of aspiration, organizations' performance goals are more likely to be met if they are consistent with the levels of aspiration of the organizations' employees.

In what is usually regarded as the first motivation research on management accounting practices, Stedry (1960) predicts and provides experimental evidence that individual performance is an interactive function of the difficulty and the timing of an imposed budget. Stedry uses three levels of imposed budgets (easy, medium, and difficult) and finds that when individuals receive the budget goal *before* setting their personal aspiration level, performance is highest with the difficult budget goal, because individuals adopt this goal as their own aspiration level. In contrast, if they receive the budget goal *after* setting their own aspiration level, the difficult budget goal does not result in higher performance than the medium budget goal, because individuals tend to retain the (more moderate) level of aspiration they chose initially.

Stedry (1960) provides initial evidence that the subjective effects of budget goal difficulty itself, in addition to the objective consequences of reaching it or failing to reach it, can influence individuals' motivation and performance. Much of the subsequent management accounting research on how budget goal difficulty influences individuals' mental representations and hence their motivation and performance derives from three theories that are related to level of aspiration theory: goal setting theory, cognitive dissonance theory, and organizational justice theory. In total, these motivation theories examine the effects of setting budget goals on level of aspiration, motivation, and performance, and assume that motivation and expected performance are unproblematically related—if there is a highly motivating goal, then on average performance will be at a high level.

3.2. Goal-Setting Theory

Goal-setting theory is related to level of aspiration theory. Both are based on Lewin's field theory, which models individuals as desiring to have goals, choosing goals, and being motivated to reach these goals (Weiner, 1989). Both theories assume that a major determinant of individuals' choice of goals is their past performance and ability. Goal-setting theory assumes that individuals' consciously chosen goals affect their motivation by one of four mechanisms: goals arouse effort to achieve goals; goals direct attention and effort towards goals; goals increase effort persistence; and goals affect action indirectly by leading to the arousal, discovery, and/or use of task-relevant knowledge and strategies (Locke & Latham, 2002; Mitchell & Daniels, 2003; Pinder, 1998).

Goal-setting theory has been the motivation theory most frequently used to study motivation in organizations. The results of over 1,000 studies provide consistent evidence on how goals influence performance and factors that mediate the goal-performance relation (Locke & Latham, 2002). First, performance is a positive function of goal difficulty until individuals reach the limits of their ability or until their commitment to a difficult goal decreases. Second, when performance is controllable, specific goals reduce variation in performance by decreasing ambiguity about what performance is to be attained. Third, performance is not increased by participation in setting goals compared to imposed goals, holding constant goal difficulty and beliefs about self-efficacy. Fourth, performance is not directly influenced by incentives; instead, incentives influence goal levels or commitment to achieving goals, which in turn influence performance. Fifth, people use feedback on progress toward reaching a goal to assess what they need to do to reach the goal. Finally, the goal-performance relation is moderated by goal commitment, goal importance, feedback, task complexity, and self-efficacy.

Three management accounting studies provide evidence on the effects of budget goal setting. Kenis (1979) predicts and reports that budget goal specificity increases budget motivation, budget performance, and cost-efficiency performance. He also predicts and finds that budget goal difficulty and budget feedback increase budget motivation, but contrary to his prediction based on goal-setting

theory he found that budget goal difficulty and budget feedback have no effect on budget performance. However, goal-setting theory predicts that a necessary condition for goal difficulty to influence performance is that feedback on progress toward achieving the goal be provided. This implies that the additive model used by Kenis (1979) is incorrect; instead, an interaction model should have been used with budget goal difficulty and budget feedback as interacting independent variables. In response to this causal-model misspecification, Hirst & Lowy (1990) examined this issue and provided analysis and evidence that budget performance is a positive ordinal interactive (not additive) function of budget goal difficulty and budget goal feedback. Hirst & Yetton (1999) reported that budget goal specificity increases the level of performance and decreases the variance in performance.

3.3. Cognitive Dissonance Theory

This theory assumes that individuals want consistency between their cognitions (e.g., attitude, belief, knowledge, opinion) and between their cognitions and behavior (Deutsch & Krauss, 1965; Festinger, 1957; Shaw & Costanzo, 1982). When there is inconsistency, individuals experience cognitive dissonance: an aversive state of cognitive tension that they desire to avoid. Individuals are motivated to reduce this tension (and to avoid increasing tension), and thus to return to a state of cognitive consistency. The most common way for people to reduce this tension is to change their cognitions so that their cognitions are consistent with each other and with their behavior.

Cognitive dissonance often occurs after making a voluntary decision because some attributes of the chosen alternative are consistent with negative pre-decision cognitions about this alternative, and some attributes of the rejected alternatives are consistent with positive pre-decision cognitions about the rejected alternatives. Cognitive dissonance is especially strong when decision alternatives are important and of equal attractiveness. Individuals are motivated to reduce post-decision cognitive dissonance, typically by increasing positive cognitions about the chosen alternative (e.g., focusing on the chosen alternative's attributes that are consistent with positive pre-decision cognitions about this alternative) and/or decreasing their positive cognitions about the rejected alternatives (e.g., focusing on the rejected alternatives' attributes that are consistent with negative pre-decision cognitions about the rejected alternatives). Alternatively, people can alter their behavior (e.g., reverse their decision) or selectively seek new information to increase cognitive consistency (e.g., find information that supports the alternative chosen rather than the rejected alternatives) in an attempt to reduce the dissonance.

In management accounting research, cognitive dissonance theory provides an explanation for how cognition or mental representations mediate between budget goal difficulty and performance. For example, Tiller (1983) predicts and finds that under participative budgeting, commitment to achieving a budget goal and performance are higher when individuals select a more difficult budget goal compared to when they select a less difficult budget goal. This prediction is based on the assumption that the effort required to achieve the budget is aversive and increases with budget goal difficulty. In this situation, individuals can experience cognitive dissonance because they have voluntarily chosen this aversive experience. They can reduce this cognitive dissonance by increasing their commitment to achieving the budget goal (i.e., increasing their positive cognitions about their chosen budget goal).

3.4. Organizational Justice Theory

Beginning with equity theory in the 1960s, some motivation psychology research has addressed how people's beliefs about equity, fairness, and justice influence their work-related motivation (Donovan, 2001; Gilliand & Chan, 2001; Pinder, 1998). Stemming from cognitive dissonance theory, equity theory assumes that people are motivated to maintain a balance in exchange relationships and assess this balance (equity) by comparing their inputs and outcomes to others' inputs and outcomes (Adams, 1963; Shaw & Costanzo 1982). If people believe that their input/outcome ratio is inequitable when compared to others', they will experience negative emotions. They will attempt to minimize these negative emotions by increasing or decreasing their inputs and/or outcomes, depending on which is appropriate.

Equity theory provides the basis for organizational justice theory. Organizational justice theory assumes that people are primarily concerned with two types of justice: distributive and procedural. Individuals' beliefs about distributive justice relate to the fairness of the distribution of outcomes between themselves and relevant others. Procedural justice refers to the fairness of the process by which outcomes are determined, independent of what the outcomes actually are. Individuals commonly regard processes as fairer when they have voice (ability to express their opinion about a pending decision) and/or vote (ability to influence the outcome of a pending decision). Referent cognitions theory integrates elements of distributive and procedural justice, predicting that individuals

compare their outcome to the outcomes of referent others to determine whether the distribution of outcomes is unfair (Folger, 1986). If this comparison indicates that they received an inequitable outcome, then they assess the fairness of the process used to determine the outcome and how justifiable the decision is for the circumstances. If they believe the procedure is fair, then they will come to believe that the outcome also is fair. If they believe the process is unfair, then they will reduce their input or engage in gaming to create fairness.

Organizational justice theory, like level of aspiration and goal setting theories, assumes that individuals' subjective assessments of actual or possible outcomes influence their motivation and that their assessments are based on a comparison to a reference point. In level of aspiration and goal setting theories, the reference point is self-set goals; in equity and organizational justice theories, the reference is others' inputs and outcomes. These theories also are similar in that they assume that a difference between what ought to be and what is (e.g., between goal and performance, conflicting cognitions, or expectation of justice and experienced injustice) creates cognitive inconsistency and/or tension that motivate behavior to eliminate the difference.

Some research provides experimental evidence on organizational justice applied to budgeting. In a participative budgeting context, Libby (1999) predicts and finds that when subordinates have involvement (voice) in setting their own budget but the final budget set by their superior is not what they requested, their performance is higher if they receive an explanation for why their request did not influence the budget than if they do not receive such an explanation. In an imposed budgeting context, Libby (2001) examines whether subordinates' performance is affected by their beliefs about the fairness of a budgeting process and budgets. As predicted, she finds that performance is lower only when both the budgeting process and the budget itself are believed to be unfair. These results indicate that individuals' performance is not affected by what they believe is an unfair budget as long as they believe the budgeting process is fair.

3.5. Expectancy Theory

Expectancy theory assumes that individuals choose intended actions, effort levels, and occupations that maximize their expected pleasure and minimize their expected pain, consistent with hedonism. Donovan (2001), Kanfer (1990), and Pinder (1998) review and analyze evidence on expectancy theory. Expectancy theory models individuals' motivational force as a function of their expectancy (subjective probability that their effort will result in a first-level outcome such as performance), instrumentality (subjective probability that performance will result in a second-level outcome such as pay), and valence (the affective orientation toward the second-level outcome). Individuals are assumed to combine expectancies, instrumentalities, and valences consistent with expected value calculations to determine their motivational force toward each alternative and then choose the alternative with the highest motivational force.

Brownell & McInnes (1986) use expectancy theory to provide evidence on whether motivation mediates between participative budgeting and performance, as assumed by prior research. Their results indicate that participative budgeting increases two components of motivation—expectancy (the subjective probability that effort will result in achieving the budget) and instrumentality (the subjective probability that achieving the budget will result in receiving a reward). However, motivation measured as the combination of the expectancy theory components does not increase because the increase in probabilities is offset by the decrease in valences. Brownell and McInnes speculate that their results are contrary to their predictions because of potential theoretical misspecifications such as the incorrect direction of causality (performance influences participative budgeting and vice versa) and omitted variables such as budget goal difficulty.

3.6. Attribution Theory

Heider (1958) began the study of how people attribute causes to their own and others' behavior in order to explain and predict behavior in their environment (Shaw & Costanzo 1982; Weiner, 1989). Attribution theory has given particular attention to the ascription of behavior to causes that are internal (ability, effort) or external (task difficulty, luck) to the focal person, that is, the person whose behavior is being observed or evaluated. Many studies have found that the focal person tends to attribute his or her own behavior more to external causes, while other people tend to attribute the same behavior more to internal causes; this is called the actor–observer bias. These findings are of importance to management accounting because they provide a basis for explaining and predicting how individuals will subjectively explain why actual and budgeted performance differ. Moreover, they indicate that the subjective explanations of superiors and subordinates for the subordinates' budget variances predictably differ, and both of their subjective explanations can

diverge from objective assessments of the budget variance.

Shields et al. (1981) provide evidence that when individuals assume the role of a superior or a subordinate and are asked to explain the subordinate's reported manufacturing performance, they use the attributions identified by psychology research. When individuals assume the role of the superior (subordinate) their attributions for the subordinate's reported performance is more to internal (external) than to external (internal) causes. Harrison et al. (1988) extend Shields et al. (1981) and find, as predicted, that when individuals assume the role of a superior or a subordinate and are asked to explain the subordinate's reported unfavorable production variance, they use more internal attributions as superiors than they do as subordinates. Harrison et al. (1988) also include a variance investigation decision in which the superiors and subordinates select from a list provided by the researchers questions that they would most want to be answered by a variance investigation. As predicted, the superiors (subordinates) selected more questions relating to information that is internal (external) to the subordinate, and the internality of their attributions is associated with the extent to which they select questions aimed at finding out internal information.

3.7. Person–Environment Fit Theory

This theory is based on Lewin's field theory and assumes that motivation is a function of the fit between individuals' performance capability and their environment (Caplan, 1983; Edwards, 1996; Van Harrison, 1978, 1985). As environmental demands such as budget goal difficulty increasingly exceed individuals' performance capability (e.g., skill, effort, physical, and monetary resources), fit decreases and they experience stress (tension) due to task overload from task demands exceeding their performance capability. This in turn increases the individuals' subjective uncertainty about the effects of their effort, which results in feelings of ambiguity and/or loss of control which then diffuse and reduce their effort, thus reducing their performance.

Shields et al. (2000) use this theory to develop predictions about how stress mediates the effects of budgeting on performance. They predict and find that participative budgeting influences performance by three paths. First, participative budgeting increases feelings of being in control, which decreases stress, thus increasing performance. Second, participative budgeting reduces the difficulty of budget goals, making it more likely that the goals will not exceed individuals' performance capability. This match of goals and capabilities reduces stress and thereby increases performance. Third, participative budgeting increases budget-based incentives, which are expected to arouse and focus effort, thus increasing performance capability, which in turn reduces stress and increases performance.

4. Social Psychology Theories

Social psychology is concerned with how individuals' minds and behavior are influenced by other people, including their understanding of people (social cognition, attribution, person impression), attitudes and social influence, and social interaction and relationships (Taylor et al., 2003). Reviews of social psychology theories include Deutsch & Krauss (1965), Shaw & Costanzo (1982), and Taylor et al. (2003). Role theory is the first social psychology theory used in management accounting research, and it has since then been used in subsequent management accounting research as well. Recent research on management accounting has used three other social psychology theories—social comparison theory, social identity theory, and group identification theory. The assumptions that underpin these three theories are identified when each theory is presented.

4.1. Role Theory

Role theory uses a set of constructs derived from anthropology, social psychology, and sociology to explain and predict how people function in a social context (Deutsch & Krauss, 1965; Shaw & Costanzo 1982). This theory assumes that individuals' behavior is influenced by role expectations and norms that are held by others concerning how individuals in a particular role are expected to behave (e.g., supervisor, worker) (Deutsch & Krauss, 1965; Katz & Kahn, 1978; Shaw & Costanzo 1982).

Two key concepts in role theory that are related to management accounting research are role conflict and role ambiguity. Role conflict occurs when individuals are confronted with conflicting inter- or intra-role expectations and it is not possible for them to comply with all of the expectations. Role ambiguity occurs when individuals experience uncertainty about what behavior is expected of them. Role conflict or ambiguity can increase stress, tension, and anxiety arising from cognitive inconsistency, which can lead to coping and defensive behaviors, including aggressive action and communication, hostile feelings towards others, social withdrawal, job dissatisfaction, and loss of self-confidence, self-esteem, interpersonal trust, and respect for others, as well as physiological problems (Kahn et al., 1964).

DeCoster & Fertakis (1968) use role theory to structure their investigation of an issue raised by Argyris (1952, 1953): how budgeting and supervisors' interaction with their superior influences the supervisors' budget-induced pressure. The assumption made is that the more supervisors respond to their superior's sent role expectations concerning budgeting and budget-related behavior and performance, the more pressure they will experience arising from role conflict and ambiguity. For example, if the superior emphasizes several budget goals (e.g., increase profits and increase quality and customer service), then supervisors are more likely to experience role conflict and ambiguity because they will not know how to accomplish all of the budget goals simultaneously. Budget-induced pressure is predicted to affect supervisors' leadership style. In particular, DeCoster & Fertakis (1968) predict that the higher the budget-induced pressure on the supervisor, the more likely the supervisor will have an initiating-structure leadership style, in which supervisors' interaction with their employees is focused on ensuring that the employees comply with budgeting procedures and achieve the budget. In contrast, as budget-induced pressure decreases, supervisors are more likely to have a considerate leadership style in which they focus more on having positive relations with their subordinates, including more participation. Contrary to their prediction, their results indicated that budget-induced pressure was positively associated with both leadership styles.[6] These results are primarily driven by pressure from supervisors' immediate superior to comply with budget procedures, achieve budgets, and explain unfavorable budget variances. In contrast, pressure from procedures for formulating budgets, budget administration, and budgeting staff are not related to either leadership style.

Hopwood (1972) uses role theory to investigate how superior managers' use of budget and performance information to evaluate subordinate managers' performance affects the latter managers' job-related stress, which is assumed to arise from role ambiguity and conflict. Because accounting-budget information is an incomplete representation of managers' actions and performance, how superior managers use this information when evaluating subordinate managers can influence the latter's role conflict and ambiguity, and hence stress. When this incomplete information is used in a rigid short-run cost-minimization style to evaluate performance, subordinate managers are more likely to believe that they are being incorrectly evaluated and thus to experience role conflict, ambiguity, and stress. In contrast, when superior managers use a flexible long-run profit-maximization style of evaluating performance, subordinate managers are more likely to believe that they are being correctly evaluated and experience less stress. As predicted, Hopwood finds that subordinate managers' job-related stress is highest when their superior managers use accounting-budget information in a rigid short-run cost-minimization style to evaluate performance and lowest when accounting information is used in a flexible long-run profit-maximizing style.

The findings of DeCoster & Fertakis (1968) and Hopwood (1972) have had an important influence on management accounting research. In particular, many later studies investigate how role ambiguity and role conflict mediate the effects of management accounting (e.g., budgeting, evaluating performance) on job-related stress, dysfunctional behavior, and performance.

4.2. Social Comparison Theory

Social comparison theory assumes that individuals have a need for accurate self-evaluation, self-enhancement, and self-improvement of their abilities, opinions, performance, emotions, and accomplishments (Shaw & Costanzo 1982; Taylor et al., 2003). When possible, individuals compare themselves to objective information (e.g., performance standards); lacking access to such information, they compare themselves to others. A key choice is the individual(s) to whom people choose to compare themselves. For example, people can compare themselves to others who are similar or dissimilar with respect to the object that is being compared (e.g., performance). If dissimilar, then the choice of comparison-others can depend on the purpose of social comparison: (1) if people are seeking self-enhancing evaluations, then they make downward social comparisons by comparing themselves to others who have less of the object of comparison (e.g., lower ability); or (2) if they are seeking self-improvement evaluations, then they make upward social evaluations by comparing themselves to others who have more of the object of comparison (e.g., higher profits). People frequently choose to compare themselves to other people who are in similar situations or have similar tasks to perform such as co-workers (e.g., benchmarking).

Frederickson (1992) uses social comparison theory to predict how relative performance feedback and evaluation influence individuals' task effort. He

[6]Considerate and initiating-structure leadership styles are not subsititutes. Research indicates that the most effective leaders have high levels of both leadership styles (Halpin 1957).

predicts that compensation based on relative performance evaluation, compared to profit sharing, cues individuals to be more competitive and exert more effort, because the comparison makes others' performance on the task salient. As predicted, Frederickson (1992) finds that individuals have higher effort levels with relative performance evaluation compared to profit sharing.[7] Because the comparisons induced by relative performance evaluation become more salient, competition is therefore expected to increase when individuals' tasks are more similar. Frederickson (1992) also predicts and finds that under relative performance evaluation, effort is higher when task similarity (degree of common uncertainty) is higher.

4.3. Social Identity Theory

Social identity theory assumes that individuals categorize their social world into in-groups (e.g., an individual's work team) and out-groups (e.g., work teams in other organizations). They derive self-esteem from their social identity as a member of an in-group, and their self-concept depends on how they evaluate their in-group relative to other groups (Tajfel, 1982). Social identity rises from a self-categorization process in which individuals group themselves with others on the basis of similarities. Social identification with a group influences how individuals interact with other members of the group, interpret information about the group, and make decisions that affect the group (Lembke & Wilson, 1998). Moreover, the more individuals socially identify with a group, the more they focus their effort on the group's outcomes instead of their own outcomes (Brewer, 1979), and the more likely they are to increase their contributions of public goods to the group and behave more cooperatively when confronted with social dilemmas (Wit & Wilke, 1992).

Towry (2003) uses social identity theory as a basis for predicting the effectiveness of two systems of mutual monitoring and incentives in a teamwork environment. When team identity is strong, team members are more likely to behave cooperatively in ways that are best for their team. The directional effect of their cooperative behavior on effort, however, depends on whether the monitoring and incentive system is vertical or horizontal. In a vertical system, team members observe each other's actions and report them to their superior; each team member's compensation is then based on his or her effort (as reported by the other team members) and truthfulness in reporting on other team members (as judged by comparing the multiple reports). In a horizontal system, team members' compensation is based on team output, and team members induce effort from other members through formal sanctions, peer pressure, or side payments. Strong team identity in a vertical system leads to lower effort, falsely reported as high effort; the superior cannot easily detect the team members' misreporting because with strong team identity they collude. In contrast, strong team identity in a horizontal system leads to higher levels of effort as team members cooperate more to increase the total team output that provides the basis for their rewards.

5. Cognitive Psychology Theories

Management accounting researchers began using cognitive psychology theories in the 1970s to study how individuals' cognitive processing of management accounting information influences thinking, in particular, judgments and decisions. Cognition consists of mental processes and states. Mental processes include:

- attention—the allocation of limited processing capacity to a stimulus (information);
- memory—encoding of information as knowledge in long-term memory, structure or representation of knowledge in long-term memory, and retrieval of knowledge from long-term memory for thinking;
- thinking—higher-order mental processes that include problem solving, reasoning, judging, and decision-making; and
- learning—process of actively constructing new ideas or concepts based upon current and past knowledge.

Mental states include attitudes, beliefs, knowledge, and preferences.

Most cognitive psychology theories assume that cognition is boundedly rational rather than perfectly rational and optimizing[8] That is, individuals intend to behave rationally but do not do so perfectly because their limited cognitive processing capacity is often exceeded by the demands of complex and ill-structured problems like those related to developing and implementing budgets (e.g., searching for information, identifying alternatives, and assessing the costs, benefits, and probabilities associated with each alternative). Because individuals do not always have

[7]As Frederickson (1992) points out, the prediction of a positive effect of relative performance evaluation on effort can be derived on the basis of agency theory.

[8]For analysis and evidence on bounded rationality, see Conlisk (1996), Rabin (1998), and Shafir and LeBoeuf (2002).

the mental capacity to consider all information about all alternatives and select the best one, they frequently select the first alternative identified that provides benefits above some aspiration level.[9]

Much cognitive psychology research examines how and how well individuals make judgments and decisions (Baron, 2000; Goldstein & Hogarth, 1997; Hastie & Dawes, 2001; Hastie & Pennington, 1995). A judgment is a comparison of a stimulus to another stimulus or the evaluation of a stimulus in relation to a standard (e.g., manager A's performance is better than manager B's performance, manager A's performance should be rated excellent according to the organization's evaluation criteria). A decision is the choice of a stimulus (alternative, action) from a set of stimuli.

We distinguish two theoretical perspectives in the management accounting research on judgment and decision-making: behavioral decision theory and judgment and decision performance. Behavioral decision theory is based on decision theory from economics and statistics and uses optimizing models like Bayes' theorem and regression analysis as benchmarks to assess how and how well individuals *typically* make judgments and decisions. Research on judgment and decision performance is concerned with identifying *sources of variation* (e.g., cognitive ability, knowledge, motivation) in how and how well individuals make judgments and decisions (Einhorn & Hogarth, 1981; Libby & Luft, 1993; Libby, 1995). The remainder of this section is organized by reviewing these two theoretical perspectives and management accounting research that is informed by them.

5.1. Behavioral Decision Theory

Behavioral decision theory consists of two major theoretical perspectives that have been used by management accounting researchers: probabilistic judgment and probabilistic functionalism. Each is presented below.

5.1.1. Probabilistic Judgment

Probabilistic judgment is concerned with how and how well individuals subjectively judge probabilities and combine them with utilities or value to form judgments. Much psychology research on subjective probabilities focuses on how to elicit subjective probabilities, whether the probabilities elicited are coherent or in agreement with probability axioms (e.g., probabilities should sum to one), the calibration of subjective probabilities in relation to objective probabilities (a key finding is that individuals are overconfident), and whether revision of probabilities is consistent with Bayes' theorem (a key finding is that individuals' subjective probability revision is conservative relative to Bayesian revision). Reviews of this research are in Slovic & Lichtenstein (1971), Slovic et al. (1977), and Poulton (1994). Ashton (1982) and Libby (1981) provide reviews of behavioral decision theory that are tailored to the interests of accounting researchers.

An important focus of probabilistic judgment research is whether individuals' revisions of their subjective probabilities are consistent with revisions implied by formal statistical models, probability axioms, or logic. Einhorn & Hogarth (1986) identify "cues to causality" that people use to develop and/or revise subjective probabilities that an effect is due to a particular possible cause. For example, we would expect that a cause of an effect temporally occurs before that effect happens. When a possible cause of an effect temporally occurs before the effect, individuals' subjective probability that this possible cause is a cause of that effect is higher than when that possible cause does not temporally occur before that effect. Similarly, the larger the covariation (correlation) between a possible cause and an effect, the higher an individuals' subjective probability would be that this possible cause is a cause of that effect. Finally, besides temporal order and covariation, another cue to causality is the similarity of the length (duration) and strength (magnitude) of a possible cause and an effect. Individuals tend to believe that large effects that last for a long time are caused by sources that are large and last for a long time. Thus, a possible cause and effect of similar length or strength are more likely to be judged to have a cause-effect relation than a possible cause and effect with dissimilar lengths or strengths.

Brown (1985, 1987) provides evidence on whether individuals' revision of their subjective probabilities about the possible cause of a reported labor-efficiency variance is consistent with these cues to causality. As predicted, individuals' judgments of the probability that a possible cause is actually a cause of a variance are influenced by information about the covariation of the variance and its possible cause (Brown, 1985, 1987), the temporal order of the variance and its possible cause (Brown, 1985), and the similarity of magnitude of deviation from normal levels of the variance and its possible cause (Brown, 1987).

[9]The alternative selected does not necessarily represent the optimal trade-off between the costs and benefits of searching and processing information; it does not necessarily maximize an individual's expected utility.

5.1.2. Heuristics and Biases

The initial research on probabilistic judgment assumes that individuals' judgments are similar to the judgments implied by optimizing models. However, research consistently reports that individuals' probabilistic judgments sometimes deviate systematically and severely from the judgments implied by these models. Tversky & Kahneman (1974) began to identify cognitive processes called heuristics that can explain and predict these judgment biases.[10] People often use heuristics because of their bounded rationality: the information-processing demands of strict optimization in complex tasks often exceed individuals' cognitive capabilities. Research has identified many heuristics that are used to subjectively assess and revise probabilities as well as to search for information in external sources such as accounting reports.

Tversky & Kahneman (1974) identify three heuristics that individuals use to develop and revise subjective probabilities: availability, representativeness, and anchoring and adjustment. Availability is the subjective estimation of the probability of an event by the ease with which instances of the event or similar events are brought to mind. An event is more available when it is more familiar, salient, recent, or imaginable. Representativeness is the subjective estimation of the probability that object A (sample) belongs to class B (population) by the degree to which A is similar to or resembles B. Probability estimates based on representativeness are not influenced by base rates, sample sizes, or regression to the mean. Finally, anchoring and adjustment is the subjective estimation of an uncertain value such as the probability of an event by using an initial value that readily comes to mind and adjusting it for additional information. While the adjustment is in the correct direction, it is of insufficient magnitude.

Some management accounting research investigates whether individuals' subjective probabilities based on management accounting information are consistent with the use of heuristics. Brown (1981) examines whether individuals' revision of the subjective probability that a process is in control is consistent with the anchoring and adjustment heuristic. Individuals revise their subjective probability each time they receive a new report on the efficiency of a process. He finds that, on average, individuals are conservative in their revision relative to the revision implied by Bayes' theorem, consistent with anchoring and adjustment.

Lewis et al. (1983) examine whether individuals' variance investigation decisions are consistent with the use of the representativeness heuristic. Their evidence indicates that almost all individuals use a strategy consistent with the representativeness heuristic. In particular, almost all individuals use a control-chart strategy in which they decide whether a production process is in or out of control based on whether the mean weight of a sample of a product is more than one standard deviation above the mean weight of products made by that process when the process is in control. Very few decisions are influenced by the prior probability that the process is in control or by the costs of Type I and II errors. The lack of influence of prior probabilities and cost of decision errors is surprising because the experimental design exposes each individual to different levels of the prior probabilities and decision error costs; yet very few individuals change their decision strategy in response to these changes.

5.1.3. Prospect Theory and Framing

Research on heuristics and biases also is associated with investigation of differences between the subjective value of decision-alternative outcomes and the values assumed by expected utility theory. Expected utility theory assumes that individuals subjectively value (estimate a utility for) each possible outcome of a risky decision based on their total wealth or welfare if that outcome occurs. In contrast, prospect theory assumes that individuals subjectively value each outcome as a gain or loss relative to a reference point (e.g., the status quo) in a two-phase process (Kahneman & Tversky, 1979). In the first phase, called editing, individuals organize and reformulate their decision options in order to simplify their subsequent evaluation and choice. Editing consists of several cognitive operations, including coding, which is the identification of each possible outcome as a gain or loss relative to a reference point. In the second phase, called evaluation, individuals assign a subjective value to each outcome, weigh uncertain outcomes based on their likelihood of occurring, and then choose the prospect with the highest expected value. The subjective value of gain and loss outcomes (deviation from a zero-valued reference point) forms an S-shaped value function that is concave for gains, convex for losses, and steeper for losses than for gains. An important consequence of editing and evaluation is that individuals' choice of alternatives can depend on how a decision is framed. Considering

[10]See Kahneman et al. (1982) and Gilovich, Griffin & Kahneman (2002) for research on heuristics.

decision alternatives that have the same monetary outcome, individuals are likely to value that outcome more highly when it is framed as a gain relative to a low reference point rather than a loss relative to a higher reference point.

When an action results in multiple outcomes, such as a sequence of monetary gains and losses, individuals frame and evaluate these outcomes through "mental accounts," which specify which outcomes are evaluated jointly and which are evaluated separately (Kahneman & Tversky, 1984; Tversky & Kahneman, 1981). If both the costs and benefits of a decision alternative are in the same mental account, then they are netted against each other before evaluation. The cost is thus treated as a reduction of the gain (benefit), rather than a loss, reducing its negative effect on the value of the alternative. If costs and benefits are in separate mental accounts, then they are subjectively valued separately: the cost is treated as a loss and therefore valued more negatively.

Lipe (1993) examines framing effects of variance investigation decisions on performance evaluation decisions. An expenditure resulting from a variance investigation (e.g., cost of investigating) can be framed as a gain reduction or a loss depending on whether that expenditure is believed to have a benefit. Individuals are expected to be more (less) likely to believe that the expenditure has a benefit when the investigation finds that a system is out of (in) control. When the system is found to be out of control and the expenditure is framed as a gain reduction, the individual responsible for making the expenditure is expected to receive a more favorable performance evaluation. In contrast, when the system is found to be in control and the expenditure is framed as a loss, the individual responsible for making the expenditure is expected to receive a less favorable performance evaluation. Lipe (1993) provides evidence consistent with these expectations.

Luft (1994) provides evidence that individuals' choice of incentive contract depends on how the payoffs are framed. Consider two incentive contracts that have the same expected pay but differ in how their payoffs are framed, either as a fixed salary plus a bonus if performance exceeds a standard or a higher fixed salary minus a penalty if performance is less than the standard. While expected utility theory predicts that individuals are indifferent between the two incentive contracts, prospect theory predicts that individuals will select the incentive contract framed as a bonus because penalties (losses) are more aversive than missed bonuses (reduced gains). Luft (1994) finds that individuals' choice of incentive contract is consistent with the prediction from prospect theory.

5.1.4. Search Heuristics

In addition to using heuristics to subjectively assess and revise probabilities, individuals also use heuristics to search for information in external environments (e.g., accounting reports) (Payne et al., 1993, 1997). Search includes scanning, attending to, and acquiring information to be encoded into memory for use in making judgments and decisions. The search heuristics individuals use depends on task complexity, which varies with the number of variables and the number of attributes (dimensions) that describe the variables. For example, in a performance report, task complexity increases with increases in the number of responsibility centers and/or the number of performance measures for each responsibility center.

As task complexity increases, individuals are less likely to use compensatory (optimizing) search heuristics and more likely to use noncompensatory search heuristics because compensatory heuristics are more cognitively demanding. Compensatory search heuristics result in searching all of the attribute information (or at least the same attribute information) for every variable. Noncompensatory search heuristics result in selective search to reduce task complexity: individuals search only one or a few attribute information items for each variable, and these attribute information items are not necessarily the same for every variable. In consequence, the consistency of search across variables decreases. This increase in search variability occurs more often in response to increases in the number of variables than in response to increases in the number of attributes per variable. In addition, as the number of variables increase and individuals use more noncompensatory search heuristics, their search pattern becomes less within-variable across-attributes and more within-attribute across-variables. Finally, as the number of variables or attributes increases, individuals increase the absolute amount of their search but decrease the percentage of the total information available that they search.

These search heuristics can be used in examining accounting reports such as performance reports in which variables (columns) are responsibility centers or budget, actual and variance, and attributes (rows) are performance measures. Shields (1980, 1983) predicts and finds that the complexity of a performance report influences individuals' use of search heuristics and their search behavior. In particular, as the number of responsibility centers in a report increases, the consistency of search behavior decreases (more variability across responsibility centers in the amount of information search per center), but there is no comparable decrease in search consistency as the

number of performance measures per responsibility center increases. Further, as the number of responsibility centers increases, individuals' search pattern is less within a responsibility center across performance measures and more within a performance measure across centers. Finally, as the number of centers or measures in a report increases, individuals' absolute amount of search increases but they search a smaller percent of the total information available. Overall, these predictions and results are consistent with individuals' search of information in performance reports becoming less optimizing as the "size" of the report increases.

5.1.5. Probabilistic Functionalism

This theoretical perspective stems from Brunswik's theory of visual perception (Hammond & Stewart, 2001). The original focus of the theory is on how a three-dimensional object in the environment (distal stimulus) is transformed to a two-dimensional object in a retina (proximal stimulus). Because this transformation is not one-to-one or continuous, the mapping between the distal and proximal stimuli is probabilistic. In consequence, perception is a psychological construction or inference of a percept from an incomplete and fallible set of sensory cues. Perception is functional in that when individuals are better at constructing or inferring the true nature of the distal stimulus, they are able to make more accurate predictions about their environment, which increases the probability that they will survive. The probabilistic nature of perception led Brunswik to believe that a multiple regression model represents perception well because it has the properties he specified for quasi-rationality of perception. In particular, like a multiple regression model, constructing or inferring a distal stimulus involves using several cues that identify features of the distal stimulus, and these cues are intercorrelated and have limited ability to predict the distal stimulus.

Extending this theory of perception to judgment, Brunswik believes that multiple regression models are a valid paramorphic ("as if") representation of how individuals subjectively use multiple information cues to form judgments. Hammond (1955), Hursch et al. (1964), and Tucker (1964) formalize this paramorphic representation of judgment by developing and applying Brunswik's lens model (named after an analogy to the lens in visual perception), which includes a regression model of the task environment (relating the environmental cues and an environmental outcome) and a regression model of the person's judgments (relating the environmental cues and his/her predictive judgments about the outcome). Further, they develop several measures of judgment performance, including:[11]

- achievement, the correlation between a person's predictions and the realized outcomes;
- matching, the correlation between predictions made by a model of a person's judgments and predictions made by the environmental model;
- consistency, the degree to which a person uses the same model from prediction to prediction;
- cue utilization, the weighting of individual cues in making predictions;
- consensus, the degree of similarity of predictions across individuals; and
- self-insight, the degree to which an individual's ex post explanations for how he or she made his or her predictions correspond to how he or she actually made his or her predictions.

Brunswik's theory of probabilistic functionalism also provides the basis for research on multiple-cue probability learning, which focuses on how individuals learn probabilistic relations between multiple cue and criterion variables and how feedback influences this learning (Brehmer, 1988; Holzworth, 2001). In particular, research investigates how three types of feedback (outcome, task properties, and cognitive) influence probabilistic learning and, more generally, judgment performance. Outcome feedback is information about the realized outcomes individuals are trying to predict, task properties feedback is information about the optimal relation between the cues and realized outcomes, and cognitive feedback is information about the relation between the cues and individuals' judgments (Brehmer & Joyce, 1988). Research indicates that outcome feedback typically does not improve learning or judgment performance as much as task properties feedback does; and in some situations outcome feedback can actually decrease judgment performance (Balzer et al., 1989).

Some managerial accounting researchers use the lens model to provide evidence on how and how well individuals process management accounting information to form judgments and make decisions. Ashton (1981) uses the lens model and multiple-cue probability learning to investigate how well a focal person can learn to make product-pricing decisions consistent with another person's product-pricing decisions based on three environmental cues (product cost,

[11] Ashton (1982) provides a good analysis of the lens model and these various measures of judgment performance in an accounting context.

elasticity of demand, competitors' speed in bringing similar products to market). In the first part of the experiment, after receiving information about the other person's pricing decisions and the three cues available to make the decisions, the focal person is asked to make pricing decisions for another set of similar products consistent with how the other person used the three cues to make the original pricing decisions. The experiment manipulates the predictability of the other person's pricing decisions, given the three cues. As predicted, an increase in the predictability of the other person's decisions leads to an increase in how well focal individuals learn the other person's decision model (matching) and how consistently they apply that model to make their decisions (consistency), thus resulting in an increase in their performance, which Ashton defines as matching times consistency. Also, individuals with more education (doctoral vs. undergraduate and MBA students) have higher judgment performance in terms of achievement, matching, and consistency. In the second part of the experiment, focal individuals are provided with either relatively general or specific task properties feedback about how the three cues should be used to make the product-pricing decisions. Contrary to prediction, matching, consistency, and performance do not increase with the specificity of the feedback.

Luft & Shields (2001) use the lens model and multiple-cue probability learning research to investigate the role of accounting in determining how and how well individuals learn the effect of intangibles expenditures on future profits. They predict and find that when intangibles expenditures are expensed (capitalized), individuals allocate more attention to learning current-period (future-period) effects of expenditures. Although experimental participants believe ex ante that intangibles will affect future profits regardless of whether they are expensed or capitalized, they learn the magnitude of future-period effects and use them better in predicting profits when intangibles are capitalized. Consistent with expectations, mean prediction error, achievement, consistency, consensus, and self-insight are all higher when intangibles are capitalized, holding constant the statistical relation between intangibles expenditures and profits.

Lipe & Salterio (2000) rely on multiple-cue utilization research (Slovic & MacPhillamy, 1974) to predict how individuals will use performance measures that are either common or unique to subunits in evaluating the performance of the subunit managers. They predict that when individuals are faced with a set of performance measures, some of which are common to all subunit managers and some unique to particular subunit managers, their performance evaluations will be influenced more by the common measures and less by the unique measures. In order to minimize cognitive effort, individuals are expected to make comparative evaluations of the subunit managers because comparisons are easier to make than separate evaluations of each subunit manager. Moreover, comparisons are easier to make with performance measures that are common across subunit managers than with measures that are unique. Their results support their prediction.

5.2. Judgment and Decision Performance

Most behavioral decision theory studies in management accounting have focused on predicting and explaining mean judgment and decision behavior (e.g., on average, individuals behave as predicted by Einhorn & Hogarth's (1986) cues to causality or Kahneman & Tversky's (1979) prospect theory). Another stream of research has focused on predicting and explaining variation in individuals' judgment and decision performance (e.g., which individuals, under what circumstances, ''see through'' misleading accounting or use heuristics). Psychology studies that examine causes and effects of variables such as cognitive ability, knowledge, and motivation provide the basis for models explaining individual variation. Einhorn & Hogarth (1981) are the first to put this literature together in the form of a conceptual equation of the determinants of judgment and decision performance. Libby & Luft (1993) and Libby (1995) provide literature reviews and analysis to elaborate on this conceptual equation and organize accounting and auditing literature to provide insight into determinants of judgment and decision performance in accounting and auditing settings.

The primary focus of this research has been on the psychological variables, in particular cognitive ability, knowledge, and motivation, that affect how and how well individuals make judgments and decisions, and on how knowledge is influenced by the interaction of ability and experience. Some early studies examine how these variables independently affect judgment and decision performance, while newer studies examine how they affect performance interactively or as part of a casual chain. A smaller body of research examines how environmental variables, such as accountability, incentives, feedback, task complexity, and time pressure, independently or in interaction with psychological variables, influence judgment and decision performance.

Dearman & Shields (2005) predict that decision performance following a change in the cost-accounting method is a function of the three-way interaction of general problem-solving ability, intrinsic motivation,

and relevant cost-accounting knowledge. They study a setting in which individuals make product-pricing decisions based on the product cost, product production volume, and a market index that indicates the level of competition. After making a set of pricing decisions for products with diverse resource-consumption patterns, individuals are informed that the product-costing method changed from either volume-based to activity-based costing (ABC) or vice versa. The individuals who appropriately change their decision model in response to the change in the product-costing method have high levels of general problem-solving ability, intrinsic motivation, and relevant cost-accounting knowledge. Individuals lacking high levels of *all* three variables either made no change or made an incorrect change in their decision model when the costing method changed. These results indicate that, at least in this setting, high motivation cannot substitute effectively for high ability or task-relevant knowledge (and vice versa) as a source of high performance.

Some studies provide evidence on how knowledge content and/or structure affect judgment and decision performance (Anderson, 2000, 2005). Knowledge content refers to information that is in memory, including general information about the world and information specific to particular tasks. Knowledge structure refers to the way individual items of knowledge are linked to each other in memory (e.g., causally, hierarchically, spatially, temporally). Knowledge that individuals possess can be more or less accessible (and thus more or less likely to be used), depending on how it is structured and how the knowledge structure corresponds to the task structure (Anderson, 2000, 2005).

For example, research in cognitive psychology finds that decision context influences the mental representation of a decision (e.g., what elements of the decision are seen as important and how they are linked). The mental representation in turn influences decision processes and outcomes. Vera-Muñoz (1998) uses this literature to argue that for individuals with high levels of financial-accounting knowledge, mental representations of business (not personal) decisions will resemble financial-accounting representations of business, in that they omit opportunity costs. In consequence, Vera-Muñoz (1998) predicts and finds that in a business context, individuals with high levels of financial-accounting knowledge will ignore more opportunity costs in making resource-allocation decisions than individuals with lower levels of financial-accounting knowledge. She also predicts and finds that individuals with high levels of financial-accounting knowledge will ignore more opportunity costs when a resource-allocation decision is in the business compared to non-business context.

Dearman & Shields (2001) provide evidence that the content and structure of cost-accounting knowledge can influence individuals' cost-based judgment performance. They base their predictions on psychology research showing that judgment performance increases when individuals have more task-relevant knowledge content and/or their knowledge is more structured by task-relevant cause-and-effect relations and has more refined partitions of knowledge categories. Dearman & Shields (2001) examine a situation in which individuals make profit-prediction judgments based on product costs that are measured and reported by a volume-based cost system for products with diverse resource-consumption patterns. In this situation, they predict and find that judgment performance is higher for individuals who have more ABC knowledge content and less volume-based knowledge content because the former is more relevant to the task at hand as it provides a more accurate representation of cost causality when products have diverse resource consumption. They also predict and find that judgment performance is higher for individuals whose cost knowledge is structured more consistently with an activity knowledge structure because this structure is relevant to the task at hand. Dearman & Shields (2001) also predict but do not find that judgment performance is lower for individuals whose cost knowledge is structured more consistently with a physical-resource (materials–labor–overhead) knowledge structure.

5.2.1. Mental Models

Accounting-related knowledge can take the form of mental models, which are subjective, internal representations of systems of causal relations that can be used to support judgments and decisions (Markman, 1999; Markman & Gentner, 2001). Mental models usually differ from formal scientific models with respect to three properties that can influence how and how well individuals make judgments and decisions: *qualitative*, not quantitative; they often *substitute* similar but more familiar attributes for the attributes in formal scientific models; and they often are *incomplete* compared to formal scientific models because they omit parts of long or complex causal chains.

Krishnan et al. (2005) study how individuals' subjective performance-measure weighting decisions for incentive compensation are influenced by the precision of a performance measure and the error covariance between that and another measure. Based on mental model theory, they predict and find experimental evidence that most individuals use the measures' error variance (precision) and error covariance

to determine performance-measure weights, but whether they use these attributes as predicted by agency theory depends on their mental models. About half of the experimental participants have mental models that are complete qualitative versions of an agency-theory model and thus make decisions that are qualitatively consistent with the agency-theory model. Most other participants' mental models are incomplete versions of the agency-theory model, which results in predictable patterns of decision error: directionally incorrect responses to changes in precision and error covariance, and failure to take into account the spill-over effect of changes in one measure's precision on the other measure's optimal weight.

5.2.2. Outcome Effects

Both psychology research and management accounting textbooks have warned against individuals' tendency to overweight decision outcomes in evaluating decision-makers and to ignore the possibility that bad outcomes can result from good decisions. Two management accounting studies argue that the extent of evaluators' dependence on decision-outcome information depends on their mental representations, which in turn depend on their experience.

Brown & Solomon (1993) compare performance evaluations by evaluators who have either been or not been involved in the evaluatee's decision-making but in both cases have equal information about the evaluatee's decisions. Those individuals involved with the decision-making are expected to have a mental representation of the decision that is more like that of the decision-maker, and thus their evaluations of the decision-maker are expected to be less influenced by decision outcomes. Brown & Solomon (1993) provide evidence consistent with this expectation.

The setting used by Brown & Solomon (1993) allows them to identify a difference in performance evaluations across experimental conditions but not to identify which evaluations are better or optimal because the optimal weight on decision outcomes in their performance-evaluation task is unknown. Frederickson et al. (1999) use a setting in which the optimal weight on decision outcomes in a performance-evaluation task is zero. Evaluators receive instructions that the optimal weight is zero, and they indicate that they agree that this is the correct weight, since they have complete information about whether the evaluatee made the right decisions ex ante. Nevertheless, their evaluations are influenced by decision outcomes if they themselves have prior experience of being evaluated on the basis of decision outcomes rather than on ex ante decision quality. Frederickson et al. (1999) argue that this experience with outcome-based evaluations strengthens the link between decision outcomes and evaluations in evaluators' minds, and that the more such experience evaluators have (the more frequently they have been evaluated based on either outcomes or decisions), the stronger the link will be. As predicted, they find that evaluators' evaluations are influenced by an interaction between the basis on which the evaluators themselves were evaluated in the past and the frequency with which they were evaluated. Evaluators' evaluations are farthest from the optimum when they have been frequently evaluated based on decision outcomes in the past and nearest to the optimum when they have been frequently evaluated based on decision quality in the past; their evaluations are in between these extremes when they have been less-frequently evaluated on either basis.

6. Conclusion

In this final section we summarize what has been learned about management accounting practices from research based on cognitive, motivational, and social psychology theories. Although the specific psychology theories employed in management accounting research have been numerous and diverse, a limited number of common themes appear. These can be grouped under the headings of motivational and informational effects of management accounting practices.

6.1. Motivational Effects

Common themes in this literature are the effects of reference points (e.g., budget goals) and the effects of internal conflicts or inconsistencies among mental representations and behavior. Goal-setting theory, level of aspiration theory, organizational justice theory, and prospect theory all propose that motivation depends on a comparison between an actual or possible outcome and a reference point determined by individuals' mental representations of the task. Holding constant the objective measure of an outcome and the cost of achieving it, individuals are less motivated (less willing to exert effort) to achieve that outcome if it is beyond their reference point (e.g., a higher level of profit or a lower level of cost) than if it is not. Reference points are often influenced by management accounting practices. For example, in level of aspiration and goal-setting theories, the reference point is a self-set or imposed and accepted goal, such as a budget goal (Hirst & Lowy, 1990; Kenis, 1979; Stedry, 1960). In organizational justice theory and social comparison theory, the reference point is the outcome individuals believe they should have received or

the outcomes of relevant other individuals, for example, the performance of others at a similar task (relative performance evaluation) (Frederickson, 1992) or a budget goal that meets some social norms of fairness (Libby, 2001). In prospect theory, the reference point is often what the management accounting practice indicates as the status quo (e.g., base salary) (Luft, 1994).

Cognitive dissonance theory, role theory, and the theory of person–environment fit all identify motivational effects arising from individuals' desire for consistency among their mental representations and behaviors. Holding constant the objective measures of an outcome and the cost of achieving a goal, individuals are more motivated to achieve the goal if doing so increases this consistency. They are less motivated if achieving the goal does not increase this consistency and they continue to be exposed to cognitive conflict, role ambiguity, and stress. For example, cognitive dissonance theory predicts that once individuals have chosen a goal such as a budget goal and mentally represented it as a good choice, they are motivated to achieve that goal not only by the attraction of external rewards, but also because achieving that goal is consistent with the positive mental representation of their choice (and perhaps of themselves), whereas failure could provide an aversive, conflicting negative representation (Tiller, 1983). Role theory and person–environment fit focus on the demotivating effects arising from cognitive conflicts and stress arising from lack of consistency among individuals' mental representations and behaviors. Management accounting practices (e.g., budget-based evaluation) can result in lower levels of motivation by supporting conflicting or ambiguous representations of the individual's responsibilities that induce stress, dissatisfaction, or loss of self-esteem, sense of control, and interpersonal trust (Hopwood, 1972; Shields et al., 2000).

6.2. Informational Effects

Management accounting practices influence judgments and decisions not only by providing information but also by influencing how boundedly rational individuals search and process this information and mentally represent their organizations and environments. The direction and magnitude of these influences of management accounting practices often depend on individuals' experience, knowledge, and ability, and on elements of the task and its context.

Research on informational effects moves between two poles. On the one hand, it identifies ways in which heuristics succeed in producing judgments and decisions very similar to the outputs of optimizing models. On the other hand, this research identifies suboptimal (often biased) judgments and decisions that result from the cognitive limitations of individuals faced with the cognitive demands of management accounting tasks.

Subjective judgment and decision processes involving management accounting information are influenced by many of the same variables and sometimes provide approximately the same output as optimizing models (e.g., variance investigation decisions in Brown [1981, 1985, 1987] and Lewis et al. [1983]). Under favorable conditions (e.g., predictability is high, accounting is consistent with the underlying economic relations), individuals can make subjective product-pricing decisions and profit predictions that are similar to the outputs of optimizing statistical decision or prediction models (Ashton, 1981; Luft & Shields, 2001).

Subjective judgments and decisions using management accounting information often differ from the outputs of optimizing models, however, especially as the cognitive demands of processing the information for optimal judgments and decisions increases. Management accounting practices can influence the extent and direction of predictable biases in individuals' heuristic search and use of information by influencing attention allocation, mental representations, and the usability or effectiveness of heuristics.

Management accounting practices can influence attention allocation by making some information items more salient than others and thus more likely to be acquired and fully processed. For example, capitalizing (expensing) expenditures on intangibles directs attention toward long-term (current-period) expenditure-profit relations in multi-period accounting data, making it more (less) likely that subjective judgment of long-term relations based on such data will be accurate (Luft & Shields, 2001).

Management accounting practices can influence how information is mentally represented and linked with other information in memory; and individuals' mental representations and linkages in turn influence their acquisition and use of additional information. For example, past experience with outcome-based evaluations of decision performance strengthens the link between outcomes and evaluations in individuals' minds and makes it more likely that they will use outcome-based evaluation even when they believe it is suboptimal (Frederickson et al., 1999). Conversely, involvement in the evaluatee's decision strengthens the evaluator's mental representation of the pre-outcome decision process and weakens the effect of outcome information on evaluations of decision performance (Brown & Solomon, 1993).

Management accounting practices can influence individuals' heuristic information search and use to the extent that the selection and structuring of management-accounting information is consistent with the effective use of heuristics for information search and use. For example, how completely and consistently individuals search a report of responsibility centers' performance depends on whether the report covers a small number of responsibility centers with a large number of performance measures for each (resulting more complete and consistent searches) or a large number of responsibility centers with a small number of performance measures for each (less complete and consistent searches) (Shields, 1980, 1983). Similarly, the completeness of individuals' use of multiple measures in evaluating multiple managers depends on whether the measures in a report are common to all of the managers or unique to each manager (Lipe & Salterio, 2000).

The extent to which management accounting practices affect bias in heuristic judgments and decisions by the means described above can depend on individuals' knowledge, abilities, and motivation. For example, in Dearman & Shields (2005), individuals' performance in cost-based pricing decisions is not affected by a change in product-costing method for individuals who have high levels of cost-accounting knowledge, intrinsic motivation, *and* general problem-solving ability, but for individuals with low levels of any one or more of these person-characteristic variables, the accounting change reduces their decision performance.

6.3. Future Research

In addition to the psychology theories used in management accounting research and summarized in this chapter, inspection of contemporary psychology literature would reveal many other theories in the subfields of cognitive, motivation, and social psychology (e.g., theories of affect and emotion), as well as theories from other subfields (e.g., neuropsychology), which have not yet been used in management accounting research but might prove relevant in the future. Moreover, as described in the introduction section, researchers often use psychology theories together with theories from other disciplines that provide relevant information, such as benchmarks of economically optimal decisions or performance. Thus, it has become increasingly evident that multiple theories are potentially relevant to any given management accounting practice. While theory selection has often been somewhat *ad hoc*, as researchers have explored the initial possibilities of using psychology theory to explain and predict management accounting practices, management accounting research can benefit from more careful consideration of questions like the following:

- When will a management accounting practice and its causes and/or effects be better explained by psychology theories only or by integrating psychology theory with theory from another theoretical perspective such as economics or sociology (Covaleski et al., 2006; Luft and Shields, 2006)?
- When will a management accounting practice and its causes and/or effects be better explained by theories from cognitive, motivation, or social psychology or some combination of them?
- Which among many possible motivation sources (e.g., goals, equity, dissonance reduction, level of aspiration) or information-processing characteristics (e.g., anchoring and adjustment, attribution biases, cue utilization, representativeness) is most relevant to a particular management accounting practice?

Future research can benefit from task analysis (Schraagen et al., 2000) and carefully matching task characteristics with theory, in order to identify the theory most relevant to a particular management accounting practice. For example, if organizations typically assign the task only to highly trained specialists, then cognitive theories (e.g., theories of expertise) are likely to be important to task performance. If the task or the incentive system for it is differently structured depending on the degree of social contact or similarity among individuals who perform the task, then social psychology theories can be relevant. If performance on the task is highly effort-dependent, then theories of motivation can be important in explaining differences in task performance.

Task analysis can sometimes identify more than one theory as clearly relevant to a particular management accounting practice. In such cases, management accounting research can also benefit from accurate identification of competing and complementary relations among these theories and from studies that provide evidence to support choice among competing theories and integration of complementary theories.[12]

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[12]See Covaleski et al. (2006) and Luft & Shields (2006) for more extensive discussions of identifying and using competing and complementary theories.

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Economics in Management Accounting

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Abstract: This chapter illustrates the importance of economic management accounting research (EMAR) to the development of management accounting, its current state and its characteristics. This review is based on the UK/US literature and the mathematics is kept to a minimum. Detailed presentations of mathematical models are in the relevant subject chapters. After the introduction, the second section considers what might be involved in adopting an economic approach and looks briefly at the criticisms made of this approach. The next two sections survey some of the historical foundations of management accounting that underlie some of the more recent developments. The fifth section considers the 'birth' of EMAR, in the 1960s and 1970s, and reviews the development of some of the major research themes from that time and considers their continued promise. The final section considers a few subjects not otherwise covered and sums up.

1. Introduction

This chapter gives a personal view about some developments on applications of economic management accounting research (EMAR). It illustrates the importance of economics to the development of management accounting, its current state and its characteristics. The focus will be on some technologies in management accounting with economic foundations that have generally proved sustainable, are in use and, often, are still being developed. The emphasis will be on the use of economics in these developments, on their diffusion over time and on their future progress. It is hoped that by tracing some of the evolution of EMAR, its essential and developing characteristics will become apparent. This review will be based on the UK/US literature. The emphasis and the chronology of developments differ in other countries.

This chapter does not purport to be a comprehensive review of the use of EMAR currently or of its strengths and weaknesses. These would be major tasks. Much of this Handbook reviews EMAR applied to specific subjects. Nor does it discuss fully EMAR as it has evolved over time. This too would be a major task (which could be of great importance, for example, in explaining the generation of some of the strengths and weaknesses of today's management accounting), nor does it seek to explain how economic methodologies are and could be used in management accounting (see Demski, 2006). It may come as a surprise that this chapter does not comprise detailed presentations of the mathematical models of EMAR. These models are presented in detail in the subject chapters of this volume. This allows us to focus on the common and specific characteristics of these models, on their growth and on providing a brief evaluation of these research approaches.

The views given here are not based on extensive research but do draw on long experience. Much of the chapter, therefore, cannot help but be contestable. References cited are restricted to either 'classics' or personal favourites. However, it is hoped that sufficient references are given to allow readers to begin to investigate in more detail the research discussed here.

There is no doubt that EMAR is an important part of management accounting research. Indeed, in terms of the number of publications, it may still dominate. For example, Mensah et al. (2004) calculate that nearly 50 per cent of the management accounting articles published from 1986 to 2000 in four mainstream accounting journals were economics based. The next highest basic discipline represented was organisational behaviour, which accounted for about 14 per cent of the published articles. However, Hesford et al. (2006) who investigated a much wider portfolio of journals, which entertain articles from much wider variety of disciplines over the period 1981–2000,

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found that economics-based articles represented 39 per cent of the management accounting articles published while sociology-based articles formed 35 per cent of the articles published.

Prior to considering specific ideas, we look first in the second section at what might be involved in adopting an economic approach generally and specifically to management accounting research and look briefly at both the criticisms made of this approach and the degree of the interchange between economics and EMAR. Thus, the second section gives a view as to what 'economic approach' means to me. Such statements are highly contestable and there is an enormous literature in this area, often of a highly abstract and philosophical nature. In the third section, we consider some historical foundations to management accounting, which underlie some of the more recent developments. The general approach of this chapter is to deliberately look at the historical developments of EMAR as a way of understanding what EMAR attempts to do. It also allows some evaluation of current EMAR without getting involved in the technical noise and debate surrounding contemporary articles. In the fourth section, we consider the constituents of EMAR in the 1950s and 1960s to give some indication of the degree to which earlier work continues to affect EMAR and of the major changes that had begun to take place around the later time. Those ideas that have sustained over time and those that have faded away will be indicated and some of the consequences of this will be discussed.

One might say that economics-based research in management accounting, as we now know it, was really initiated in the 1960s and 1970s. The fifth section reviews the development of some of the major research themes from then and considers their continued promise.

Finally, we will sum up in Section 6. Our survey is too cursory, is built on illustrative examples and lacks in theory and empirical evidence to allow any hypotheses to be generated and to be explored. However, a few defensible notions can be suggested:

1. Formal and technical EMAR was born in the late 1960s/early 1970s (a rather long gestation period). It was then, and is now, generally derivative of extant economic theory and, to a lesser degree, of decision theory.
2. The early research themes have generally persisted to the present day (though, of course, some have either died or declined in importance).
3. Relatively few entirely new areas of research have emerged in recent years and few research streams have found closure—by the provision of a generally accepted explanation of the phenomena investigated.
4. A concern for the acceptance of research ideas in practice does not figure strongly in our literature survey, nor does a major concern for obtaining empirical evidence (may be, because it is too hard to build large data banks and, at least until recently, other methods have not been tried).
5. The organizational, industrial and national specific natures of management accounting means that few EMAR findings (if any) of generalizability can be found.

2. The Economic Approach

Robbins (1932) defined economics as 'the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses'. This definition encompasses the important concept for management accounting of opportunity cost (the benefits from the foregone alternative) and the crucial question of 'what differences does it make?' in the comparisons of options for the use of scarce resources. A more explicit definition is 'economics is the science which studies how scarce resources are employed for the satisfaction of the needs of men living in society: on the one hand, it is interested in the essential operations of production, distribution and consumption of goods, and on the other hand, in the institutions and activities whose object it is to facilitate these operations' (Malinvaud, 1972: 1). All this falls within the remit of EMAR.

These two definitions embody a number of concerns that underlie some explicit and implicit criticisms of the economic approach, which have helped to encourage many of the other approaches to management accounting that are surveyed in these two volumes. For example, many critics disagree with the implicit assumption in these definitions of optimising through markets by actors intent only on maximising their personal economic welfare. In contrast, actors are seen as neither completely rational nor purely personal. Strictly, economic theory can deal with such characteristics; users of economic models may be altruistic and cooperative to a degree.

2.1. The Economic Foundations

The foundations of micro-economic models are the personal and rational deployment of goods or commodities including services within both households and firms and other organisations that transform goods into other commodities, and the trading of goods in perfect and complete markets that generate commodity prices in the reigning environments with

the initial resources available in the community. Micro-economic theory has two main objectives. One is to explain how markets obtain equilibrium and to predict how equilibria vary with changes in exogenous parameters. Such equilibria form the economic environment for firms in the economy. These markets yield the prices and quantities of commodities used in management accounting. Otherwise, market equilibrium does not figure strongly in management accounting with its concern for firm-specific decision-making and control, or performance measurement, and its therefore partial equilibrium orientation. The second objective is to seek the optimal organisation of production, consumption and exchange. This objective is central to management accounting when it seeks to maximise profits and net worth. Even here, management accounting only focuses on production and generally ignores exchange and consumption problems by implicitly assuming perfect and complete markets, at least for those items that are not of first-order concern.

The next section outlines the fundamentals of firm cost structure as an illustration of what might be called the 'economic approach'. Generally, management accounting focuses on the organisation's cost architecture. Economics yields ways of modelling this structure to allow the optimisation of the firm's input and output choices. The essence here is to focus on the endogenous solutions to problems, given the exogenous variables.

2.1.1. Firm Cost Structures

The starting point for looking analytically at the economics of the firm is to model the cost structure of the firm (Christensen & Demski, 1997; Demski, 2006; Christensen & Hemmer, 2006).

In general terms, a cost function for a multi-product firm can be written (see Chambers, 1988) as

$$C(w, y) = \min(wx : x \in V(y),\ x > 0) \qquad (1)$$

where w is an input price vector or price set (w_i, $i = 1, \ldots, m$), y an output vector (y_j, $j = 1, \ldots, n$) and x an input vector (x_j, $j = 1, \ldots, m$). $V(y)$ is the input requirement set comprising all input combinations capable of producing output y and includes the optimal technology for each combination of inputs. The conditionality symbol (:) requires that all input bundles are within the available technology. Often in models, this optimal technology is expressed as a production function.[1] The production function charts the efficient input bundles for given outputs. One of the concerns of management accounting is to seek to discover such efficient bundles.

Thus, eq. (1) says the cost function is a function of input prices, output and technology. The input price set and available technology constrain the permissible cost function. Costs are minimised by choosing those non-negative inputs (x) within the available technology, which minimise the cost of producing the desired output (y). For a more detailed presentation, see Christensen & Hemmer (2006).

A foundation of this model is that the cost function is the dual of technology. That is, where the cost function is differentiable in input prices, there exists a vector of cost-minimising input demands, which is identical to the profile of the cost function in the face of changing input prices (Chambers, 1988: 56). Thus, the character of the cost function is determined by the production function. The essence of EMAR is to determine functional relations between inputs and outputs, using market prices where appropriate, and use these to build a model so as to find a maximising solution. The effects of changes in parameters are explored using comparative statics, which compares solutions under different assumptions about parameters. Major results of this model are that it is *marginal* quantities that matter and that marginal changes should be costed on the basis of 'what difference do they make' when evaluated at their opportunity costs (the benefits of the options their production causes to be forgone). All economic costs are opportunity costs. Marginal cost is the fundamental cost concept of the model, not average costs that are indeterminate with multi-outputs.

This model of cost structure is very general and can incorporate linear and nonlinear technologies and common and joint costs (allowing for economies of scope [see Baumol et al., 1988]). This structure has been used to analytically model activity-based costing (ABC) (see, for example, Banker & Hughes,

[1] A production function indicates the maximum output y from a bundle of inputs subject to the restrictions that characterise the production function. Thus, the well-known Cobb–Douglas production function can be written as $y = x_1^{\alpha} x_2^{\beta}$, $\alpha, \beta > 0$. y is output, x_1 and x_2 are inputs and the superscripts α, β indicate the relation between the two inputs; that is, whether they are substitutes or complements. Thus, $\alpha + \beta < 1$ implies decreasing returns to scale. $y = \min(x(x_1/B_{11}), x_2/B_{12})$ represents a Leontief production function where the technology uses at least B_{11} units of x, and B_{12} units of x_2 to produce a unit of output. That is, a minimum quantity of each of the two inputs is required and no substitution between the inputs is possible. Thus, a constraint on an input restricts possible outputs (as, for example, in linear programming).

1994; Bromwich & Hong, 1999). It also provides a foundation for principal and agent models. One criticism of this type of economic model is that it provides a long-run analysis—all inputs are normally assumed variable—an assumption shared with ABC. However, economists are used to dealing with short-run decisions where some inputs are fixed. The emphasis is still on seeking efficient outcomes. Cost minimisation now takes place by minimising the cost of variable inputs subject to constraints on fixed inputs. Average variable costs are therefore minimised, given the fixed factors.[2] Thus, costs for a given level of output are higher where inputs are constrained than where they are freely available. Thus, the minimum variable cost for a level of fixed factors generates one point on the long-run average cost curve, which charts the costs for all amounts of factors with no factor limited (Chambers, 1988: 100–109). Thus, the fixity of inputs is an (endogenous) decision variable for the firm. Once the bundle of fixed resources is decided, the firm optimises using its short-run cost function. In this way, standard micro-economics can cope with both a restriction on and a surplus of capacity. Altering the quantity of fixed inputs will require the incursion of adjustment costs and experiencing an adjustment time lag both of which may differ between factors (Nickell, 1978). This model may be further augmented using the 'transaction costs' literature: Williamson (1989). These concerns are now central to current research in capacity planning and pricing (Balakrishnan & Sivaramakrishnan, 2002; Gök, 2002).

Much of EMAR examines various accounting architectures using the lens provided by this model to determine whether the model can capture sufficiently the underlying economics of the situation for the problem in mind. The aim is to understand management accounting, its causes and effects including distortions from the economic model, and to improve its consistency with the underlying economic structure. It is implicit that this allows a 'better' accounting. For some researchers, it is sufficient that economics helps us understand some accounting problems (for example, overhead allocation). However, understanding the models and their results do not necessarily lead directly to general suggestions for improved practice. This perceived failure in generating practical solutions is often seen as a major criticism of management accounting research. However, such critics often forget the role of research findings in professional accounting syllabi. Another problem that arises from the model is that revenue ($f(p_j, y_j)$, where p represents output prices ($j = 1,\ldots, n$)), is seen as a second-order concern. Revenue is seen as not owned by the management accountant and generally has not been of significant interest to management accounting researchers even though much of the analysis applied to costs could be used to look analytically at revenues (see, however, Banker & Hughes, 1994).

2.1.2. Uncertainty

A second fundamental model in EMAR is that used for treating uncertainty. Amazingly, most of management accounting practice still uses very crude adjustments for uncertainty and some areas of management accounting research do not consider the impact of uncertainty (for example, on cost structures other than, perforce, in related empirical work). Agent and principal theory and information economics are two areas of management accounting research that address uncertainty.

The optimal decision under uncertainty with a given information set in a very simple setting can be written as

$$\begin{aligned} \mathrm{E}(U : a^*, y_k, \eta_j) = & \max_{a_i}[u(a_i, s_j)\phi(s_j : y_k)] \\ & a \in A(a_i = 1, \ldots, A) \\ \text{subject to :} & \\ & y_k \in \eta_j \end{aligned} \tag{2}$$

This simple seeming model is actually very complex in that some of the variables represent very complex ideas. The model is an example of state preference theory where the only uncertainty in the model is that of which state of the environment ($s_j, j = 1,\ldots, S$) will occur out of the set of states (S). The probability of the occurrence of each state is ϕ ($j = 1,\ldots, S$). Preferences for the uncertain outcomes ($x_{ij} = f(a_i, s_j)$) are measured by a utility function (U) that reflects the decision-maker's attitude to risk (and, where appropriate, time preference). The information system (η_j) yields signals ($y_k, k = 1,\ldots, K$) as to the likelihood of each state. The decision-maker's task is to maximise the expected utility E(U) where E is the expectation operator obtained by choosing the optimal act (a^*) out of the available acts (a_i, $i = 1,\ldots, A$), given the signal $y_k (k = l,\ldots, K)$ from the information set η_j. Again, conditionality is signified by the symbol.

[2]The short-run cost curve can be written as $C(w^1, y, x^2_{\max}) = \min\{w^1x^1 : x^1 \in (f(x^1, x^2) \geq y)\}$. Here $x^2_{\max}$ represents the maximum available input x^2. The objective is to minimise the cost of x^1: $C(w^1, x^1)$ for a given y, subject to (as indicated by :) x^1 being attainable, given: y, the technology and the maximum available amount of x^2 as represented by the function $f(x^1, x^2) \geq y$, where $f(\cdot)$ is the production function.

The right-hand side of eq. (2) indicates that for a given signal the decision-maker proceeds by seeking the action (a^*) that maximises the expected utility from that generated by each possible action (a_i) and state combination (a_i, s_j) weighted by the probability of the state $\phi(s_j)$ conditional on the signal y_k from the information system. With a perfect information system, each signal is associated with one and only one state and all states have such a signal associated with them. Alternatively, the information system may be either imperfect with a signal signifying only the occurrence of a set of states (for example, y_k may signal the occurrence of the set of states $\{s_1, s_2, s_3\}$) or be noisy, where a signal signifies the occurrence of a state in a probabilistic way (here, y_k may signal state 1 with, say, a 0.75 probability and state 2 with a 0.25 probability).

The following equation yields the expected utility from making the optimal decision relying on information system η_j:

$$\mathrm{E}(U : \eta_j) = \mathrm{E}(U : a^*, y_k, \eta_j)\phi y_k \tag{3}$$

Here the expected utility $\mathrm{E}(U: a^*, y_k, \eta_j)$, obtained by acting optimally on each signal from the information system from eq. (2), is weighted by the likelihood of each signal (ϕy_k) to give the overall expected utility of the decision, given the information system.

Information has value if it changes the decision that would have otherwise been made. The value of information is the difference between the expected utility generated by the decision with the information system and the expected utility of the decision without the information. Assuming a risk-neutral decision-maker (who makes decisions on the basis of expected [average] monetary values [EMV]), the value of a perfect information system can be expressed as:

Expected value of perfect information (EVPI):

$$\mathrm{E}[\max_{a_i}(x_{ij} : s_j)] - \max_{a_i} \mathrm{E}[x_{ij} : s_j] \tag{4}$$

The first term says that we should determine the act that maximises the monetary outcome for each state given its occurrence and weight all these outcomes by the likelihood of the state being signalled by the perfect information system. Although the perfect information system will announce which state has occurred, the signal it will announce is uncertain prior to having access to the system and therefore the decision-maker has to assign probabilities to each signal receipt so as to value the information system. The second term says we should choose the act that maximises EMV without information using as weights the decision-maker's view of the probabilities of the occurrence of each state. The difference is, therefore, the EMV obtained because of the new decisions allowed by having access to the perfect information system. The value of perfect information cannot be negative and is the maximum price a risk-neutral decision-maker would pay for a perfect information system for a given problem. It provides an upper bound on the value of all information systems appropriate for the decision.

Again, modelling the relevant functional relationships is of the essence. This model is an 'as if' model. It predicts the results of rational decision-making using practical methods 'as if' the analytical model were used instead. Such models of uncertainty are used analytically: in decision-making including those that involved a principal and agent setting and in either choosing or redesigning information systems (see, for example, Antle & Demski, 1988; Feltham & Xie, 1994).

The same results apply where the decision-maker is risk averse (that is, will not accept a fair gamble). Here in order to obtain a monetary value for the value of an information system, it is necessary to convert the utility amounts into certainty equivalents (the amount of money received with certainty having the same utility as an uncertain monetary payoff) and then determine the value of information. The monetary value obtained is personal to the decision-maker and reflects the decision-maker's attitude towards risk. A surprising and, perhaps, counter-intuitive result is that a risk-averse decision-maker will not necessarily value more highly a given information system than a risk-neutral person.

Implicit in economic models is conflict between actors with different tastes, endowments and information. Generally such conflicts are resolved by trading on well-organised markets. A third major EMAR model, the principal and agent model, explicitly models such conflicts in organisations where tastes differ and information is asymmetric between actors. This will be discussed later (see also Lambert, 2006), but it relies upon the two models introduced here.

2.2. The Interchange between Management Accounting and Economics

It is fair to say that these models in management accounting (and, indeed, in other areas of accounting) are derivative (build on) of economics. The management accounting literature has, however, recast these models, 'fine tuned' them to its purposes and extended their use into a wide range of settings. However, it is fair to say that little of EMAR has made any major impact on economic theory. This is less true of empirical work. Moderate impacts by management accounting have been made in the

information economics area, and some of the work in the analytical control area of management accounting has been used in economics.

However, a recent book by two economists, *Theory of Incentives: the Principal- Agent Model* (Laffont & Martimont, 2002), cites the work of only four management accounting researchers. Mensah et al. (2004) survey citations for management accounting articles in both accounting and non-accounting journals in the period 1986–2000. They report that economics-based management accounting papers account for 50 per cent of the management accounting citations in non-accounting journals after discounting those articles in non-accounting journal articles with any accounting authors. The average citation rate for economics-based articles in non-accounting journals was 2.3 citations per article when articles with some accounting authorship were included dropping to 1.15 when no accounting author is involved. This suggests that such involvement increases the visibility of accounting in economics journals. Whilst this paints a somewhat better picture of the cross-fertilisation between management accounting and economics than suggested above, it does not indicate any substantial impact on mainstream economics. Moreover, Mensah et al. (2004) note that the average citations in non-accounting journals have fallen over time—a trend followed by citations in economics journals. The authors point out that citations may not measure the real influence of management accounting research on other disciplines (but it surely is suggestive), and that management accounting articles considered come from only four long-standing journals.[3]

Zimmerman (2001), in a provocative article considering empirical management accounting research, suggests that empirical work has switched from seeking to test theory to testing the claims of suggested new practice-orientated approaches. This lack of theory orientation might reduce the perceived relevance of articles to economics researchers.

Examples of analytical accounting research quoted in the economics literature include work showing that the information requirements of agency models may be different from those of decision-making models because agency models require information that measures effort rather than information that helps optimise wealth (Gjesdal, 1981), delegated responsibilities within organisations (Demski & Sappington, 1984), transfer pricing and the management accounting uses of residual income including relative benefit depreciation (Reichelstein, 1997). It may be expected that some of the developing analytical works on ABC and on target costing (when the latter is more developed) may yield citations in the economics literature. In sum, it is not unreasonable to say that the EMAR community is not very visible to other economically orientated researchers.

I realise that statements concerning the low 'spill over' of EMAR are controversial, and that other researchers might put forward many counter examples. I apologise to those whose contributions I have neglected. However, a lack of spill over to economics is not entirely surprising. Neo-classical micro-economics is concerned with predicting how the decisions of firms will affect market prices and market demand and supply. Generally, economics has had little concern with control issues within the firms at least until recently. However, the lack of impact of management accounting research on principal and agent and imperfect contracting settings is surprising, given the many common interests of economists and accountants working in these areas (see Laffont & Martimont, 2002; Milgrom & Roberts, 1992).

2.3. Criticisms of Economic Management Accounting Research

Economics-based management accounting has been attacked extensively by researchers associated with other perspectives on management accounting.[4] The first attack sees this approach as fatally flawed because it accepts the capitalist economy and is seen as supporting and sustaining its perceived weaknesses, especially that of the 'unfair' distribution of resources (Niemark & Tinker, 1986). A related criticism is that the objective of maximising shareholder wealth aids only a part of the society. For other stakeholders either they are ignored or their wishes are constrained. Thus, in neo-classical economics, labour receives only its market price, which it is asserted does not reflect the contribution that labour makes to the firm's wealth. With this view, the role of the performance measure function of management accounting is not to give incentive to personnel but rather to control their ability to work as a social force (Hopper & Armstrong, 1991).

Another criticism does not accept the stylised characteristics of the firm-used in economics. Generally economics is seen as treating the firm as a black

[3] *Accounting, Organizations and Society*, *Journal of Accounting and Economics*, *Journal of Accounting Research* and *The Accounting Review*.

[4] The following description of other theories of management accounting has been much improved by Malmi & Granlund (2005).

box and not modelling the internal institutions of firms. However, such intra-firm modelling is now a crucial element of economic research (see Arrow, 1974; Hart, 1995; Milgrom & Roberts, 1992, Chapters 1 and 2). Other critics doubt the reality of the economic view of the institutions and activities that facilitate the production and distribution of goods in the economy. Economics itself has sought to introduce many richer descriptions of institutions and their coordination, especially within the firm, by using the behavioural theory of the firm (Cyert & March, 1963) incorporating satisficing goals (Simon, 1947) and especially transaction economics (Coase, 1937; Williamson, 1985, 1989), and seeking to deal with imperfect contracting (Hart, 1995) (see also Milgrom & Roberts, 1992).

Similarly, many commentators believe that economic theory neither incorporates the behavioural characteristics of the individuals making up the firm nor allows them to cooperate and thereby resolve conflicts. Much of micro-economics, the economics of organizations and industrial organization economics, is now using new approaches to tackle these problems. These topics include bounded rationality and incomplete contracting, moral hazard, adverse selection, rent seeking, analytical approaches to compensation and motivation and the boundaries of the firm. Many of these topics figure in agent and principal research in economics. Such approaches are shared with and by EMAR. Moreover, a variety of behavioural characteristics can be modelled in EMAR, if of significance to behaviour.

Many of the chapters in this handbook advocate a variety of non-economic lens to consider the firm. More generally, these different lens seek to widen the theoretical bases for studying the underlying psychological, social, organisational and institutional factors impinging on the firm and its management accounting system (Miller & O'Leary, 1990). The most fundamental criticism remains the need for management accounting research to mobilise the critiques of profit-maximising organisations and their effects on society as a whole and, with analytical approaches, seek to improve the understanding of these phenomena.

These alternative approaches to management accounting tend to confine themselves to their own literature. An important future research endeavour will be to seek to integrate these and the economic approach. Anchoring research to empirical evidence obtained from field studies and action research is an important part of many of these alternative perspectives. Thus, the economic approach could learn from these other methods the need to expose more of its findings to empirical evidence obtained from a widening of the modes of evidence collection from the large databases conventionally used in economics to include some surveys, field studies and action research (constructive research). Economics itself is also seeking other ways to obtain 'evidence' by using laboratory experiments and simulation (see Plott, 1982; Rosenzweig & Wolpin, 2000; Sugden, 2005).

Economic research is deliberately positive and seeks to improve economic efficiency. The search for efficiency is a major motivator in the economy, and it is to be expected that organised groups of people seeking to make decisions will wish to obtain efficiency whatever their ultimate objectives. Inefficient outcomes will not be sustained by rational groups as some members of the group will propose alternatives with, if necessary, promised side payments to others in the group in order to achieve outcomes that those making side payments will prefer and to which others, including those receiving side payments, are indifferent. However, there may be many actions that satisfy these criteria. Ideally, seeking efficiency will maximise the bundle of outputs available for distribution. Efficiency does not resolve either distribution or ethical issues. Ideally, EMAR seeks to improve the efficiency of organisations. Any attempt to integrate this approach with other approaches to management accounting research must seek to avoid abandoning the positive efficiency orientation of economics-based research. This may be impossible for other approaches that are explicitly normative.

2.4. The Impact of Research on Practice

A strong theme in management accounting generally is that research has had little impact on practice (see, for example, Lee, 2003). Such statements tend to be based on anecdotal evidence. It is difficult to see how such a general hypothesis could be tested and how sufficient data could be assembled to achieve this. Later in this chapter a list of economically based techniques and tools is given, which have impacted on practice. These techniques and tools are not all necessarily explicitly based on EMAR but they are at least based on generally accepted economic notions. This is not to say that all research articles individually or even groups of articles addressing the same subject necessarily impact on practice. The history of acceptance of improvements suggests that acceptance by practice may be very difficult to achieve and may require many attempts over time to gain acceptance. Moreover, such acceptance may be cyclical.

Many articles are not expected to directly impact on practice but rather to explain and predict phe-

nomena and increase understanding of them. Such research may be highly technical and formal and not suitable for an immediate transfer to practice. Principal and agent theory provides an example. However, embedded in formal agency models are a number of prescriptions for management, including that control should be based on information which measures the effort exerted, not on controllability of outcomes by managers as is traditional (Antle & Demski, 1988), and that decisions about managerial incentives are a function of both the rewards offered to management and the risk imposed on them and the trade-offs between them (see later). Principal and agent theory also emphasises that the effectiveness of an incentive scheme depends on whether and how easily such schemes can be re-negotiated by the contracting parties. It also points up the need for incentives to be based on objective information.

EMAR clearly has not had the same impact on the economy as finance theory where major research started around the same time as did substantial research using economics in management accounting. There are many possible reasons for this. One is that management accounting research is focused on the individual organisation, whereas finance theory deals with a better understanding of finance markets and often makes suggestions that improve the workings of markets (for example, options and sophisticated derivatives). This suggests that management accounting research should focus more on theory that impacts across markets. A problem here is that statements to the finance market that the firm has improved either its decision-making system or control system have only a 'one-off' effect on stock prices. Market-perceived improvements in a firm's decision-making procedures and control systems will be reflected in a revision of expected cash flows and their variances. The new net worth of the firm will then remain unchanged unless the expected alteration in cash flows is not justified *ex post* or until a new management accounting system is introduced whereas finance initiatives seem never ending. Economic-orientated management accounting research also suffers relatively to finance research as there are not yet major data banks with which to test analytical theory and also it shares the reluctance of economics researchers to undertake case studies.

3. The Historical Development of Economics-Based Management (Cost) Accounting

It is not intended to review this history in any detail. In this handbook, Boyns & Edwards (2006) and Fleischmann & Tyson (2006) provide full descriptions of the early historical development of cost accounting in the United Kingdom and the United States of America. These and other research articles indicate that much of this history is contestable. Here a few economic strands are considered. These historical uses of economics in cost accounting were based not on university research, but rather on work by practitioners, often engineers and consultants, who did, however, entertain notions taken from economics. This review suggests that even without accounting research, market pressures will help to make firms work in an economical way. It also suggests that some individuals are able to discover some of the relevant economic principles.

3.1. The Early History

The early history of accounting within the firm, from say 1840s to 1910, first involves what might be called bookkeeping for costs and revenues. It secondly has a strong economic base in that its development involved seeking more sophisticated product costs. These above two strands in due course formed the core of cost accounting. The history of the development of costing is much debated. This is not surprising as the archives discovered so far are fragmentary and organisationally and nationally specific. The relatively few writings of leading practitioners suggest an advocacy of new approaches not taken up by industry in general. However, there are a substantial number of illustrations of the early or very early use of advanced concepts. For example, the implied use of opportunity cost reasoning has been found very early in steel companies in Wales (in Jones, 1985). The view adopted in this chapter is that developments in accounting are, at least, partially due to economic factors where desires to improve economic efficiency and to respond to market pressures to reduce costs may be seen as important factors in these developments (Fleischmann & Tyson, 1997; Tyson, 1992). Critics of this view see its proponents as going beyond seeking to discover the effects of accounting developments (an example might be Johnson & Kaplan, 1987; see also Hoskin & Macve, 1996; MacDonald & Richardson, 2002).

Both Chandler (1977) and Solomons (1952b) date the development of modern costing in the United States to the period 1870–1900. They attribute this change to a concern to fix the prices of orders for jobs in an increasingly competitive environment. However, the literature concerned was not representative of general practice that still used rough and ready costing methods focussing only on the prime costs, the outputs of which had only a poor relationship with added cost.

A variety of methods of attaching overheads to prime costs grew up from around the 1880s with the machine hour rate gaining acceptance between 1900 and 1910 (Hamilton Church, 1901, quoted by Solomons, 1952b). Hamilton Church's system did impact on practice. He was critical of both the percentage of wage and labour hours based methods, both of which he regarded as crude. He advocates instead a scientific machine hour rate for each production centre. This involved levying a supplementary rate to solve the problem of dealing with idle capacity. Later practice saw that the supplementary rate was not a cost. The allocation of overheads, although general practice (as it is today), had its contemporary critics. One thrust of these arguments was that it was the market price that mattered (Emerson, 1904). The other criticism was that the allocation of overheads was arbitrary (Hamilton, 1910). Both these themes continue to be debated today. Debated is used advisedly as although research shows conclusively that overhead allocation cannot be other than arbitrary (Thomas, 1969, 1974), practice overwhelmingly continues to use overhead allocation.

The other perspective on costing that was developed at this time and continues to have relevance today is the recognition that cost is a function of the volume of production. The possibility of diminishing returns was recognised in economics as early as the late seventeenth century and at the end of the nineteenth century economists had a more general understanding of the significance of marginal costs than did accountants. The most important accounting publication on costing in the last quarter of nineteenth century was an English book by Garcke & Fells (1887). Garcke was a working electrical engineer and company chairman. John Fells was an accountant who also worked in industry and became a consultant. Their first contribution was to integrate cost accounts with the financial accounting system. They also recognised the futility of the allocation of fixed costs and distinguished fixed costs from variable. This understanding of fixed and variable costs by a few leading accounting thinkers was supported by the early understanding of the 'break-even' chart (Hess, 1903), which encompassed all the usual ideas of said charts.

During this period, accounting was mainly identified with auditing and financial reporting and generally accountants were not involved in cost accounting developments, which were the province of engineers and consultants seeking to solve the practical problems of pricing of jobs and batches of products. It is not clear when accountants became involved. My own guess is that it might date from around the First World War (1914–1918).

3.2. Inter-War Developments

The changes in management accounting from just after the First World War until the 1950s frequently seem to differ between the United States of America and the United Kingdom (see Boyns & Edwards, 2006; Fleischmann & Tyson, 2006). Both national histories suggest that the First World War had little effect on costing systems. However, in the United Kingdom there was a wish to continue the freedom that internal accounting had gained from the dominance of financial accounting and auditing during the war, which led to the foundation of the Institute of Cost and Works Accountants in 1919. Fleischmann & Tyson (2006) suggest that during the interwar period, and, indeed, for some time after, cost accountants were second-class members of the United States' accounting profession. Maybe, cost information and cost control were accorded relatively low importance, as the United States of America was the dominant supplier of manufacturers to the world up until the 1970s. In the United Kingdom, this period is seen as a period of growth in cost accounting.

Both countries saw a 'costing war' in 1920s, a period when full allocation overhead systems were challenged by 'marginal costers' without any obvious conclusion, although many firms currently entertain a marginal contribution perspective. More generally, research suggests that in the two countries the growth of cost accounting and later management accounting cannot be traced to 'trigger' events such as wars, but reflected, as now, developments in the two economies, the changing characters and sizes of firms over time, and the great importance of technology including organizational restructuring.

4. Growth of Economic Management Accounting Research in Universities

As far as is known, no comprehensive treatments exists of the initiation and burgeoning of management accounting research in universities in the twentieth century either in general or concentrating on the part utilising economic reasoning. Of course, a number of articles chart the development of specific management accounting subjects. A number of chapters in this handbook provide more or less detailed descriptions of the development of specific areas of management accounting (see, for example, Haka, 2006, on capital budgets and Merchant & Otley, 2006, on control and accountability). Such a study even if confined to EMAR would be a major endeavour that would, however, represent an important research

contribution. The intention in this section is to give only a flavour of the development of economics-based research by considering a number of indicators. Thus, first, two collections of reprinted cost and management accounting articles edited by David Solomons published in 1952 and in 1968 will be considered. The first was titled *Studies in Costing* and the second *Studies in Cost Analysis* (Solomons, 1952a, 1968).

The first Solomons' volume presents some of the results of the earlier years of university research, and the second the beginning of what might be considered the explosion in economics-based research, which has continued to the present day. A consideration of Bierman & Dyckman (1971) will illustrate other research not covered in our earlier review.

4.1. Studies in Costing (Solomons, 1952a)

This collection consists of two types of article, those written earlier in the late 1930s and 1940s and contemporary leading edge articles. Included were 15 articles involving academics and 9 by businessmen or consultants. The citation dates are those of the original publication to give a feeling for the timing of the ideas. This volume will be reviewed in some detail as some of its content has 'surprise value' and includes research problems that have continued to cause controversy for many years including today.

All the articles involved used economic notions. Some of the items under the subheading *Concepts of Costs and Costing* were interest on capital as part of manufacturing costs (this debate continues today), the debate about direct costing which had ranged especially strongly in the 1920s, standard costing (N.A.C.A., 1948) and criticisms of the use of common-sense bases for overhead allocation not based on empirical evidence. These criticisms included that conventional overhead allocation makes costs a function of capacity and is therefore useless for pricing. A number of other articles were on costs for decision-making and on cost allocation, which have since become classics. Interestingly, these and other similar articles were mainly published in professional journals and were meant to influence practitioners. Costs and joint production were considered to no real purpose (Renold, 1947).

The major economically orientated articles were those written by two UK economists (Coase, 1938; Edwards, 1937a) in the late 1930s. These ideas were supplemented by other articles in the collection, two by Edwards (1937b), one on costing and joint production and one on budgetary control Edwards (1937c), and Baxter (1938) on the economic approach to overhead allocation. Here he gives a very clear critique of the problems with overhead allocation, but suggests that such an allocation could be seen as an attempt to 'proxy' the opportunity cost of fixed resources, a theme that continues to be explored in current research on capacity planning and pricing. These were the first articles to explicitly apply economic cost theory to costing and to contrast the approaches of economists to costs to those of accountants. (However, Clark (1923), an economist, introduced both different costs for different purposes and differential costs for different product mixes.) They argued for the use of economic concepts including marginal and opportunity costs and promulgated the idea of asking in decision-making 'what difference does a proposal make in terms of revenue and costs?'

Coase (1938) and Edwards (1937a) both criticised the conventional allocation of overheads in decision-making although an analytical proof had to wait for Thomas (1969, 1974), albeit within a financial accounting perspective. Coase especially raised many concerns still discussed today, including uncertainty and the use of discounted future cash flows building on the work of Austrian economists. He also showed the importance of opportunity cost in decision-making and applied this reasoning to a number of cost components—including material and depreciation, although opportunity cost reasoning was still quite new to economics. Edwards clearly understood the problems of costing multi-products. All the above articles took economic theory for granted and concentrated on suggesting improvements to accounts and on a new theory of accounting for decision-making. Generally, the articles comprise a substantial repetition of a few themes. None of the articles considered or attempted to provide any treatment of the major agency concerns of today—matters that were not taken up in a formal way until the 1970s (see later), although the collection included two practitioner-based articles on standard costing which included the use of standard overheads.

Among the leading edge articles was an article by Gordon (1948) contrasting the pricing approaches of accountants and economists (full cost allocation versus the marginal approach). This did provide brief references to the use of a formal cost function. Another major economically orientated article was by Grant (1943), a then very advanced treatment of the economics of depreciation grounded on the classic book the *Valuation of Property* by Bonbright (1937). Grant defined depreciation in a number of ways. Depreciation was equal to the change in value of an asset over a period expressed using market value or the 'value to the owner' valuation base, now well

known in financial accounting. Another was the standard accounting approach and the third was called 'appraisal' depreciation where the upper limit on the value of an owned asset is the cost of the same services from the most economical new asset. Grant allows for time value of money and advocates 'sinking fund depreciation'. He makes the important point that this was at the time the conventional theory in engineering. More importantly, he made clear that he (and, presumably, at least other engineering academics) understood the fundamental conservation theorem of residual income. He also says that this relation does not deal with allotting depreciation to periods: a problem that still adheres to residual income today. He makes many other points that would be regarded as contemporary today. For example, he seems to anticipate relative benefit depreciation (see later and Rogerson, 1997). Another leading edge article was a fairly formal treatment by Dean (1951) on Break-Even analysis, which had been discussed earlier in the twentieth century, especially in the 1920s but in a less formal way. Overall, the articles in the collection are not analytical, do not use modelling and suggest that there was little empirical work to call upon. Only illustrative examples from the writers' personal experiences are used.

4.2. Studies in Cost Analysis (1968)

This collection retained a number of articles from the previous collection including Solomons on history (1952b) and articles by Coase (1938), Dean (1951), Edwards (1937a), Grant (1943) and Lang (1947), which suggests that these were seen as classics at the time. The Edwards and Coase articles can be seen as such today. In contrast to the first collection, a few other social science approaches to accounting are included. Only 8 of the articles involved practitioners whereas 28 involved academics. It is not intended to discuss the individual articles in this collection in as much detail as the 1952 collection because there seems to be fewer articles with 'surprise value' to today's researchers.

Relative to the 1952 collection far more of the academic articles were published in research journals by US academics. A number of others were published in the *Harvard Business Review*. Compared with the 1952 collection, a large number of new subjects were included, although Baxter & Oxenfeldt (1961) reiterated the reasoning of Coase and Edwards in an attempt to revivify full cost allocation by suggesting that overheads plus profit may yield a rough guide to opportunity costs. These articles either addressed new tools for accountants or introduced accounting researchers to new disciplines, such as operational research (OR). The new tools included linear programming, regression analysis and statistical control, elementary uncertainty and a mention of the theory of games. There was only one article that employed analytical micro-economics (Oliver, 1962) in the course of deriving an empirical cost function using cross-sectional least-squares regression on actual data on driving and license permits, dealing with all the usual statistical problems, such as heteroscedasticity, at an elementary level.

Generally, all the articles seen through today's lens strike one as elementary. This is not surprising as the material in the collection is between 40- and 50 years old. Anticipating a later section, the question arises as to how long-lived or persistent have been the new research topics in the 1968 collection. Two articles look at the possible relationships between OR and accounting (Beer, 1954; Churchman & Ackloff, 1955). It is suggested that conventional accounting costs are of little use for OR models. Rather the focus is on improving productivity by using appropriate decision models, with costs determined appropriately for the problem. In contrast, accounting seeks cost reduction using budgets and standard costs. It is also suggested that OR needs forward-looking costs and has to deal with uncertainty, intangibles and lost opportunities. The emphasis in OR is strongly on 'scientific modelling'. In the 1960s, co-operation between accounting and OR was seen as having substantial promise.

For a substantial time, linear programming and its variants did figure in accounting research as illustrated by five new articles in the collection employing linear programming. A major contribution of linear programming to management accounting was to use the dual of the original linear programming problem to illustrate and determine opportunity costs (see Samuels, 1965, for a review of the literature in this area). Probably the pinnacle of the use of linear programming in accounting was that of Amey (1969, Chapters 4 and 5) (see also Ijiri, 1965; Ijiri et al., 1963; Mao, 1969; Scapens, 1979) in a book advocating measuring efficiency in relation to optimal planning budgets using a relatively comprehensive linear programming model of the firm. Aside from this, the promise of this approach has not been realised. Surprisingly, this includes goal programming which by incorporating a variety of goals in the programme expands the possible coverage of programming models (see Charnes et al., 1963; Mao, 1969).

The importance attached to the possible contribution of linear programming is signified by the articles in this area in the collection; see Baumol & Sevin (1957), Holton (1961) and Samuels (1965). Ijiri et al.

(1963) exemplifies how a fully fledged linear programming model optimises retained earnings commencing with balance sheet amounts and accounting transactions. An innovative contribution to standard costing is that of Demski (1968) who uses linear programming to generate opportunity cost variances by distinguishing operating variances from planning variances due to changes in the environment.

As has been said, the importance accorded to mathematical programming in this collection does not seem to have persisted in research. However, it was, perhaps, the first approach that required researchers to model the underlying economics of the problem being considered. Programming seems now to be a research tool used where appropriate, although programming is often used in obtaining the solutions of models. The opportunities to use programming seem fairly infrequent. This may be because of the very restrictive assumptions of Leontief technology, which underlies linear programming and seemingly relatively few practical applications.

Four of the new articles are related to new cost concepts. Two articles look at depreciation and find accounting depreciation wanting. Others suggest using variants of economic depreciation. Ross (1960) advocates depreciation based on 'user cost', the present value of the foregone alternative future use resulting from existing use but without considering today's problem of dealing with any 'quasi' or 'super' profits generated by the asset (Grant, 1943). One of the others (Shillinglaw, 1963) introduces the concept of attributable cost, the mean cost per unit that could be avoided if a product or process were discontinued entirely without altering other aspects of the firm's cost architecture. This concept might be seen as progenitor of long-run incremental cost concepts. The fourth article surveys a variety of ways of accounting for multiple products.

Benston (1966) introduces multiple regression analysis (complementing the article by Oliver, 1962). Regression analysis is also used in an article on statistical cost control. Two further articles suggest expansion of break-even analysis to allow for uncertainty and the cost of capital (Jaedicke & Robichek, 1964; Manes, 1966). Uncertainty in the area of statistical control is considered in two articles.

4.3. What is Missing?

Of course, collections of articles reflect the interest of the editor(s) and the perceived interests of readers. This is especially true of Solomons' second collection (1968), which includes articles up to 1965 at a time when research growth and depth were beginning to expand very rapidly. Some indications of other important subjects and further developments of subjects in the collection are given by considering areas not in Solomons (1968). Bierman & Dyckman (1971), in an analytical management accounting textbook, reflected the contemporary research literature. Only chapters either on subjects not represented in Solomons (1968) or showing advances on Solomons (1968) will be considered. The analysis will also trace the developments up to the present of those subjects in Bierman & Dyckman (1971), which no longer are major subjects for EMAR.

The first chapter on cost accounting systems had little new in it, but does suggest that a contribution margin approach to overheads is better than the standard approach to fixed cost variances (Horngren, 1967; Schwayder, 1968). The second chapter deals in a more advanced way than in Solomons (1968) with statistical cost control, for example, it includes Bayesian revision. It is, of course, quite derivative of statistics and information economics (see Pratt et al., 1965, for a classic treatment).

Chapter 4 features learning curves at a very simple level. This is a subject that did figure in research and is still important in some industries, but generally has not been incorporated in cost functions used by accounting researchers. The next chapter is on Cost–Price–Volume decisions, which were well represented in Solomons' second collection. The chapter does, however, illustrate the level of cost modelling in accounting at the time. This is very straightforward (variable and fixed costs). No attempt is made to model the assumed technology involved as we did in an illustrative way earlier in this chapter (see also Christensen & Hemmer, 2006). For a comparison with the then much more technical and richer approach in micro-economic theory, see Henderson & Quandt (1958), Chapter 3. Chapter 8 discusses joint cost and joint products where jointness is reserved for operations that automatically generate multi-products in fixed proportions; the remaining costs discussed being those that would now be called common costs. It is accepted, as is now standard, that the distinction between these two types of costs is blurred. Currently, both types of costs are often labelled common costs. In Bierman & Dyckman (1971), joint products are to be costed as a bundle and equated to the marginal revenue of the bundle. Other than this, joint costs are to be allocated using preferably the gross sales value method, although the alternative of charging for joint costs on the basis of the elasticity of demand of the joint products is introduced (Bromwich & Hong, 2000). Chapter 9 discusses distribution costs (King, 1964), a subject which seems to come and go in terms of later research.

Chapter 17 discusses the then very recent idea of using present value-related performance measures. Here depreciation is equated to economic depreciation (taken as annuity depreciation). They also advocate the charging of imputed interest. Although the use of present values represents a major change in management accounting, the authors did not explicitly mention residual income, which was advocated by Solomons (1965) and which now forms a major strand of EMAR.

4.3.1. Transfer Pricing

Chapter 11 gave a good presentation of the economic aspects of transfer pricing using the well-established economics (see Gould, 1964; Hirshleifer, 1956, 1957). The approach utilised is, of course, a purely economic one. The total marginal cost of a firm's divisions (intermediate product division and a distribution division) is equated with the firm's marginal revenue so as to determine optimal output to maximise profits. The transfer price between the two divisions is set at the intermediate product division's marginal cost assuming no alternative market exists for the intermediate product. The classic treatments encompass the cases of a monopolistic buying division and a monopolistic selling division and imperfections in the final selling market. The dangers of unthinkingly using marginal costs for transfer prices are spelt out, and it is suggested that the setting of transfer prices cannot be restricted to the results of economic analysis. A major paradox of transfer pricing, which still concerns later writers, is not mentioned. Firms are assumed to arise because of the advantages of internalising market imperfections, but the use of transfer prices seek to restore the (presumably, imperfect) market within the firm. There is no analytical discussion of why decentralisation might be necessary.

Later work has modelled situations where the classic marginal cost transfer price is not optimal, see Göx & Schiller (2006). For example, where divisional managers have private knowledge of the effect of divisional effort relative to the results of using resources transferred from the centre and, therefore, seek to reduce divisional effort by using excessive amounts of transferred resource. This problem is overcome by setting the transfer price above cost (Antle & Fellingham, 1997; Harris et al., 1982). Several problems in transfer pricing have been considered in the later literature. All of these use theories that have originated elsewhere, especially in agency theory. They indicate a need to depart from the classical marginal cost transfer price.

Adverse selection arises where an agent has asymmetric information concerning the quality of resources including his or her own quality. Here the transfer price to the buying division comprises the seller's cost of production, a reimbursement of the agent's personal cost of achieving target level of effort plus payments for the expected value of the agent's information (Vaysman, 1996). A 'hold-up' problem arises where a division undertakes an upfront investment, the fruits of which can only be realised by selling the division's product within the firm. The investing division is therefore vulnerable to exploitation by other parts of the firm. Here, the classic marginal cost transfer price will not work if the investment is cost reducing. Edlin & Reichelstein (1995) show that one possible solution is to allow divisions to negotiate provided that if negotiations break down the centre enforces a default quantity of the intermediate product that ensures the investing division invests efficiently. It has also been shown that if a firm's transfer regime is public, strategic considerations can affect transfer prices (Göx, 2000). Another research thrust is to make comparisons between different transfer pricing schemes (Baldenius, 2000). In my view, this area is not currently a widely shared major research thrust, at least in terms of its 'feed forward' to other areas. It may, however, be an important element in exploring analytically the shifts in the boundaries of organisations (see, for example, Baiman & Rajan, 2002). This may also generate a compelling theory of decentralisation.

4.3.2. Capital Budgeting

Most of the remainder of the book (Chapters 13–16) is concerned with capital budgeting. This covers now very familiar ground including internal rate of return versus net present value, debt refunding, the lease or buy decision, inflation and risk and utility—all at a now fairly elementary level. The cost of capital and capital rationing were not addressed, although substantial literature in both had built up by 1971 (see Baumol & Quandt, 1965; Hirshleifer, 1970; Lorie & Savage, 1955). This may suggest that the split between finance and accounting had, at least, begun to happen in the 1970s. It is now almost universal in the United States. Current EMAR research tends to assume that the cost of capital is determined exogenously from the management accounting system and does not consider capital rationing.

Clearly, capital budgeting is an example of an analytical economic approach. It involves modelling cash flows and allowing for risk preferences so as to maximise the net worth of the principal by following

analytical rules. However, management accounting researchers have not and do not make much of contribution to mainstream models. Of course, the ideas of and uses of discounting have a very long history. Haka (2006), in a very good survey of capital budgeting, indicates that engineers developed these ideas in an investment context in the late nineteenth and early twentieth centuries (including Grant, an author in the first Solomons collection, 1952). Much of then extant theory was developed in the 1950s by economists and finance researchers (see Solomon, 1959, for a collection of some of the most important articles). Only one accountant researcher stands out as contributing at this time (Shillinglaw, 1955). It was not until the 1950s that these ideas began to be publicised (for the first textbook, see Dean, 1951). Possibly, the most well-known US book was *The Capital Budgeting Decision* first published by Bierman & Smidt (1960). Possibly the equivalent UK book, though based on more research by the authors, was by Merrett & Sykes (1963). Haka (2006) gives Robert Anthony, an accounting professor at Harvard, the role of being a principal agent of the diffusion of discounted cash flow procedures through his textbook, *Management Accounting: Text and Cases,* first published in 1956. The lack of an EMAR contribution is also true of the major later developments in the area, such as real options (Dixit & Pindyck, 1996). However, some accounting researchers have used real options in their work (Antle et al., 2001). Accounting researchers have, however, worked on a number of capital budgeting problems in an agency context. One in an agency context is discussed by Lambert (2001) (see also Lambert, 2006), where agency models with private information are used to model capital budgeting decisions where the agent is able to capitalise some investment resources for personal use (Antle & Fellingham, 1997). Other agency models have considered investment authority levels, the project search process and the use of residual income in managerial incentives in capital budgeting (see Haka, 2006, Section 4). Another area where accounting researchers have been active is in obtaining empirical evidence of the use of capital budgeting techniques and their diffusion (Haka, 1987; Klammer, 1973; Pike, 1983).

Reading the wider literature on capital budgeting as discussed by Haka (2006), it is difficult to escape the view that the capital budgeting 'game' involves much more than just the economic analytics of investment appraisal. Predictions in the area have to allow for a wide set of variables, including information imperfections, organisational and societal structures, seemingly plain irrationality and unexpected results. The economic approach is, however, richer in its consideration of some of these aspects than might be thought. At its most sophisticated, it allows for personal maximisation by the principal and agent(s) allowing for both some cooperative and altruistic conduct, differing discount rates, time spans and risk preferences, differentiated personal information, incentive structures, options to future conduct and the exploitation of synergies. Personal maximisation is limited by the contracts used, the legal regime and the enforceable parts of the regulatory environment.

My own feeling is that leaving mainstream capital budgeting (and, indeed, corporate finance) to finance researchers denies EMAR major research opportunities. As finance incorporates more institutions and becomes more behavioural, there are more opportunities for accounting and finance researchers to work together.

5. Major Research Thrusts

Here a few selected research areas that are both contemporary and active and have demonstrated persistence will be considered. Most are subject to separate chapters in this handbook, and therefore detailed (and without doubt), weaker, reviews of these areas are not provided here. Rather, the emphasis is on identifying them as examples of EMAR and their role in aiding our understanding of management accounting. One thing is clear that these research endeavours taken together with those discussed earlier cover only part of the research space of management accounting. There is great promise in EMAR researchers co-operating with others who use a different 'lens' to consider management accounting. Other disciplines and approaches dominate in a number of areas including a concern for organisational and national cultures, budgets, operations management, non-financial measures, management control systems, inter-organisational and inter-country settings. Some of the topics that might benefit from initial or additional EMAR not considered in this chapter are budgets and budgeting, including cost variances and cost management, responsibility accounting, international control (and international aspects more generally), product costing, quality, just in time and benchmarking. These topics are taken from a taxonomy of management accounting research suggested by Shields (1997). We now consider a few major research areas in EMAR not yet taken up in this article.

5.1. Information Economics Including Decision-Making with Uncertainty

This cannot really be discussed without considering its fundamental role in agency and imperfect

contracting for which it is both a necessary prior development and an essential continuing foundation. However, it does have a separate existence in providing information for decision-making outside the incentive and performance literature.

As is the usual pattern suggested in this chapter, much of the core development of information economics took place outside management accounting, and accounting generally. Writing in 1964, Fishburn (1964) indicated that there had been a large body of work on decision theory since the Second World War although, of course, key elements like modern utility theory grounded on rational axioms and subjective probabilities had been understood to a degree for a long time (see Luce & Raiffa, 1957; Savage, 1954; Von Neumann & Morgenstern, 1947). Similarly, the concept of the value of information was well known at this time. Thus, Marschak coined the term the demand value of information and of inexact information in 1954 (Marschak, 1954). Here the value of an information channel is defined as the difference between the maximum utility determined in terms of certainty equivalents achievable with and without the information channel. Later work refined this definition (Arrow, 1970, originally published in 1963). Marschak & Radner (1972) approached information via the theory of teams where the concern is achieving optimal communication between agents with different information sets but with a common utility function, thus abstracting from moral hazard.

Possibly the other major development in information economics was the use of the concept of fineness of information structures where fineness refers to the richness of the signals from an information structure. Fineness allows the comparison of costless information structures for all choice problems for which they are relevant for a finite set of states and signals. Two information systems will be ranked equally if they are as fine as each other; that is, if one structure can be 'garbled' (without access to additional information) so as to provide at least identical signals to the other. The first system will be preferred where one system is a sub-partition of the other. Unfortunately, not all or, perhaps, even many, information systems are comparable in their degrees of fineness (see Blackwell & Girschick, 1954; Marschak & Miyasawa, 1968; McGuire, 1972).

As was made clear earlier (see Section 2), information economics is a core and an essential discipline to EMAR involving maximisation of expected utility of the principal allowing for the uncertainty attached to states, risk attitudes and time preference, and the revision of *ex ante* information incorporating the actual signals from the information set via Bayesian revision so as to update state probabilities. Attempts to simplify decision models have been suggested (as in Demski & Feltham, 1976, Chapter 3). (For more recent treatment see Demski, 1994.) These attempts to make problems amenable to analysis represent a major contribution to using uncertainty models in more real world settings, and free such models to a degree from the confines of abstract rigour. However, there are difficulties with the information economics approach when used within the organisation with multi-actors, as individual preferences may have to be taken into account because a well-organised market may not be available to allow the individual to optimise using the market. Here an acceptable sharing arrangement may be impossible. Arrow's impossibility theorem says no mechanism exists that provides a collective choice solution, which does not infringe simple rules or requirements that are believed to be generally shared (Arrow, 1963a).[5] This really means that solutions in multi-person settings generally have to be imperfect and second best. Even here, in order to avoid the problem of gauging individual preferences some representational utility function is often used. One way forward is to modify the problem into a simpler pay-off adequate model.

I am sure I am being very unfair to many researchers but three accounting researchers, Butterworth, Demski and Feltham (in alphabetical order only), have led the way in making information economics an essential tool of accounting researchers, although the current leading edge models are mathematically more sophisticated and employed over a much wider range of settings. Importantly, they pioneered designing models relevant to accounting generally and to management accounting particularly. Feltham wrote the first article introducing information economics and the valuation of information systems to accountants (Feltham, 1968; see also Feltham & Demski, 1970). He followed this up by a research monograph somewhat more aimed towards management accounting (Feltham, 1972). Demski (1972) authored a research monograph on information analysis focusing on information choice and control decisions. Butterworth's (1972) contribution was to suggest the use of simplified decision models

[5]These requirements include: all desired outcomes are admissible and can be completely and transitively ordered, pareto optimality, the independence of irrelevant alternatives (those not in the setting being modelled) and non-dictatorship (Sen, 1970).

structured using matrix algebra in order to make solutions computationally practical. He discusses this mainly in a financial accounting context, although he provides an early but fairly exhaustive discussion of the value of information and the comparative values of information systems. In a variety of papers, he also explored the bounds that could be put on the value of information.[6]

A specific contribution of Demski (1969) was to combine the planning and control views of the decision process. Here, knowledge of the decision-making model is assumed and it is then sought to optimise as best as we can with the information system used for the decision. The assumptions made prior to the decision and the decision model itself provide 'feedforward' information, which aids predicting the optimum action. 'Feedback' is information about significant errors in prior information and the decision model. It is pointed out that such errors may be difficult to detect and here it may be necessary to resort to heuristic methods.

This brief summary of the early work in information economics in accounting is unrepresentative of the continuing output of these and other authors. Modern information economics research has shifted away from the OR approach of seeking the optimal information system to trying to understand the reasons for and consequences of using different information systems and altering existing systems. In my view, the use of information economics in EMAR has become an integral part of agency and contract research. One major area of growth outside this context has been seeking to understand public information in multi-person models (as distinct from the earlier work that sought to optimise for a single principal or decision–maker, see Christensen & Feltham, 2003). This research thrust may seem a little removed from EMAR, but management accounting is becoming more related to stock markets and more involved with effect of published enterprise information in, for example, helping to compile narrative reports explaining the firm's likely future. Moreover, one of the major, somewhat under-investigated, problems in management accounting is how far should reports be made public within the firm. That is, should performance reports be widely shared or should they be confined to subordinate–superior relations? This aspect of information may become more important as the boundaries of firms become more nebulous. Another recent extension of information economics is looking at errors in costing and performance measures and seeing how individual errors may interact with other errors, often producing counter-intuitive results (for a recent paper see Arya et al., 2004, and for a detailed survey, see Labro, 2006).

Information economics has been a persistent research approach, which has now been strongly integrated into management accounting research and, indeed, accounting research generally.

5.2. Agency Theory

Modern agency theory is very rich in theoretical findings across a very wide area of management accounting. Here, we generally focus on the principal and agent model. As this body of thought is reviewed by Lambert (2001, 2006; a more technical approach), only a few major research thrusts will be reviewed here. Good technical introductions are Laffont & Martimont (2002) and Macho-Stadler & Perez-Castrillo (2001), but my personal favourite is Kreps (1990) Part IV. Demski (1994, Chapters 18–24) provides a more accounting orientated approach. Agency theory clearly falls into the area of EMAR. The simplest (moral hazard) variant has a principal who delegates an effortful task to a better informed risk-averse agent. It seeks to maximise the usually risk-neutral principal's wealth in an uncertain setting by the principal selecting an incentive function which ensures that the risk-averse agent by personally optimising with this incentive function adopts conduct congruent with the principal's wishes. This conduct is guaranteed by the principal seeking to maximise subject to satisfying the agent's participation constraint and incentive compatibility constraint, which ensures that it is in the agent's best interest to pursue the principal's wishes. Thus, agency theory involves personal maximisation under uncertainty. It has been criticised for this. A very mild version of this criticism is 'this literature tends to consider the employee as an individual who is motivated solely by financial considerations. The reality is somewhat more complicated than this simple model implies, although, it can be used to gain insights in real world behaviour' (Otley, 2005: 92).

Generally, agency theory utilises most of the assumptions of micro-theory. For example, it usually assumes that all markets the firm deals with are perfect and in equilibrium (but see Fama, 1980). Indeed, the only imperfection in the simple variant discussed above is asymmetric information (here hidden action) where the principal knows everything the agent knows except the action taken by the agent which cannot be contracted upon as it is non-verifiable by a third party. Thus, agency theory deals with second-best solutions

[6]Butterworth died in 1984. A full bibliography of his work is in Feltham et al. (1988) (pp. 14–16).

(first best is where all information is known to both parties).

The resulting contract is expensive to the principal in that it involves a deviation from the optimal risk sharing solution of the first best contract where the risk-neutral principal bears all the risk and the risk-averse agent bears none. However, in the second-best situation, the optimal contract requires the agent to bear risk in order to incentivise the degree of effort desired by the principal. Thus, the principal has to pay the agent for bearing this risk.

With averse selection the contract imposes costs on the principal relative to the first best (full information) contract because the principal has to pay to obtain or extract the private information processed by the agent. Although in both cases, the distortion away from fully perfect and complete markets may seem small, contracts allowing for such deviations may be very complex even in simple settings. The portfolio of settings that may be characterised as even simple agency problems is very rich.

Looking at this description of the cardinal agency models makes it clear why agency has such appeal to the EMAR researchers. The rise of agency theory allowed for the first time the use of analytical and economic approaches to incentive structures and optimal performance measurement. It provided a rational, purely economic framework for problems in setting performance measurement targets, such as the level at which budgetary and standard costing targets should be set, whether more than one performance measure is optimal and what types of contracts are optimal in different situations. It also helps to answer continuing management accounting questions, such as why are overheads allocated, and suggests the best types of remuneration packages for achieving a given purpose. It also promises answers to questions, such as why is performance measurement so difficult.

But its contribution is in providing theories, that is, it helps to understand aspects of the application of agency theory to management accounting and to make predictions about management accounting. It has proved enormously difficult to derive direct and practical improvements from the theory. For example, even in a simple setting, the agent's incentive function may be nonlinear in the performance measures used. Of course, as has been said, a number of high-level general suggestions have been made. The theory can also say important things about optimal delegation within the firm and about how its relationships with other firms might be organised. Agency theory has highlighted the 'hold-up' problem both within the firm and between firms.

In my view, extant agency models cannot provide simple universal prescriptions for performance improvement such as are 'promised' by such methods as economic value added approaches, such as EVA (copyrighted by Stern Stewart), ABC and the balanced scorecard. This is because the settings dealt with by agency are intrinsically complex. Linear incentive contracts have been used by many researchers, perhaps reflecting the wish for practical application but also recognising that, at least, anecdotal evidence suggests that many incentive systems used in practice appear to be linear of the form $a+bx$, where a is a constant and b is the reward coefficient based on x the observed performance measure. Holmström & Milgrom (1987) have derived the conditions under which linear contracts can be used without distortion from optimal models. These are especially useful in multi-action and multi-period settings. However, such contracts work only under very restrictive assumptions but they are used for a variety of reasons. First, as has been said, on the grounds that practical incentive systems generally appear to be linear. Secondly, their use allows highly complex models to be solved. Thirdly, such models yield results seemingly congruent with intuition. Thus, researchers using linear contracts trade off optimal contracts for tractability. The problem here is that it may be very difficult to determine the cost of this in terms of foregone optimality (see Hemmer, 2004).

5.2.1. Early Development of Agency

As with most of the other subjects discussed here, agency theory understood here as principal and agency models was developed originally by economists. Part of the first chapter of Laffont & Martimont (2002) traces the early discussion about incentives in classical and neo-classical economics when this was not seen as a mainstream issue. Barnard (1938), a manager and management writer, was, perhaps, the person who originated modern concerns with agency though at a non-technical level. In his *Functions of the Executive*, he stressed the need to give incentives to people to cooperate in organisations. He also presented the logic of the participation constraint, saying that people will only be willing to join or stay in an organisation if promised at least what they could earn elsewhere. Arrow (1963b) was the first economist to introduce the concept of moral hazard as an important aspect of management. Ross (1974) was one of the first who defined the problem formally as an agent/principal relationship. He formulated the now classical agency problem and stresses the need to obtain congruency between what

the principal desires and what is optimal for the agent by inducing similarity in the agent's and principal's view of actions. This is achieved by insuring the agent against risk so that the agent is willing to adjust to the principal's utility function. Here Ross is interested in avoiding the problem of different risk attitudes between the principal and the agent. He does not consider the problem of getting the agent to extend the optimal amount of effort desired by the principal. A number of people contributed to bring the agency model to the form in which we know it today. Holmström (1979) sets out the moral hazard model in its now familiar shape. Mirrlees (1971) laid the groundwork for today's familiar model by showing that the standard solution model of maximising subject to constraints and solving for first-order conditions would not work unless the optimum for the agent was unique. In a classic paper, Grossman & Hart (1983) solved this problem by suggesting that the solution should be undertaken in the now familiar two steps. First, for each given action the principal should find an incentive scheme that minimises the cost of the agent choosing that action and secondly, the agent should choose the action that optimises net benefits for the principal. They also showed that the agent's reward should be based on how strongly the information available signals the effort extended (using the monotone likelihood ratio condition). Finally, they also demonstrate that the reward to the agent should not necessarily be always increasing with the performance measure.

Holmström's (1979) article additionally generated a major stream in EMAR. He was the first researcher to investigate the importance of the availability of multi-performance measures to the principal. He showed that additional information sources are useful, providing that no one information source is a sufficient statistic for the agent's effort. This led to a number of articles, some of which have been taken up in the economics literature. One of the most important of these was that of Gjesdal (1981) who showed that the information required for monitoring agent effort was different from that required for optimal decisions. Antle & Demski (1988) used Holmström's framework to show that the traditional view of controllability where the manager was held responsible for only those items that can be affected by the manager's activities was wrong. They show that any signal that contains information about managerial effort should be used in optimal performance measurement. Banker & Datar (1989) and Feltham & Xie (1994) utilise this framework to examine optimal performance measurement. Feltham & Xie (1994) show that using multi-performance measures can overcome flaws in a single measure. Thus, a short-term measure that is not necessarily strongly congruent with the principal's goals but is verifiable can be supplemented by a long-term measure that better reflects goal congruence but has a lesser degree of verifiability.

Early uses of agency theory in accounting were by Butterworth et al. (1981), Demski & Feltham (1979), and Butterworth & Falk (1983). Butterworth et al. (1981) argued strongly from an agency point of view that accounting should play a stronger role in performance measurement and in contractual settings. In a more management accounting orientated paper, Demski & Feltham (1979) explore the implications of an agency perspective embracing both moral hazard and adverse selection. They show that budget-based incentive systems are superior (in terms of the benefits being shared) to a linear contract in terms of performance measures.

5.2.2. Modern Management Accounting and Agency

The growth of agency and contracting research in management accounting over the last 30 years has been enormous. The details will be left to Lambert (2006). Here I will just catalogue some of the major areas of endeavour. The literature has increased our understanding of management accounting immensely. My own feeling is that without the ability to use agency theory EMAR would have achieved much less. One thing that does emerge from reading surveys, such as Lambert (2001), is that a relatively small number of researchers are responsible for most agency articles in both general accounting journals (however defined) and in the two specialist management accounting journals. However, this group of researchers are very persistent in generating research contributions.

Agency theory is very rich in applications. To give a flavour of this important part of EMAR and to conclude the discussion of agency, Table 1 lists a number of agency applications by subject area (mainly involving moral hazard) (not ordered in any special way).

Table 1 also gives for each subject area some representative authors and articles. The author selection is chosen to give only an indication of some of the people working in the area and the articles are generally the ones that have often been cited. There are many others that could be quoted. I have tended to choose 'old favourites'.

5.3. Apologies

There are many other areas of EMAR that could be reviewed but space precludes much further discussion. Most of these other topics are in any case

Table 1. Some important applications of agency research in management accounting.

Subject	Representative authors	Representative articles
Capital budgets, including residual income	Antle, Fellingham, Eppen, Reichelstein and Rogerson	Antle & Fellingham (1997). Rogerson (1997)
Aggregation of performance measures	Banker, Datar, Feltham and Xie	Banker & Datar (1989) Feltham & Xie (1994)
Controllability of performance and relative performance evaluation	Antle, Demski, Dye, Baiman and Noel	Antle & Demski (1988) Baiman & Noel (1982) Dye (1992)
Use of non-financial measures	Hemmer, Ittner and Larcker	Hemmer (1996) Ittner et al. (1997)
Additional performance measures including stock-based performance margins	Bushman, Indjejikian, Banker, Datar, Dutta, Feltham, Reichelstein and Xie	Bushman & Indjejikian (1993) Banker & Datar (1989) Dutta & Reichelstein (2005) Feltham & Xie (1994)
Transfer pricing and boundaries of the firm	Baldenius, Baiman and Rajan	Baldenius (2000) Baiman & Rajan (2002)
Cost allocation	Demski, Magee and Wagenhofer	Magee (1988) Wagenhofer (1996)

reviewed in the subject chapters of this handbook. However, I do wish to say something about two final subjects.

5.3.1. Cost Structures

The first is work in the areas of cost structures (see Christensen & Hemmer, 2006). My impression (with no attempt to back this evidence) is that for a long time EMAR in this area has lagged behind developments in economies. Thus, what is called production analysis in economics—the relation between the cost function and the firm's underlying technology—was slow to enter into EMAR. Work on multi-products and economics of scope has not really been taken up (see Baumol et al., 1988). Similarly, EMAR has not developed a substantial literature on jointness between cost objects (see Baumol et al., 1988; Faulhaber, 1975; see also Bromwich & Hong, 2000, for one such attempt). Nor have EMAR researchers really developed methods to deal with the effects of jointness between cost objects on determining what are permissible cost structures (the presence of jointness would seem to invalidate the application of ABC; see Bromwich & Hong, 1999). EMAR was late in subjecting ABC to analysis (the first article was Noreen, 1991). However, analytical articles focusing on ABC have improved the general approach used in EMAR towards cost structures (see Bromwich & Hong, 1999; Christensen & Demski, 1997). My own view is that we now have a reasonable idea under what conditions the use of ABC (and its variants) reflects the underlying technology of the firm. Similarly, recent attempts to explore how far ABC permits escape from the distortions of costs induced by allocation methods and by extant cost structures have led to a wider concern with trying to understand how cost distortions arise and the many factors that may cause such distortions (see Datar & Gupta, 1994; Datar et al., 1993). Whatever the merits or otherwise of ABC, it has, with something of a lag, strengthened EMAR's enquiries into cost functions.

Another research thrust involving cost structures is that concerned with determining the cost of capacity and exploring its relationship with pricing (see Balakrishnan & Sivaramakrishnan, 2002, for a very good review; see also Banker & Hughes, 1994; Göx, 2002). Here, one reason for allocating fixed overheads is explored.

As was said earlier, the costing of capacity is a classic economic question (Viner, 1931). The classical answer is clear. At the point where capacity is equal to the quantity demanded with given prices, long-run marginal cost (LRMC) equals short-run marginal cost (SRMC). Thus, either LRMC, which includes the cost of capacity (expressed in terms of a capacity cost per unit of production and assuming no joint assets exist), or SRMC may be used in decision-making. Thus, here full costing can be used in decision-making. However, this provides no justification for using arbitrary overhead allocations. If capacity is too low then opportunity cost should be used to value production. SRMC, which does not include any capacity costs (on the assumption of no alternative use), should be used where there is excess capacity.

Current studies extend this setting to allow for pricing and capacity planning using simple second-best rules because fully fledged models are held to be impossible to solve. These studies allow for hard and soft constraints on capacity. Soft constraints permit expansion of capacity but with a penalty cost.

The conclusions generated are generally, strikingly similar to the classical results. As might be expected with soft constraints, the opportunity cost associated with capacity becomes the full cost of the product unit (including the cost of additional capacity). The analysis becomes more complex when pricing flexibility is allowed. A new emphasis is to discover conditions where capacity and process decisions are separable for individual resources or products. For example, this is possible where capacity can be augmented (Banker & Hughes, 1994). However, Göx (2002) shows that the classical answer of using marginal cost becomes important again when demand is revealed after capacity is planned but prior to prices being set, that is, full cost cannot be used generally.

5.3.2. Residual Income

Residual income is a little unusual in its development and in its permanency as a research strand relative to other subjects discussed here.[7] Preinreich (1938) who, amazingly, was a sole practitioner, showed that using residual income provided another way of calculating the present value of a capital project (see also Grant, 1943; Lücke, 1955, a German accounting academic). He also anticipated the ability to reconcile accounting figures and capital values. He however makes little of the fact that this applies for any book value and method of depreciation—an important finding that has been regularly re-discovered by accounting researchers (including Edwards & Bell, 1961; Peasnell, 1982). No further developments occurred in this area in a management accounting context until it was revivified by Solomons (1965), seemingly after observing its limited use in practice and without explicit reference to earlier research. This stimulated a number of research themes by accounting researchers, mainly from the UK (see Bromwich & Walker, 1998). In the early 1970s, Bromwich (1973) and Flower (1971) identified a major problem that still plagues this area. The residual income for any period may not yield signals consistent with project net present values. Flower and Bromwich anticipated Rogerson's (1997) work by showing that using economic depreciation (a variant of relative benefit depreciation, Rogerson, 1997) dealt with this problem. Grinyer (1985, 1987) suggested another method using relative benefit depreciation. This strand of research was taken no further forward in the 1970s, as relative benefit depreciation (sometimes, appreciation rather than depreciation) was thought unlikely to obtain theoretical and, more importantly, practical acceptance.

The subject of residual income was again resurrected in the 1990s in three separate strands that seem to be independent of the earlier research. Stern Stewart and others argued for the practical application of residual income to ensure that managers were incentivised to select positive NPV projects (Stern et al., 1995). This body of practically orientated work used a number of techniques to smooth the earlier problems and others flowing from using traditional financial accounting. Independently, Ohlson, and later Feltham, used residual income to reconcile corporate valuations based on financial accounting numbers with stock market values (see Feltham & Ohlson, 1995). Finally, in the 1990s, Reichelstein (1997) writing in the context of divisional performance measurement showed, utilising Rogerson's work, that residual income based performance measures are the only ones that can achieve goal congruence between divisional management and corporate management; Reichelstein and others have used this basic framework in a variety of ways. Dutta & Reichelstein (2005) review some of the earlier findings in this area and discuss multi-performance measures in a multi-period and multi-task agency problem. They show that optimal performance measurement requires the use of cash flows, accruals and stock prices. Accounting income in the form of residual income provides desirable investment incentives as it protects the agent from the immediate effects of investment outlays by capitalising investment expenditures, but with 'soft' assets will provide accounting measurements with error. A performance measure based on forward-looking stock market prices has desirable incentive properties but includes items beyond the manager's control. They find that a weighted average of market value added and residual income provides an optimal performance measure. The weights depend on the errors in accounting capitalisation and the variability of future cash flows reflected in stock prices. Dutta and Reichelstein's ability to extend the area of employment of residual income research is to be welcomed.

As one of the residual income researchers of the 1970s, I still worry that relative benefit depreciation may be a major problem for both the theoretical and practical acceptance of incentive systems based on residual income. Some of these concerns might be overcome if market price-based valuation were adopted for all assets and liabilities. See Bromwich & Walker (1998) for other possible problems with residual income.

[7]This section relies upon Bromwich & Walker (1998).

6. Conclusions

This chapter first attempted to explain and demonstrate what constitutes EMAR and briefly set out the methods and assumptions used. Introductory matters also dealt with include the development of accounting based on economics, the spill-over of EMAR to economics and some criticisms of EMAR.

It was suggested that EMAR, as now understood, began in the late 1960s/early 1970s. Some EMAR subjects that were either to be further refined or appeared in management accounting after the early 1970s were presented. First, the development of capital budgeting was discussed and then growth of information economics in management accounting was charted, and finally the application of agency theory to management accounting over time was also discussed. In my view, these three subjects illustrate 'permanent' components of EMAR even though capital budgeting has been neglected in EMAR.

Research on capital budgets, information economics and agency theory in the 1970s imported research from economics and really for the first time applied the full characteristics of EMAR. Of course, information economics and agency have since diversified from, at least, some of the problems investigated by economists to encompass a wide range of accounting concerns. It might be predicted that as economics looks at areas of interest to accounting the feedback between accounting and economics will intensify. The number of fundamental findings in accounting seems small. However, there is no reason to assume that next major results may not arise from accounting researchers.

6.1. Persistence in Research

One interesting question arising from our survey is the different degrees of persistency of the research thrusts identified. Opportunity cost reasoning is now used unconsciously by most accounting researchers and has entered into the language of practitioners. Early interest in mainstream budgetary control and standard costing does not seem to have persisted significantly over time with only a few articles in recent years (mainly of an agency nature). Little seems to have come from the wish for accounting and operations research to cooperate. Linear programming and mathematical programming generally have not continued to be used significantly in EMAR (except that many models involve mathematical programming solutions). It would be an interesting research project to address the reasons for this but some current common areas, such as supply chains, do involve integration of the two disciplines. Transfer pricing seems to be making slow progress and has not generated a theory capable of explaining the use of decentralisation (Göx & Schiller, 2006).

Generally, capital budgeting has disappeared from EMAR (Haka, 2006). As I have suggested, this is a mistake as the concerns of management accounting can affect the cost of capital and funding decisions. I believe we should welcome much more interaction between finance and accounting and also believe this is a promising area for EMAR research. Christensen & Feltham (2003) provide evidence for this claim. Two very persistent and still developing streams of research are information economics and agency, although the non-agency aspects of information economics seem somewhat neglected. Feltham (2005) views agency as a sub-discipline of information economics. As was indicated early residual income has been resurrected. It is too early to say whether ABC will become a continuing research stream as it is to say whether the associated revitalised interest in cost structures will be sustained.

One development that comes out of our survey is that the early wish to directly influence practice has been substituted by a desire to understand management accounting and to make analytically based predictions and generate hypotheses about management accounting. Some commentators feel that the ultimate test of the success of management accounting research is its impact on practice, and that management accounting generally and EMAR have failed this test. It is not possible here to attempt to evaluate this view (but see earlier). However, it might be said that it is often difficult to predict which, if any, part of a research portfolio will impact on practice in time. The uses of management accounting are often firm, industry and culture specific, and this militates against general application of research findings.

My own, probably unfair, reading of our survey is that much of EMAR is conducted in somewhat isolated and subject-dependent islands, even though they generally speak a common language. Currently, each island seems to have a fairly static population of researchers. Moreover, 'tourism' is very difficult and neither encouraged nor liked by potential travellers. I believe that EMAR would gain from more interaction between its, possibly, self-imposed disciplinary areas. Most ideas are exported from the largest island: where the subjects of concern are information economics, imperfect contracting and predominantly agency. It is a matter of concern that new paradigms do not seem obviously to be emerging.

Although many commentators argue that EMAR should widen its scope to encompass findings from other research areas addressing management accounting, our survey does not suggest that this is

happening. Moreover, at least some EMAR researchers would be cautious about such endeavours. See Zimmerman (2001) addressing a different context.

One other possible casual conclusion from this survey is that only a relatively few writers are responsible for much of the current EMAR output and this tendency is, perhaps, more pronounced in sub-areas of EMAR. As an illustration, of the 93 citations in Lambert (2006), 47 per cent of these involved one or more of only 10 authors. Widening the catchment area of authors can only improve EMAR.

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Theorizing Contingencies in Management Control Systems Research

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Abstract: Contingency-based research has a long tradition in the study of management control systems (MCS). Researchers have attempted to explain the effectiveness of MCS by examining designs that best suit the nature of the environment, technology, size, structure, strategy and national culture. In recent years, contingency-based research has maintained its popularity with studies including these variables but redefining them in contemporary terms. This chapter provides a critical review of findings from contingency-based studies over the past 25 yr, deriving a series of propositions relating MCS to organizational context. The chapter examines issues related to the purpose of MCS, the elements of MCS, the meaning and measurement of contextual variables and issues concerning theory development. The final section considers the possibility that contingency-based ideas can encompass insights from a variety of theories to help understand MCS within its organizational context.

1. Introduction

The three purposes of this chapter are to provide a review of empirical, contingency-based research as it has developed since the early 1980s; to critically evaluate this work; and consider a variety of theoretical foundations that may assist in developing future research. The review is based, in the main, on research employing survey-based methods that has been published in a broad selection of accounting and management journals.[1] The review is selective and illustrative of issues pertinent to the development of a contingency-based framework for the design of management controls systems (MCS), and does not attempt a comprehensive coverage of relevant research.

The chapter is structured as follows. The next section introduces the area of contingency-based MCS research and provides an overview of findings over the past 25 yr. The following nine sections review articles in terms of their contribution to understanding topics considered within contingency-based research. These are: the meaning of MCS, outcomes of MCS, and the contextual variables of external environment, technology (traditional and contemporary), organizational structure, size, strategy and national culture. Each section comprises two parts: first, findings from the extant literature are presented, and a series of propositions summarizing these findings are offered;

[1]The journals include: Accounting, Organizations and Society; Accounting and Business Research; Accounting and Finance; Accountability and Performance, Behavioral Research in Accounting; Contemporary Accounting Research, European Accounting Review, International Journal of Accounting, Journal of Accounting and Economics, Journal of Accounting Literature, Journal of Accounting Research; Journal of Accounting and Public Policy; Journal of Business Finance and Accounting, Journal of Cost Management; Journal of Financial Economics; Journal of Management Accounting Research; Management Accounting Research, The Accounting Review and The American Economic Review. In addition, articles are drawn from management journals: Administrative Science Quarterly, Academy of Management Journal, Academy of Management Review, Advances in Strategic Management, American Psychologist, Decision Sciences, California Management Review, Journal of Applied Psychology, Journal of Management, Journal of Marketing Research, Journal of Occupational and Organizational Psychology, Harvard Business Review, Human Relations, Human Resource Management, Management International Review, Management Science, Marketing Science, Organizational Dynamics, Organizational Studies, OMEGA, Personnel Psychology and Strategic Management Journal and Sociology.

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and second, critical issues concerning each variable are examined with a view to identifying area that provide challenges for improvement and opportunities for future research. Following these sections, issues concerning theory development are examined. Finally, the potential role of a variety of theories in progressing understanding of contingency-based research in MCS is considered.

2. An Organizational Framework for Contingency-Based MCS Research

The identification of contextual variables potentially implicated in the design of effective MCS can be traced to the original structural contingency frameworks developed within organizational theory. Theorists such as Burns & Stalker (1961), Perrow (1970), Thompson (1967), Lawrence & Lorsch (1967) and Galbraith (1973) focused on the impact of environment and technology on organizational structure. Early accounting researchers drew on this work to investigate the importance of environment, technology, structure and size to the design of MCS. Reviews conducted 25 yr ago by Waterhouse & Tiessen (1978) and Otley (1980) were able to structure their commentaries by categorizing the early research into these key variables.

In considering MCS research since 1980, it is apparent that these key variables have been confirmed as descriptors of fundamental, generic elements of context. Many recent studies, included in this review, focus on contemporary aspects of the environment, technologies and structural arrangements. They draw on the original organizational theorists to develop arguments that help explain how the effectiveness of MCS depends on the nature of contemporary settings. Also, recent research has considered the relevance of additional contextual variables to the design of MCS. Perhaps the most important new stream of literature has been that which is related to the role of strategy. This has been assimilated within the traditional organizational model in ways that suggest important links among strategy, environment, technology, organizational structure and MCS (see Langfield-Smith, 2006, for a review). The importance of technology to MCS design has been enriched by research drawing on the manufacturing literature (Hayes et al., 1988; Skinner, 1975), and the work of economists such as Milgrom & Roberts (1990). Issues concerning the role of MCS within advanced manufacturing settings such as Total Quality Management (TQM), Just-in-Time (JIT) and Flexible Manufacturing (FM) have been explored (see Young & Selto, 1991, for a review). Researchers have gained new insights into the role of MCS within new structural arrangements, such as teams, by drawing on the human resource management literature that investigates the dynamics of teams including issues concerning performance evaluation (Cohen, 1993; Katzenbach & Smith, 1993). National culture has been identified as an element of context following the development of multinational operations in many organizations (see Harrison & McKinnon, 1999, for a review).

In reviewing the past 25 yr of contingency-based research, it is important to consider the extent to which progress has been made in developing an empirical body of literature relating MCS to elements of context. The conventional, functionalist contingency-based approach to research assumes that MCS are adopted to assist managers achieve some desired organizational outcomes or organizational goals. The appropriate design(s) of MCS will be influenced by the context within which they operate. The following nine sections consider: *the meaning of MCS*, the *outcomes of MCS* and the key contextual variables as they have evolved, historically, in the literature. First, the relationship between MCS and the *external environment* is considered. This is followed by *technology* (both *traditional* and *contemporary*), *structure* and *size*. Next, *strategy* is examined. Finally, the role of *national culture* in MCS design is reviewed. On the basis of the empirical findings, propositions that relate contextual variables to the MCS are offered. Assessing these propositions requires considering the shortcomings in contingency-based research, identifying the extent to which progress has been made in addressing these issues and noting opportunities for improvements and future directions.[2]

3. The Meaning of MCS

The terms management accounting (MA), management accounting systems (MAS), management control systems (MCS) and organizational controls (OC) are sometimes used interchangeably. MA refers to a collection of practices such as budgeting or product costing, while MAS refers to the systematic use of MA to achieve some goal. MCS is a broader term that encompasses MAS and also includes other controls

[2]Since 1980, several commentators have provided critiques of contingency research in management accounting based on their beliefs of shortcoming in prior studies (Otley, 1980; Otley & Wilkinson, 1988; Moores & Chenhall, 1994; Covaleski et al., 1996; Chapman, 1997; Fisher, 1995, 1998; and Ittner & Larcker, 2001 for a more general review of empirical research in MCS). In this chapter, the main criticisms concerning variable definition and measurement are considered within the critical evaluation of the contingency variables. Several authors note that contingency research has not considered interpretive and critical views of the world. These issues are examined in the final section of the chapter.

such as personal or clan controls. OC is sometimes used to refer to controls built into activities and processes such as statistical quality control or just-in-time management. The term MCS is used, in the main, throughout this chapter.

The definition of MCS has evolved over the year from one focusing on the provision of more formal, financially quantifiable information to assist managerial decision making to another that embraces a much broader scope of information. This includes external information related to markets, customers, competitors, non-financial information related to production processes, predictive information and a broad array of decision support mechanisms and informal personal and social controls. Conventionally, MCS are perceived as passive tools, providing information to assist managers. However, approaches following a sociological orientation see MCS as more active, furnishing individuals with power to achieve their own ends. Contingency-based research follows the more conventional view that perceives MCS as a passive tool designed to assist a manager's decision making.

Contingency-based research has focused on a variety of aspects of MCS. These include practices such as ABC/ABM (Anderson & Young, 1999; Gosselin, 1997), non-financial performance measures (see Ittner & Larcker, 1998b for a review), balanced scorecards (Davis & Albright, 2004; Hoque & James, 2000; Malina & Selto, 2001; Malmi, 2001), post-completion audits (Chenhall & Morris, 1993; Smith, 1993), variance analysis (Emsley, 2000) and economic value analysis (Biddle et al., 1998). Several studies examine how budgetary practices are used such as budget participation (see Shields & Shields, 1988, for a review), budget slack (Davila & Wouters 2005; Dunk, 1993; see Dunk and Nouri, 1998, for a review; Merchant, 1985b; Van der Stede, 2000; Webb, 2002), tight budgetary control (Van der Stede, 2001) and the role of budgetary targets in managing role ambiguity (Marginson & Ogden, 2005). Other areas of interest in MCS research are the information dimensions that underlie MCS. The most important dimensions include the following: a composite dimension covering the importance of meeting budgets, formality of communications and systems sophistication, links to rewards systems (Bruns & Waterhouse, 1975; Merchant, 1981), sophistication of controls (Khandwalla, 1972), reliance on accounting performance measures (Brownell, 1982a, 1987; see Hartmann, 2000 for a review; Hopwood, 1972, 1974; Hirst, 1981; Imoisoli, 1989; Otley, 1978), dimensions of information such as scope, timeliness and aggregations (Chenhall & Morris, 1986; Gordon and Narayanan, 1984; Larcker, 1981), sophistication of capital budgeting (Haka, 1987; Larcker, 1983), cost consciousness (Shields & Young, 1994), competitor-focused accounting (Guilding, 1999; Guilding & McManus, 2002), strategic interactive controls and diagnostic controls (Simons, 1995), sensitivity and precision of performance measures (Abernethy, et al., 2004; Banker & Datar, 1989), activity knowledge structure (Dearman & Shields, 2001), common compared to unique performance measures (Lipe & Salterio, 2000).

3.1. Critical Evaluation

Overall, assessing findings from contingency-based research involves judging how the results accumulate to provide generalizable findings concerning MCS. As is common in many social sciences, MCS researchers are faced with decisions on whether to build on an existing area of study, such as the role of formal budgets, or identify emerging aspects of MCS, such as balanced scorecards or target costing, and investigate the settings within which they may be most beneficial.

Within the body of literature reviewed in this chapter, there is a mixture of studies focused on traditional themes and studies exploring recently emerging elements of MCS and context. Both types of studies are required. Studying the role of novel MCS practices within contemporary settings is necessary to ensure that MCS research is relevant. Given that many dimensions of MCS and their contexts change, novel studies will always be required to address emerging issues (Atkinson et al., 1997). There is a pressing need for studies of situations in which contemporary MCS may be best suited. A solid body of research has emerged that has examined the design and implementation of ABC/ABM with important contingencies associated with successful implementation emerging from the research (Anderson, 1995; Anderson & Young, 1999; Anderson, et al., 2001; Chenhall, 2004; Foster & Swenson, 1997; Kennedy & Affleck-Graves, 2001; Krumwiede, 1998; McGowan & Klammer, 1997; Shields, 1995). Recent work has begun to examine situations within which balanced scorecards may best suit (Davis & Albright, 2004; Hoque & James, 2000; Ittner & Larcker, 1998b, 2001, 2003; Malmi, 2001) and if non-financial performance indicators are universally effective (Abernethy & Lillis, 1995; Chenhall, 1997; Ittner & Larcker, 1998a; Perera, et al., 1997). However, there is very little published contingency work on the practices of target costing, life cycle costing and product life cycles.

Some recent studies have examined how MCS link to aspects of the production processes such as links to value chain analysis (Dekker, 2003), measures of the benefits of supplier partnerships (Seal et al., 1999) and using total cost of ownership for sourcing decisions (Wouters et al., 2005). The implications for MCS of

coordinating inter-organizational relationships, such as alliances between suppliers and customers, are being examined (Cooper & Slagmulder, 2004; Dekker, 2004; Håkan & Lind, 2004). Work has begun to shed light on how enterprise resource planning relates to MCS (Chapman, 2005; Dechow & Mouritsen, 2005). Davila (2000) identified information that is related to issues concerning customers, product design, time, cost, resources and profitability, which is distinguished on the level of detail, updating frequency and interactive use with operational personnel.

Contemporary MCS research has drawn on ideas from disciplines such as economics with insights provided from agency theory (Baiman, 1982, 1990; Lambert, 2006 Handbook). Also, operations management has highlighted the need for MCS to be grounded in an understanding of the value chain and how this provides the potential to effect desired strategies. For example, for some time, considerable interest has been devoted to relating costing (Berliner & Brimson, 1988) and performance measurement (AAA, 1990) to an analysis of operations by way of value chain analysis. However, links with other disciplines such as marketing and human resource management have not been widely explored. There has been some MCS research that has specifically addressed marketing issues, particularly, customer performance measures or customer focus. These identify customer-based accounting performance measures (Guilding & McManus, 2002) and the way that including these measures within MCS broadens the role of management accounting (Vaivio, 1999). Customer satisfaction has been included in a variety of studies (Banker et al., 2000; Ittner & Larcker, 1998a). However, the marketing literature identifies a rich context that has great relevance to MCS. For example, marketing research has focused on determinates of customer satisfaction such as loyalty (Heskett et al., 1994; Reicheld, 1996), and links with desired outcomes (Anderson et al., 1994, 1997; Fornell et al., 1996). MCS research has started examining these issues. For example, Smith & Wright (2004) show the importance of customer loyalty to financial performance and how loyalty is enhanced by post-sale service quality but not by product quality. The *lifetime value of a customer* (CLV) is based on assumptions of customer loyalty and their annual consumption of goods and services (Reichheld, 1996). Other useful ideas include the *service profit chain* that maintains that there are strong direct links between profit, growth, customer loyalty, customer satisfaction, the value of goods and services delivered to customers and employee capability, satisfaction, loyalty and productivity (Heskett et al., 1994). *The service profit chain* has been likened to a form of balanced scorecard with its focus on drivers and means–end relationships. Measuring *brand equity* has sought to identify the effectiveness of brand-building activities of managers and isolates factors such as loyalty, perceived quality, associations and awareness (Aaker, 1991). Very little research in MCS has attempted to identify how the marketing context affects the way in which MCS are employed and how marketing and MCS may combine to effect desired outcomes.

Human resource management provides a rich area for research. For example, what are the contingencies affecting the assessment of human resource management initiatives? Examples of the latter include measurement to guide and evaluate the learning capabilities of the organization, measures such as team maturity indexes and organizational climate surveys that attempt to assess the effectiveness of administrative innovations. Recent developments of relevance to MCS researchers include corporate social reporting (including triple bottom line and environmental reporting) (Al-Tuwaijri et al., 2004; Gray, 1996, 2002; Patten, 2002), 360-degree performance evaluation (Hazucha et al., 1993), forensic accounting (Manning, 2000), intangible assets (Grojer, 2001; Power, 2001), knowledge-based organizations (Ditillo, 2004) and intellectual capital (Andeiessen, 2004; Brooking, 1996; Edvinsson, 2002; Stewart, 2001; Sveiby, 1997). Studies have examined the role of intellectual capital and the design of MCS (Widener, 2004), using intellectual capital for managing knowledge (Mouritsen et al., 2001) and for mobilizing change (Johanson et al., 2001). Linking intangibles and intellectual capital to financial performance has been attempted by way of the human capital index (HCI) developed by Watson-Wyatt (Watson & Wyatt, 2005). Contingency research can assist understanding by examining how MCS are implicated in these areas, and if the effectiveness of these approaches is context specific.

Finally, there is a need for more research into service and not-for-profit organizations as these entities become increasingly important within most economies. Examples of this research are the use of MCS in hospitals (Abernethy & Brownell, 1999; MacArthur and Stanahan, 1998; Noreen & Soderstrom, 1994), in the public sector (Gieger & Ittner, 1996; Williams et al., 1990) and the military (Chenhall & Euske, 2005).

Notwithstanding the importance of studying controls that are relevant to contemporary settings, it is important to develop knowledge in ways that ensure coherence in the study of elements of MAS and contextual variables, and in the findings of these studies. Such confidence can be derived from replication studies that enhance the validity and reliability of findings and thereby provide a strong base to move

forward by way of model development (Lindsay, 1995). Commentators have been critical that in most areas of MCS research, studies have not developed sufficient 'critical mass' to confirm findings.

In some areas of MCS that have attracted a substantial research effort, such as RAPM, variation in dimensions of variables across studies and different measures of the variables have inhibited the coherent accumulation of findings (Hartmann, 2000; Kren & Liao, 1988). This is particularly the case where the MCS constructs are defined from practice, as opposed to more exact definitions derived from theory.[3] The way in which studies evolved within the area of RAPM helps illustrate several difficulties in isolating the meaning and measurement of MCS variables (Hartmann, 2000; Otley & Fakiolas, 2000). First, the precise meaning of the concept of RAPM has been confused by lack of definition of what is accounting and non-accounting and what is reliance (Hartmann, 2000). Given the ambiguity with the concept, it is not surprising that researchers sought to gain clarification by modifying their studies as understanding of RAPM and its measurement developed. Such refining of concepts and measurement is common in other social sciences, such as psychology. It is unfortunate that it is not part of the MCS research tradition to spend more time on developing robust measures of the elements of MCS, particularly when there is ambiguity in the meaning of constructs. For example, it is not clear how balanced scorecards should be measured. It seems likely that the content and implementation of balanced scorecards vary widely among organizations. It would seem useful to develop a valid measure of balanced scorecards that could then be used by researchers to explore the role of balanced scorecards within the context within which the scorecards are applied. While such a valid measure would enhance consistency between studies, a difficulty exists in the dynamic nature of MCS practices. MCS that are valid today may lose validity as they evolve through time. Certainly, because of advances in information technology (IT) software, some types of balanced scorecards being employed today are more comprehensive and strategic in nature than those being used 5 yr ago. Similarly, the concept of RAPM and how it relates to broader controls has changed since the early work in the 1970s and 1980s. Without accommodating changes in contemporary control systems, concepts and measures of MCS are unlikely to address pertinent, contemporary issues. A research climate that encouraged the development of valid concepts and measures of MCS would have to recognize the need for modification to incorporate the evolution of MCS.

Participative budgeting has also been studied widely. Unlike RAPM, participation in budgets has almost universally been conceptualized and measured following Milani (1975). In some studies, additional measures are employed to provide some validation on the primary measure (Brownell & McInnes, 1986). Other studies of budget-related behaviour have drawn on attitudes and satisfaction with budgets, as developed by Swieringa & Moncur (1975). There have been a considerable number of studies that have confirmed the measurement of the generic MCS characteristics of broad scope, timeliness, aggregation and integration. These studies have employed concepts and measures developed by Chenhall & Morris (1986), sometimes with minor adjustments to suit the particular setting, and appear to be robust across a variety of settings. However, there has been little replication or coherence in measurement development in studies examining MCS practices of contemporary interest such as static–flexible budgets, non-financial performance measures, activity-based accounting, competitor-focused accounting and product development information. Similarly, while studies have explored important areas of MCS such as social controls, personnel control, sophisticated integrative mechanisms, administrative controls, interpersonal controls and sophisticated controls, there has been very little replication.

A further criticism related to the nature of accounting controls within contingency-based research is that these form only part of broader control systems (Chapman, 1998; Merchant, 1985a; Otley, 1980, 1994). Contingency-based research has focused on specific elements of accounting controls, generic information dimensions of MCS, with a limited number of studies examining broader elements of control, such as clan and informal controls, or integrative mechanisms. A difficulty in studying specific elements of MCS in isolation from other organizational controls is the potential for serious model under specification. Thus, if specific accounting controls are systematically linked with other organizational controls, studies that exclude or do not control these elements within the research method may report spurious findings. For example, a study focused only on formal budget systems may argue that they are unsuitable in uncertain operating conditions as they include incomplete information and lack flexibility. However, evidence may indicate that successful organizations rely extensively on formal budgets. This unexpected finding occurs as a consequence of limiting the study to budgets without

[3]See Bisbe et al. (2005) for a discussion of the importance of defining the meaning of MCS constructs and the difference between practice-based and theory-based constructs.

considering broader control and information networks. It may be that successful organizations operating in uncertain conditions have formal budgets but they are systematically combined with open and flexible informal communications between managers. The formal budgets are useful in assisting planning and curbing excessive innovation, while the informal communications provide broader information in flexible ways. Simons (1987, 1991, 1995) showed that formal budgets can provide interactive controls in uncertain conditions whereby the budgets generate intelligence data to build internal pressure to break out of narrow search routines and encourage the emergence of new strategic initiatives. Chapman (1998) also argues that in uncertain conditions effective organizations can employ formal accounting but they should take place within a situation that involves intense verbal communication between organizational groups. Frow et al. (2005) found that managers were able to manage high levels of interdependencies by cooperating informally (informal channel of social interaction) but did so within the framework of formal systems (formally directed procedures). This approach helped specify what was required and how it could be achieved by managing interdependencies. Also, formal controls were used when informal arrangements were not physically possible or when they broke down.

A way of addressing these concerns is to identify a variety of control taxonomies and consider how they relate to various aspects of MCS. One such taxonomy involves classifying controls as ranging from mechanistic to organic. Mechanistic controls rely on formal rules, standardized operating procedures and routines. Organic systems are more flexible, responsive, involve fewer rules and standardized procedures and tend to be richer in data.[4] Table 1 provides a grouping of elements of MCS and control types commonly found in research, in terms of the organic or mechanistic nature of control.

These taxonomies are useful for addressing concerns of how MCS relates to broader control systems and can guide research into how particular aspects of MCS are consistent with the control 'culture' of organizations.

Finally, it should be noted that there is a distinction between the adoption of MCS and the implementation of the systems. Much can be learned about the success or otherwise of MCS by examining how the control culture, organic or mechanistic, influences the processes of implementation. This becomes particularly important while studying the adoption of innovative MCS such as activity-based accounting (Anderson & Young, 1999; Gosselin, 1997; Krumwiede, 1998; Shields, 1995) and balanced scorecards (Hoque & James, 2000; Ittner & Larcker, 2003) both of which often become closely linked to the organization's control culture; and the extent of change in MCS, in general (Baines & Langfield-Smith, 2003; Libby & Waterhouse, 1996; Williams & Seaman, 2001).

It seems clear that broader issues of control are likely to have implications for research into understanding MCS design. There have been advances over the past 20 yr in demonstrating the importance of considering management accounting practices as aspects of MCS. Understanding how specific aspects of management accounting relates to broader control concepts, as outlined in Table 1, assists in researching the complementary or substitution effects of non-accounting controls. An important part of the research agenda is to understand how different controls can be combined, to suit the particular circumstances of the organization (Fisher, 1995). In studying broad controls, it is necessary to be aware of the boundaries that some organizations and accountants place around MAS and MCS. Without such awareness, there can be confusion as to what is a formal accounting control, what is a structural control, what are personnel and informal controls.

4. Outcomes of MCS

Outcomes may be separated into issues related to the *use* or *usefulness* of the MCS, *behavioural* and *organizational* outcomes. There is an implied connection between these outcomes. If the MCS are found to be useful then they are likely to be used and provide satisfaction to individuals, who then presumably can approach their tasks with enhanced information. As a consequence, these individuals take improved decisions and better achieve organizational goals. Clearly, there are broad leaps in logic from useful MCS, to improved job satisfaction and enhanced organizational performance. Moreover, there is no

[4]Several authors provide for an elaboration of mechanistic and organic control. Perrow (1970) distinguishes mechanistic from organic controls on the basis of manager's discretion, power and coordination within groups and interdependence between groups. Organic controls involve higher discretion and power, coordination by mutual adjustment and high interdependence between work groups. Ouchi (1977, 1979) identifies market controls (prices), mechanistic formal bureaucratic controls (rules to control output of work and the behaviour of workers), and organic, informal clan controls (recruitment, traditions and ceremonial control). Galbraith (1973) refers to mechanistic controls as rules, programs and procedures, hierarchy and goal setting; and organic controls as creating slack resources, self-contained tasks, vertical information systems and lateral relations.

Table 1. Organic and mechanistic forms of MCS.

More organic
Clan controls (Ouchi, 1980; Govindarajan and Fisher, 1990) (control cultures and norms)
Social controls (Merchant, 1985a) (self and group controls), (Rockness and Shields, 1984) (input controls—social controls and budgets).
Personnel controls (Merchant, 1985a) (selection, training, culture, group rewards, resources); Abernethy and Brownell, 1997) (socialization and training)
Sophisticated integrative mechanisms (Abernethy and Lillis, 1995) (task forces, meetings, etc.)
Prospect controls (Macintosh, 1994) (focus on plans and the future, infrequent and general reporting)
MCS that provide broad scope information, flexible aggregations and integrative information, and information provided in a timely way (Chenhall and Morris, 1986)
Static/flexible budgets (Brownell and Merchant, 1990) (flexibility of budgets to volume changes)
Participative budgets (Shields and Shields (1988) (involvement of subordinates in setting budgets)
Low reliance on accounting controls (Hirst, 1981; Brownell, 1982; 1987) (use of more profit oriented controls or non-accounting)
Budget slack (Merchant, 1985b; Dunk, 1993) (excess resources over that needed to complete tasks efficiently)
Competitor-focused accounting (Guilding, 1999) (competitor cost assessment, position monitoring and appraisal, strategic costing and pricing)
Strategic interactive controls (Simons, 1995) (use of performance evaluation for strategic planning)
Product development information (Davila, 2000) (levels of detail, frequency of updating and pattern of usage for information related to product cost and design, time related, customer related, resource inputs, profitability)
Enabling controls (Ahrens & Chapman, 2004)
More mechanistic
Budget constrained performance evaluation style (Hopwood, 1972) (high emphasis on cost budgets)
Budget control (Rockness and Shields, 1984)
High reliance on accounting controls (Hirst, 1981; Brownell, 1982, 1987) (accounting for performance evaluation)
High budget use (Bruns and Waterhouse, 1975; Merchant, 1981, (importance, involvement, time spent on budgets)
Narrow scope (Chenhall and Morris, 1986) (financial, internal, historic)
Sophisticated capital budgeting (Larcker, 1981; Haka, 1987) (DCF, etc.)
Sophisticated controls (Khandwalla, 1972) (standard costing, incremental costing, statistical quality control, inventory control)
Operating procedures, budgets and statistical reports (Macintosh and Daft, 1987).
Administrative use of budgets (Hopwood, 1972; Merchant, 1981) (importance of meeting budget, formality of communications, systems sophistication and participation)
Inter personnel controls (Bruns and Waterhouse, 1975) (Lack of formal controls but centralization, lack of autonomy, pressure inducing actions by superiors)
Output and results controls (Merchant, 1985a; Macintosh, 1994) (outcomes or effectiveness)
Behavior controls (Ouchi, 1979, Merchant, 1985a, Rockness and Shields, 1984) (standardization, rules, formalization)
Patriarchal control (Whitley, 1999) (personal & informal, centralized control from the top)
Action controls (Merchant, 1985a); process controls, manufacturing performance measures (Chenhall, 1997) (direct measures of production processes)
Diagnostic controls (Simons, 1995) (use of control to provide feedback on operations)
Coercive controls (Ahrens & Chapman, 2004)

compelling evidence to suggest that such links exist. Even within contingency-based research, the link between enhanced organizational performance and usefulness of some aspect of MCS may well depend on the appropriateness of the useful MCS to the context of the organization.

Considerations of interest to designers and researchers of MCS have been the extent to which the systems provide information (Mia & Chenhall, 1994), the degree of use (Abernethy & Guthrie, 1994; Anderson & Young, 1999; Foster & Swenson, 1997; Guilding, 1999), the usefulness of the information (Chenhall & Morris, 1986; Shields, 1995) or the beneficial nature of the MCS (Chenhall & Langfield-Smith, 1998a), importance in making operational decisions (Bouwens & Abernethy, 2000), importance to product development (Davila, 2000), whether they are helpful to the organization (Guilding, 1999) and satisfaction with the systems (Bruns & Waterhouse, 1975; Ittner & Larcker, 1998b).

Behavioural outcomes such as job satisfaction have been important in human resource management. The

provision of a work-place environment to enhance employee welfare or job satisfaction is seen by some as a worthwhile goal in its own right. Moreover, other things being same, it may be presumed that individuals who are satisfied with their jobs will identify with organizational goals and work more effectively. Interestingly, there have not been many MCS studies that have examined the effects of MCS on job satisfaction (Banker et al., 1993; Brownell, 1982b; Chenhall, 1986). A variety of studies has examined the effect of MCS on job-related tension or stress (Brownell & Hirst, 1986; Hopwood, 1972; Hirst, 1983; Shields et al., 2000). Unlike job satisfaction, stress appears to be more closely related to the nature of the MCS and is implicated in associations with performance (Shields et al., 2000).

Organizational outcomes in contingency-based research have been dominated by self-assessment processes where individuals provide an indication of their performance, or their organizational unit, across a range of potentially important managerial processes (see e.g. Mahoney et al., 1963) or goals of the organization (Govindarajan, 1984). The issue of the validity of self-assessment is often raised as a concern. Evidence suggests that a subordinate's self-assessment correlates with objective assessments (Bommer et al., 1995; Venkatraman & Ramanujam, 1987) and with a superior's subjective assessment (Furnham & Stringfield, 1994; Heneman, 1974; Riggo & Cole, 1992). Notwithstanding this evidence, it is always reassuring when a superior's performance rating of the respondent is included in the study.

There has been a growing body of research relating MCS change to share prices, although this is not widespread. Larcker (1983) found that firms adopting incentive performance plans experienced an increase in capital investment and a positive security market reaction on disclosure of the plan to the market. Gordon & Smith (1992) reported that returns to investors were higher for firms employing post-completion reviews when matched with asymmetric information, capital intensity, capital expenditure and insider ownership. Smith (1993) identified that positive returns were associated with post-completion reviews in abandonment decisions. McConnell & Muscarella (1985) report positive associations between announcements of increases in capital investment plans, MCS and share price movement. However, Gordon & Silvester (1999) found no significant association between the installation of ABC and significant stock market reaction. Ittner & Larcker (1998a) and Ittner et al. (2002, 2003) have included share price movement as a measure of performance in studies of the effectiveness of performance measures. Kennedy & Affleck-Graves (2001) examined the effect of ABC on stock returns. This poses the question as to whether improved understanding would follow from studying these main effects within a variety of organizational contexts or not. These studies do not employ contingency-based approaches as they explore only the main effects between share price movement and the adoption of elements of MCS (Studies often examine industry effects and the importance of capital expenditure). Progress in this area may be limited due to the difficulties in extracting the effects of adopting different MCS on share prices from other events that may be associated with share price movements. With numerous possible events effecting share prices, control problems can become acute. Also, data collection is complicated because of the need to collect data on the adoption and implementation of MCS by survey methods and then to match these with share price changes. Also, perhaps the lack of research in the area says something about the different types of training between researchers in finance and management accounting.

4.1. Critical Evaluation

Contingency-based studies have examined MCS as both dependent and independent variables. To examine fit between MCS and context, some commentators have claimed that the outcome variables should be some dimension of desired organizational or managerial performance (Otley, 1980; Otley & Wilkinson, 1988). Good fit means enhanced performance, while poor fit implies diminished performance. While it is often claimed that the ultimate goal of MCS research is to provide findings that assist managers achieve their goals or those of their organization, MCS research has continued to include dimensions of MCS, their use and usefulness, as the outcome variable. Also, it is noteworthy that performance has been included as an independent variable explaining some characteristics of MCS (see Langfield-Smith, 2006, for a discussion).

While not explicit in most studies with MCS as the outcome variable, it is implied that associations between context and MCS reflect equilibrium conditions, or indicate optimal solutions because of survival-of-the-fittest conditions. If equilibrium is assumed, then studying performance is inappropriate as every firm has optimal performance given its situation. There is a view that studying MCS as the outcome variable is justified as rational managers are unlikely to adopt or use MCS that do not assist in enhancing performance (An alternate view is that managers may adopt MCS for institutional or political reasons that may be inconsistent with rational economic reasons.) Alternatively, some argue that links between MCS, context and performance can be

tenuous as they involve many factors concerning the quality of managing the production processes (Birnberg et al., 1983; Kren & Liao, 1988). In general, if disequilibrium conditions are assumed, then it may be useful for contingency-based studies to first establish adoption and use of MCS, then to examine how they are used to enhance decision quality and finally investigate links with organizational performance.

Care is required when interpreting studies that have outcome variables related to the characteristics of MCS, such as 'use' and 'usefulness' of the systems. Individuals may be forced to use MCS, such as budgets or DCF analysis in decision making, even though they find them of little use. Also, linking 'use', 'usefulness', 'benefits' or 'satisfaction' to organizational effectiveness is potentially problematic. A particular MCS may be perceived as not useful and rate low in satisfaction or benefits but organizational performance may be high due to the supply of required information from other sources, either formal or informal. These issues can be resolved by careful attention to the research question. It is quite legitimate to study the adoption of systems and their use. However, it may not be appropriate to claim that these outcomes are of value in improving organizational performance. Similarly, the extent to which MCS are perceived as useful may not imply improved organizational performance. If studying one aspect of the MCS in isolation from other sources of information, researchers should ensure that the studied attribute is the sole source of the information being studied. If an aspect of the MCS is being considered within situations that include broader information and controls, the potential influence of these other controls should be included or controlled within the research design.

In summary, despite the critique that contingency-based studies should include organizational performance as the dependent variable, studies still follow approaches with MCS as the dependent variable. Care in theory construction, including clarification of assumptions related to equilibrium conditions, is required in following either approach. Studies can provide important insights into the extent of adoption, use and usefulness of MCS; however, it should not be assumed that the models necessarily lead to enhanced organizational performance. Similarly, if performance is the dependent variable then compelling theory is required to show how the combination of MCS and context enable managers to take more effective decisions that enhance organizational performance.

Given the assumption that organizations should identify organizational performance as the criterion variable, a critical issue is, what constitutes performance? Distinguishing official and operative goals would seem an essential aspect of MCS research that includes consideration of goals, mainly as it flags that the issue of organizational goals is far from being unproblematic (Perrow, 1970). Investigating these goals requires a dynamic approach that examines the goal formulation process. There are several issues that become important. First, goal formulation or change often involves the influence of new powerful players, either within or outside the organization, who can dramatically change official goals. MCS can act either as a tool to effect such changes or hinder their acceptance within the organization. For example, a new Chief Executive Officer may stipulate that improved shareholder value is a priority. Consequently, performance measurement based on Economic Value Analysis may be introduced in an attempt to align the actions of all employees with the single objective of improving economic value. Second, changes in the areas of organizational effectiveness can redirect goals to those areas of effectiveness. The unplanned discovery of a new technology that potentially increases throughput can result in the adoption of 'timely' delivery as a goal of the organization.

Third, it is apparent that the measurement of goals can have explicit effects on goal formulation, both intended and unintended. Goals may be selected or evolve as they can be measured readily by the MCS. A preoccupation with formal, 'hard' measures may direct attention to those measures at the expense of the subtleties of the situation. For example, measuring aspects of customer or employee satisfaction, the organizational culture or intellectual capital often require more subjective assessments of progress and, as such, may receive less attention than activities subjected to hard measures such as production rejects or throughput.

Fourth, in addition to influencing types of goals, MCS may affect goal achievement by establishing standards or benchmarks for performance. Goals that are too hard may cause frustration and withdrawal, while standards that are too easy may not provide sufficient challenge. Standards that are achievable but with sufficient stretch to provide a challenge are often recommended as ideal. However, in today's environment of intense competition and global operations, requirements for substantial continuous improvement may mean that difficult standards based on continuous improvements are required to survive. Performance measures can readily establish targets that require continuous improvement.

Fifth, recently many organizations have recognized the need to satisfy multiple and potentially competing goals. Mission statements identify the requirements to attract and maintain shareholders, employees and customers; and to do so in ways that are socially acceptable. Accountants have responded by

refining triple bottom line reporting, environmental accounting, social corporate reporting and corporate sustainability (Epstein & Birchard, 2000).

Sixth, aligning operative goals with official goals is an important aspect of strategic management. This is the essence of performance hierarchies and balanced scorecards that attempt to capture the interactive effects of official goals associated with the interests of shareholders, customers, the internal processes and the potential for the organization to sustain itself by learning and innovation. Moreover, these types of performance management methods attempt to align strategy with operations by translating official goals into operative goals and cascading the latter down through the organization. Of course, connections between official and operative goals can be quite different in similar organizations. Achieving shareholder welfare might require organizations to follow different operative goals concerning decisions on quality, cost, delivery and the like.

Linkages between MCS and organizational goals are quite explicit, as a primary function of MCS is to measure progress towards achieving desired organizational ends. It is a useful exercise when evaluating characteristics of MCS used for reporting on goals to judge the extent to which they accommodate the following: consider multiple stakeholders; measure efficiency, effectiveness and equity; capture financial and non-financial outcomes; provide vertical links between strategy and operations and horizontal links across the value chain; provide information on how the organization relates to its external environment and its ability to adapt. Presumably, balanced scorecards or performance hierarchies provide a methodology to tackle many of these issues. The complexity of achieving these expectations may help to explain why many firms that attempt to adopt balanced scorecards have difficulty in implementing them.

5. Contextual Variables and MCS

Before examining the contextual variables, a distinction is noted between generic and specific definitions. When considering environment, specific definitions refer to particular attributes such as intense price competition from existing or potential competitors, or the likelihood of a change in the availability of materials. Generic definitions attempt to capture the effects of specific attributes in a more generalized way. Generic definitions enable designers and researchers of MCS to discuss the influence of contextual variables without having to identify the particular details of individual organizations. Constructing taxonomies of context and theories relating these to the use of MCS and organizational outcomes becomes more tractable. Clearly, to make prescriptive recommendations to a particular organization, it is necessary that the specific attributes of the environment be identified. Moving between the generic and specific should not be problematic provided the generic definitions are robust. Chapman (1997) provides a discussion of the trade-offs between simplicity, accuracy and generalizability in variable definition.

5.1. The External Environment

The external environment is a powerful contextual variable that is at the foundation of contingency-based research. Perhaps the most widely researched aspect of the environment is uncertainty. Early contingency research in organizational design focused on the effects of uncertainty on organizational structure. Examples include Burns & Stalker (1961), Lawrence & Lorsch (1967), Perrow (1970) and Galbraith (1973). It is important to distinguish uncertainty from risk. Risk is concerned with situations in which probabilities can be attached to particular events, whereas uncertainty defines situations in which probabilities cannot be attached and even the elements of the environment may not be predictable. The importance of uncertainty as a fundamental variable in MCS contingency-based research has been stressed recently by Chapman (1997) and Hartmann (2000). Both reinterpret aspects of MCS research by examining the impact of environmental uncertainty.

Uncertainty and risk do not provide a comprehensive description of the environment. Khandwalla (1977) provides a useful taxonomy of environmental variables. These include turbulence (risky, unpredictable, fluctuating and ambiguous), hostility (stressful, dominating and restrictive), diversity (variety in products, inputs and customers) and complexity (rapidly developing technologies). Other elements of the environment that may generate pressure or provide opportunities include complexity and dynamism (Duncan, 1972), (simple–complex and static–dynamic (Waterhouse & Tiessen, 1978]), controllable and uncontrollable (Ewusi-Mensah, 1981), ambiguity (Ouchi, 1979) or equivocality (Daft & Macintosh, 1981).

In MCS research, uncertainty has been related to the usefulness of broad scope information (Chenhall & Morris, 1986; Chong & Chong, 1997; Gordon & Narayanan, 1984; Gul & Chia, 1994) and timely information (Chenhall & Morris, 1986); performance evaluation characterized by a more subjective evaluation style (Govindarajan, 1984; Moores & Sharma, 1998); less reliance on incentive-based pay (Bloom, 1998), non-accounting style of performance evaluation rather than a budget-constrained or profit-oriented style (Ross, 1995) and participative budgeting (Govindarajan,

1986).[5] Functional area, particularly research and development (R&D) (seen as facing higher environmental uncertainty compared to marketing) combined with budgetary participation was shown to enhance performance (Brownell, 1985). Changes in the competitive environment were associated with strategy, organizational design and technology, all of which were associated with changes in non-financial indicators (Baines & Langfield-Smith, 2003).

Some evidence suggests the benefits of combinations of traditional budgetary controls and more interpersonal and flexible controls in conditions of environmental uncertainty. Ezzamel (1990) reported that high environmental uncertainty was associated with an emphasis on budgets for evaluation and required not only explanation of variances but also high participation and interpersonal interactions between superiors and subordinates. Merchant (1990) found that environmental uncertainty was linked to pressure to meet financial targets but there was some flexibility by way of higher manipulation of information. In a study of four cases, Chapman (1998) proposed that accounting has a planning role to play in conditions of uncertainty; but there must be substantial interactions between accountants and other managers to cope with changing conditions as they unfold in unpredictable ways.

Environmental hostility (difficulty) has been associated with a strong emphasis on meeting budgets (Otley, 1978). Hostility from intense competition has been related to a reliance on formal control (Imoisili, 1985) and sophisticated accounting, production and statistical control (Khandwalla, 1972). However, certain specific elements of competitive position, such as strength of market position and stages in product life cycles were not associated with the importance of budgets or participation (Merchant, 1984). Also, environmental complexity (but only when derived from suppliers and government), independent of function, was associated with a reduced emphasis on budgets (Brownell, 1985).

From these illustrations, it can be seen that a consistent stream of research over the past 20 yr has confirmed that uncertainty has been associated with a need for more open, externally focused, non-financial styles of MCS. However, hostile and turbulent conditions appear, in the main, to be best served by a reliance on formal controls and an emphasis on budgets. The question may be posed, what is the appropriate MCS for organizations operating in conditions of uncertainty, turbulence and hostility? The organizational design literature proposes that organizations facing extreme pressure will initially tighten control as such pressure is likely to threaten short-term survival and then adopt more organic controls (Khandwalla, 1977). Little is known about the appropriate design of MCS to assist in managing complex and competing forces from the external environment. It would be useful to examine how contemporary, interactive information systems can provide a blend of tight controls with the opportunity to source more open, informal and subjective information. Certainly, there is evidence that effective organizations combine tight controls with more open, informal and flexible information and communication systems (Ahrens & Chapman, 2004; Chapman, 1998; Chenhall & Morris, 1995; Simons, 1987).

The following propositions summarize the research findings relating MCS to the external environment.

5.1.1. Propositions Concerning the External Environment and MCS

The more uncertain the external environment, the more open and externally focused the MCS.

The more hostile and turbulent the external environment, the greater the reliance on formal controls and emphasis on traditional budgets.

Where MCS focused on tight financial controls are used, in uncertain external environments, they will be used together with an emphasis on flexible, interpersonal interactions.

5.1.2. Critical Evaluation

The distinction between dimensions within the external environment, such as uncertainty, hostility and complexity are important to MCS design. More mechanistic, formal MCS tend to provide incomplete information in uncertain conditions and require rapid reformulation to cope with the unfolding unpredictability. However, in complex situations there is a need for more information within the MCS, but once designed the systems should be sufficient to assist in taking and implementing decisions. Clear specification of the environmental dimensions of interest is required, as different theories are required to consider the effects of different dimensions. There are rich research opportunities to investigate appropriate MCS design for settings that are uncertain and also hostile and complex.

Interpreting studies that have examined the influence of the external environment is complicated by the use of different measures of the same environmental construct. For example, Gordon & Narayanan's (1984) studied of the association between

[5]The theory used by Ross (1995) examines task uncertainty but the study measures environmental uncertainty.

perceived environmental uncertainty and more broadly scoped MCS. They used a measure of uncertainty that captured the intensity of competition, the dynamic and unpredictable nature of the external environment and elements of change. In studying the same type of MCS variables, Chenhall & Morris (1986) used a measure of uncertainty that considered lack of information on environmental factors, inability to assign probabilities on how the environment will affect success or failure and not knowing the outcome of decisions on how the organization would lose if the decision were incorrect. The measure used by Gordon & Narayanan (1984) is more specifically focused on the external situation than Chenhall & Morris (1986), which has a composite of external components and implications for internal decisions. Even within the measure used by Gordon & Narayanan (1984) elements of unpredictability are combined with difficulty. Tymond et al. (1998) provide a comprehensive review of MCS research investigating the role of environmental uncertainty, providing recommendations that the measures should involve top managers' perceptions of the external environment. The application of a single valid and reliable measure of environmental uncertainty would assist in comparing the results of studies examining uncertainty and help build a coherent body of knowledge on the effects of this variable on MCS design.

The environment will continue to be a central element of context in contingency-based research. The specific attributes of the environment are changing and should be included in future studies. The external environment that most organizations face includes increased social pressure on issues such as environmental ecology and the economic and social well being of employees and society. The implications for management and MCS of global competition and operations are increasingly important. As organizations become involved in networks involving other entities such as joint ventures and supplier and customer alliances, the boundaries between what is internal and external become blurred and consequently the role of MCS will likely change. Additionally, the way in which the environment exerts pressure should be explored. Granlund & Lukka (1998) note that pressure may come from economic causes, coercion from institutions, normative pressure derived from appropriate social conduct and the tendency to mimic apparently successful practices.

5.2. Generic Concepts of Technology

Technology has many meanings in organizational behavior. At a general level, technology refers to how the organization's work processes operate (the way tasks transform inputs into outputs) and includes hardware (such as machines and tools), materials, people, software and knowledge. Three generic types of technology of importance to MCS design maybe identified from the organizational literature: complexity, task uncertainty and interdependence.[6]

Using these notions of technology, several key attributes that may influence MCS design can be derived. First, organizations producing highly specialized, non-standard, differentiated products are likely to employ complex unit or batch technologies. These will tend to involve processes that have low analyzability of processes and many exceptions. Also, managers are likely to have imperfect knowledge of processes and low ability to measure outputs. A need for flexible responses to specific customers increases interdependencies across the value chain involving reciprocal interactions with customers, suppliers and functional units such as marketing, production, purchasing and R&D. It might be expected that these types of technologies would require controls to encourage flexible responses, high levels of open communication within the work force and systems to manage the interdependencies. Traditional, mechanistic MCS based on financial controls would not seem to suit these circumstances.

Second, organizations that produce standard, undifferentiated products employing capital intensive, automated processes are likely to employ mass production and process technologies. These will involve highly analyzable processes and few exceptions. Knowledge of processes and measures of output will be more readily available. Interdependencies are moderate being sequential. This technology requires standardized, administrative controls such as traditional, formal financial MCS. A variant of this technology is where there are non-standard products but the processes are well understood. Interdependencies with customers are likely to be reciprocal. This technology is typical of an

[6]Complexity derives from standardization of work, with large-batch and mass production (e.g. highly automated factories), process and small-batch unit technologies representing increasing levels of complexity (Woodward, 1965). Task uncertainty refers to variability in tasks and the analyzability of methods of performing the tasks with high variability and unanalyzable tasks inducing control difficulties and a need for more organic controls (Perrow, 1970). Task uncertainty also concerns the knowledge of transformation processes and predictability in measuring outputs (Ouchi, 1979). Interdependence increases the level of coordination difficulties, and has implications for control systems, as the interdependencies move from pooled (no direct relationship between adjacent processes), to sequential (one-way interdependencies), to reciprocal (two-way interdependencies).

organization producing customized products but employing reasonably automated processes. Controls are required that are flexible and that are consistent with managing interdependencies. A reliance on traditional administrative controls, including financial MCS, is unlikely to provide required flexibility and more open, informal controls will be more suitable to manage interdependencies. At the same time, traditional, formal controls may assist in controlling processes that are well understood.

5.2.1. Findings: Standardized-Automated Processes and MCS

Technologies characterized by more (less) standardized and automated processes are served by more (less) traditional formal MCS with highly (less) developed process controls (Khandwalla, 1977); high (low) budget use (Merchant, 1984) and high (low) budgetary controls (Dunk, 1992). High budgetary slack provides a buffer against low predictability within the processes and is found less in more predictable, automated processes with high workflow integration (Merchant, 1985b). Alternatively, slack will be positively related to less automated, less predictable job- or batch-type technologies.

5.2.2. Task Uncertainty and MCS

Technologies with high (low) task analyzability are related to a high (low) reliance on standard operating procedures, programs and plans (Daft & Macintosh, 1981); tasks high in difficulty and variability are associated with a low reliance on accounting performance measures (Hirst, 1983); knowledge of task transformations is associated with behaviour control (but only limited support was found for relationships between measurability of output and control systems) (Rockness & Shields, 1984); technologies with few (many) exceptions that are high (low) in analyzability are associated with accounting (personnel) controls (Abernethy & Brownell, 1997). Mia & Chenhall (1994) demonstrated that marketing departments faced more task uncertainty than production departments and consequently used broad scope information to enhance performance. Brownell & Dunk (1991) showed that there was a fit between conditions of low task difficulty, participative budgeting and a high budget emphasis; while high task difficulty suited participation with or without a strong budget emphasis. Lau et al. (1995) provided similar results, although they found that high participation and high task difficulty provided a fit irrespective of budget emphasis, while high participation and high budget emphasis enhanced performance in low task difficulty situations. Brownell & Merchant (1990) found that higher (lower) standardization of products (high knowledge of input/output relations) combined with flexible (static) budgets and low (high) participation to enhance performance. Brownell & Merchant's (1990) finding that low task uncertainty combined with more flexible budgets is somewhat inconsistent with other findings linking high task uncertainty with more informal, open MCS.

5.2.3. Interdependence and MCS

Low levels of interdependence have been linked to budgets, operating procedures and statistical reports; with statistical reports used for planning and informal coordination used in highly interdependent situations (Macintosh & Daft, 1987). In low interdependent public sector organizations there was an emphasis on budget analysis and managers' influence on budgets but infrequent interactions with superiors and little required explanation from budgets (Williams et al., 1990). In more complex situations (reciprocal interdependencies), there was less emphasis on budgets and more frequent interaction between subordinates and superiors. High (low) interdependence was found to be associated with broad (narrow) scope MCS that focuses (lack of focus) on appropriate aggregations and integrative information (Chenhall & Morris, 1986). Strategies of customization were associated with high levels of interdependence with the latter correlating with the importance for operational decisions of the information characteristics of integration, aggregation and timeliness (Bouwens & Abernethy, 2000).[7] Gerdin (2005a) found that high interdependence was associated with both the amount of MAS information for decision making and the frequency of its use. Moreover, the amount of MAS information was associated with high performance. This study shows how greater use of MCS was a response to interdependence and how this information assisted in maintaining high performance. Abernethy et al. (2004) found that aggregated divisional summary performance measures were positively associated with interdependencies when the division is affected by other divisions, but there was a

[7]Differences in findings between Chenhall & Morris (1986) and Bouwens & Abernethy (2000) relate to the usefulness of broad scope and timely MCS. Concerning broad scope MCS, perhaps the interdependence considered in operating decisions, as studied by Bouwens & Abernethy (2000), relates to internal considerations and therefore broad scope information that tends to be focused on external information would not be useful. There does not appear to be any obvious explanation for differing results related to timely information.

negative association when the division's activities affect others. This finding indicates that in situations of sequential interdependencies the importance of aggregate divisional summary measures depends on the direction of the sequence.

5.2.4. Propositions Concerning Generic Concepts of Technology and MCS

The more technologies are characterized by standardized and automated processes, the more formal the controls including a reliance on process control and traditional budgets with less budgetary slack.

The more technologies are characterized by high levels of task uncertainty, the more informal the controls including less reliance on standard operating procedures, programs and plans, accounting performance measures, behaviour controls; higher participation in budgeting; more personal controls, clan controls and use of broad scope MCS.

The more technologies are characterized by high levels of interdependence, the more informal the controls including fewer statistical operating procedures; more statistical planning reports and informal coordination; less emphasis on budgets and more frequent interactions between subordinates and superiors; greater usefulness of aggregated and integrated MCS, greater use of MCS and more important aggregated divisional summary performance reports.

5.3. Contemporary Technologies

Over the past 20 yr, MCS research has developed to consider the role of advanced technologies such as JIT, TQM and FM as dimensions of context. To establish the importance of these elements of technology, accounting researchers have drawn on theories from manufacturing developed by theorists such Hayes et al. (1988), Skinner (1975) and from economics such as notions of complementarities as modelled by Milgrom & Roberts (1990). Young & Selto (1991) provide a review of new manufacturing practices and some implications for performance measures and incentive schemes, arguing a need to consider technology changes within their organizational context.

Notwithstanding the importance of manufacturing theories, understanding the appropriate fit between MCS and advanced technologies is assisted by reflecting on the basic, generic notions of technology addressed above. Kalagnanam & Lindsay (1999) argue that JIT is best suited to open, informal and organic forms of controls. They claim that organic systems can best manage the close linkages or coupling within JIT that can cause variability (task uncertainty due to many exceptions) between elements of production processes (interdependence). Organic systems are also required to manage the need for flexible responses to customers, which involves coordinating reciprocal interdependencies across the value chain. Finally, JIT implies continuous improvement that is best served by commitment to change from the shop floor, which is encouraged by organic systems.

Similar arguments may be made for implementing innovative MCS in TQM and FM situations. These technologies have high variability and low analyzability. The low analyzability derives from the need to continually exploit potential complementarities between the various elements of TQM practices (Chenhall, 1997). (In TQM situations, management may strive to develop processes with high analyzability, but the need to continually balance the way the technology delivers on competing priorities makes this task difficult to analyze). Also, TQM and FM involve the effective management of interdependencies within production processes including relationships with customers, suppliers and other external parties. Controls are required to encourage managers and shop-floor employees to focus on the critical elements of variability within the TQM programs and to provide effective links across the value chain. This information is generated at both the process (cybernetic type controls such as statistical process controls) and strategic levels (i.e. linking processes to strategic outcomes). Continuous improvement requires access to knowledge on world's best practice and systems to encourage innovation. Appropriate control systems should be open and informal, include broad scope information, benchmarking and performance measures that indicate links between strategy and operations such as balanced scorecards and strategic integrative controls.

5.3.1. Findings: Advanced Technologies and MCS

Ittner & Larcker (1995) demonstrated that product-focused TQM was linked to timely problem solving information and flexible revisions to reward systems. They found for advanced (holistic) TQM, external benchmarking and the integration of quality and strategic information are important. Ittner & Larcker (1997) examined the association between quality programs and a variety of strategic controls related to implementation, internal and external monitoring. Links between quality and strategic controls were found, with differences between countries. Also, sample-wide performance effects were restricted to controls concerning managers' participation in approving quality programs and team formulation, with other associations contingent on industry effects. Sim & Killough (1998) found

that customer and quality performance was higher in TQM and JIT situations where there were customer- and quality-related performance goals and incentives compared to where fixed pay was used. Ittner et al. (1999) reported that performance gains from supplier partnership practices were associated with extensive use of non-price selection criteria, frequent meetings and interactions with suppliers and supplier certification. These controls were not effective for arms-length supplier relations. Kalagnanam & Lindsay (1999) showed that organic MCS were associated with effective JIT systems. Some studies have examined the role of non-financial performance measures in advanced technologies. Banker et al. (1993) found that JIT, TQM, teamwork and worker morale were associated with the provision of non-financial, quality and productivity measures to shop-floor employees. Fullerton & McWatters (2002) identified that non-traditional performance measures (bottom-up measures, product and vendor quality), compensation rewards based on non-traditional measures and empowerment were related to more advanced JIT.

There is some evidence suggesting that relying on non-financial measures to evaluate managers in TQM situations provides interactive strategic control (Chenhall, 1997). Mia (2000) discovered that the provision of broadly based MCS enhanced organizational performance in JIT settings. The broad MCS included performance targets related to non-financial manufacturing indicators, actual performance on those targets, organizational financial indicators and industry and organizational trends on overall performance. Maiga & Jacops (2005) found that quality goals, quality feedback and quality incentives were antecedents to quality performance, which in turn was associated with customer satisfaction but not with financial performance. Customer-focused manufacturing, together with advanced manufacturing technology (AMT), have been associated with non-financial measures (Perera et al., 1997). It is noteworthy that there is ambiguity in findings related to the extent to which associations between usefulness of non-financial performance measures and advanced technologies are related to enhanced performance. For example, Chenhall (1997) found positive performance effects between combinations of non-financial measures and TQM, while Perera et al. (1997) did not. One explanation for these different findings is in the use of the performance measures. Chenhall (1997) related the measures to reward-and-compensation systems, whereas Perera et al. (1997) did not make this linkage. Perhaps the extent to which non-financial measures are used to evaluate and reward managers may be important in understanding the links among performance measures, advanced technologies and performance (Chenhall, 1997, cf. Perera et al., 1997). This suggestion is consistent with Sim and Killough's (1998) findings that incentive pay enhanced the positive effects of TQM and JIT on customer and quality performance. Also, Larcker's (1983) market-based study found that the combination of incentive schemes and capital investment was associated with improved investor return. Sprinkle (2000) reporting a laboratory study, demonstrated the importance of incentive schemes to enhance both absolute performance and rates of improvement by encouraging individuals to spend more time on tasks and to use and analyze information.

Foster & Horngren (1988) found that flexible manufacturing systems (FMS) were associated with performance measures focused on time, quality, operating efficiency and flexibility. There was also a change in the costing methods (allocations, treatment of costs as period and changes in the components of direct costs). However, FM has been linked to a de-emphasis of efficiency-based measures with control derived from integrative liaison devices (Abernethy & Lillis, 1995). It is to be noted that there is a difference between FMS that are *technical systems* such as computer-aided design and computer-assisted manufacturing (CAD/CAM) and FM that is a generic notion of technology emphasizing a *strategy* of flexible response and customization. Lillis (2002) found that the extent to which operating units followed strategies of responsiveness or quality affected the extent to which managers found multiple measures assisted them. While multiple measures assisted in managing quality strategies, managers found them more problematic for responsiveness strategies, possibly because of the difficulties of designing complete measures for responsiveness.

More research is needed to explore whether both focused formal controls at the operational level and more complex integrative devices can co-exist to assist control within TQM and FM situations. Also, links between different types of controls for operational, managerial and strategic decisions should be explored. For example, Chenhall & Langfield-Smith (1998a) link performance with combinations of various traditional and contemporary controls with a range of strategies and manufacturing practices.

5.3.2. Propositions Concerning Advanced Technologies and MCS

TQM is associated with broadly based MCS including timely, flexible and externally focused information;

close interactions between advanced technologies and strategy; and non-financial performance measurement.

The extent to which combinations of advanced technologies and non-financial performance measures are associated with enhanced performance depends on the degree to which the measures are used as part of reward and compensation schemes.

The advanced technologies of JIT and FMS are associated with broadly based MCS such as informal controls and greater use of non-financial performance measures.

FM is associated with the use of informal, integrative mechanisms.

Supplier partnership practices are associated with non-financial measures, informal meetings and interactions across the value chain.

5.3.3. Critical Evaluation

The three generic concepts of technology that have been used in MCS research (complexity, task uncertainty and interdependence) are separate constructs but there are some common themes concerning uncertainty. It seems likely that conversion of inputs into outputs within less complex, mass production technologies is more programmable and predictable than in job- or batch-styled technologies servicing customized products. High levels of predictability are associated with the throughput of process technologies but not for the management of breakdowns and other exceptions. The construct of task uncertainty concerns lack of information and is a combination of variability or lack of knowledge about alternatives and uncertainty about how to analyze the variations, or measure outputs, that occur during the conversion of materials into output. Higher levels of interdependence, where the work of one sub-unit is complicated by having to rely on another, raises the possibility of more uncertainty derived from lack of control over the supplying sub-unit.

The importance of uncertainty as an aspect of both environment and technology has led to some ambiguity between environmental and technological uncertainty in MCS research. For example, Hirst (1983) argued that accounting performance measures would be inappropriate in conditions of environmental uncertainty but measured uncertainty with a composite measure comprising both elements of task and environmental uncertainty arguing that the concepts are measuring the same thing. Ross (1995) theorizes effects between task uncertainty and performance measures but uses measures of environmental uncertainty. Clarification of links between environmental and technological uncertainty is required to isolate potentially different effects of these variables on MCS design. For example, external uncertainty implies a lack of information that makes it difficult to plan types of products and services, levels of output and create contingency plans. Also, it makes evaluation difficult as demand may change in ways beyond the control of managers. This suggests that more flexible, interactive MCS are required to encourage learning and adaptation and evaluate managers on the basis of more subjective measures or against adjustable criteria dependent on changing circumstances. The uncertainty associated with technology is, in part, derived from the environment with the technology being responsive to the uncertainty associated with markets and product requirements. Thus, technology may respond to environmental uncertainty by becoming more flexible or by employing JIT techniques. The appropriate MCS design is likely to be more flexible and organic. However, uncertainty, also, is caused directly within the technical processes, independently from environmental conditions. This may be derived from a search for improvements in product design and cost efficiencies and is likely to increase concern with managing uncertainty and complexity associated with the production processes. These conditions may prompt the adoption of planning and evaluation systems such as activity-based accounting, non-financial manufacturing performance measures and supplier networks.

Despite the links between environmental and task uncertainty, where possible researchers should draw on work that has tried to resolve issues related to the validity and reliability of measures concerning these contextual variables. An example of this is Brownell & Dunk (1991) who sought to reconcile findings related to the role of task uncertainty to the study of budgetary-related behaviours. Studies by Hirst (1983) and Brownell & Hirst (1986), used a measure of task uncertainty that aggregated the separate dimensions of task difficulty (analyzability) and variability (number of exceptions). Brownell & Dunk (1991), argued that such a composite measure is inappropriate as it mixes up the potential effects of difficulty and analyzability. They found that task difficulty, and not task variability, moderated the effects of budget behaviours on performance.

The area of contemporary manufacturing practices, such as JIT, TQM, FM and AMT, has provided many opportunities for contingency-based research (Young & Selto, 1991). Ideas from economics concerning complementarities are likely to prove useful in modelling the way multiple aspects of manufacturing can be combined optimally (Milgrom & Roberts,

1990).[8] Developing an understanding of best manufacturing practices and the way in which manufacturing aligns with or provides the impetus for strategy would seem to be a necessary step in ensuring that MCS design maintains relevance to the technical core of organizations. Closer cooperation between MCS researchers and manufacturing technology experts and industrial engineers would be fruitful. The importance of advances in information technology (IT) cannot be underestimated (Arunachalam, 2004; Chapman & Chua, 2003). The adoption of interactive IT systems, such as SAP R/3, often triggers the adoption of particular performance and costing systems.

As the average life span of products decrease, consideration of the life cycle of products has become a concern in manufacturing. Short product life cycles place demands for new product initiatives and alter cost structures. Also, decreasing life cycles increase operating risk and require increased capital investment. Understanding how MCS innovations, such as target costing, can assist management within these settings will likely become increasingly important.

There has been little work that has investigated how MCS are best suited to different stages in the growth of firms. Important topics are the role of more formal systems at the stages of new firm formation, early growth, maturity and decline. Questions arise concerning the requirements of MCS at these different stages. Particularly, are there differences in the role of MCS in growth compared to more mature stages, and how are MCS implicated in the transition across stages? Moores & Yuen (2001) provide an examination of issues concerning different aspects of MCS that are important for different stages of the growth cycle of firms. Davila (2005) examined how MCS formalize human resource management in small growing firms. Davila & Foster (2005) consider how firms adopt and implement budgets as they grow from the initiation stage to more mature entities.

Finally, it is noteworthy, that most contingency-based MCS research has involved large, manufacturing organizations. There have been some studies in the hospital and hospitality sectors but, on the whole, there has been little research investigating the service and government sectors. Some examples include studies within government agencies (Gieger & Ittner, 1996; Williams et al., 1990), in hospitals (Abernethy & Brownell, 1999; MacArthur and Stanahan, 1998; Noreen & Soderstrom, 1994), R&D (Shields & Young, 1994) and marketing departments (Foster & Gupta, 1994; Guilding & McManus, 2002; Smith & Wright, 2004). The growth in importance of service industries such as hospitality and tourism and the introduction of managerial approaches to public sector management provide many opportunities for future research.

5.4. Organizational Structure

Organizational structure is about the formal specification of different roles for organizational members, or tasks for groups, to ensure that the activities of the organization are carried out.

Structural arrangements influence the efficiency of work, the motivation of individuals, information flows and control systems and can help shape the future of the organization.

There have been various definitions of organizational structure. An important distinction is the difference between the outcomes of structure and the structural mechanisms. Lawrence & Lorsch (1967) refer to structure, generically, as the way in which the organization is differentiated and integrated. Differentiation is concerned with the extent to which sub-unit managers act as quasi-entrepreneurs, while integration is defined as the extent to which the sub-units act in ways that are consistent with organizational goals. The mechanisms to achieve differentiation involve decentralizing authority, while integration involves rules, operating procedures, committees and the like. Pugh et al. (1968, 1969) empirically identified examples of structural mechanisms that have been used commonly in contingency-based research, including centralization, standardization, formalization and configuration.

Burns & Stalker (1961) discuss structure, generically, in terms of mechanistic and organic approaches. The means to achieve these forms of structure involve mechanisms such as rules, procedures and openness of communications and decision processes. Perrow (1970) identified structure in terms of bureaucratic and non-bureaucratic approaches. Designers of MCS have been concerned with formulating MCS to be consistent with the intent of organizational structure. Consequently, it is useful to consider the extent to which MCS are mechanistic or organic, or to which they differentiate or integrate.[9]

The choice of structure in organizational contingency research has focused on the appropriate structure to fit the levels of uncertainty in the environment

[8] It is important to note differences between theories based on contingent compared to complementary relationships. Contingent relationships consider the design of controllable variables, for example budgets, in response to exogenous variables, for example the environment. Complementary relationships involve the co-design of multi-controllable variables, for example aspects of manufacturing.

[9] Table 1 considers the way in which elements of MCS can be grouped as mechanistic or organic.

(Burns & Stalker, 1961; Drazin & Van de Ven, 1985; Galbraith, 1973; Lawrence & Lorsch, 1967), strategy (Chandler, 1962) and the organization's technology (Galbraith, 1973; Perrow, 1970; Thompson, 1967; Woodward, 1965). Generally, it is believed that more organic structures are suited to uncertain environments. However, it should be noted that Lawrence & Lorsch (1967) identified a need for higher levels of differentiation to cope with diverse and uncertain environments and that this causes potential integration problems that require sophisticated liaison mechanisms (integrative personnel, meetings), rather than rules and procedures. This type of response is something of a hybrid between mechanistic (for differentiation) and organic types of structure (for integration) to manage uncertainty.

A large body of literature suggests that strategies characterized by diversification require differentiated, divisional structures (Chandler, 1962; Chenhall, 1979; Dyas & Thanheiser, 1976; Shannon, 1973). Also, it may be argued that once particular structures are in place then decisions will be influenced by the opportunities afforded by managers from authority granted to them and, perhaps, by the political interests of those individuals. Thus, strategy might follow structure (Donaldson, 1987). Often the structural arrangements have important implications for information flows that may shape or bias the future directions of the organization (Bower, 1970).

In the prior section, extensive links between technology and types of controls were drawn. It is, also, noteworthy that early studies of organizational design identified important links between technology and structure. Particularly, early research found that changing to more efficient technologies did not necessarily lead to enhanced effectiveness. Implementing the new efficient technologies involved reformulating the existing roles and structures that were accepted by individuals. These reformulated structures were not well received by employees. As a consequence, there were dramatic negative effects in the way individuals related to the new technologies and consequently there was a deterioration in performance. It was apparent that *socio-technical* approaches were required to ensure improved organizational performance (Trist & Bamforth, 1951). These early observations are important to many recent structural innovations such as work-based teams that attempt to harness developments in technology with the efficient blending of appropriate skills and the motivating force of teamwork.

When evaluating contingency relationships between MCS and structure, elements of environment, technology and strategy are likely to be implicated in the relationships and, as such, much can be gained by considering them at the same time.

5.4.1. Findings: Organizational Structure and MCS

Evidence from MCS research suggests linkages between large and diversified organizations that employ differentiated structures and the use of MCS to assist in integration. Large firms with sophisticated technologies that are decentralized have been associated with a strong emphasis on formal MCS (Bruns & Waterhouse, 1975); and large, diverse, decentralized firms used more administrative controls (importance placed on budgets, sophisticated budgets, formal patterns of communications and participation in budgets) (Merchant, 1981). Managers of decentralized organizations were identified as perceiving aggregated and integrated information as useful (Chenhall & Morris, 1986). From a corporate managers viewpoint, Abernethy et al. (2004) found that decentralization was associated with the importance given to highly aggregated divisional summary measures (financial and efficiency output measures) to assess divisional performance. This supports the idea that in highly differentiated situations, performance evaluation should respect the decision rights of managers. More specific non-aggregated measures are inconsistent with high autonomy.

There is some evidence relating MCS to functions within organization. Functional differentiation (more responsibility over areas of manufacturing) was linked to formality of budgetary processes (Merchant, 1984). Hayes (1977) found that the importance of evaluating factors related to internal operations, external conditions and interdependencies depended on the functional nature of departments. In production departments, overall effectiveness was associated with factors related to the performance of internal factors. For marketing, performance of factors related to the external operating conditions and interdependencies were most important. Functional differentiation has been linked to environmental uncertainty to demonstrate how R&D units, compared to marketing, are better suited to participative budgeting (Brownell, 1985). Mia & Chenhall (1994) found that marketing, compared to production, involves higher task uncertainty and this explained why marketing managers used broad scope information more effectively than those in production. Concerning particular functional decisions, Foster & Gupta (1994) identified that improvements in MCS would be valued for pricing decisions, customer mix, sales force or promotions and product mix. Costing information was perceived as useful for decisions concerning

products and customers. There was a difference between potential and actual use of MCS in the area of marketing.

Budgetary participation has been studied extensively and associated with a wide variety of contextual elements (see Shields & Shields, 1988, for a review). Structural contingencies linked to effective participative budgeting have included functional differentiation, specifically R&D compared to marketing (Brownell, 1985); leadership style employing high compared to low budget emphasis (Brownell, 1982a); a consideration rather than initiating style of leadership (Brownell, 1983); decentralization (Gul et al., 1995), as well as the findings, mentioned above, related to decentralization (Merchant, 1981). As noted, the theories used to examine functional differentiation relied on links to external environmental uncertainty, rather than structure, *per se* (Brownell, 1985).

The ways in which MCS combine with elements of organizational structure to provide differentiation and integration within contemporary organizational structures provide many opportunities for worthwhile research. Particularly, there are few studies that have considered the fit between organic structures and MCS. Organizational theory would suggest a need for flexible, open information systems rather than tight budgetary systems. Gordon & Narayanan (1984) found that organic structures were best served by broad scope and future-oriented information. Some researchers have found that more organic, behaviourally-oriented implementation is required to ensure the success of activity-based accounting (Foster & Swenson, 1997; Shields, 1995). Gosselin (1997) found that activity-based costing is adopted and implemented in organizations with more mechanistic structures. Particularly, mechanistic structures (vertical differentiation or bureaucratic decision processes) facilitate adoption of activity-based costing (an administrative innovation) and centralization and formalization were associated with implementing activity-based costing. Organic structures were more suited to activity analysis and activity–cost analysis (technical innovation). Presumably, organizations proceeding from activity analysis to activity-based costing would require elements of organic and mechanistic structures to carry them through the stages of activity analysis to activity-based costing.

An important element of contemporary structures is teams. As yet there are few studies that have considered the role of MCS within team-based structures. Young & Selto (1993) predicted that teamwork and problem-solving abilities of shop-floor employees would be associated with high performance related to JIT outcomes. Their study in a single organization did not reveal these associations due, in part, to an inability of workers to address process problems and poor implementation of JIT-compatible management controls.

Scott & Tiessen (1999) reported that team-based structures were associated with high task complexity and that team performance was associated with the use of comprehensive performance measures (financial and non-financial), formulated participatively and used for compensation. In an experimental study, Drake et al. (1999) found that in team structures the interaction between ABC (cf. volume-based accounting) and rewards based on group incentives (cf. assessment of individuals compared to other workers) was associated with cooperative innovations, lower costs and higher profits. Chalos & Poon (2000) identified that participation in capital budgeting teams was associated with improved performance with information sharing and an emphasis on performance-based budget, intervening in this relationship. Chenhall & Langfield-Smith (2003) found that formal performance measures based on productivity and an associated gain-sharing scheme were inconsistent with developing the high levels of trust necessary for self-empowered teams to operate effectively.

5.4.2. Propositions Concerning Organizational Structure and MCS

Large organizations with sophisticated technologies and high diversity that have more decentralized structures are associated with more formal, traditional MCS (e.g. budgets and formal communications).

R&D departments compared to marketing departments, which face higher levels of task uncertainty, are associated with participative budgeting; and marketing compared to production departments, which face higher levels of external environmental uncertainty, are associated with more open, informal MCS.

The structural characteristics of functional differentiation based on R&D compared to marketing, leadership style characterized by a consideration compared to initiating style, and higher levels of decentralization are associated with participative budgeting.

Decentralization is associated with the MCS characteristics of aggregation and integration.

Team-based structures are associated with participation and comprehensive performance measures used for compensation.

Organic organizational structures are associated with perceptions that future-orientated MCS are more useful, and with the effective implementation of activity analysis and activity–cost analysis.

5.4.3. Critical Evaluation

Structural mechanisms have been conceived of as involving differentiation and integration (Lawrence & Lorsch, 1967). Concerning differentiation, conventional thinking in management accounting proposes that decentralization should be combined with profit centre responsibility accounting systems. To achieve integration, simple mechanisms such as operating procedures and formal budgets have been recommended. It is of interest to observe the extent to which these recommendations appear somewhat inconsistent with the suggestions of Lawrence & Lorsch (1967) that highly differentiated organizations should employ complex liaison mechanisms to achieve integration. Closer inspection of empirical findings suggests that comprehensive and formal mechanistic controls might be only one aspect of coordinative efforts in differentiated organizations. Khandwalla (1972, 1977) found that large decentralized companies employed sophisticated controls but also utilized high levels of participation and human relations approaches to coordinate activities. Certainly, participation in budgeting has been linked to decentralized organizations. Merchant (1981) found participation was one aspect of administrative controls. Gul et al. (1995) found an association between decentralization and participative budgeting. How the participation of individuals in formal budgets might link to more organic forms of control is an interesting area for further research. Most of the participation studies examine participation from the perspective of the subordinate. However, Clinton & Hunton (2001) showed that performance effects depended on participation congruence, or the difference between the perceived need and the degree of participation allowed (See also Chenhall, 1986, who found that the dyadic configuration between superior and subordinates' approach to participation, captured by their level of authoritarianism, affected job satisfaction). The role of budgets within organizations that have developed structures based on delayering, developing teams and empowering employees should be investigated. Galbraith (1973, p. 145) alludes to the need to focus on the process of decision making and conflict resolution in situations in which there is ambiguity and conflict between the various structural units and roles within organizations (See Chenhall & Langfield-Smith, 1998b, for a study of the role of management accounting in firms developing change programs focused on teams).

Care should be employed in selecting measurement instruments related to structure. Structure has been measured in terms of decentralization of authority (Abernethy et al., 2004; Bruns & Waterhouse, 1975; Chenhall & Morris, 1986; Chia, 1995; Gul et al., 1995; Libby & Waterhouse, 1996; Merchant, 1981), structuring of activities (Bruns & Waterhouse, 1975), interdependence (Abernethy et al., 2004; Chenhall & Morris, 1986; Gerdin, 2005a; Macintosh & Daft, 1987) and organic–mechanistic orientations (Gordon & Narayanan, 1984). Measures of decentralization, structuring of activities and interdependence have relied, in the main, on those developed by the Aston school (Pugh et al., 1968, 1969). The organic–mechanistic nature of structure has been derived from Khandwalla (1977). The Aston measures have been subjected to considerable scrutiny and empirical testing for validity and reliability in the organizational literature. The use of more novel measures, such as those related to team-based structures, will require consideration of work that has developed these measures (Cohen et al., 1996).

As with other elements of context, in contemporary settings, structure remains an important factor in understanding MCS design. Many argue that adjustments to structure are required to ensure employee commitment to organizational goals related to continuous improvement (Katzenbach & Smith, 1993). Structural innovations, such as delayering, flat structures, networking, process orientations and team-based work groups concern the removal of barriers between organizational activities. Such seamless organizational structures appear to be inconsistent with traditional profit centres and responsibility accounting, yet many organizations maintain these hierarchical structures. Empowerment and teamwork have replaced participation as the appropriate concept for understanding the efforts of many organizations to gain employee involvement. Team-based structures, either as permanent work-based teams or special-purpose teams, are widespread. Issues of coordination, performance evaluation and reward systems in team-based organizations are important research areas. Much can be learned from linking MCS research agendas with work of human resource management researchers.

5.5. Size

Growth in size has enabled firms to improve efficiency, providing opportunities for specialization and the division of labour. Large organizations tend to have more power in controlling their operating environment, and when employing large-scale mass-production techniques have reduced task uncertainty. However, as organizations become larger the need for managers to handle greater quantities of information increases to a point where they have to institute controls such as rules, documentation, specialization of roles and functions,

extended hierarchies and greater decentralization of hierarchical structures (Child & Mansfield, 1972). Contemporary large organizations often develop close associations with suppliers and customers, which blurs the boundaries between organizations, thereby increasing further the size of the entity. Size has also provided organizations with the resources to expand into global operations, sometimes by way of mergers, takeovers, licensing or other collaborative arrangements. These developments create additional administrative concerns due to increased levels of complexity within the production processes and with managing interdependencies with global partners.

5.5.1. Findings: Size and MCS

Few MCS studies have explicitly considered size as a contextual variable. In the main, studies have examined relatively large organizations, usually justifying this as large firms tend to adopt the type of practices incorporated within more formal MCS.

Studies that have examined size have considered its effects together with other elements of context such as technology, product diversity and have examined an array of controls. Khandwalla (1972, 1977) found that large firms were more diversified in product lines, employed mass-production techniques, were more divisionalized and made greater use of sophisticated controls and environmental information gathering such as forecasting and market research. The papers by Bruns & Waterhouse (1975) and Merchant (1981), discussed earlier in terms of organizational structure, provide evidence related to size. Bruns & Waterhouse (1975) identified two forms of control associated with size: administrative with large firms and personal with small firms. Administrative control comprised more sophisticated technologies, formalized operating procedures, high levels of specialists and work-related rules. Managers perceived that employees had high levels of control and had high levels of participation in setting standards and spent more time in budgeting. They perceived budgets as limiting innovation and flexibility in structuring organizations. Interpersonal control involved centralized decision making, individuals saw themselves as having more interaction on budget-related matters, not having their methods of reaching budgets accepted and being required to explain budget variances. Individuals were satisfied with their superior–subordinate relationships. Merchant's (1981) study also considered size as an aspect of a multiple variable approach. Large, diverse firms were more decentralized, used sophisticated budgets in a participative way and employed more formal communications.

5.5.2. Propositions Concerning Size and MCS

Large organizations are associated with more diversified operations, formalization of procedures and specialization of functions.

Large organizations are associated with more divisionalized organizational structures.

Large organizations are associated with an emphasis on and participation in budgets and sophisticated controls.

5.5.3. Critical Evaluation

Most contingency-based MCS research has studied larger organizations but has not considered size variation within larger entities. This is unfortunate as there is evidence from early organizational contingency studies that the relationship between size and administrative arrangements such as specialization, formalization and the vertical span increases with size but at a declining rate. Thus, while it is reasonable to assume that large firms employ formal MCS, it is possible that different types of controls will be appropriate within these large firms, depending on size.

The role of MCS in smaller or medium-sized entities has received little attention in the contingency-based MCS literature (for an example see, Reid & Smith, 2000); even, the role of MCS in firms that change size due to rapid internal growth, takeover or merger has not been explored. It seems likely that the role of formal and interpersonal controls would differ depending on size and rate of change in size. Many opportunities for contingency-based MCS research are likely to be found in the area of small- and medium-sized business (see for example articles in the *Journal of Small Business Management* and the *International Small Business Journal*).

An impact of technological change and structural reform has been to reduce the number of employees, both shop-floor employees and the number of middle-level managers. In as much as the number of employees is associated with coordination and control issues, reduced size, due to the substitution of capital for labour, will have implications for MCS. For example, the combination of process controls to monitor machines and informal controls for evaluating people will likely become more important where there are fewer employees operating and managing capital intensive technologies.

Concerning measurement, there are several ways of estimating size including profits, sales volume, assets, share valuation and employees. The use of financial measures can make comparisons between organizations difficult as different accounting treatments can be found between firms. Most contingency-based

MCS studies have defined and measured size as the number of employees. Numbers of employees have been found to correlate with net assets (Pugh et al., 1968, 1969).

It is possible that the precise measure of size could be important depending on the element of context and dimensions of MCS being studied. If the theory is considering the effectiveness of budgets to coordinate individual activities, then employees is appropriate. If, however, the study is examining the effects of environment on the effectiveness of customer-focused accounting then sales and assets might be more appropriate, as these measures capture market power that can lead to barriers to entry or industry concentration. Khandwalla (1972) argues that forecast sales are the best indicator and he discusses how size may relate to planning, budgeting and structural modification.

5.6. Strategy

Strategy is somewhat different from other contingency variables. In a sense, it is not an element of context, rather it is the means whereby managers can influence the nature of the external environment, the technologies of the organization, the structural arrangements and the control culture and the MCS. The role of strategy is important as it addresses the criticism that contingency-based research assumes that an organization's MCS is determined by context and that managers are captured by their operating situation.

Recently, MCS research has recognized that managers have 'strategic choice' whereby they can position their organizations in particular environments. Thus, if the current product range is too uncertain, reformulating product strategy into a market that is more predictable may remove the pressure from the environment. It may, also, limit potential opportunities and therefore require the organization to examine its attitudes to the trade-off between potential returns and acceptable risk and uncertainty. Notwithstanding the strategic direction selected by the organization, contingency-based research predicts that certain types of MCS will be more suited to particular strategies. The powerful influence of strategy is evidenced by the popular use of terms such as strategies of TQM, the strategic imperative of an empowered workforce and strategic management accounting. Langfield-Smith (2006) provides a summary of research into MCS and strategy.

Several generic strategy taxonomies have been developed including entrepreneurial-conservative (Miller & Friesen, 1982); prospectors-analysers-defenders (Miles & Snow, 1978); build-hold-harvest (Gupta & Govindarajan, 1984); and product differentiation-cost leadership (Porter, 1980). Evidence from the strategy-organizational design research suggests that strategies characterized by a conservative orientation, defenders, harvest and cost leadership are best served by centralized control systems, specialized and formalized work, simple coordination mechanisms and attention directing to problem areas (Miller & Friesen, 1982; Miles & Snow, 1978; Porter, 1980). Strategies characterized by an entrepreneurial orientation, prospectors, build and product differentiation are linked to lack of standardized procedures, decentralized and results-oriented evaluation, flexible structures and processes, complex coordination of overlapping project teams, and attention directing to curb excess innovation. Simons (1994) argues that four dimensions of MCS link to strategy: belief systems to communicate and reinforce basic values and missions, boundary systems to establish limits and rules to be respected, diagnostic controls to monitor outcomes and correct deviations and interactive controls to enable top managers to personally involve themselves with subordinates and operations with a view to forcing dialogue and learning.

5.6.1. Findings: Strategy and MCS

From MCS research, evidence suggests links between strategy and cost control and to formality of performance evaluation. The studies are focused on strategy at the strategic business unit level, rather than corporate or functional levels. Most of the studies explore the association between MCS and strategic typologies. Conservatives, defenders and cost leadership strategies find cost control and specific operating goals and budgets more appropriate than entrepreneurs, prospectors and product differentiation strategies (Chenhall & Morris, 1995; Dent, 1990; Simons, 1987). Simons (1991) found that entities with little sense of urgency about creating a vision did not employ interactive controls. These generalizations are fairly simplistic. Merchant (1990) found no association between different growth strategies and pressure to meet financial targets. Simons (1987) demonstrated that tight controls were apparent in more entrepreneurial strategies, perhaps to balance excessive innovation and to help learning in uncertain environments. Chenhall & Morris (1995) found that tight control was suitable for conservative strategies; however, tight control was also found in entrepreneurial situations but, importantly, operating together with organic decision styles and communications. Again, the apparent paradox can be explained by the need for organic systems to encourage innovation and tight controls to curb excessive innovation.

Concerning performance measurement, build compared to harvest strategies and a reliance on long-term and subjective evaluation for managers' bonuses were associated with enhanced effectiveness. However, the association between strategy and effectiveness did not depend on short-term criteria for evaluation (Govindarajan & Gupta, 1985). Product differentiation (low cost) was associated with a de-emphasis (emphasis) on budgetary goals for performance evaluation (Govindarajan, 1988). Also, product differentiation with high (low) sharing of resources, and a reliance on behaviour (output) controls, was associated with enhanced effectiveness (Govindarajan & Fisher, 1990). Resource sharing was defined in terms of sharing the functional activities of marketing, production and R&D, and behaviour controls were considered to require more subjective performance evaluation. A study by Abernethy & Brownell (1999) found that hospitals undergoing strategic change (a more prospector type of strategy) used budgets interactively, focusing on dialogue, communication and learning (more organic styles of control). Van der Stede (2000) showed that product differentiation strategies were associated with less rigid budgetary control, which in turn, was associated with increased budgetary slack, although there were no direct effects between strategy and slack. Chenhall (2005) found that integrative performance measurement systems (strategic & operational linkages, customer orientation and a supplier orientation) assisted organizations to develop competitive strategies related to delivery and flexibility, and low cost-price. These effects were mediated, in part, by the intervening roles of strategic alignment of manufacturing and organizational learning.

Evidence on the usefulness of more broad scope planning information for prospector companies and for those following build compared to harvest strategies was found by Guilding (1999). In this study, the scope of the information related to competitor-focused accounting that incorporated competitor cost assessment, competitive position monitoring, competitor appraisal based on published financial statements, strategic costing and strategic pricing. Bouwens & Abernethy (2000) found that the level of importance to operational decision making of more integrated, aggregated and timely information was correlated with customization strategies. While associations with broad scope information were not found, the study focused on importance for 'operational' decisions, which presumably excluded decisions concerning markets and customer requirements that are more likely to involve broad scope information.

5.6.2. Propositions Concerning Strategy and MCS

Strategies characterized by conservatism, defender orientations and cost leadership are more associated with formal, traditional MCS focused on cost control, specific operating goals and budgets and rigid budget controls, than entrepreneurial, build and product differentiation strategies.

Concerning product differentiation, competitor-focused strategies are associated with broad scope MCS for planning purposes, and customization strategies are associated with aggregated, integrated and timely MCS for operational decisions.

Entrepreneurial strategies are associated with both formal, traditional MCS and organic decision making and communications.

Strategies characterized by defender and harvest orientations and following cost leadership are associated with formal performance measurement systems including objective budget performance targets, compared to more prospector strategies that require informal, open MCS characterized by more subjective long-term controls and interactive use of budgets focused on informal communications.

5.6.3. Critical Evaluation

Ideally, the role of strategy is dynamic involving managers in continually assessing the way combinations of environmental conditions, technologies and structures enhance performance. MCS has the potential to aid managers in this process by assisting them in formulating strategy related to markets and products, required technologies and appropriate structures. MCS can then be implicated in the implementation and monitoring of strategies, providing feedback for learning and information to be used interactively to formulate strategy. Few studies in MCS have investigated these issues (see Simons, 1987, 1991, 1994), rather most have been restricted to identifying MCS that are appropriate for different strategic archetypes.

While there are some common elements in these different strategic archetypes, there are significant differences; consequently, care is needed in developing theory that is specific to the archetypes employed in the study. For example, Fisher & Govindarajan (1993) develop theory to examine strategy and alternative controls based on the different needs derived from combinations of strategic mission, using concepts of build, hold and harvest, and competitive strategy, using product differentiation and low-cost taxonomies.

The extent to which these archetypes, which were developed in the 1970s and 1980s, maintain their

relevance to contemporary settings is questionable (Kotha & Vadlamani, 1995; Miller & Roth, 1994; Shortell & Zajac, 1990). Strategies are being complicated by the need for most organizations to be both low-cost producers and to provide customers with high-quality, timely and reliable delivery. More meaningful associations between strategy, environment and internal operations may become apparent if specific elements of strategic priorities are investigated. Relevant research is available based on contemporary strategic priorities (Miller et al., 1992) and has been applied in management accounting research (Chenhall & Langfield-Smith, 1998a; Chenhall, 2005).

Contemporary notions of strategy may also be employed usefully to investigate the role of MCS in change and innovation. While, some insights can be gained by examining movement across dimensions of archetypes, such as a change from harvest to prospector orientations (Abernethy & Brownell, 1999), greater understanding is possible by considering theories that relate to the dynamics of strategy. These include differences between incremental, synthetic and discontinuous change (Tushman & Nadler, 1986), the role of strategic intent (Hamel & Prahlad, 1989) and strategic resources (Amit & Schoemaker, 1993), the difference between intended and emerging strategies (Mintzberg, 1994), styles of management that encourage change (Kanter, 1982), the impediments to change of any formal resource allocation process (Quinn, 1985), and the way MCS can be used to manage both evolutionary and revolutionary change (Simons, 1994).

There have been concerns with the measurement of strategy. Measures used to study strategy have been criticized as mixing up elements of the environment with organizational attributes (thus studies of strategy and environment would be invalid). Measures tend not to relate to competitors; and this makes comparisons across industry groups problematic. Managers have difficulty relating to descriptions used to capture generic typologies such as build, harvest and prospect (see Langfield-Smith, 2006, for discussion of strategy measures). Strategy research should consider work that has attempted to validate strategy measures such as Dess & Davis (1984), Miller & Friesen (1986), Shortell & Zajac (1990), Miller & Roth (1994) and Kotha & Vadlamani (1995).

5.7. Culture

The relationship between the design of MCS and national culture represents an extension of contingency-based research from its organizational foundations into more sociological concerns. The basic proposition is that different countries possess particular cultural characteristics that predispose individuals from within these cultures to respond in distinctive ways to MCS. Culture has become important in the design of MCS over the past 20 yr as many companies have developed multinational operations. These companies face the issue of whether to transfer their domestic MCS overseas, or redesign their systems to fit the cultural characteristics of the offshore entities. Compared to studies of other contextual variables, research into culture has been limited and is somewhat exploratory.

There is a plethora of meanings of culture. However, Kaplan (1965) claims there is consensus among anthropologists that culture is composed of patterned and interrelated traditions, which are transmitted over time and space by non-biological mechanisms based on man's uniquely developed linguistic and non-linguistic symbolizing capabilities. Culture can be described by inherent traits such as knowledge, belief, art, morals, law, custom and other capabilities and habits acquired by man as a member of society (Seymour-Smith, 1986). However, often culture is conceptualized as a set of characteristics isolated to suit the methodological and scientific needs of the research community. The most widely used characteristics were developed by Hofstede (1984) who described the cultural values as power distance (acceptance of unequal distribution of power), individualism vs. collectivism (placing self-interest ahead of the group), uncertainty avoidance (preference to avoid uncertainty and rely on rules and structures), masculinity vs. femininity (achievement, assertiveness and material success vs. modesty and preference for quality of life) and, subsequently, Confucian dynamism (status, respect for tradition and protecting one's face) (Hofstede & Bond, 1988). Virtually all MCS contingency-based studies have used these values to study the influence of culture.

5.7.1. Findings: Culture and MCS

Contingency-based research in MCS has examined associations between cultural dimensions and elements of structure such as standardization, decentralization and control system characteristics such as formality of controls, reliance of accounting performance measures and budgetary participation. Overall, the research has provided mixed results as to whether culture does have effects across aspects of MCS. There are few areas where consensus can be drawn. This is because studies have examined different combinations of cultural dimensions and have considered aspects of MCS in different ways. As a

consequence, there is little overlap between studies to enable themes to be drawn or comparisons made and generalizations developed. The following are examples of studies that have examined accounting controls. Harrison (1992) demonstrated that differences between Singapore and Australian managers did not moderate the relationship between budget emphasis in evaluation and either job-related tension or job satisfaction. However, the relationship between reliance on accounting performance measures and low job-related tension and high job satisfaction was stronger for Singapore managers, the explanation being that these managers had low individualism and high power distance compared to Australian managers (Harrison, 1993). O'Conner (1995) argued that the low power distance found in western parent companies would dominate over high power distance found in their local Singapore subsidiaries, thereby enhancing the effectiveness of the parent MCS. Using these arguments he found that the relationship between role ambiguity and superior–subordinate relationships (perceptions of competence and trustworthiness) and both participation in budgeting and in performance evaluation were stronger in foreign subsidiaries than local Singapore entities. Merchant et al. (1995) studied Taiwanese and US firms and found that culture was not important in explaining use or effectiveness of the degree of subjectivity in profit centre manager's performance evaluation. However, they found that the use of long-term incentives was more important in Taiwanese firms.

Several studies have considered broader aspects of MCS with less equivocal results. Snodgrass & Grant (1986) found that Japanese, compared to US, companies experience less explicit controls and more implicit controls in monitoring, evaluation and rewarding. Ueno & Wu (1993) also found differences between Japanese and US managers on MCS characteristics. They theoretically linked individualism with US managers and found, empirically, that they used more formal communications, built slack, used controllability in budgeting and long-term horizons for performance evaluation. Uncertainty avoidance was linked to Japanese firms to explain a preference for broad time horizons and structured budgetary processes. These associations were not supported empirically, leading to the conclusion that individualism is the dominant predictor of MCS. Vance et al. (1992) studied formality of controls, team development, appraisal systems, intrinsic or extrinsic rewards and frequency of feedback in Indonesian, Malaysian, Thai and US firms. Significant differences were found not only between US and Asian firms but also among the different Asian firms. This study is distinctive as it used both Hofstede's dimensions plus other concepts of culture drawn from anthropology. Finally, studies using experimental methods have failed to support expected effects and have revealed ambiguous findings (Chow et al., 1991, 1994).

Given the exploratory nature of research examining culture and the lack of consensus on findings, only a general proposition relating culture to MCS is presented.

5.7.2. Proposition Concerning Culture and MCS

National culture is associated with the design of MCS.

5.7.3. Critical Evaluation

The dominant notion of culture employed in MCS-culture research has been the Hofstede (1984) values. However, several criticisms can be made as to how this approach to defining and measuring culture has been employed (Harrison & McKinnon 1999; see Baskerville, 2003, and Hofstede, 2003 for a discussion of Hofstede's approach to studying culture). First, it assumes that the different values have the same intensity within a culture. If this is not the case, then some value may be more dominant than others and have a prominent effect. Second, some studies do not consider all of Hofstede's values. It is possible that omitted values may have effects that are relevant to the study. Third, most studies assume that countries differ on values and proceed to test for differences between countries without directly assessing cultural values; however, countries' cultures maybe changing due to education and globalization. It is, therefore, important to check that the assumed values of a country are still apparent in contemporary studies. Fourth, while the Hofstede's values provide a convenient tool for research, it does represent a restricted view of culture. Its exclusive use has prohibited development of understanding how behaviour is influenced by the fundamental traits that influence how individuals think, feel and respond. More subtle notions of culture involving myths and ritual, language and narrative are not considered. It seems likely that theories and methods drawn from anthropology and sociology are more suited to understanding how these subtle factors combine to influence how individuals respond to MCS.

While national culture has been studied extensively, it seems likely that other variables such as markets and technologies may interact with cultures in systematic ways to effect MCS design. For example, the adoption of certain types of advanced technologies appears to work most effectively if attributes of collectivism are apparent. This combination of

technology and culture may suggest that certain types of performance measures, suited to the technology but consistent with collectivism, would be more appropriate. One variable that offers promise in the study of culture is organizational culture (Martin, 1992). It is possible that a strong organizational culture may dominate national culture in the work situation. Little work has been completed in the area of organizational culture and MCS design. Henri (2005) identified the 'competing values' model of organizational culture (Quinn, 1988) and used the control–flexibility aspects to study variations in the use of performance measures, employing survey-based methods. As with national culture, the meaning of organizational culture and its study are well served by the application of the research paradigms and methods from sociology and anthropology.

5.8. Continuing Relevance of Traditional Elements of Context

Insights into the present-day context of MCS can be gained by reflecting on the issues drawn from traditional contingency-based work. The environment will become more uncertain, hostile and complex as a result of contemporary pressures. There will be a need for organizations to develop increased environmental responsibility. Technologies will be found to have varying degrees of complexity, uncertainty and interdependencies that promote control issues. Structures will be employed that not only assist in developing more organic ways to communicate, but also provide enhanced differentiation to motivate and position individuals close to the business operations. Additionally, structures that empower individuals will be sought, with the purpose of providing a healthy and fulfilling work environment while better equipping the organization to achieve best practices. The challenges to coordination derived from size will increasingly become important as organizations enlarge due to developing close relationships with suppliers and customers and engaging in global operations by direct expansion, acquisition and merger. Notions of strategy are likely to be redefined and it will be necessary for MCS researchers to keep abreast of strategy commentators who reflect on the relevance of concepts developed by earlier writers. Culture will increase in relevance as firms continue to develop multinational operations and will likely best be researched by conceiving culture in richer terms than the value systems of Hofstede.

6. Issues Related to Theory Development

There are various forms of theoretical fit that have been used to classify contingency-based research in MCS: selection, fit (congruence and interaction) and systems (Donaldson, 2001; Drazin & Van de Ven, 1985).[10] Selection studies examine the way contextual factors are related to aspects of MCS with no attempt to assess whether this association is linked to performance (Chenhall & Morris, 1986; Merchant, 1985b). Fit approaches include studies that examine how organizational context influences the relationship between MCS and organizational performance (Brownell, 1983, 1985; Dunk, 1993; Govindarajan & Gupta, 1985). Systems models consider the way in which multiple aspects of controls systems and dimensions of context interact in a variety of ways to enhance performance (Chenhall & Langfield-Smith, 1998a; Gerdin, 2005c; Selto et al., 1995). Luft & Shields (2003) provide a refinement to classify and discuss theories employed in contingency-based MCS research. This involves considering the structural relations between variables, the nature of the causality between the variables and the levels of analysis.[11]

6.1. Structural Relationships between Variables

There are several forms of structural relationships. Selection studies are concerned with examining the extent to which MCS are related to elements of context and involve additive models. For example, it might be predicted that the use of balanced scorecards might be more extensive in conditions of low, compared to high, environmental uncertainty. To investigate these relationships, tests of association such as correlation analysis, or if there are multiple elements of context, multivariate techniques such as regression analysis are used (Anderson & Young, 1999; Bruns & Waterhouse, 1975; Guilding, 1999; Merchant, 1984).

[10]There is variation in the use of terminology to describe various forms of fit. Gerdin & Greve (2004) distinguish congruence and contingency approaches. Congruence is where there is no attempt to include performance in the study, whereas contingency includes performance. Donaldson (2001) defines contingency as congruence that includes performance in the study. In this chapter, the term selection is used when studies exclude performance (see also Drazin & Van de Ven, 1985) and congruence fit when they do include performance.

[11]See also Briers & Hirst (1990) and Fisher (1995, 1998) for discussions of theory development within MCS contingency research, Ittner & Larcker (2000) for issues related to MCS research in general and Gerdin & Greve (2004) for a discussion of different forms of contingency models used in MCS research and the dangers of loosely drawing on one form of model to support another form. See also a debate between Gerdin (2005a,b) and Hartmann (2005) on the distinction between contingency models.

Contingency fit may be defined as congruence (Donaldson, 2001). The congruence perspective sees fit as a 'combination of the levels of the contingency variable and MCS that produces higher performance than other combinations' (Donaldson, 2001, p. 186). That means, for each level or score of a contextual variable there is a unique MCS value that will maximize organizational performance, with all other MCS values at that level of the contextual variable resulting in lower performance. For each level of a contextual variable, say environmental uncertainty, a unique score for a MCS variable becomes appropriate; say the degree to which budgets are used in a flexible way. Any mismatch between the specific level of the contextual variable and the appropriate MCS score results in a decrease in performance (Donaldson, 2001, p. 186). This type of model has not been used widely in MCS research. The method to test the relationships is to assess the difference, or deviation, between the ideal and actual fit and to assess the extent to which these deviations are negatively associated with performance. There are several ways to calculate deviations from fit. One way is to use 'residual analysis' (Duncan & Moores, 1989). This approach regresses the MCS variable against the contextual variable, arguing from theory that a significant association will be apparent, indicating fit, and any misfit will be captured in the equation's residuals. To test for the effects of misfit, the residuals are regressed against performance, predicting that performance will be negatively associated with the residuals (or lack of fit). (See Ittner, et al., 2002, for a recent application of this technique). Another method to determine deviation is to subtract actual fit from ideal fit by way of 'Euclidean distance' with high deviation scores being predicted to be associated with negative performance (Drazin & Van de Ven, 1985). Fit may be determined theoretically (Drazin & Van de Ven, 1985) or empirically by regressing MCS with the contextual variable and using the regression to predict the MCS that fits the level of context. It is often recommended that the regression should be performed on a sub-sample of the best performers, selected from the full sample, thereby ensuring that fit represents high performance. However, this technique was not developed as way of examining how a single MCS variable fits with an element of context, rather it is used to examine multiple variables that form a systems fit (Govindarajan, 1988; Selto et al., 1995). An alterative measure for measuring misfit is by matching. Matching involves determining fit and misfit by subtracting the score for the MCS variable from the contextual variable, measured on the same scale, with scores of zero indicating fit and movement away from zero indicating degrees of misfit.[12] Again, the matching score is regressed against performance predicting that high scores will be associated with lower performance.

Interaction models are used where the nature or strength of a relationship between MCS and an outcome criterion will depend on the influence of particular aspects of context (Brownell, 1982a, 1983, 1985; Davila, 2000). Interaction approaches share with congruence fit the idea that there are appropriate combinations of context and MCS that produce effective performance. However, rather than specifying fit that relates unique scores of the MCS variable to each level, or aspect, of the contextual variable, interaction suggests that certain combinations of context and the MCS will be more effective than other combinations of context and MCS. Interaction variable models have been the dominant forms in contingency-based research. For linear interaction models, moderated regression analysis or analysis of variance is appropriate. Hartmann & Moers (1999) provide an extensive review of the shortcomings of interaction or moderated regression models as applied to budgetary research over the past 25 yr.

A third form of modelling involves systems approaches that also describe fit but do so by testing multiple fits simultaneously, involving a wider variety of dimensions of context and MCS. Variation in performance stems from variations in overall systemic fit, with multiple, equally effective alternatives being possible. Techniques to test systems models include the use of Euclidean distance (Selto et al., 1995) and cluster analysis (Chenhall & Langfield-Smith, 1998a; Gerdin, 2005c). These approaches are less rigorous than regression and require many decisions in terms of the type of analysis and given the complexity of the relationships between variables, interpretation and theory building can be difficult.[13] They do, however,

[12]Studies of the contingency relationship between participation and locus of control by Brownell (1982b) and Frucot & Shearon (1991) use 'matching' to test their data. The 'matched score is regressed against performance, predicting that high score are associated with lower performance. However, the theory and the form of the hypothesized relationships are of an interaction model, while the test using 'matching' is consistent with a congruence fit model (see Hartmann & Moers, 1999, p. 298–299, for a discussion of this point).

[13]Chenhall & Langfield-Smith (1998a) use cluster analysis in an exploratory way to links many aspect of MCS to a wide variety of strategy and manufacturing variables, whereas Gerdin (2005c) argues from theory that technological interdependence, organizational structure and MAS theoretically combine in predictable ways and then uses cluster analysis to test the prediction.

provide a way of addressing the criticism that contingency-based research provides only a partial understanding of MCS and its context. For exploratory research, Ittner & Larcker (2001) note the potential of recursive partitioning to split samples into a sequence of sub-groups thereby generating a tree-like structure that describes a nesting of independent variables (Ittner et al., 1999).

Intervening variable models represent a fourth form of modelling that have been employed in researching the relationships between MCS and outcomes. These models do not examine contingency relationships in that they do not aim to study the effects of context on the effectiveness of MCS. Rather, intervening variable models examine how MCS have their effects and provide evidence on the assumed causal mechanisms that lie behind the association between MCS and outcomes. Often, intervening models involve the specification of causal paths between MCS, context and outcomes (Shields et al., 2000; Van der Stede, 2000). It is possible that the same variable could be used as a contextual variable or as an intervening variable. It is essential that the nature of the relationship is supported by theory that argues for either contingency or intervening variable relationships. Bisbe and Otley (2004) show how arguments can support the relationships between interactive control systems, innovation and performance with the relationships being either a contingent or intervening variable effect. Separate tests supported the contingent relationships between innovation and interactive controls affecting performance but not the intervening role of innovation in the relationship between interactive controls and performance. (See Gerdin, 2005b, and Hartmann, 2005, for an exchange of views on the distinction between intervening and contingent modelling).

Intervening variable models may identify the antecedents to MCS, or they may demonstrate how the relationship between MCS and outcomes are explained by intervening variables. It is often important to decompose the association between MCS and outcomes into indirect effects operating through the intervening variable and the direct effect that captures all remaining effects influencing the association between MCS and outcomes. Initially, studies examining intervening models used a combination of linear regression and simple correlations to identify paths between variables and then used these paths to decompose correlations of interest into direct and indirect effects (Chenhall & Brownell, 1988; Shields & Young, 1993). More recently, powerful structural equation models (SEM), such as EQS, LISREL, AMOS and PLS, have been employed that enable latent variables to be constructed from multi-item questionnaires and to identify, simultaneously, statistical significance with multiple dependent variables (Anderson & Young, 1999; Baines & Langfield-Smith, 2003; Chenhall, 2005; Shields et al., 2000). It is possible to combine moderating variables within an intervening model by examining the extent to which a variable moderates the effects on one or more of the paths (Scott & Tiessen, 1999). Also, SEM models provide methods to examine moderating effects within path models. Given the recent criticism directed towards moderating variable models, there is a danger that researchers will try and force arguments about interaction effects into intervening variable models. As indicated above, it is possible to examine both moderating and intervening models as competing models; each based on strong theory, and then test both separately to identify which is a better explanation (Bisbe & Otley, 2004).

6.2. Causality

Concerning causality, contingency-based research within MCS research has, in the main, been survey based and this tends to limit the scope of the studies to consider situations involving unidirectional relationships (MCS determines outcomes) or bi-directional relationships (MCS determines outcomes, which then determines MCS). Most of the MCS research implicitly assumes unidirectional relationships. If the relationships are bi-directional, then it is possible that they are simultaneously determined representing a situation in equilibrium, or they are related cyclically where MCS determines outcomes, then outcomes determine MCS, followed by MCS effecting outcomes and so on. Given the existence of cyclical relationships, the predictions from contingency-based theory may differ depending on which stage of the cycle is being proposed (Donaldson, 2001, p. 246–271). Moreover, given that most contingency-based research has used cross-sectional survey methods, the results are relevant to only one stage of the cycle. Recent critiques of contingency research recommend that researchers study the dynamics of how organizations move between misfit and fit, through time as they adjust to changing circumstances (Donaldson, 2001, p. 275–289; Gerdin, 2005b; Hartmann, 2005). Donalson (2001: p. 280) refers to this approach as SARFIT, 'structural adaptation to regain fit'.

6.3. Levels of Analysis

The issue of levels of analysis is important to theory construction within contingency-based research. Care is required in maintaining consistency between the theory, the unit or level of analysis and the source of measurement. Consider examining the usefulness of budgets to evaluate sub-unit performance. Budget

usefulness is considered to depend on environmental uncertainty and managers' experience with budgets. The usefulness of budgets may be considered as a sub-unit variable and the appropriate concept of environment is one that applies to the particular sub-units, such as uncertainty with sub-unit products or suppliers. The assumption is that all managers within the sub-unit will be expected to respond to the environmental uncertainty in the same way. Any difference at the individual level that may potentially affect budget usefulness is noise. However, if individuals within the sub-unit are expected to respond differently because of different experience with budgets, an issue arises as to what is the appropriate level of analysis. The usefulness of budgets and environmental uncertainty are sub-unit variables and experience with budgets is an individual level. If an individual level is adopted then the usefulness of budgets at the sub-unit level and the environmental uncertainty facing the sub-unit are inappropriate as the uncertainty is assumed to be the same for all individuals within the sub-unit. If the theory is cross-level and includes both sub-unit and individual levels, then the sub-unit level of analysis can be preserved by splitting the existing sub-units into new sub-units based on different degrees of the individual level variable. For example, new sub-units would be created that capture the four combinations of high or low uncertainty and high or low experience with budgeting. More generally, the appropriate model for this is an interaction model (Luft & Shields, 2003: p. 199).

Luft and Shields (2003: p. 197) also note the distinction between cross-level studies that require interaction models and multiple-level models. Multiple-level models include variables at different levels that do not affect a variable at another level. In this situation, the multiple effects are additive, with the use of nested or hierarchical models to partial out additive effects at different levels. In addition, Luft & Shields (2003: p. 196) indicate how sample size can be affected by levels of analysis. They show that it is important to identify if the effects of MCS are related to individuals (e.g. 4,000), the organizations within which they work (e.g. 40) or the industries (e.g. 4). The sample size will be dependent on the level of analysis, be that 4,000 for individual level, 40 for organizational level and 4 for industry level. For a comprehensive discussion of these issues and an evaluation of an extensive list of MCS studies, see Luft & Shields (2003).

7. Alternate Theories and Contingency-Based Research

The term contingency means that something is true only under specified conditions. As such there is no 'contingency theory', rather a variety of theories may be used to explain and predict the conditions under which particular MCS will be found or whether they will be associated with enhanced performance. Contingency-based research has its foundations in organizational theory, which considers only organizational and environmental contextual variables. The early MCS contingency-based research used organizational theories developed in the 1960s and 1970s. Theorists such as Woodward (1965), Burns & Stalker (1961), Perrow (1970), Thompson (1967) and Galbraith (1973) considered generic notions of context and provided persuasive arguments as to how they relate to organizational structures and systems. There is a viewpoint that advances in contingency-based research will be best served by developing and refining theory within its organizational core. Certainly, the concepts and ideas from organizational theory continue to provide a coherent and rich foundation to examine traditional and new MCS within contemporary settings. Much can be gained in understanding the implications of contemporary elements of environment, technology and structure to the design and implementation of MCS by considering the insights provided by these early theoreticians. For example, Chapman (1997) examined the role of uncertainty in MCS design by reflecting on Galbraith's (1973) theories relating uncertainty to the supply and demand for information. Kalagnanam & Lindsay (1999) develop theory on the importance of organic controls for JIT situations by employing ideas from Woodward (1965).

Given the fairly obvious proposition that most events and the outcomes of those events are likely to depend on the contextual settings, an important issue is whether future contingency-based frameworks can be advanced by integrating insights from alternate theoretical perspectives into organizational adaptation and functioning. Theories from economics and psychology, as well as organizational theories, have much to say about the adoption and implementation of MCS. These theories follow a functionalist approach that considers the utility of MCS in achieving purposeful outcomes.

Theories from economics, such as agency theory have, in the main, considered the role of incentive schemes to gain employee commitment to those organizational goals prescribed by principals. Agents are assumed to be self-serving and opportunistic (see Baiman, 1982, 1990, for reviews of agency theory related to MCS research). Most studies have employed analytic research techniques. A number of studies employing agency theory have used survey methods to study organizational slack (Dunk, 1993), responsibility accounting (Baiman et al., 1995), performance measures (Bushman et al., 1995) and participative

budgeting (Shields & Young, 1993). Shields (1997) provides a review of various types of MCS research, including studies that have employed agency theory.

Agency theories have been criticized for not considering the context in which principals and agents contract and for not investigating the trade-offs with other elements of control systems (Merchant & Simons, 1986; Shields, 1997). These ideas may be developed by considering self-serving behaviour as a variable influencing the relationship between incentives and performance, with more organizationally focused attitudes being an alternative requiring different forms of incentive schemes (Davis, 1997a,b). Concerning the role of non-financial considerations, Luft (1997) argues that agency theory relationships may be supported empirically but the inclusion of factors important to agents, such as ethical and fairness considerations, may affect these findings. Evans et al. (2001) found that managers will sacrifice wealth to make honest or partially honest reports and they do not lie more as payoff for lying increases. In an experimental study, they showed that more effective employment contracts than those suggested by conventional economic analysis can be devised by using managers' preferences for honest reporting. Kunz & Pfaff (2002) identified that that under certain specific conditions, high intrinsic motivation undermines agency theory predictions related to performance pay in corporations. However, the conditions within which this may occur are special and are easily avoidable in real life. While concern with intrinsic–extrinsic motivation did not seem promising in understanding agency theory predictions, the authors recommend that agency theory could well include consideration of implicit contracts, self-perception and social interactions, fairness and reciprocity, social norms and the analyses of fuzzy incentives.

Population–ecology theory asserts that fit is attained by a process of Darwinian natural selection working through births and deaths in the population of organizations (Hannan & Freeman, 1989). Organizations that have appropriate adaptive mechanisms and do not fail are selected for survival. The analysis is done at the aggregate population level, without explicitly considering how individual organizations adapt. While population–ecology has been criticized as it does not consider individual organization adaptation, it does examine issues concerned with the birth and death of organizations, areas that are neglected by contingency researchers. Population–ecology and contingency-based research might be developed by examining the preconditions that are associated with those organizations selected for birth and those associated with mortality. For example, environments rich in opportunities may be associated with new start-up firms, or certain interactions between strategies, internal structures and control systems might be associated with those populations experiencing higher levels of mortality.

The area of psychology has relevance to understanding MCS and has provided the basis for some research over the past 20 yr.This research has attempted to identify if individual characteristics such as personality or cognitive style affect the way individuals react and respond to different aspects of MCS. For example, studies have found that the effectiveness of budgetary participation is moderated by an individual's locus of control (Brownell, 1981), or the levels of authoritarianism of superiors and subordinates (Chenhall, 1986). It is possible that personality factors may be important moderators in the relationship between conventional organizational contextual variables and the usefulness of MCS. For example, Hartmann (2000) argues that the relationship between the acceptance of RAPM and environmental uncertainty may be moderated by an individual's tolerance for ambiguity with low tolerance individuals more readily accepting RAPM in conditions of uncertainty as it helps reduce ambiguity. Individual cognitive style has been associated with a proclivity for individuals to use different forms of information, such as opportunity cost (Chenhall & Morris, 1991). It has been shown that MCS success is likely to depend on the extent to which individuals have organizational commitment (Nouri & Parker, 1998), the generation of high levels of trust between employees and managers (Ross, 1994), or whether organizational justice is achieved in implementing MCS (Libby, 1999).

Concern with individual attributes can usefully be combined with organizational context by examining the compatibility between individuals and their work situation. This has been referred to as person–environment fit (Deci, 1980) and person–organization fit (Kristof, 1996). These approaches assert that environmental or organizational factors provide explanations of behaviour based on observable events but that consideration of individuals can enhance predictions as they bring a unique interpretation to the situation. Often person–environment fit examines the extent to which individuals demand for financial, physical and psychological resources, as well as task-related opportunities, fits with the supply of these attributes from the organization. Alternatively, fit is seen as the extent to which the individual's abilities fit the organization's requirements for contributions. Shields et al. (2000) draw on person–environment fit to argue that stress may be derived from differences between performance demands of a task and the individual's performance capabilities. Participation in standard setting was shown to decrease stress by increasing individual's feeling of control. Fisher (1996) found that

the usefulness of MCS could be determined from considering individuals' locus of control and the levels of uncertainty in the environment. Contrary to expectations, individuals with an external locus of control found broad scope and timely information more useful when they perceived the environment as uncertain compared to those with an internal locus of control. Govindarajan (1988) demonstrated that managers with an internal locus of control operating in decentralized situations with a low emphasis on meeting budgets were associated with high performance in strategic business units employing product differentiation strategies. Gupta & Govindarajan (1984) provided evidence linking a strategic business unit's build (harvest) strategy with the individual manager characteristics of greater (less) marketing or sales experience and willingness to take risk, and greater (lower) tolerance for ambiguity.

It seems likely that personality, cognitive style and issues associated with commitment, trust and organizational justice could help explain the way individuals react to information in different contextual settings, and as such can be included readily within contingency-based frameworks. When combining different levels of analysis, care is required in theory development and method to ensure that combinations of individual and organizational variables are theoretically and empirically legitimate.

Another area that draws on concerns with the way managers take decisions is behavioural economics. This approach emphasizes what actually happens, rather than the logical conditions necessary for things to happen, to generate a strong descriptive base for economic research. A large body of research, originally associated with the Carnegie school (Cyert & March, 1963; March & Simon, 1958;), but also explicit in the psychology of economic decision making (Kahneman & Tversky, 1984; Katona, 1951), has suggested that individuals have cognitive limitations that influence decision making. Factors such as limited information-processing capacity, selective perception and satisficing rather than optimizing and bounded rationality all help explain why individuals behave in ways that may be inconsistent with predictions based on assumptions of rational economic decision making.

Behavioural economics presents important challenges to understanding the way managers approach resource allocation decisions. These include ideas of muddling through by Braybrooke & Lindblom (1970). They argue that rather than using formal, analytical, rational-comprehensive planning, managers use seat-of-the-pants judgement to muddle through. Cohen et al.'s (1972) garbage-can model of behaviour suggests that mangers have a repertoire of problem responses. Managers recognize problems when they match situations in which they have developed solutions. A difficulty with these observations for functionalist contingency-based research is that there is little that is prescriptive in terms of designing MCS. However, these types of issues are important to understand, as they may provide the diagnostics for why the design of MCS, which appears to fit context, still do not generate effective organizational performance.

The work of Williamson (1985, 1986) focused on information problems and how managers take decisions. A major contribution of relevance to organizational control concerns identifying when the performance of the firm is influenced by its organizational structure. Williamson examines the issue of when transactions are better completed within firms and when they are best executed by markets. Issues of divisional structures, profit centres and transfer pricing have been informed by these theories (Colbert & Spicer, 1995; Spicer, 1988; Spicer & Ballow, 1983; Swieringa & Waterhouse, 1982). Importantly, Williamsons's work recognizes that there is no obvious single optimal method for internal organization. At any one time, the appropriate structures and controls will depend on product portfolios or the extent of vertical integration. Gilad et al. (1988) provide a brief overview of the development and contribution of behavioural economics.

A criticism of contingency-based research is that it has relied on traditional, functionalist theories and has not applied more interpretive and critical views. Alternative approaches, derived from sociology literature, have been used in MCS research to provide this interpretive and critical focus. In the main, these approaches have rejected the assumptions upon which functionalist contingency research is based.[14] A strength of 'alternative' approaches is that they show the potential conflict between individuals and groups and how MCS may be implicated in these struggles. For example, MCS are not assumed to lead

[14]MCS are not seen as passive mechanisms to be used by managers to assist in optimizing resource allocation. Rather, they may be used to legitimate particular power relationships within organizations or enable groups within society to maintain their command over resources or political direction. MCS may be motivated by mimicry and compliance rather than a need for enhanced efficiency. Managers may espouse intent for efficiency but respond to MCS in ways constrained by bounded rationality, limited information processing capacity, selective perception and satisficing rather than optimizing behaviour. MCS may be instrumental in limiting progress because it inhibits innovative thought or it may have a role in assisting in the adoption of change by providing the basis to control the new initiatives.

necessarily to enhanced effectiveness, rather they are used for political and power purposes by groups within the organization or within the society at large, and are not associated with the welfare of the organization. These themes are attractive to research approaches that are radical or socially critical. Baxter & Chua (2003) provide a review of the various streams of sociology that have been used in MCS research.

Often sociological approaches involve examining novel relationships, processes and their contextual setting. The preferred method to collect and interpret data is case studies. Case studies are very powerful for identifying research problems and in developing and generalizing theory (Covaleski et al., 1996). (See Baxter & Chua, 1998, 2003, for a summary and synthesis of this form of research, Atkinson & Shaffir, 1998, for a discussion of the case study method of research in MCS, and Young & Selto, 1993, for difficulties in case research). However, restricting research to cases limits the possibilities for causal inference and generalizability to broader populations. Also, it is difficult to make progress in understanding the more subtle insights derived from alternate approaches without attempting to identify general patterns of causation (Donaldson, 1985). Much can be gained by combining case evidence with surveys within contingency-based frameworks. For example, Young & Selto (1993), Shields & Young (1993), Kalagnanam & Lindsay (1999) and Davila (2000) present site visits or case studies as part of problem identification and theory construction to propose relationships between MCS and contextual variables that are then tested by the use of survey methods.

An important issue is whether 'alternate' theories of MCS research can be combined with traditional, functionalist models. While these paradigms have different theoretical and philosophical bases, some researchers have used contingency-based ideas to develop convergence between these approaches. Many of the insights concerning the role of institutions within society on the adoption of MCS can be combined readily with contingency concepts (Gieger & Ittner, 1996; Scott, 1987). Also, the way in which power is implicated in the adoption and use of MCS to effect resource distribution or induce change can be examined within contingency-based approaches (Bariff and Galbriath, 1978; Hage, 1980). Moreover, understanding of the influence of power and politics may be illuminated by considering theories related to environmental, technical and structural context. A contingency-based approach attempts to map variables and demonstrate potential relationships between these variables, which may include power and politics, and indicate potential links with outcomes.

Caution must be directed at any approach providing some unification between functionalist and 'alternate' approaches. Literature examining MCS from various organizational, economic and psychological perspectives assume that the study of MCS is conducted within situations that can be well specified and understood. The search is for generalizable findings; unique situations are seen as anomalies and are important only as they help understand how to move towards well-structured and ordered solutions. Sociological approaches use a variety of theories to understand organizational settings that are often so ill structured that regularities cannot be meaningfully represented. Some commentators claim that different theories offer fundamentally different insights into the nature of MCS and should not be blended but kept separate providing alternative ways of understanding the multiple roles of MCS in organizations. Any attempt at amalgamation is unlikely to attain a true synthesis as one theory inevitable subsumes others (Covaleski et al., 1996; Dirsmith et al., 1985). However, a proliferation of theoretical alternatives, without an integrative framework, can be confusing to both managers and students and much is lost in fragmentation across many unconnected streams of research. Some contingency-based researchers see a challenge in providing an integrating framework that combines structure and process, to assist managers, students and researchers find a path through the many diverse paradigms used to study MCS (see Donaldson, 1995, for an attempt to integrate a variety of theories using structural contingency frameworks as the unifying theme). Also, attempts to assimilate ideas from alternative theories could generate constructive debate on competing organizational ends, the role of different groups within organizations and stakeholders, and a variety of values and purposes associated with MCS including the implications of alternatives to traditional rational economic values, and the role of different elements of organizational context (Jonsson & Macintosh, 1997).

8. Conclusion

Contingency-based research has approached the study of MCS assuming that managers act with an intent to adapt their organizations to changes in contingencies in order to attain fit and enhanced performance. There is a considerable body of literature, which while not without imperfections in method, has provided a basis for generalized propositions between elements of MCS and context. The basic framework and potential strength of the method provide a basis to persist with contingency-based research to uncover generalizable findings that can enhance desired

organizational outcomes. To maintain the relevance of MCS contingency-based research, scholars will need to focus their attention on contemporary dimensions of MCS, context and organizational and social outcomes. Notwithstanding the need to study issues of contemporary relevance, much can be gained by reflecting on the work of original organizational theorists and more recent thinking in areas such as strategy, organizational and cultural change, manufacturing, information technology and human resource management. Other approaches based on economics and psychology can readily be included within contingency-based frameworks. While founded on non-functionalist approaches to studying MCS, insights drawn from 'alternate' theories can also assist in elaborating the traditional contingency-based model. Moreover, contingency-based research can provide an ordered way to integrate thinking about the sociological processes effecting MCS in action, perhaps combining these insights with conventional elements of contingency-based models. Such a research agenda involves many issues concerning theory development and model construction that provide challenges for researchers.

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Critical Theorising in Management Accounting Research

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Abstract: There is a long and distinguished history of critical theorising in management accounting, but some doubt its continuing relevance to understanding modern management, organisations and the world, more generally. We address this issue by showing how three broad approaches to critical theory (labour process, critical theory and post-structuralism) help us understand two major developments in modern management accounting. We review the critical accounting literature in strategic management accounting and new public management to show, *inter alia*, the enduring value of a socially and historically contextualised view of management accounting that emphasises power and conflict, examines the multiplicity of mechanisms of commodification and is oriented to social improvement. The chapter concludes by identifying some continuing challenges and highlights the achievements of critical theorising in management accounting.

"(T)he past is country from which we all have emigrated… its loss is part of our common humanity… the writer who is out-of-country and even out-of-language may experience this loss in an intensified form. It is made more concrete for him by the physical fact of discontinuity, of his present being in a different place from his past, of his being 'elsewhere'. This may enable him to speak properly and concretely on a subject of universal significance and appeal.… The broken glass is not merely a mirror of nostalgia. It is also, I believe, a useful tool with which to work in the present."

(Salman Rushdie, Imaginary Homelands, Granta Books, 1991, p. 12).

1. Introduction

This chapter reflects on critical theorising in management accounting (MA) through Rushdie's 'broken glass'. As longstanding critical theorists in MA, we revisit the past not for its nostalgic value but for what it offers for learning about the future. For us, critical theorising connects the past to the present by analysing how changing roles of MA are linked to other management technologies and socio-economic changes. This chapter demonstrates the continuing relevance in two areas of MA: strategic management accounting (SMA) in the private sector and 'new public management' (NPM) in the public (or not for profit) sector. Importantly for us, critical theorising requires the theorist to recognise how they influence the world they analyse, and their responsibility to intervene to improve the well being of organisational participants.

In order to contextualise the Rushdie quotation, we offer a little personal history, hopefully avoiding narcissistic reflexivity, to explain our attraction to critical theorising, particularly radical theories of organisations that emphasise power and conflict (Cooper, 1981, 1983; Hopper & Powell, 1985). Our (joint) past began in a collaboration to research management control in the British coal mining industry. Our initial motivation was to study 'accounting in practice' to examine whether conventional theories of accounting and control, notably structural functionalist approaches such as contingency theory and economic approaches such as agency and transaction cost theories, adequately explained budgeting and performance evaluation in a large, complex organisation. Our

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experiences led us to emphasise institutional (notably Meyer and Rowan, 1977) and grounded approaches to theory construction (Berry et al., 1985a). Yet the research occurred just before a major strike that signalled the demise of an industry that employed hundreds of thousands of people, dominated the lives of many British communities and was a bedrock of British manufacturing. Events during the prolonged, bitter dispute left us unsatisfied with our initial theorising as it tended to ignore this wider context. The National Coal Board had been the archetypal 'old' manufacturing industry and its demise was a major marker of British de-industrialisation, and the rise of privatisation and shareholder-dominated models of strategy. Accounting was at the forefront of these wider changes, yet MA research seemed to assume what happened within an organisation could be understood without reference to developments beyond its boundaries. In brief, the experience made the central ideas of various critical theories real and salient to us. To fully understand MA one must examine its social, economic and political context and recognise the role of power and conflict (Capps et al., 1989; Hopper et al., 1986). MA is not simply a technical activity but a set of practices that produce and reproduce not just organisational life but also social and economic life at a more macro level.

We offer these observations to reflect on whether past critical theorising is relevant today: a different time and place where the dominant language concerns globalisation, fragmentation, identity and image, performance, competitive strategy and market rationality. One response is to emphasise how today differs from the 1970s, when the labour movement was stronger, mass production was common in the Western world, many states followed Keynesian intervention and social-welfare policies, and the aftermath of the Vietnam War meant imperialist adventures were unpopular. Today, faith in management (and accounting) science as a vehicle for social progress has been undermined. Instead, rationalists stress on strategy, performance measurement and accountability; and large segments of life, previously relatively immune from formalised MA, have been brought into the discipline of the market through MA techniques. Normative theorising by academics is now unfashionable and accounting academics disdain this, along with management consulting posing as academic research (Zimmerman, 2001). So, for those who emphasise differences between then and now, the question is: what place is there in an age of shareholder value maximisation for critical theorising that emphasises reflexivity and engagement, and improving the social welfare of multiple organisational stakeholders?

While differences undoubtedly exist, we believe the world today is fundamentally similar to the 1970s. Fundamental antagonisms between labour and capital still exist, and many advanced capitalist institutions since World War II—the corporation, nation-state and family—remain in place. Of course, manifestations of each change but the fundamental, capitalist nature of modern society is not in doubt. New accounting techniques (and old accounting technologies re-presented in new guises) emerge but the role of accounting in organisations and society changes little. Critical theories identify the enduring roles of institutions and MA, thereby establishing continuity, commonalities and differences across time.

Rather than examining developments and disputes in critical theorising, we illustrate its enduring relevance and insight for two topical areas of MA, namely SMA and NPM. Versions of SMA endeavour to link strategy and strategic performance measurement, and MA to marketing and inter-organisational relations (e.g. Bromwich, 1990; Chapman, 2005; Gordon et al., 1978; Roslender & Hart, 2003; Shank & Govindarajan, 1993; Simmonds, 1981; Simons, 1990) but they share several loosely connected components—such as value chain analysis, new costing approaches (e.g. target- and activity-based costing) and a focus on strategic performance measurement. What critical theorising exposes and examines is how their adoption of a (shareholder) value ideology sustains organisational profitability in the face of alternative, antagonistic claims. Similarly, definitions of NPM contain conflicting components but all exert market discipline on areas of life previously governed by other forms of rationality (Guthrie et al., 2005; Hood, 1995; Pollitt & Bouckhaert, 2004). Areas as diverse as the management of education, cities, local and central government, cultural organisations and healthcare have been subjected to results-based management, public–private financing, responsibility (accountability) systems and strategic planning. MA has played a central role in this. Although we do not deny that MA is important elsewhere, examining these two areas enables us to demonstrate how critical theorising over the last 30 years not only attends to what is different and new, but also shows how these innovations represent enduring features of how MA helps organise and control current versions of capitalism.

The chapter proceeds thus. The next section outlines our understanding of critical theorising, which is divided into three broad areas: labour process, critical theory and theories of subjectivity and identity. These are explained in Section 3. Then Sections 4 and 5 apply each critical approach to SMA and NPM respectively. The chapter concludes by examining the

achievements of critical theorising, gaps and important areas for future work.

2. What is Critical Theorising in Management Accounting?

For articulating what is critical theorising, we again return to the past and our previous attempts to review this. Our research on the coal industry put us in contact with other researchers in economics, political science, sociology, history and industrial relations trying to make sense of the industry, its history, context and conflicts (see Cooper & Hopper, 1990). This led us to organise the first of a continuing series of Interdisciplinary Perspectives on Accounting Conferences, which continues to be a vibrant and important intellectual forum for critical theorising in accounting.[1] In writing two introductions (Cooper & Hopper, 1987, 1990) to collections from the first conference, we avoided defining 'critical accounting' as the area was contested and emergent. We did not want to constrain new approaches but instead articulate a broad church that not only included critiques of mainstream research but also work which stressed holism, dynamic socio-economic and historical contexts, the centrality of power and conflict, a broader set of constituencies than managers and capital markets, scepticism of absolutist beliefs in 'scientific' research methods and active engagement by researchers. These remain dominant themes in critical MA.

The delineation by Jones & Dugdale (2001) of accounting regimes offers a useful working definition of critical MA features:

> A system of governance that operates: at a *macro level* of national and international society, polity and economy; at the *micro level of organization*; and permeates the *personal level* where accounting constitutes both rules and resources for action. It encompasses an *economic dimension* (calculation of the production, distribution and consumption of value), a *political dimension* (regulation and accountability), and an *ideological dimension* (forms of accounting reflexivity). (p. 58)

This enables us to identify four distinctive contributions of critical MA theorising. First, the idea of changing regimes identifies the chameleon-like ability of accounting to reflect (and sustain) regimes of power over time—be they raw nineteenth-century capitalism, contemporary advanced global capitalism, different business systems (Whitley, 1999b) or international regimes that govern relations between rich and poor nations. Second, the stress on the macro emphasises that accounting is not an inevitable outcome of market forces or technological change but is implicated in, and reflects political, social and economic struggles, the outcomes of which are contingent. The development of accounting had (and has) many possibilities that retrospective explanations (written from the vantage of victors and the present day) ignore. Thus, it is important to consider history (particularly histories that identify 'what might have been') and institutions like the state. Third, MA is associated with struggles for control rooted in organisational processes and their socio-economic context: the macro and micro are reciprocally related. Local conflicts over rewards and extracting worker effort are linked to broader struggles involving governance, ideology and knowledge that sustain and legitimate dominant regimes of economic calculation and control. Fourth, atomised and deterministic portrayals of the person are rejected: Issues of individual agency, subjectivity and identity bearing on conflict and consent in life are integral to any critical analysis.

Several recent reviews of critical accounting[2] overlap with this one. Baxter & Chua (2003) identify seven research perspectives that have flourished under the label 'alternative' and clearly overlap with the term 'critical': a non-rational design school; naturalistic research; the radical alternative; institutional theory; structuration theory; a Foucauldian approach and a Latourian approach. They claim that alternative perspectives adopt a non-positivist approach that raises significant insights about MA practice including its different rationalities; how it is enacted and gains meaning; the potency of its technologies; the unpredictable, non-linear and socially embedded nature of MA change; and how MA is both constrained and enabled by the bodily habitudes of its exponents.

Roslender (1995) offers an introductory review of critical MA. He identifies self-awareness as its basic purpose and stresses how it can help management accountants understand their position in organisations and society, and the effects of their calculative techniques. He points out that in the best MA research, researchers are aware of the impact of their studies. He identifies several theoretical approaches that emphasise awareness: interpretive sociology, political economy,

[1] In seeking funding for this conference from an 'independent' UK government social science research agency, we were told we could have the money requested if we changed our proposed title from 'Critical Perspectives on Accounting' to the more politically acceptable 'Interdisciplinary Perspectives on Accounting'.

[2] Several of these reviews avoid using the term 'critical', perhaps for reasons related to our naming of the first Interdisciplinary Perspectives on Accounting conference.

labour process, critical theory, Foucauldian perspectives and deconstruction. Roslender & Dillard (2003) claim that the 'interdisciplinary project' uses various social sciences to question the legitimacy of accounting knowledge. They distinguish 'critical' work from other interdisciplinary accounting approaches by its advocacy of political engagement for social and political change, echoing Roslender's previous emphasis on self-awareness. All approaches identified by Roslender & Dillard (2003) reject the notion of the objective and neutral researcher, and emphasise the importance of reflexivity by the researcher and the self-awareness of subjects (Tinker, 2002b). For critical researchers, posturing as a disinterested neutral observer is as political an act as being involved in change (Tinker, 1991) for it implicitly reinforces the status quo (Willmott et al., 1993). Thus critical work pursues the public interest and reforms based on reflective self-awareness, involving not merely critique but also activism (Neu et al., 2001).

Critical researchers make their allegiances explicit in responding to calls to make social sciences more relevant in the modern age (Flyvbyerg, 1999). Being 'critical' or reflexive is not a monopoly of critical accounting research; it is not the only inter-disciplinary and holistic approach; its focus on power, conflict and social transformation is not unique; and useful theories and empirical observations are not confined to this area. However, critical theory is distinctive in its commitment to sociology and political economy associated with 'radical' politics. Hence the claim by Dillard (1991) that critical theory tries to enhance individual well being and autonomy through societal critique within a social-science domain that recognises that accounting is both a technology and an ideology linked to identity, consciousness, alienation, oppression and emancipation. Cooper & Morgan (2005) advocate case study research combining various theoretical perspectives to address values, encourage reflexivity and engage practising accountants.

The boundaries of critical theory are porous and unclear due to its derivation from diverse theories. Unsurprisingly, critical theorising is beset by almost as many methodological disputes within the field as with approaches that lie outside. However, critical theory recognises that choices of empirical and theoretical boundaries are a political act. It is therefore suspicious of research which attempts to rigidly demarcate boundaries between the researcher and subjects, and differentiate between the micro and the macro, means and ends, financial and management accounting, the organisation and its environment, or the sociological and the economic. Major debates within critical theorising concern the nature of accounting within contemporary society, forms and mechanisms of power, possibilities for social and organisational transformation. Such debates reflect different beliefs about the nature of society and organisations and the constitution of knowledge (Burrell & Morgan, 1979; Chua, 1986a, 1986b; Cooper, 1983; Hopper & Powell, 1985; Tinker, 1985). Boundaries privilege interests and sustain partiality. This chapter is not immune from this: it excludes research and theorising covered elsewhere in this Handbook or is judged to lie outside our framing of critical theorising.[3] This review concentrates on MA work that embraces what Baxter & Chua (2003) term 'a radical alternative' (a political economy genre, especially structural and cultural Marxism inspired by Braverman, Habermas and Bourdieu), along with work on power, self-control and identity inspired partly by these authors, and also by Foucault and Latour.

2.1. Labour Process Theory

Control (and struggles about value) is central to labour process theorising about MA. Basically it asks who benefits from organisational activity and why control systems change. Braverman (1974) reinvigorated labour process theorising by redirecting attention to issues of control (Tinker, 2002b). From this perspective, conflicts about the production and distribution of the economic surplus explain the nature of MA. Braverman reworked Marxist analyses of capitalism, pointing out the over-emphasis on distribution and the relative neglect of production issues in class conflict. The problem of extracting effort from wage labour, when surplus value is appropriated by capital, lies at the heart of labour process analysis. Firms can buy labour time through wages but not labour commitment and effort. Inherent contradictions and conflicts of interest produce struggles in the workplace and beyond, determine class relations, and are complemented by a superstructure of institutions, including the state, media and education that serve dominant interests. For example, Braverman traced how 'Scientific Management' reasserted management control over craft labour to facilitate monopoly capitalism.

Capitalism brought universal degradation of labour. Many nation-states mitigated the harshness of capitalism through social-welfare benefits and

[3]For example, researchers such as Dirsmith and Covaleski have produced important papers within institutional theory arguing that MA is used for external legitimacy rather than managerial efficiency, and is often decoupled from operations (e.g. Covaleski & Dirsmith, 1983, 1986, 1988a, 1988b, 1995;Covaleski et al. 1993, 2003). But like many interpretive case studies of MA, including those that examine unanticipated consequences and resistances, their work does not appear to have an orientation towards human emancipation and change, and thus is outside the focus of this chapter.

Keynesian economic policies that smoothed trade cycles and unemployment, and diverted labour's attention from national politics to workplace struggles. As Braverman acknowledged, his work paid little attention to subjectivity, which will be addressed later when we discuss theories of identity. This is important because militancy beyond the workplace depends on workers perceiving themselves as exploited, associating this with collective class interests, and seeking programmes of political reform. However, the predicted militancy did not invariably occur—often employees consent to and accept organisational controls. Hence, the extension of analyses to subjectivity, including gaming (Burawoy, 1979) and worker identity (Burawoy, 1985, 1996). Nevertheless, as will be demonstrated, this work still emphasises MA's role in controlling labour and extracting economic surplus, and how employee resistance, conflict and consent are integral to this.

Neimark & Tinker (1986) and Hopper et al. (1987) compare and contrast labour process theory with other accounting theories. They argue that a crucial element of labour process theory—dialectical analysis—can inform accounting by drawing attention to contradictions in social processes, recursive social relations, how ensuing contradictions stimulate social change, and how any equilibrium achieved is unstable and contains the seeds of its own destruction. Labour process addresses how labour is reproduced (created and sustained) outside the workplace (e.g. through family and educational practices, cultural and leisure activities) and links struggles at work to wider social struggles and the pursuit of surplus value. Accounting is seen as a crucial calculus for valuation (Bryer, 2006; Tinker et al., 1982) but whereas orthodox theories depict improvements in efficiency as beneficial, labour process theory asks: who benefits? The theory points out that increased surplus for capital can be due to lower wages, unemployment, work intensification and environmental degradation; and it traces how the law, accounting, education, the media and other ideologies naturalise and legitimise distributional effects.

Crudely, orthodox management theories depict organizations as unitary bodies characterised by rational and co-operative relations whose participants work harmoniously to achieve generally accepted, mutually beneficial goals. MA is seen as providing information for rational planning, organizational design and decision-making. In contrast, labour process theory depicts organisations as sites of persistent conflict where the manufacture of employee compliance and consent is a fragile achievement. Employee resistance (feared, potential or actual) is important for shaping controls: hence the emphasis on industrial relations. Labour process theory sees organisational goals as reifications[4]—organisational myths and rhetorical devices used by dominant interests to mask conflicts of interests and inequalities of power and rewards. MA is an ideological language of calculation directed at employee control. History is important, especially that part which emphasises the totality of social systems, their constant transformation, organisational and environmental linkages, contradictions and conflicts in unequal social relations, and their temporary resolution by ideological, social and organisational compacts (Neimark & Tinker, 1986, 1987). Thus managers may negotiate temporary and unstable accords between conflicting groups aided by external institutions such as the state, but this only suppresses conflicts inherent in contradictions. Periodically tensions become unsustainable, accords break down and major changes are precipitated. Employee deviance to managerial wishes is not seen as irrational or a consequence of defective system design or implementation, but is expected. The labelling of deviance depends on the perspective and interests of the labeller.

Traditionally, employee consent was seen as 'false consciousnesses', i.e. they accepted their lot because exploitation and inequities were masked by ideologies spawned by state and employer organs. For example, market and profit imperatives are legitimated and reinforced by forms of accounting that mask alternative calculi that reveal social cost benefits or inequitable distribution of rewards. In short, there is a belief that a 'better' accounting that serves collective or 'public' interest exists (though it may await discovery). However, intellectually and practically, such meta-narratives of events and prescriptions for the public good have been viewed with suspicion.

2.2. Critical Theory

While all theorising in this chapter can be labelled 'critical', a specific variant developed after World War I, particularly in Germany, became known as critical theory (i.e. capitalised). Like labour process theories, critical theory sought to revitalise Marxism, but by examining cultural features of modern capitalism, especially the nature of obedience, the failure of working class resistance, rationality and rationalisation, and the increasing commodification of human activities (Held, 1980). Habermas focussed on distinctions between the public and private realms, rationality, the role of law and authoritative rules (Habermas, 1996) and tried to establish a radical version of communication on the basis of genuine consensus that acknowledges power

[4]Attributing needs and goals to an abstract subjectively created entity.

and disadvantage in modern societies (Habermas, 1984, 1986). We include Bourdieu (1977, 1984) as a Critical Theorist, because he too expands analyses of capital and social reproduction by focussing on cultural features of modern life, emphasises critical reflexivity, stresses the importance of recognising actors and the power relations they are embedded in and develops a theory of politics to facilitate human emancipation (Bourdieu, 1998).

Critical theory has impacted organisation and communication theory (see Alvesson & Willmott, 1992, 2004). In accounting, Laughlin's (1987) interpretation has been influential, emphasising interpretative schemas and accounting transformation at societal and organisational levels (Broadbent & Laughlin, 1997). However, ideas of other critical theorists, such as Adorno and Horkheimer, who examined the manipulation of human desires and consciousness,[5] are less prominent in accounting research. Habermas tries to construct a non-oppressive social theory with a universal, inclusive moral framework by combining ideas of reason and rationality with a desire for consensus to improve the human condition. His theory of communicative action explores conditions that permit people to understand, agree and plan for action. His desire to replace revolution with communicative action stems from a belief in everyone's potential for rationality, which pursues a democratic socialist tradition that locates rationality and change in structures of interpersonal linguistic communication rather than science or expertise. Both Habermas and Bourdieu argue that contemporary society is weakened by major institutions such as the market, the state and organisations that employ a strategic and instrumental rationality that supplants the logic and modes of rationality of the life-world. Both writers also have an enviable profile as public intellectuals. For example, Habermas used the popular press to attack historians trying to attribute Nazism and the Holocaust to a reaction against Bolshevism and needs to rehabilitate the German armed forces. Bourdieu (1998) is a collection of speeches and interventions that challenge attacks on unions, the welfare state and immigrants. Perhaps his most powerful critiques are on investor-led globalisation, neo-liberalism and marginal economics.

2.3. Post-Structuralist Theories of Power and Identity

Several critical MA researchers disassociate themselves from labour process and critical theory, seeing them as too deterministic and inadequate for theorising human subjectivity and identity. The dominant influence here has been the theories of Foucault and other post-structuralists who examine power, human subjectivity and knowledge to reconsider strategies for human emancipation. There is a tendency to emphasise epistemological differences between Marxists and Foucauldians (see, Neimark, 1990, 1994; Tinker, 2005) but we believe these are often over-stated or over-emphasise specific aspects of both theories. While some interpretations of Foucault and post-structuralists (such as Latour) emphasise a denial of deep structures (such as capitalism) and their approach to emancipation is often ironic and despairing, such theories do prompt reconsiderations of power and local strategies of emancipation based on 'personal' politics around issues such as gender, race and sexuality.

We consider the most 'critical' element of Foucault's work: his analysis of mechanisms of power for discipline and control in modern institutions (Foucault, 1977). Foucault emphasises archaeology: systems of thought and knowledge (epistemes or discursive formations) are deemed not as rules of grammar or logic but ways of governing consciousness that preclude other possibilities. 'Truth' is essentially a product of the discourse that justifies disciplinary power in a particular period. Thus Foucauldian accounting researchers view modern accounting programmes as techniques to render subjects visible and governable following shifts from sovereign to disciplinary power post-enlightenment. Foucault explains historical transition through genealogy: particular systems of thought stem from contingent turns of history. Foucauldian researchers reject functional, deterministic explanations based on social improvement or class interests. Instead their genealogical investigations (see Kearins & Hooper, 2002) attribute accounting innovations to complex, dispersed events that grant the possibility of new discourses and knowledge arising rather than a single origin (Miller & Napier, 1993). Archaeological methods trace how complex webs of discourses and practices during particular legal and institutional circumstances legitimate accounting methods of firms or states within programmes for managing government and society (see Hopwood, 1987; Miller & Napier, 1993). However, relations between discourses and practice are seen as problematic (Rose & Miller, 1992). The recurring theme of accounting knowledge and technology being constructed in contingent networks of people, circumstances, institutions and interests has led several researchers to turn to the sociology of science to study accounting's evolution as a technology (Bloomfield et al., 1992; Miller, 1997; Preston et al., 1992) and attendant processes of knowledge formation (Gendron et al., forthcoming; Jones & Dugdale, 2002).

[5]However, Gallhofer & Haslam (1997, 2003) have developed an emancipatory accounting by using the Critical Theories of Adorno, Marcuse and Benjamin.

For us, Foucauldian theories of power and subjectivity complement labour process approaches and critical theory. The popularity of Foucault owes much to its association with allegedly post-modern conditions that prevail today. Power and class in contemporary society are more fragmented and based on lifestyles rather than economic relations, consumption of images rather than mass-produced products and knowledge rather than physical production. People are more sceptical about grand truths, scientific reason, utopian solutions and ideologies—hence politics is more marginal, allegiances vacillating and based around single issues rather than political parties. In this view, the post-modern condition is organised around modern communications rather than face-to-face interaction in local communities. Many critical theorists accept these observations but see them as another era of capitalist adjustment that will eventually reach crisis and change (Harvey, 1990). They argue that post-modernism is empirically dubious and conservative for it de-emphasises economic differences, conflict and political engagement. Also, power-knowledge may appear totalising and neglectful of the role of resistance.

On the other hand, Foucauldians argue that conventional knowledge can be challenged by alternative forms of discourse, which has led to heightened interest in language and literary theory. Arrington & Francis (1989) use contemporary work on language to argue that fact, value, truth and falsity cannot be distinguished: labels on truth claims merely reflect the power of the speaker and the resources s/he can draw on. Subsequently, Arrington & Schweiker (1992) claim that accounting knowledge is a product of rhetoric and power, and challenge absolutist claims to truth, reductionism, knowledge closure, and encourage self-reflection by researchers. Arrington & Watkins (2002) argue that many 'critical' accounting writers are too evaluative, and a post-modern perspective expands rather than diminishes space for political engagement and critique, challenges the legitimacy of conventional wisdom, develops a minimalist justification of power, elevates competence as a principle virtue and blurs dubious distinctions between public and private life.

There are overlaps between labour process ideas, critical theory and theories of power and subjectivity, but for ease of exposition we discuss their application to SMA and NPM separately. However, some accounting studies combine different versions of critical theorising. Perhaps the most notable is Chua & Degeling (1993) who address both SMA and NPM when studying new costing systems in healthcare and draw on all three versions of critical theorising. Other examples include Oakes et al. (1998), Ezzamel & Willmott (1998) and Quattrone & Hopper (2005), all of which are discussed under one or other versions of critical theory. Further, the discussion thus far of critical theories has been sketchy: specific elements of each are discussed in our review of their applications to SMA and NPM, and a more integrated synthesis is offered in Section 5.

3. Critical Theorising on Strategic Management Accounting

This section considers what insights come from examining SMA, a contemporary MA theme, when critical theory lenses are cast upon it. We focus on corporations as public sector organisations separately, though SMA can form part of NPM. An explicit interest in strategy emerged during the 1980s: organisations were recommended to develop strategic thinking and capability. However, as Knights & Morgan (1990) point out, it was as if organisations discovered a deficiency that had previously not been a problem. This highlights two aspects of our desire to view MA through the 'broken glass' of critical theory. First, there is strong continuity in organisational and managerial practices: managers and academics did not talk much (if ever) about strategy before the 1980s but this does not mean their actions lacked long-term purpose. Second, identifying the rise and fall of MA practices associated with acting strategically gives insight into the fluctuating strategic practices and techniques (including accounting ones) offered as a means of acting profitably.

Accounting has been strongly influenced by commendations for managers to act and think strategically. Simmonds (1981) broadened MA by developing cost information systems for marketing decisions but the major impetus came from Johnson & Kaplan (1987), who argued that conventional MA had become irrelevant and was a contributor to the decline of American industry. Conventional MA, from their perspective, was too influenced by Generally Accepted Accountancy Principles (GAAP) and financial reporting; and cost information frequently provided wrong strategic signals, erroneously suggested benefits from small production runs and over-estimated costs of standardized mass production. Cooper & Kaplan (1991) argued that SMA required new costing systems, such as activity-based costing (ABC): its 'activity analysis' resonated with other strategic concerns, such as business process re-engineering. Hence strategic cost systems soon incorporated Japanese MA practices such as target costing, operations costing and accounting for quality, and the focus shifted from cost information for decision-making and performance evaluation to cost management and controlling total costs.

Shank & Govindarajan (1993) derived a form of strategic cost analysis from Porter's analysis of strategy that portrayed organisations as 'value chains': thence the need to determine value-adding elements and appropriate degrees of vertical integration. Bromwich (1990) reinforces this with an economic rationale for tracing cost structures of competitors, suppliers and customers. Recently SMA has focussed on strategic performance measurement to incorporate broader aspects of an organisation's performance—a re-discovery of Likert's (1967) earlier assertion that non-financial measures are leading indicators of financial performance. Initially, the balanced scorecard (BSC) (1992)—the most widely promoted and popular strategic performance measurement technique—was a measurement tool but is now promoted as a language and tool of strategy (Kaplan & Norton, 1996a, 1996b) that maps an organisation and its strategy (Kaplan & Norton, 2001, 2004).

3.1. Labour Process Theory and Strategic Management Accounting

This section discusses how labour process examinations of SMA reveal the significance of power and societal institutions (notably the state), how SMA innovations are rooted historically in conflicts over economic surplus, and how and why different SMA techniques are used at specific conjunctures. Worker resistance is central in labour process theorising, and recent developments are attentive to worker subjectivity and identity and how developments within the firm relate to the international division of labour and global restructuring. Labour process theories challenge technical explanations of the rise of SMA in influential, early statements by Kaplan (e.g. Kaplan, 1983, 1984; Johnson & Kaplan, 1987) on the failure of traditional MA and the need for a more strategic orientation.

Hopper & Armstrong (1991), like others (e.g. Arnold, 1999; Ezzamel et al., 1990), critique Johnson & Kaplan's (1987) history of MA and their propositions for making MA more strategic. Drawing from labour histories in the US, they argue that accounting techniques and calculations were not driven by economic or technological imperatives (as argued by Johnson and Kaplan) but were rooted in labour–capital struggles associated with different strategies by firms to control labour in various epochs of capitalistic development. For example, cost accounting developments helped destroy internal subcontracting and craft control in early factories. Similarly, Bougen (1989) found the Renold Company's introduction of joint consultation was linked to tighter management control. Oakes & Miranti (1996) observed how Louis D. Brandeis's evidence to a 1910 Interstate Commerce Commission claimed that US railroads could save a million dollars a day if they introduced Scientific Management (in particular, standard costing). Ensuing press attention helped precipitate a preoccupation with efficiency and Scientific Management and the diffusion of standard costing. In general, the advent of 'Scientific' Management (and associated developments of standard costing and treating labour as homogenous and a variable rather than a fixed cost), and the subsequent organised labour and corporations' accord led to increased monopoly pricing, the smoothing of production and employment patterns, and a shift of economic pressures to secondary labour and producer markets. Hopper & Armstrong (1991) conclude that in today's global capitalism, controls associated with a labour and capital accord are being abandoned as corporations experiment with new methods and control ideologies, reflected in current fashions in SMA. Evidence supporting this comes from Tinker & Neimark (1988) who linked financial reporting changes by General Motors to their strategy to internationalise and remove impediments to capital accumulation aided by the state. Hopper et al. (1986) demonstrate how MA and control systems likewise shifted historically in the British coal mining industry.

For labour process theories, the language of SMA is subjective, malleable and reproduces dominant interests. Armstrong (1989) argues that budgetary controls and variance reports contain dysfunctional features but persist because they divert blame from senior managers and legitimise specific conceptions of value that may vary according to social conditions but consistently benefit the dominant class. Tinker (1980), for example, shows how accounting regimes in different epochs in a British multinational operating in Sierra Leone masked inequities, reinforced coercion and reproduced market ideology beneficial to the firm's owners but not Sierra Leone. Tinker et al. (1982) argue that deconstructing the language and rhetoric of accounting can demonstrate its allegiances to, and legitimation of, dominant interests by reproducing contemporary concepts of value.

Such histories challenge conventional MA assumptions, endorsed in orthodox histories and SMA proposals, that accounting is neutral and objective, emerged through competition and technological advance, and organisations are harmonious and unitary. Instead, labour process theorists point out that techniques like SMA reflect varying strategies and techniques for securing control over labour, consistent with studies by Friedman (1977, 1990), Edwards (1979) and Gordon et al. (1982) showing how management strategies of control vary from repression (through punitive and direct control) to accommodation (emphasising responsibility, participation, empowerment) and are

contingent upon different capital accumulation strategies over time. MA must be seen in a broader socio-economic context that constrains managerial action.

Labour process studies reveal that choices were made by workers and managers: alternative means of control existed or could have been created. This remains so today. What constitutes SMA varies—there is contingency and agency in different locales—the US pattern is not invariably the universal norm. Bourguignon et al. (2004), for example, show that strategic performance measurement systems varied between North America and France, reflecting different ideologies of control and histories of capitalist development. Wardell & Weisenfeld (1991) attribute standard costs, budgets and performance report variances becoming widespread in the US prior to World War II but not in the UK until the 1970s to different patterns of industrial relations, management styles and labour activism in each country. McLean's (1996) historical study of control of workers in the UK and US shipbuilding industries attributed differences between the two countries to different political, social and industrial pressures. UK employers favoured craft administration and direct control due to labour shortages and the power of craft labour, whereas US firms relied more on participative accounting controls based on a labour–capital accord.

How the accounting profession helps produce specific, financially based forms of strategic management in the UK has been a focus of Armstrong's research, which reflects several themes in labour process studies of SMA. His historical and comparative analyses demonstrate the contingent form that strategic controls can take, with financial controls often competing with those offered by other professions. Armstrong (1985) claims that the dominance of accounting controls in UK firms was not merely capitalists' response to failures of engineering controls associated with Scientific Management but a product of inter-professional rivalries amongst engineers, personnel managers and accountants to provide capital with techniques to control labour. The success of UK accountants and the power of the UK accounting profession are attributed to their appropriation of an abstract body of (engineering) knowledge and making it more congruent with capitalist interests. Accounting controls were influential in Britain, Armstrong argues, because they endorsed the favoured British mode for extracting and appropriating surplus value. The dominance of accountants and accounting techniques was not inevitable, e.g. in Germany, engineers were powerful. Armstrong (1987) attributed the pre-eminence of accountants in British management hierarchies and financial modes of control in British companies' to the British capital market's stress on audits, which established a power-base for the accounting profession to sponsor its preferred modes of internal control. Moreover, state intervention during World War II favoured financial controls because they avoided direct industrial intervention and helped maintain *laisser faire* capitalism. This and widespread mergers further strengthened accountants' position within management. Further evidence linking industrial restructuring with cost accounting comes from Walker & Mitchell (1996), who show how printing trade associations promoted uniform costing to advance employer interests over those of unionised labour and unorganised customers. Challenges to employers' negative attitudes to scientific costing foundered due to traditional attitudes, the effects of war, adverse macro-economic conditions and resistance to change. Instead, uniform costing was adopted following the creation of a trade association and attempts at cartelisation (Mitchell & Walker, 1997).

Following Braverman (1974), labour process studies regard issues of de-skilling as a management attempt to extract increased surplus through the generalised application of local worker knowledge and experience. Loft (1986) and Cooper & Taylor (2000) examine de-skilling with respect to firms extracting the knowledge of 'lowly' and mainly female cost clerks. They demonstrate that the antecedents of cost accounting professionals lay partly in 'non-qualified' clerical employees, whose work experience and knowledge was reformulated by management and applied throughout the organisation. Armstrong (2002a) illustrates how ABC is related to de-skilling. ABC abstracts knowledge of activities, especially by middle management, whose work is then treated as discretionary variable overhead rather than fixed overheads and evaluated according to whether it is 'value adding'. Armstrong (2002a) notes how ABC/M became a lucrative industry for accounting firm's consultancy operations. He argues that it extends accountability by treating staff departments as mass-producers of repeated acts of routine service 'for' particular cost-objects, creates performance indicators that link payroll budgets to activity volumes, fosters temporary staff employment, and when linked with 'value analysis', strips-out staff work not within ABC/M's definition of activities, and makes routine non-routine work in fields such as human resource management, marketing or purchasing, which have their own, possibly more valid, means of managing. We see here the nature of fundamental conflict at work: in attempts to render organisations more profitable (efficient), workers become unemployed, work is intensified (greater effort, longer unpaid hours of work) and workers must develop new

knowledge and skills, euphemistically known as 'working smarter'.

Armstrong (2002b) indicates that being exploited does not mean this will be perceived as such. Work and one's position is in part subjectively determined and a source of self-identity. Labour process theorising addresses this. For example, Oakes & Covaleski (1994) examine accounting-based incentive plans (often a significant element of SMA), including profit sharing, in three firms in the 1950s and early 1960s. They found that the degree to which incentive plans incorporated accounting-based performance elements depended on control (and resistance) problems and participants' priorities, especially organised labour's response to engineering versus accounting measures of productivity; differences in union support for, or opposition to, incentive systems; and labour's ability and willingness to confront accounting representations. Both local and national unions wanted to manage incentives whilst maintaining other union objectives, but this was limited by the circumscribed nature of US unionism. Details of profit sharing were not understandable outside the context of labour processes, including meaning, discourses of action and legitimacy. Labour did not challenge the objectivity of accounting numbers, unlike engineering standards, not only because they had less direct experience or expertise of them, but also because their use, often from published accounts and Wall Street reports, reinforced workers' identity as mature and cooperative individuals, whereas engineering measures treated them like children.

Worker identity is central to labour process studies on new forms of management, including SMA. These often combine elements of labour process and post-structuralist theorising of SMA, sometimes making proponents of either theory uncomfortable with the synthesis (Tinker, 2002b). Ezzamel & Willmott (1998) explore subjectivity and accounting calculations in a vertically integrated global retailer. Ezzamel et al. (2001) question whether the 'factory of the future' is a total institution in which self-subordination through new wave management is virtually inescapable. They trace how repeated corporate-driven initiatives to implement lean manufacturing and re-engineer working practices were frustrated by workers' individual and collective resistance and their maintenance of distance from them. Mainstream analyses emphasise the novelty and mutual benefits of teamwork, but Ezzamel et al. (2004c) found that the politics of production in a manufacturing plant of a large multinational associated was crucial for understanding how accounting discourses were received by employees and their responses. Faced by market shifts and changed company ownership, senior managers tried to enhance productivity and profits through changed production methods, management style and accounting techniques—including ABC/M, throughput accounting, cellular manufacturing and non-discretionary management. Shop-floor workers interpreted these initiatives as efforts to intensify labour by reducing the head count; hence they resisted them. For 13 years, management's rhetoric of corporate governance was mediated by workers' ability to create a space defining and articulating their own interests that challenged managers' discourses and rationalities promoting the 'new' accounting (and management) techniques. This brought vacillating managerial approaches. Labour resistance was not only due to traditional labour process issues concerning pay and employment but also because of perceived threats to workers' identity as knowledgeable agents of production with discretion.

Labour process theory neglected conflicts not easily conceived simply as between labour and capital: work, gender and racial ones being obvious instances. However, more recently this has alleviated. Neimark & Tinker (1987) used dialectical analysis to demonstrate how General Motors' (GM) used women as a reserve army of employees in war and other times of male labour shortages, and how GM's annual reports ideologically justified this. In contrast, Knights & Collinson (1987) combine labour process concerns with Foucauldian notions to explore worker subjectivity and how discipline is embedded in routine social practices in modern power-knowledge regimes. They trace how technologies of psychological (i.e. human relations) and financial accounting managerial discipline exerted power on an all-male shop floor. Management's attempts to communicate reinforced worker suspicion and distrust but financial accounts presented in a redundancy audit went unchallenged. Knights and Collinson argue that financial discipline, in contrast to psychological discipline, is more effective because it accords with the subjective identity of male shop-floor workers as economic breadwinners and their tough, masculine, practical and independent beliefs. In other words, the masculine subjectivity of male manual workers contributes to the power of financial accounting to discipline labour.[6]

Contemporary labour process theory also addresses the position of managers, who are both agents of capital and wage labour like other workers. Thus

[6]The critical literature contains considerable work on accounting and gender (e.g., *Accounting, Auditing and Accountability Journal*, 1992, 5 (3) and race (Anissette, 2003). However, because most is arguably on employment, professional and financial accounting issues it has not been systematically reviewed here though it is highly relevant to MA.

management is partly an agent of capital, a pragmatic mediator between capital and labour, and an agent of its own interests (Teulings, 1986). Saravanamuthu & Tinker (2003) illustrate how management in an Australian subsidiary of a multinational firm accommodated labour's needs, diluted capital's interest or mobilised an efficiency ethos, depending on the politics of control in specific units or plants. Managers could not employ coercive and/or technocratic methods constantly, but had to be politically sensitive. Technology, worker skill and product competition affected worker's ability to resist, and management's strategies to control the labour process had to accommodate this. Thus they used coercive techniques and new forms of economic citizenship in different parts of the factory at different times. Accounting influenced the identity of management as it made certain performance factors visible but overall economic and distributional issues were given primacy. Sturdy (1997), when studying IT strategy consultancy in UK financial services, rejected portrayals of managers as vulnerable beings searching for apparently technical solutions and/or existential security. He draws attention to client resistance and the pressures of consultancy given their mixed fortunes as agents of capital, and intra-management conflicts over transforming managerial work and discourses. He portrays consultancy as a dialectical, yet structurally and existentially self-defeating process. Further studies of management consultants are warranted as they play a pivotal role in diffusing accounting knowledge, including SMA ideas and techniques (Qu, 2006), which frequently fail.

Labour process theory emphasises the importance of studying MA in the context of global capitalism and recognising limits to management given the different interests they face, the influence of external institutions such as the state and ideologies promulgated by education, consultants and the media. Conventional SMA analysis focuses on internal factors, especially at the level of individuals, groups and departments, in the belief that management styles, strategies and techniques are central. In contrast, Williams et al. (1994) draw on their studies of the motor industry to critique Johnson's (1992) promotion of quality management and Japanese style SMA. They show that comparative economic performance between car companies owes little to different management systems, but this is explained by different exchange and wage rates and historic developments. Armstrong (1998) argues that MA pays insufficient attention to economic regulation and calculation by the nation-state within global capitalism. Focusing on international transfer pricing regulation, he argues that state-centered perspectives are conceptually inadequate, and neo-classical analyses are methodologically and conceptually blind to increasingly international capitalist social relations, post-1945. He uses labour process theory to argue that transfer pricing is a focal point of contact between trans-national corporations and nation-states (notably, tax authorities). Macintosh (1995) similarly argues that divisional management juggle profits in large, multi-divisional, multinational organisations because of the contradiction between headquarters' desire to appropriate profits from business units globally and local forces seeking their application to social production. Divisional performance measurement systems, particularly Economic Value Added (EVA), play a major role here, as they become the terrain for struggle and resistance by local managers who use resources under their authority to resist and acquire control over their own and their unit's destiny.

Changes in SMA may be old solutions, albeit in a new guise, in a new epoch of capitalism grappling with enduring issues. Armstrong et al. (1996) found a lower overall incidence of budgetary controls in large UK companies than expected from textbook readings. The existence of budgets was associated with size, diversity and internal co-ordination problems. The predominant factor affecting the use of return-on-investment (ROI) targets in budgetary control was internal trading under conditions of external competition and strong trade unions. ROI targets constituted a counter-trade union strategy by defining business unit profitability in unattainable terms (due to external competition) and exporting excess costs elsewhere in the organisation. Low labour cost ratios were a sign of workforce weakness, used especially in companies with large proportions of part-time or female workers with higher turnover rates than male full-timers and easier to lay-off or put on short-time. The use of budgets was related to managerial autonomy and was intimately linked with labour control. Armstrong (2000) argues that budgetary control reproduces insecure forms of employment, and is reflected in costing assumptions that direct labour is a variable cost. He also argues that historical studies show budgets shift the costs of trade cycles from capital to labour. Budget targets incorporating direct labour costs are more prevalent in companies where workers are least able to resist 'flexibility' and where redundancies are possible if unit performance fell below expectations. There is a strong, positive association between proportions of female and part-time workers and using unit labour costs and direct labour cost/sales ratios as performance targets. ROI targets were associated with redundancies in business units that failed to perform satisfactorily. He argues that accounting control systems frustrate trade union aims of secure income and employment.

SMA often incorporates customer-oriented accounting techniques but labour process studies suggest that these merely reflect a desire to be more profitable—not treating customers differently. Thus Boyce (2000) found the rhetoric of 'the customer is king' involving customer focus, and valuation in health insurance and banking was used selectively to calculate the financial value of particular customers and improve shareholder income and wealth, but at the cost of reductions in service to poorer clients.

SMA has been promoted as a response to Japanese competition and/or incorporating Japanese best practice, e.g. Johnson (1992) strongly advocates that US industry should adopt Total Quality Management (TQM). But such methods are not universally acclaimed in Japan (Oguri, 2002; Tai, 1990). Moreover, Ezzamel (1994a) argues that TQM can be as hierarchical as conventional methods and its performance evaluation methods may destroy autonomy and creativity. Later research (Ezzamel & Willmott, 1998) showed that team-oriented production can be as alienating and conflict prone as traditional approaches based on Scientific Management. Team production extended rather than supplanted traditional, hierarchical systems of management control, and self-managing teams and continuous improvement contravened workers' established self-identity as machinists and mates. A group bonus system raised output but teamwork fermented hostility to management's aim of making teams self-managing.

Strategic performance measurements, especially economic value-added and shareholder value measurement, are closely connected with a substantive but often overlooked element of SMA, namely the assertion of the merits of a shareholder value orientation,[7] presented under a rubric of neutral management methods. This reproduces beliefs and provides additional mechanisms for achieving the ideology of shareholder wealth maximisation, creating an impression that this objective is natural and inevitable. Labour process theory argues that this is morally and politically suspect (Engelen, 2002), not universally applicable, and benefits capital at the expense of other groups. Cooper & Ezzamel (2006) argue that BSC proposals typically adopt a shareholder perspective that denies multiple stakeholders. Whilst Kaplan and Norton may talk about multiple perspectives on performance, all lead to the financial concern of 'how are we performing for the providers of capital?' Hence Yuthas & Tinker (1994) dismiss ABC, TQM (and by implication, EVA and the BSC) as the latest accounting techniques that impose social order and hegemony consistent with ideological realignments. Promoters of SMA are seen as offering transitional business ideologies spanning the era between the repressive politics of Thatcher and Reagan and the emergent, cultural and welfarist politics of Clinton and Blair. Nevertheless, SMA will continue to shift to meet shareholder needs as the social and political milieu changes.

3.2. Critical Theory and Strategic Management Accounting

Critical theory research on SMA is sparse, though it is sometimes difficult to distinguish it from labour process studies. However, two elements of critical theory inform SMA: a concern with organisational dialogue and interventions directed at human emancipation. Both draw on Habermas' ideas about deliberative democracy and communicative action, and focus on accountability involving performance measurement. A third element—reflexivity, power and value—based on Bourdieu's analysis of multiple capitals in social fields, is pertinent to SMA but is examined later within NPM research.

Laughlin offers the most sustained application of critical theory to accounting, mainly through the ideas of Habermas. While much of his research is in the public sector (and thus discussed later), he raises methodological issues (Laughlin, 1987, 1995) related to developing SMA for interventions that engage managers and stimulate change with emancipatory potential. Intervention is central to critical theorising, like action research in MA (Jonsson, 1996; Laughlin, 1991) but there is little published MA research on this. Of course, there are many management consulting projects but these are managerially oriented with a limited view of social benefits: They assume that what is good for the organisation is beneficial for all.

Habermas insists that substantive change involves learning and distinguishes instrumental and communicative rationality. These ideas underpin research by Roberts (1991, 1996; Roberts & Scapens, 1985) claiming that hierarchical instrumental accountability, typically associated with formal accounting systems, undermines organisational learning and managers' commitment to the organisation, whereas more informal, socialising forms enhance learning and in-depth understanding. Townley et al. (2003) examine fundamental (double-loop) learning and accountability,

[7] Ittner & Larcker's (2001) review of MA research explicitly links much of what we call SMA to 'value-based management', a term used by consultants to link the techniques to shareholder value maximization. Perhaps ironically, Ittner and Larcker complain that there are few, careful empirical studies that demonstrate that many SMA ideas (ABC, EVA, BSC, etc.) actually improve corporate profitability.

building on suggestions for deliberative democratic processes in Habermas' proposals for communicative rationality (Forester, 2000). They found that managers responded positively to a new strategic performance measurement system because it was an opportunity for substantial dialogue about organisational activities and ends. Managerial disaffection set in when the SMA became formalised and standardised. Cooper & Ezzamel (2006) build on this to suggest that BSC could be adapted to generate serious dialogue about organisational strategy and balance instrumental and communicative rationalities.

3.3. Post-Structural Theories and Strategic Management Accounting

The third critical theory discussed in relation to SMA is a loose amalgam of approaches adopting post-structural emphases on subjectivity and identity, discourses and social reality as fragmented. These are often associated with Foucault's histories of ideas. In accounting, regrettably this has often resulted in a focus on 'how' questions and empirical detail that avoids explanations beyond surface appearances, and conclusions that encourage political despondency or apathy (Murphy, 1989; Neimark, 1990; Tinker, 2005). In contrast, we emphasise how writers such as Foucault and Latour analyse mechanisms of power, constructions of identity, and local and specific interventions to improve the human condition. Foucauldians share Marxists' scepticism about Kaplan's (1984) and Johnson & Kaplan's (1987) version of MA history and their call for SMA, particularly ABC. However, unlike labour process histories, Foucault's followers point out the diversity of influences on developments, and how modes of rationality, ideas and diverse practices are embedded in power-knowledge relations. There are two interconnected strands of Foucauldian accounting history—the archaeological and genealogical.

Archaeology identifies systems of thought and knowledge (epistemes) that govern consciousness to the degree that other 'epistemes' are excluded from consideration at particular times. 'Truth' emanates from discourse, which frames the operation of power. Thus, regarding SMA, the issue is identifying discursive practices that make strategy and accounting a concern (or problem) and how these discourses shape particular solutions. Power relations do not emanate from hierarchies and coercion, as suggested in labour process theories, but from shifting patterns of thought and ideas that influence conceptions of SMA. Archaeological methods trace how complex webs of discourses and practices within particular legal and institutional circumstances legitimate the accounting methods of firms and states within programmes to govern organisations and society (Hopwood, 1987; Miller & Napier, 1993). For example, Maltby (1997) traces how accounting's growth stems from moral discourses and the rise of middle-class beliefs about how firms and society should be run, not economic imperatives. However, whilst accounting practices need locating in broader discourses of legitimate knowledge, relations between discourses and practice are seen as problematic.

Hoskin & Macve (1986) trace the origins of contemporary MA to monasteries and medieval educational institutions, whose textual rewriting generated new power-knowledge relations that were applied to firms' control systems in the 19th century. This is very different from Johnson and Kaplan's explanation of the alleged fall of MA and the 'need' for more strategically oriented MA. For Hoskin & Macve (1988), record keeping of marks for pupils fed into educational practices, especially in military academies such as West Point in the US, whose graduates went on to fill senior financial management positions in 19th-century US firms, especially the railroads (Hoskin & Macve, 1988). In these corporations, they reproduced the examination systems of their education to create modern hierarchical systems of measurement and control. Hoskin & Macve (1994) claim that the invention of modern business and managerialism was primarily a disciplinary (ideational) breakthrough. Similarly, Quattrone (2004) argues that accounting and accountability practices within the Society of Jesus from the 16th to the 17th centuries cannot be reduced to an economic explanation (i.e. tools for measuring and allocating economic resources) but were tightly linked to absolutist Roman Catholic doctrine. For these historians, SMA develops as much through educational, religious, political and social institutions and ideas, as through economic concerns such as conflicts over surplus value.

Foucauldian accounting work draws heavily on the panopticon architecture (e.g. towers and visible cells) that enables discipline to be administered from a central viewing point (Loft, 1986), which results in self-control by those made visible (Miller & O'Leary, 1987). For example, Carmona et al. (1997) found that the cost accounting system implemented in 1773 by a large, state-owned, tobacco factory in Spain combined physical and monetary measures, monitored factory employees' activities and established a powerful regime of calculation that rendered humans visible and accountable; and enabled management to compare, differentiate, hierarchise, homogenise and even exclude individuals. Carmona et al. (2002) examined how accounting and spatial practices changed

when production shifted to a new factory, whose different architecture, reinforced by detailed accounting calculations, rendered enclosure and partitioning more disciplinary. Accounting reconfigured factory space by classifying it into cost centres, quantified activities therein, rendered spaces visible and made subjects accountable and disciplined. Miller & O'Leary (1993, 1994) argue that (see Armstrong, 2006, for a counter argument) these architectural and accountability practices are central to SMA, particularly individualised production responsibility, TQM and ABC. They argue that they inculcate American workers with a new vision of themselves, as 'economic citizens'—competitive, strategic and resourceful agents who fight for their factory and the national economy. Macintosh & Hopper (1993) bring a similar analysis to bear on other elements of SMA, notably knowledge and management of costs, when observing how Geneen's once exalted style of 'managing by numbers' at International Telephone and Telegraph Company (ITT) exerted a visibility and disciplinary regime similar to the panopticon.

Foucault tackles historical transition through genealogy, arguing that systems of thought are a result of historical contingencies. Genealogical investigation (Kearins & Hooper, 2002) attributes accounting innovations to complex, dispersed events that precipitate discourses or sets of knowledge (e.g. about SMA) rather than any single set of events or person(s) (Miller & Napier, 1993). Burchell et al. (1985) is a seminal paper in this tradition and their genealogy of the rise and fall in the advocacy of value-added accounting in the UK is relevant to post-structural analyses of SMA. For them, interests are embedded in wide-ranging social issues, often involving the state; networks are non-monolithic and changing; and pursuits of sectional interests have unanticipated consequences. Outcomes are not readily predictable from structures of interest but involve vacillating networks of people, circumstances, institutions and interests—a theme that recurs in genealogical studies. For example, Bougen et al. (1990) found accounting calculations in incentive compensation in the UK coal industry constantly reappeared and disappeared according to circumstances. They often foundered not because the accuracy of accounting numbers was challenged but because workers resisted them for moral, not economic, reasons. Similarly, Bhimani's (1994) study of management controls in French firms found prohibitive, physical and personal controls (control of the body) shifted to productive, calculative and administrative modes of management (based on abstract knowledge) following changes in subjective notions of what was proper. Walsh & Stewart (1993) found accounting changed in early Industrial Revolution factories following discursive and programmatic shifts after feudal exchanges were replaced by a wage economy and performance indicators that operated like a panopticon.

Historical studies show that SMA's concern with consumption and knowing the customer (e.g. customer and target costing) are not new: again critical theorising reveals continuities in MA, often surprising antecedents, and how accounting responds to the contingencies of its time. For example, Jeacle & Walsh (2002) employ ideas of disciplinary power and governance to study consumer credit and accounting in US departmental stores in the 1920s/1930s. They argue that accounting, especially the analysis of age-based accounts, replaced local knowledge when granting credit—hence power shifted from credit clerks to systems of 'knowing the customer'. Walsh & Jeacle (2003) trace how the widespread adoption of the Retail Inventory Method was contingent on new programmatic discourses. Its technical properties made store operations more visible and shifted power from buyers to merchandise managers and accountants. Jeacle (2003) examines how overhead allocation systems applied to standard systems for fitting clothes stemmed from a network of interests and laid the way for the standard body, essential for mass tailoring and mass consumerism.

Foucauldians, like labour process theorists, study accounting as a mechanism for controlling labour but are less concerned with issues of agency and intentionality, such as the labour process view that SMA promotes capitalist interests. For example, Miller & O'Leary (1987) attribute the emergence of standard costing in the US to diverse reasons (e.g. it would help stem national decline and reduce labour–capital conflicts) within a discourse of progress prominent in political debates in the early 20th century. They argue that standard costing's language of variances based on 'scientifically' determined performance measures of 'efficiency' constructed individuals as 'normalised'—passive, programmed and atomised. The rise of standard costing was related to an 'Efficiency Movement' that drew from contemporary writers' proposals for the rational, scientific study of the social, which spawned social programmes such as work-study, mental testing and eugenics. Like labour process theory, this version of post-structural theorising emphasises how the control of labour extends beyond the workplace into education, families and government.

More recent research by Miller & O'Leary abandons a concern with interests and intentionality for a focus on fragmented discourses. Miller & O'Leary (1990) argue that accounting technologies, especially those claiming to be innovative and strategic, derive

from an ensemble of discourses about corporations as governable entities, about new accounting vocabularies, and about what makes people rational and responsible. Miller (1991) pursues this in examining how strategically focussed innovations in financial management (DCF techniques) in the 1960s were driven by discourses on how to improve national economic performance. Miller & O'Leary (1990) argue that the adoption of DCF was not inevitable or driven by corporate management—it had been promoted much earlier, only to be ignored or treated with scepticism by agencies that later became advocates. DCF techniques only became practical and relevant when actors within 'the accounting constellation' (state planners, the profession, academia, and industry) recognised its possibilities for fusing pressing micro-level regulation problems of firms with macro-economic regulation problems of the state. The translation of DCF's technology, and by implication other techniques of SMA, helped construct management at a distance (the ability of centralised controllers to control distant activities by abstract numbers purporting to represent activities).

Miller & O'Leary's research (1993, 1994) on new North American manufacturing techniques and related accounting techniques directly addresses SMA and is controversial theoretically and methodologically (Arnold, 1998; Froud et al., 1998; Armstrong, 2006). Their study of Caterpillar's Decatur (Illinois) plant examines how economic and political discourses in the 1980s produced a 'politics of the product' that re-conceived the worker as an 'economic citizen' of the corporation and the nation. Their analysis rests on three elements of governmentality (Miller & Rose, 1990): problematisations (or rationalities), programmes and technologies. Caterpillar was problematised (at least by senior management) as unprofitable and internationally uncompetitive, so they adopted programmes incorporating world-class manufacturing and technology investments. These concentrated production in a single plant and measured the performance of each production cell. Like much SMA literature, traditional accounting programmes such as overhead recovery rates and DCF were depicted as a source of Caterpillar's problems and new management techniques focusing on product quality, re-conceptions of the customer, cellular manufacture, just-in-time and electronically co-ordinated supply chains were introduced, which brought new financial representations and calculations such as ABC, value-added analysis of supply chains, customer costing, predictive costing and investment bundling. Miller & O'Leary (1993) argue that these created new forms of visibility and governance that financially reproduced cells as a chain of customers serving one another. This created a 'myriad of little businesses' and each cell became a calculable space monitored against targets for costs, quality and throughput, benchmarked against competitors' and best practice levels. Workgroups were expected to continuously reduce costs and creatively improve operations and products, i.e. they became 'cell proprietors'. This group-based individualism tapping workers' intellectual and manual skills was portrayed as reinforcing American ideals of entrepreneurship, involvement, equality and progress. Accounting not only provided calculable knowledge about these new manufacturing spaces, but also reinforced conformity by identifying candidates for outsourcing or automation—a potent threat hanging over workers. For Miller & O'Leary, this managerial discourse of economic citizenship inverted organizational hierarchies and increased accountability to customers (see also Vaivio, 1999).

Some post-structural theorising of SMA incorporates actor network theory (ANT). This views organisations as heterogeneous, non-unitary and having dispersed social agency; and it traces how technologies (such as accounting) are formed and stabilised in diffuse networks of people and machines. Although the critical intent of post-structural theorising can be elusive, power remains central despite its abandonment of interests and intentionality as formulated in labour process and critical theory. ANT describes human actors and non-human participants (such as machines) as actants—entities defined in networks. It examines how knowledge disputes (particularly scientific and technological ones) become closed, new ideas are accepted (or not), and technologies, tools and methods are established. Knowledge gains credibility and power by enrolling support from various elements—subjects, equipment, colleagues, financiers, journal editors, grants, etc.—and continually negotiating with them in an attempt to align interests. The most important negotiation is 'translation', where actants struggle to construct common definitions and meanings, define representations and co-opt each other for individual and collective interest. Inscriptions, e.g. reports, diagrams, tables and databases, facilitate action at a distance (Robson, 1992) by stabilising representations of activities that enable them to travel across space and time, and be combined with other work. From an ANT perspective, accounting procedures and calculations are translations arising from mediation amongst multiple discourses from diverse actors and artefacts (Robson, 1991).[8]

[8] Lowe (2001a, 2001b) provides a fuller review of how ANT can contribute to accounting research and its main theoretical suppositions.

Briers & Chua (2001) traced how a heterogeneous actor network of local and global actors and actants used ABC to stabilise and mediate diverse interests. Change was cyclical—new accounting technologies were adopted for multiple reasons based on the co-constructed interests of various people in the factory, made to 'work/succeed' temporarily, and then abandoned. Jones & Dugdale (2002) also examined how ABC/M has been continually reformed and affiliated with 'new wave management': key actors and intermediaries constructed ABC as a socio-technical expert system within a network of human and non-human allies. This leads them to question distinctions between invention and discovery, and theory and practice, for explaining MA developments.

Ezzamel et al. (2004b) examined how inscriptions from new MA measures in a high-tech division of a British manufacturer tried to imbue a 'commercially' oriented employee ethos, created representational spaces that problematised traditional ways of work, and constituted and reproduced the new commercial agenda. Preston & Oakes (2001) examined how in the mid-1930s, surveyors and agents from the US Bureau of Agricultural Economics and the Soil Conservation Service descended on the Navajo Reservation and represented its members as economic subjects. Detailed reports on overgrazing and soil erosion containing maps, tables of numbers, accounts and photographs claimed to represent the real. A family budget constructing the Navajo as consumption units demonstrated how planned stock reductions to prevent further soil erosion could be offset by increased agriculture. The recommendations drawn from these representations brought economic and social disaster for the Navajo. McNamara et al. (2004) use ANT to examine how diverse actants in a multinational consumer goods company in Australia mobilised networks to reconstitute organisational knowledge, standardise skills, and facilitate sharing, linking and acting from a distance. They question whether accounting inscriptions are central to disciplinary control as many accounts claim. Instead, they argue that accounting is just one component within various organisational knowledges, whose plurality enables networks to be 'decentred' and become local sites of resistance in a post-industrial era—a point also pursued by Quattrone & Hopper (2001).

ANT writers attribute changes in accounting knowledge and organisational and social control mechanisms, such as SMA, to the modern world becoming a post-modern society characterised by the compression of time and space, and changed cultural and social relations based on fragmented class relationships, varied life styles, and an emphasis on consumption rather than production. Such theorising, whilst not critical in the sense of supporting the weak and powerless, provides new understandings of the world and accounting's role therein. Such understandings are themselves critical and emancipatory. Thus, Lowe (2004) argues that contemporary accounting compresses perceptions of time and space and reproduces a distinctive, more global, knowledge culture that is reliant on objects, dependant on experts, has more generic spaces, moves quicker and relies on information technology. Ezzamel & Robson (1995) argue that some SMA techniques are time-based management systems that commodify time, redistribute power and engender organisational conflicts over practices and time priorities. They recommend replacing SMA's pre-supposition of linear time with cyclical time. Quattrone & Hopper (2005) study time and space in two multinational organisations implementing Enterprise Resource Planning systems (ERP). The configuration of each ERP system constructed different spatial and temporal separations between headquarters and their scattered subsidiaries. How these were understood and managed had profound effects on management control. In one organisation the ERP reproduced existing structures and distance, which permitted conventional accounting controls to be maintained. The second organisation used ERP to collapse distance through real-time information, which did not increase centralisation but produced constantly changing loci of control and managerial feelings of 'minimalist' control. Nandhakumar & Jones (2001) after examining time and accounting control in project teams developing computer-based management information systems for top executives in a large multinational also found participants' management of time reproduced their social context, and they develop a theoretical framework on the social dynamics of time management that challenges traditional accounting approaches.

ANT claims that actants influence events is controversial for it can be seen as a reification. However, ANT proponents argue that 'hybrids' and multiple forms of knowledge and expertise informing social, economic, environmental and political issues, have made modern society particularly complex. 'Hybrids' of humans and objects within networks constitute 'facts' and accounting practices within organisations (Briers & Chua, 2001; Preston et al., 1992). ANT's emphasis on how hybrids, politics and interests shape knowledge and expertise (Jones & Dugdale, 2002) is a valuable antidote to orthodox, deterministic justifications, whether technological or economic, of SMA's use in modern organisations.

In general, post-structural work indicates the importance of power-knowledge relations for understanding the roles and effects of SMA, its relation to

human subjectivity and how SMA constructs and represents workers and managers. In doing so, it can inform how gender, sexuality (Knights & Collinson, 1987) and ethnicity (as noted in studies such as Efferin & Hopper, forthcoming; Wickramasinghe et al., 2004) impact on SMA's uses, understandings and effects, its diverse origins, and how controls at work interact with other levels of control (of the self, in families and in society). By doing so, it draws attention to how SMA could be different, and creates space for re-constituting and reforming SMA.

4. Critical Theorising on New Public Management

The second major area concerns the role of MA in transforming the public sector. Often referred to as NPM, it has considerable affinities to SMA, although applied to governments and public sector organisations (Hood, 1995). Like SMA, different writers and jurisdictions emphasise varying elements of NPM.[9] Nonetheless, elements of MA are commonly called upon to reform governmental and cultural spheres of modern society, rendering accountants and auditors central actors in reforms, which reinforces the difficulty of sustaining orthodox distinctions between accounting and politics (Harney, 2002). Allegedly independent public sector managers' and auditors' applications of SMA techniques as part of NPM, such as value for money auditing, ABC, the BSC, provokes questioning of their role in policy and its partisan politics (Gendron et al., 2001). Central to many versions of NPM is results management that emphasises output (or outcome) oriented performance measurement, often with a strategic focus (Cavalluzo & Ittner, 2004; Townley et al., 2003). Other reforms include strategic planning, multi-year budgeting and related experiments to encourage managerial flexibility and discretion in delivering public programmes. Some jurisdictions have developed customer-oriented accounting measures for NPM, which can be interpreted as encouraging a focus on the citizen (Mintzberg, 1996).

NPM has involved privatisations, a stress on the market for service delivery and reconfiguring organisational boundaries. In several jurisdictions, this involves 'agentification'—the creation of separate bodies no longer under direct legislative control, which has raised concern about governance structures and appropriate cultures for public sector organisations (Hood, 1998). Accounting is often important since new agencies bring new mechanisms of accountability, often relying on inspection, and internal and value for money auditing, that strongly resemble cost benefit analyses and a cost management orientation. Accounting firms have often been heavily involved in the push for privatisations associated with NPM (Arnold & Cooper, 1999). Finally, many jurisdictions, particularly those facing fiscal constraints and looking for 'off balance sheet' financing, have experimented with public–private partnerships for joint financing of major investments, such as roads, hospitals and schools. MA frequently plays a central role in associated arrangements for inter-organisational coordination and risk sharing, often replacing political and democratic controls with managerial and technical ones.

A common feature of NPM has been the application of accounting and economic logic to domains not traditionally governed by such rationales. For much of the twentieth century, fields such as healthcare, education, religion, cultural organisations and policing were not subject to direct market discipline but came under direct government control linked to professional and expert self-management. NPM reforms have challenged traditional forms of management in these domains with accounting often in the forefront of 'cultural shifts' to greater market sensitivity and economic logic (Berry et al. 1985a; Dent, 1991).

4.1. Labour Process Theory and New Public Management

Labour process theory has addressed accounting reforms in the public sector. Just as Braverman revitalised labour process analyses, Poulantzas (1973) and O'Connor (1973) offered powerful analyses of changes in state organisations, under the rubric of the 'fiscal crisis of the state'. Revived interest in theories of the state has tended to emphasise how the modern state is relatively autonomous from other capitalist developments and how it functions in managing the economy and society. There is relatively little research on state work and mechanisms used to manage it. Nevertheless, labour process analyses of NPM reforms focus on their impact upon the accumulation and distribution of surplus in society. For example, Cooper & Neu (1995) show how a fiscal crisis in a Canadian Province created by tax concessions to oil companies and the recognition of previously unrecognised 'liabilities' (and not public assets) was used to justify NPM reforms and massive social-welfare cuts.

O'Connor examines crises created by rising citizen expectations about state services (especially in health and education) and increasing military expenditures during the 'Cold War'. The state's inability to generate sufficient revenues to finance these are important for

[9]Recent surveys of NPM in practice include Pollitt & Bouckhaert (2004) and Guthrie et al. (2005).

understanding NPM, which is not merely the pursuit of technical efficiency but a means of dealing with crises in an unsustainable model of capitalism. Chwastiak has undertaken a body of research on 'Cold War' logic in the US, demonstrating how accounting legitimated and naturalised military expenditures. Chwastiak (1996, 1998) challenges technical accounting analyses on US defence contracting, pointing out their selective use of neo-classical economics to identify market imperfections with little relation to contracting in practice. She dismisses them as exercises in power and legitimation that shift the onus for fraud from firms to the government; mask subsidies to military and hi-tech firms; and promote capital accumulation by defence firms at the expense of peace and security, the economy and social relations. Chwastiak (1999) argues that accounting controls in US national defence (e.g. cost plus pricing) did not deploy resources more efficiently but rationalised the military-industrial-complex's use of management controls to maintain distributions of wealth and power and defence spending during social crises. Their internal contradictions wrought social conflict and perpetuated social inefficiencies and waste.

Chwastiak (2001) examines MA and NPM and their links to military expenditure when analysing the consequences of adopting planning, programming and budgeting (PPB). Rather than being an ostensibly value-free tool for allocating defence resources, she claims that the Secretary of Defense strategically deployed PPB to centralise resource allocation decisions within his office and normalise preparations for nuclear war by converting the 'unthinkable' into a technical and mundane resource allocation problem. Thus an economically rational frame of representation masked internal inconsistencies within a dialectical and political process. Chwastiak (2006) explores how quantifying military performance inverted strategic thinking during the Vietnam War: maximising kill ratios and minimising 'body counts' displaced discussion of strategies to win the war. In general, her work illustrates the social costs of pursuing efficiency in the military and how the logic of accounting and management science mystifies and occludes the US state's subsidy of corporations.

Others have examined MA reforms in the public sector from a labour process perspective. Dirsmith & Jablonsky (1979) found the US government adopted MBO and, despite their proclamations that it was the latest efficient management technique, it proved ineffective and was used largely to control and redirect controversy. Although they do not use the term 'ideology', they indicate the ideological role of accounting in organisational and social reform. Ezzamel & Willmott (1993) examined financial initiatives to 'reform' the UK public sector by replacing perceived bureaucratic governance based on a public service ethic with market-based systems inspired by the markets and hierarchies literature. Responsibility accounting systems were designed to mimic markets when contracting out and privatisation were seen as impractical. They found that health and community care governance developments associated with discourses and practices of economic rationality were neither 'given' nor 'natural', but secured and legitimised particular social relations. Further work by Edwards et al. (1999) examined how budgeting and accounting in a UK school management initiative linked discourses of neo-liberal government and economics to expanded accounting and budgeting in the public sector. Ezzamel et al. (2004a) shows how the reforms increased the power of head teachers and not parents, contrary to stated intentions.

Many studies of MA and NPM adopt a loose and vague version of labour process theorising, focussing on effects of reforms. We include a sample of such studies because they focus on the distributional effects of the increasing use of MA controls. With almost monotonous regularity, they show how privatisations and market-oriented accounting reforms have harmed consumers, workers and the poor, while improving the well-being of senior managers and the new shareholders. Ogden (1995) examined how accounting rendered 10 UK water companies 'suitable' for privatisation. Since then, they have been subject to 'yardstick' competition under a new regulatory framework and judgements by financial markets. Ogden traces how accounting constituted and articulated changing organisational priorities by promoting a vocabulary of costs and subsequently profit as languages of motive. Ogden & Anderson (1999) examined how water companies' managers responded to investors and financial analysts, customers and the new economic regulatory regime. Senior managers introduced flatter, less hierarchical management structures to focus on new business objectives and diminish public sector bureaucratic management attitudes. The changes were justified as empowering and granting more autonomy to local managers but they experienced greater emphasis on achieving financial targets and an intensification of performance scrutiny.

Shaoul has used 'critical financial analysis' in more direct assessments of privatisation and contracting out in the water industry (Shaoul 1997a, 1997b), animal testing related to BSE and public financing initiatives (Shaoul, 2005) that identifies their unequal effects. Similarly, Arnold & Cooper (1999) examined

the privatisation of some UK ports, pointing out how partisan advice from consulting divisions of multinational accounting firms was critical. They illustrate the devastating impact of the privatisations on local communities and employment, while investors prospered. Cole & Cooper (2006) demonstrate how rail privatisations in the UK benefited investors whilst rail safety and reliability declined. Such effects are not limited to the UK. Catchpowle & Cooper (1999) show how privatisations in South Africa, orchestrated by accounting firms, relied on MA techniques to change the culture of state enterprises to being more profit oriented and to prepare them for privatisation.

Accounting's reproduction of market values in utilities, governments and social-welfare agencies goes beyond issues of correct calculation (e.g. by using cost benefit analysis or technically correct costing). Oakes et al.'s (1994) 'in-depth hermeneutical' study of cost benefit studies in the medical literature revealed that they co-ordinated some interests but obscured and excluded others. Arnold et al. (1994) argue that discussion of 'healthcare costs' in the US press went beyond technical domains of accountancy to influence public discourses where antagonistic social interests, meanings and ideologies prevailed. Arnold & Oakes (1995) traced how accounting socially constructed and constituted US hospitals as entities, created boundaries that hindered patient care; and how the measurement, conceptualisation and discussion of costs reproduced social and economic conflicts. Accounting reforms in US healthcare reinforced gender-based policies on the duties, rewards, education and training of medical labour. MA subordinated nurses, whereas contract-based reimbursement schemes protected hospitals from public scrutiny (Covaleski & Dirsmith, 1995). Laughlin et al. (1994) also noted gender effects in UK health reform when mandatory financial and administrative reforms enabled doctors to delegate unwelcome and unwanted work to women members of the practice 'team' (notably nurses and practice managers).

New forms of cost assessment associated with public management can have unanticipated and undesirable consequences. Boden & Froud (1996) reveal how an accounting-based technique known as compliance cost assessment, although presented as rational and objective, was rooted in a pro-business ideology, used by bureaucrats for legitimation. Its cost measurements were neither stable nor coherent surrogates for social welfare or cost accounting concepts. Similarly, Berry et al. (1985b) demonstrate the arbitrariness of conventional accounting calculations for assessing the economics of coal mines under public ownership and how transfer prices between different state enterprises (electricity generation, the railways and the coal industry) constructed their relative profitability. Transfer pricing schemes that 'recognised' low coal revenues helped sustain the political attack on miners (see Cooper & Hopper, 1987). Tomlinson (1990) demonstrates that the pliability of the calculations was embedded in wider institutional relations between public sector coal mining and the government to establish a closure strategy: financial calculations were secondary and ultimately acted as *post hoc* justification.

New Zealand was a laboratory for NPM, especially a version that emphasised accounting reforms, marketisation and performance measurement. Lawrence et al. (1994) examined reforms seeking to establish a commercialised, economically driven health sector, and ways of accounting for newly constructed spheres of activity. The reforms had uncertain outcomes, were experimental, derived from an ideology without empirical support and often proved impractical. Nevertheless accountants were active within these changes and accounting was often used to arbitrate social conflict. Newberry & Pallott (2004) examined the adoption of accrual accounting measures of outputs, especially a capital charge, the treatment of departmental surpluses, interest on cash balances and performance-based rewards for chief executives. They noted the unfulfilled promise of the reforms: private sector methods did not increase but constrained managerial freedom, reduced transparency and competition between providers, and eroded departments' resources and their ability to deliver services.

NPM has extended to universities, and several labour process studies show its impact on academic labour and education outputs. Willmott et al. (1993) and Sikka et al. (1995) discuss pressures on accounting academics in increasingly commodified labour markets. Dillard & Tinker (1996) and Saravanamuthu & Tinker (2002) develop this, pointing out that NPM developments in education are not confined within an organisation's boundaries but reflect changes in wider society and increasing commodification of more areas of previously 'public' life. Dominelli & Hoogvelt (1996) argue that policies establishing an 'internal' market for resource allocation in UK universities, separating teaching from research funding, and evaluating research activity relate to broader, complex processes of economic globalisation, privatisation of the welfare state, and the changing nature of academics and intellectual work. Harley (2000) links UK research assessment exercises to increasing managerialism in higher education and commodification of academic labour. However, reactions among academic accountants

varied as peer review appealed to traditional academic identities but promoted academic divisions that dissipated resistance to its negative effects. Davies & Thomas (2002) argue that NPM in higher education has promoted a narrow academic role that supersedes notions of academic service (emphasising learning, creativity and critical reflection) and promotes a more gendered academic profile that is difficult for women to confront.

Issues associated with multiple bases of conflict have been explored in NPM and privatisations in developing countries, particularly those under pressure from trans-national institutions such as the World Bank and IMF to adopt structural adjustment programmes that promote markets in the public and private sectors. Uddin & Hopper (2001) trace how regimes of control in less-developed ex-colonial countries are transformed by state and production politics. Their case study of a soap manufacturing company in Bangladesh revealed that under state ownership, accountability, rational planning and control, and consent through bureaucratic means were subverted and transformed due to political interventions, often at the behest of trade unions. Political rather than commercial ends predominated. Systems of accounting were maintained but became marginal, ritualistic and de-coupled from operations. Privatisation brought coercive controls in new despotic regimes. The new owners destroyed union structures and internal labour markets and, following widespread redundancies, most workers were hired through internal subcontracting. The changes heightened worker divisions and rendered workers powerless to resist. Significant changes to accounting controls were made. External reporting ceased (in violation of legal requirements)—financial accounting became the preserve of the owning family and was beset with irregularities. Budgets became more market oriented and were transmitted downwards, reinforcing coercive pressures upon employees. However, a World Bank report claimed that the success of firms in this batch of privatisations warranted further privatisations. Further investigation by Uddin & Hopper (2003) failed to corroborate any significant improvements following privatisation. Wickramasinghe et al. (2004) examined accounting controls during the partial privatisation of telecommunications and showed how MA is implicated in cultural and ethnic politics. Similarly, Wickramasinghe & Hopper's (2005) study of the changing ownership of a textile mill in Sri Lanka revealed complex, dynamic interplay between cultures, politics and distribution. Davie (2000) used critical ethnography to examine accounting's role in a tribal-based corporatisation in Fiji. She found that it increased political ambiguity surrounding a controversial policy change. Assumptions about accounting's ability to reduce ambiguity and inherent ambiguities in accounting language encouraged the use of accounting which became increasingly used the more it pursued 'meaningless[ness]' and time 'eating' notions. Such research demonstrates the complex ways that labour processes operate for they emphasise racial, cultural and political differences as much as class conflicts.

4.2. Critical Theory and New Public Management

Three broad areas of accounting research on NPM use the critical theory of Habermas and Bourdieu. First, there are studies of how accounting logic (Broadbent & Laughlin, 1997) or what Power et al. (2003) call 'accountingisation' has colonised what Habermas terms the 'life world'. MA systems, typically involving costing, performance and results management, strategic planning and long-term budgeting have permeated many former public areas. Bourdieu denotes this as a shift from fields of restricted production—where multiple cultural, symbolic and economic capitals operate—to fields of wide-scale production where economic capital is dominant. Second, there has been work on accounting as a 'steering mechanism'—a controller of people, organisations and societies. The third area concerns accountability, especially how accounting and auditing provide reasons for conduct.

Broadbent & Guthrie (1992) when reviewing 'alternative' accounting research noted the difficulty of defining the public sector given its recent, ongoing transformation and the paucity of research in this domain, especially evaluative work and international comparisons. Subsequently, critical analyses of privatisation and public sector commercialisation based on 'new public sector financial management techniques' and philosophies (Hood, 1995) and international comparisons (Guthrie et al., 2005) have emerged. These combine concerns with financial reporting change (e.g. accrual-based accounting, consolidated financial statements for governments, and recognition of 'new' assets and liabilities) with MA innovations such as responsibility accounting, ABC and strategic performance measurement systems (such as BSC).

The dominant framework has been Habermasian critical theory (Power & Laughlin, 1996) and middle-range theory of Laughlin (1995), which requires empirical researchers to make explicit and justify their methodological choices and interventions. Much MA and NPM research draws on insights by Habermas and Bourdieu on changing public and private spaces;

the colonisation of the once private space of homes, culture, politics and education by markets; and challenges to traditional norms of rationality in public service. This has links to labour process interests in commodification of social relations, though critical theorists would argue labour process theorising is too oriented towards market transactions and depicting people as economic objects.

In contrast, middle-range theory, espoused by Laughlin, Broadbent and colleagues, treats each empirical domain as specific and underplays economic relations (like fiscal state crises). Their approach carries the risk of romanticising traditional and professional logics and norms. Broadbent et al. (1996) examine how promoters of economic efficiency use NPM to colonise health and education and whether they can and should instruct 'caring professions'. They doubt the wisdom of violating professional jurisdictions that emerged historically to balance the power of suppliers and consumers of care, fearing 'economic reason' may violate ethics and trust. Broadbent & Laughlin (1998) found that teachers and doctors perceived accounting and finance-led NPM reforms in schools and primary healthcare as unhelpful, intrusive and potentially dangerous, and each developed mechanisms to 'manage' these 'disturbances' to protect core activities and values. Broadbent & Laughlin (2001) examined resistance to unwanted changes, noting how organisations created satellite organisations (in their words) to 'counter environmental disturbances'.

Broadbent et al. (1999) compared educational reforms in New Zealand and the UK. Both introduced responsibility accounting systems to increase accountability, enhance management control (especially budgetary control) and strengthen performance measurement within schools, but in the UK the systems were individualised whereas New Zealand retained an organisational focus. Individualised MA for control and accountability had potentially damaging consequences for it separated strategic and moral considerations and instrumental action from ethical constraints, and undermined potential for collective action. Lawrence & Sharma (2002) used Habermas's societal development theory to examine how governments in the 1980s embraced free-market rhetoric and commercialised universities by reducing financial support, encouraging competition and demanding financial self-dependency using quasi-market funding mechanisms. This produced a new managerialism, embracing total quality management, BSC, cost reduction and performance targets measuring the productivity of academics and their departments. They conclude that pursuing business-like efficiency treated students and academic labour as commodities, education as a private good, students as customers and degraded university life and its function in society.

NPM accounting researchers using critical theory have increasingly linked more critical neo-institutional sociological theory (DiMaggio, 1983, 1991; Meyer & Rowan, 1977) to critical reflexivity (Bourdieu, 1977, 1998) to explore what happens when NPM challenges institutional norms and logics (e.g. when public servants expound 'public interest' or 'professional expertise' as the basis for policy making) (e.g., Oakes et al., 1998). This addresses power and identifies winners and losers in terms of economic capital and also other values—what Bourdieu calls cultural and symbolic capital. Bourdieu studied cultural organisations, so it is not surprising that accounting researchers have used his ideas to study museums (Oakes et al., 1998), historical sites such as the management of Pompeii (Zan, 2002) and performing arts organisations such as theatre (Christiansen & Skærbæk, 1997). Each focuses on how MA reforms pushed the identity of cultural organisations towards business, and altered relations between business managers and cultural workers. For example, Oakes et al. (1998) found the introduction of long-term business plans in museums changed the language of management, and wrought what Bourdieu calls 'symbolic violence' that de-legitimised the cultural and historical aims of the museum, challenged concepts of authenticity, limited public access and amended who had a legitimate right to frame the museums' future.

Kurunmaki (1999) also uses concepts of fields and capital when examining the financing, production and consumption of health services in Finland, and the expectations and experiences of people involved in the transition to market-based controls. She found that healthcare was a site of continuous power and control games: participants' chances of winning or losing depended on their relative power within differently valued capitals. Accounting helped change an allocation system based on planning to one based on competition. Kurunmaki (2004) found that Finnish NPM reforms that introduced calculative practices of MA, hybridised medical expertise rather than producing a jurisdictional battle between doctors and accountants, as expected. Through the transfer of techniques, medical professionals acquired many calculative skills normally the preserve of management accountants. She concluded that professional encounters are not always a battle, and abstract knowledge is not as dominant as others imply. A more nuanced and detailed understanding of inter-professional encounters is required that recognises how national settings at specific times

temporarily stabilise an assemblage of skills and techniques, abstract knowledge claims, educational institutions and academic disciplines.

Critical theory studies may treat MA as just a mechanism to change the public sector and neglect detailed analyses of its practices, but they do identify changes in organisational identity, inter-professional 'turf wars' over organisational visions, how outputs of public sector organisations are re-conceived, the effects of this upon access and services, and how MA reconstitutes relations between the citizen, the state and cultural life—also prominent issues in post-structural theories of NPM.

4.3. Post-Structural Theories and New Public Management

Post-structural theories of NPM stress the constitutive nature of MA in reforming the public sector, individual subjectivity and identity, and how accounting logic produces specific but partisan depictions of objects, e.g. customers, the body, patients and students. For example, Chua & Degeling (1993) found hospitals that used homogeneous bed day measures did not differentiate between patients but when they introduced elaborate cost and record-keeping systems (based on a form of ABC called diagnostic groups [DRGs]) that identified procedures per patient, this objectified (but dehumanised) subjects and desensitised managers to individual patients. Similarly, if the cost of interventions for particular students is known, then educational institutions may decline students that are costly. More extreme examples of the de-humanising impact of MA in public institutions are contained in Funnell (1998b), which traces the dehumanising and desensitising effects of quantification in the management of Nazi genocide, and Neu & Therrien (2003), with respect to settler's treatment of indigenous peoples in Canada. On a more mundane level, Ursell (2000) argues that new structures and regimes in British broadcasting occluded the true costs and character of television production, transformed its public service ethos and management systems to competitive and market-led values, diminished broadcasting workers' cultural creativity, and put them in a market-led dual labour and cultural products market. Townley (1996) also emphasises the constitutive roles of accounting when noting how performance measurement systems introduced in British universities in the name of greater accountability exerted disciplinary practices akin to examination and confession techniques, and altered academics' self-identity, and their perceived role and accountability.

Watkins & Arrington (forthcoming) argue that identifying the constitutive nature of accounting is a crucial political intervention. They show how a US version of NPM, the National Performance Review, was partial as it reflected one stream of American political thought but not others. They point out that accounting in NPM provides the language of competency—a core component of modernist political ideals—yet they wryly observe that while most accounting academics know the limitations of accounting, the 'public perception of economic facticity, clarity and objectivity as characteristic of accounting discourse is simply false' and researchers should 'expose this particular falsehood, thereby undermining the political supports on which the expansion and its continuing colonising force largely depends' (forthcoming, p. 13). Rose (1991) makes a similar argument about the use of numbers in British political life, though he is less direct about the responsibility of researchers for challenging presentations of accounting. Accounting numbers are crucial to modern political discourse: they do not just represent performance but produce a vision of what good government entails and they constitute public sector actors in particular ways. For example, Ogden (1997) showed how a UK regulator's attempt to empower customers of newly privatised, monopoly water companies by introducing performance measures on 'serving customers' made 'the customer', and 'customer service' calculable, with repercussions for organisational priorities. Similarly, Skaerbaek & Melander (2004) used ANT to explain how accounting measures changed during political manoeuvring within networks, which affected the characteristics, purposes and conceptions of customers in a Danish ferry company undergoing privatisation.

ANT further explores the constitutive nature of accounting in NPM. Preston et al. (1992), following Callon (1986) and Latour (1987), locate the development of budgeting and responsibility systems in British healthcare in the micro-politics and rhetorical strategies of government departments to discipline and make doctors and hospital managers more 'accountable'. These discourses failed to change medical staff's traditional norms of care and the reforms failed due to resistance of medical staff and inter-professional competition stemming from the reforms' association with accounting departments. A renamed 'resource management' system, although very similar but not associated with accounting, was more successfully implemented into the same hospitals (Bloomfield et al., 1992).

Chua & Preston (1994) compared accounting's penetration in healthcare sectors of the US, UK and Australia, finding that accounting concepts like 'costs' were not neutral but sites for struggles between divergent

interests; accounting change was not merely instrumental but reflected different organisational and societal rationalities; and its global diffusion owed more to faith than 'factual' evidence on its efficacy. Preston et al. (1997) used 'action at a distance' to examine accounting's role in Medicare in the US. DRG systems brought new relationships between the government and healthcare providers. Accounting data and calculations facilitated 'government at a distance' and alleviated problems of overtly rationing healthcare to the elderly by obfuscating how decisions were made by appearing to be a neutral technology. This study demonstrates how post-structural analysis illuminates the ways accounting procedures facilitate the operation of power, whereby large sections of the elderly (and the poor) are excluded from medical care in the name of objectivity and rationality. Other approaches have also shown how MA creates new visibilities in public sector organisations and how NPM brings new problematisations of management in the name of efficiency, transparency and accountability. For example, Covaleski & Dirsmith (1988a) examine how new budget categories brought resource conflicts between state legislators and university officials in Wisconsin but, as noted in Footnote 3, their studies of government budgeting, while pertinent, do not examine the effects of these new visibilities and problematisations, hence are not examined here.

Chua (1995) uses ANT to examine how and why three Australian hospitals 'experimented' with new accounting systems. Accounting change was not motivated by positive economic outcomes, but an uncertain faith fostered by rhetorical strategies of experts that reconciled shifting interests in a network of actors. Bloomfield & Vurdubakis (1997) noted how accounting inscriptions in UK hospitals created images of objects that rendered them visible: accounting can be both real and a simulation. 'Visions of organisation' (articulated through vocabularies of efficiency, effectiveness, the centrality of information in management, management by objectives, etc.) became aligned and translated with specific technologies (such as data modelling).

Post-structural theorising of MA and NPM, like that of SMA, pays considerable attention to resistance, as noted above. For example, in what might otherwise appear an orthodox study of resource allocation in British universities, Ezzamel (1994b) identified the effect of resistance by unit managers when confronted with new forms of budgeting seeking funding cuts. Lowe & Doolin (1999) found case-mix accounting systems intended to foster cost-consciousness by doctors exerted some control but also produced resistance. They suggest that such systems be best regarded as new discursive spaces where all organisational participants can act.

A final area of research on NPM informed by post-structuralism concerns state auditors [see the special issue of *Critical Perspectives on Accounting,* 2003, 14 (1/2)]. Auditing lies outside the scope of this book but a significant and growing area of state audit work is efficiency or value for money auditing, which covers typical MA concerns, including performance (results) measurement and costing (Pollitt et al., 1999). Radcliffe (1998) attributes the development of 'efficiency auditing' in Alberta, Canada, to wider discourses (e.g. best management practice, appropriate auditing roles) intersecting with local circumstances. Pallot (2003) offers a similar story for New Zealand. Radcliffe (1999) traces how technologies of efficiency auditing emerged: in the absence of detailed rules or standards, practitioners developed an agreed-upon knowledge and sensibility that made efficiency auditing tractable. Funnell (1998a) found the introduction of efficiency auditing in Australia created considerable stress for the Auditor-General, and politicians' intrusion into state audits contradicted the state auditor's image of robust independence and highlighted the political nature of state audit. Gendron et al. (2001) also trace how the Auditor General's promotion of efficiency auditing in Alberta compromised his/her independence. Gendron et al. (forthcoming) reveals how accountants created and legitimised their claim to expertise in efficiency auditing and performance measurement in the face of public servants' resistance or scepticism.

Research on MA in NPM suggests that much can be learned from Rushdie's 'broken glass' of critical theorising. Although there is a the risk of invoking a romantic image of government managers serving the public interest and public organisations being the natural location for human and cultural services, critical theorising is a tool of the present. It locates MA developments and associated public sector transformation in the development of modern societies and crises of the modern state. Its achievements, insights and continuing challenges are discussed below.

5. Conclusions

This conclusion identifies the contributions of critical theory to MA, especially contemporary developments in SMA and NPM. Although labour process, critical theory and post-structuralism stem from old theoretical traditions—a place 'elsewhere'—they still provide tools for examining the present where increased production and efficiency, and new ways of organisational and human interaction exist alongside intensified competition, globalisation, ecological degradation, work

intensification, human oppression and injustice. We identify two challenges for future work—disputes within critical theory that undermine collective progress and limit praxis, and positive changes to enhance the human condition. We conclude by emphasising what we have learned and what others uninvolved in critical theorising can learn from greater engagement with it.

5.1. Contributions of Critical Theorising on Management Accounting

1. Accounting techniques stem from and reproduce social relations at particular times and places. Critical theories see context not as an *ad hoc* collection of empirical observations (like many versions of contingency theory) but as expressions of capitalism and modernism. For example, recent SMA concerns stem from crises in mass production and NPM from fiscal crises of modern states.
2. MA developments are not merely driven by technological changes or competition but also corporate drives for surplus inter-professional rivalries, and control over labour. SMA is just one model of investor capitalism that shares these antecedents. NPM's history is similar but also includes desires to commodify areas of life previously not governed by economic rationalism, shifting political rationalities and state facilitation of accumulation.
3. Power and conflict remain central for understanding MA techniques, their operation and their effects. Critical theories' interpretations of power range from emphases on class conflict and ideology in labour process theories to language and discourse in post-structural theories—yet all see power as central. For example, ABC's rise may be attributable to owners' attempts to make middle management a variable cost, as Armstrong (2002a) suggests, or rhetorical battles between management consultants, accounting associations, academics and others to gain material advantage in selling ideas of control, as Jones & Dugdale (2002) claim.
4. The alleged neutrality and objectivity of MA is spurious: it is subjectively negotiated in the face of resistance, especially by labour. For example, accounting has promoted privatisations and market relations that benefit some sectors of society over others, and its theoretical base reflects market ideologies of competition rather than the logic of communities, collaboration or public service. Critical theorising analyses resistance in its socio-economic context rather than attributing it to people's character (Townley et al., 2003) or innate irrationality.
5. Accounting innovations often rest on inspiration and support from external institutions such as the state, religion or political movements. For example, Foucauldian researchers show that European firms' controls derive from philosophies and methods used in monasteries and the Roman Catholic Church. Similarly, the French state shaped organisational accounting to meet requirements of national income accounting, and in Germany employer organisations often played a role similar to the French state.
6. Critical theorising alerts us to inter-relations between technology and control. Whilst labour process theory emphasises dialectics, post-structural arguments stress how technologies, including MA practices, are mediated in complex chains of interests. Both point to limits of linear analysis, whether for understanding SMA [as in Ezzamel's study (2004) of a 'factory with a problem'] or NPM [as in Chua & Degeling's analysis (1993) of DRGs in hospitals].
7. Accounting problems and changes are not continuous but rooted in socio-economic crises within changing epochs of capitalism and negotiated social accommodations. For example, the promotion and non-adoption of an early version of SMA, value-added accounting, reflected participant's perceptions of power and advantage in a changing arena of social and industrial conflict (Burchell et al., 1985). The spurt of accounting innovation referred to by Johnson and Kaplan in the early twentieth century occurred when major social conflict, political uncertainty and industrial restructuring prevailed, which is often written out of contemporary histories (Hopper & Armstrong, 1991).

Accounting history is an area where critical research has interacted with more conventional strands for mutual benefit. Unlike other areas of MA scholarship, critical work has precipitated considerable debate amongst historical scholars and helped rejuvenate the field. For example, Fleischman (2000) examines accounting controversies over Scientific Management in the US in the early twentieth century using disparate paradigms of accounting historians—Foucauldian, labour process and economic rationalist (neoclassical). He argues that the three paradigms together enhance understanding of Taylorism, for example, the negative reaction of organised labour reflects labour process observations and the lack of practical application reflects economically rational action by entrepreneurs

Critical theorising stresses history as it frames how we interpret the present and formulate future changes. Thus, if the history of MA is presented as heroic innovations by managers and consultants to counter competition or improve efficiency, this lays a platform for similar contemporary exercises in SMA or NPM, like ABC/M, BSC, customer accounting, public–private financing or results management. Critical theorising questions this account. For example, new techniques often espouse an empirically suspect rhetoric of 'empowerment' and governance inconsistent with interests and values of others. Often the diffusion of ideas such as 'world class manufacturing' or 'intellectual capital statements' owes much to state organs concerned with economic governance and the reform of the private and public sectors. Moreover, history reveals a procession of MA 'solutions', which were adopted with fervour only to be abandoned, radically changed during usage and/or proved to be dysfunctional (March & Olsen, 1983). What may purport to be rational and self-evident may not be so to others, who may interpret it as further refinement of unwanted control. History also shows that the present was not inevitable by revealing how alternatives were fought for, lost or discarded. For example, employee struggles for greater autonomy during the introduction of Taylorism, the destruction of public service ethos by privatisations, were choices foregone, which is often forgotten, as the powerful reconstruct history.

Geographic and spatial context is emphasised in critical theorising. MA has a long tradition of surveys of different practices in different countries. Critical theorising, however, goes beyond vague notions of 'national culture' and traces MA's interaction with specific local social and economic circumstances. Wickramasinghe et al. (2004), for example, demonstrate how conflicts ensue when SMA from Japan is implemented in Sri Lanka due to post-colonial domestic politics. Bourguignon et al. (2004) show why strategic performance measurement systems vary due to different countries' ideologies. Cooper et al. (1998) and Barrett et al. (2005) show how the interaction of national stereotypes, histories, and local social and economic connections make it difficult to homogenise multinational organisations, say by imposing global SMA practices and global IT systems. Similar situations can exist within countries, as local industries and craft traditions interact with global management ideas (Djelic, 1998; Djelic & Quack, 2003). When linking potential variations to more general theories, we must avoid theories of MA that offer little more than 'it all depends'. In this respect, the 'business systems framework' (Whitley, 1999a, 1999b) offers a way to carefully explore geographical patterns and how different varieties of capitalism and other social formations impact on MA, and vice versa.

5.2. The Challenge of Internal Disputes within Critical Theorising

It is wrong to presume unanimity within critical theorising. Many would dispute including post-structural theories in this chapter, rejecting our justification that it shares a common commitment to the centrality of power and social and organisational improvement. But we should not over-emphasise distinctions between labour process, critical theory and post-structural theorising. Indeed, as mentioned earlier, there are notable attempts to combine approaches. For example, Mouritsen (1999), in a study of MA in a printworks, notes the vagueness of many terms in new management techniques and how different managers translated techniques differently. One set used them consistently with post-structural discussions of governmentality, while another used them consistently with labour process theorising. Mouritsen (1999) suggests that both theories contain insights that management use simultaneously to inform strategies, the former often for rhetorical justification and the latter more for control system design. Similarly, Chua & Degeling (1993) when examining case mix costing and prospective cost reimbursement in US hospitals root their analysis in Habermasian critical theory but incorporate elements of Foucault's notion of biopower to incorporate instrumental, moral-practical and aesthetic spheres of activity pertinent to processes of implementation and reaction. They suggest that accounting 'weaves between' these spheres and research should embrace three questions namely: instrumental—what ends have been achieved?, moral-practical—what is being morally legitimated? and aesthetic—what concept of subjectivity is created? (Chua & Degeling, 1993, p. 293) While it would be wrong to equate each question with the three forms of critical theorising discussed in this chapter, there are sufficient similarities to suggest that attention to them would enhance MA research.

Mutual engagement may enrich our understanding of MA but sharp divisions remain, notably about the nature of contingency and transformation. We discuss these below because they may preclude mainstream management accountants from seeing the contribution and potential of critical theorising, and critical theorists tend to concentrate on internal and sectarian conflicts, loosing sight of commonalities. So, without celebrating or condemning internal conflicts, we offer our opinion so others may better negotiate claims and counter claims.

Labour process analyses tend to construct models of capitalism, their attendant accounting and processes that trigger transformation. Dialectical reasoning identifies contradictions that precipitate crises, conflict and hence change, whereas conventional analysis tends to construct continuous causal models emphasising cohesion and stability. Whilst labour process analysis accepts the role of agency in outcomes of indeterminate struggles, it does so within a broader, meta-theoretical frame of analysis with, albeit sometimes implicit, criteria of what is right and wrong—whether it be inequity, injustice, alienation or exploitation. Critical theory is less explicit about wider social formations and, following the German critical theory of Habermas, Adorno, Horkheimer, Marcuse and others, asks why commodification is not resisted more, and how cultural features and ideology undermine conflict. Post-structural theory is suspicious of such meta-narratives (as well as those of neoclassical economics), which is understandable given the tragedies of 'isms' perpetrated on the masses by others on their behalf. All though see MA as power-knowledge systems with often unanticipated disciplinary effects.

Armstrong (1994) recognises the challenging work on the history and sociology of accounting inspired by Foucault and other post-structuralists, but he claims that Foucault depicts disciplinary regimes as operating primarily through a discursive constitution of the subject. This makes it difficult to see how individuals can ever resist accounting controls, and invokes the dubious assumption that disciplinary effects of accounting information are independent of physical and material sanctions. He argues that the concept of disciplinary power in modernity is so high-level in accounting research that it suppresses relevant detail, thereby offering little insight into phenomena such as change in accounting systems, relationships between accounting and other means of managerial control, and differences between accounting systems in different contexts.

The lack of attention to detail creates problems regarding transformation in Foucauldian work. Archaeological work traces how discourses and practices within particular circumstances legitimate accounting methods used within programmes for managing government and society—what has been referred to as 'governmentality' (Rose & Miller, 1992). This has yielded rich results, especially on MA's association with disciplinary practices exercised on the mind as well as the body. However, Foucauldian theory is less able to explain shifts in modern accounting practices. Here, post-structuralists tend to turn to genealogical methods and highlight contingencies and indeterminacy, there being a suspicion of more generalised models and causality. Our impression, however, is that successive Foucauldian studies of MA typically show how managers grapple with problems of calculation and control and reveal similar attempts under not dissimilar circumstances to institute accounting controls, yet all studies attribute events to contingent and seemingly unique circumstances. We are left wondering when sufficient pattern emerges from apparently contingent situations to suggest broader generalisable models.

The use of ANT by post-structuralists has reinforced work on governance. Armstrong (1994) argues that action at a distance and translation processes is a greater theoretical advance than disciplinary regimes. Translation provides insightful accounts of the diffusion and change of accounting technologies and how knowledge is produced and contested (Gendron et al., forthcoming; Preston et al., 1992). We agree with Armstrong that research on translation and governmentality would be strengthened by allowing material circumstances into the analysis, alongside discursive conditions of possibility. This is consistent with views of leading post-structuralists. For example, Latour has advocated broader political praxis based on the American pragmatists.

The apparent refusal of post-structuralists to engage in debate has been a source of tension for other critical theorists (Tinker, 2005). In 1998, this burst to the fore in two articles criticising Miller & O'Leary's research (1993, 1994) at Caterpillar. Arnold (1998) accuses Miller and O'Leary of neglecting industrial relations and resistance embodied in strikes and mass demonstrations. She argues that their analysis neglects the subjective experiences of participants; the voice of the worker; contested receptions of discourses, especially workers' cynicism and resistance; issues of politics, ethnic and gender discrimination and anti-unionism; and their relation to class conflict and material struggles in a capitalist era of regulation utilising new MA techniques linked to job losses and capitalist flight to lower wage economies. Her later paper (1999) elaborates these aspects of the Caterpillar story, and argues that the events need interpreting in a broader socio-economic analysis such as regulation theory. For her, Miller and O'Leary depict the changes as essentially contingent, de-contextualised, lacking explanatory pattern, and failed to anticipate the imminent abandonment of the Decatur plant as part of Caterpillar's strategy of shifting production to cheaper locations.

Froud et al. (1998) also complain that Miller and O'Leary rely too heavily on managerial claims and distance themselves from issues of competitiveness, managerial calculations about value-added and

distributional conflicts. For Froud et al., Miller and O'Leary's analysis of time and space within the factory ignores critical narratives about 'lean production' and 'flexible specialisation' associated with patterns of historical transformation. In contrast to Miller and O'Leary, Froud et al. (1998) analyse company data to trace the firm's declining competitiveness, its dependence on exchange rates, changing shares of value-added and political lobbying. Like Arnold, Froud et al. claim that contextual analyses rooted in the globalisation of capital and subjective experiences of employees are written out of Foucauldian analyses.

Similar points are raised by others. Ezzamel et al. (2004c), like Arnold, criticise Miller and O'Leary for neglecting transformation processes at Caterpillar's Decatur plant, especially resistance and trade union action. Armstrong (2006) suggests that Miller and O'Leary's reliance on managerial rhetoric and discourse leads them into a fantasy world of management aspirations and hopes. Cowton & Dopson (2002) apply Foucault's delineation of disciplinary controls to accounting control in a UK motor parts company and, like the former writers, found a prima facie resemblance. However, Miller and O'Leary's genealogical and governmentality approach did not 'provide tools to understand details of the landscape' for it neglected resistance, implied totalisation, ignored variations over time and failed to offer reasons for changes. They argued that it needed theoretical enrichment to encompass agency and dynamics. Macintosh & Hopper (1993) recommend labour process theory to overcome such deficiencies, whereas Cowton and Dopson commend Gidden's structuration theory (Macintosh & Scapens, 1991; Roberts & Scapens, 1985).

These contemporary disputes over theory and society might be crudely depicted as differences between modernists and post-modernists. The latter argue that philosophically it is impossible to 'prove' the validity of any meta-narrative and its attendant values; any such imposition is an act of unwarranted power; contemporary society is fragmented in terms of class allegiances and life-styles; politics is based on single issue movements such as gender or the environment; and consumption rather than production predominates life, often based around 'image' and discourse associated with the mass media rather than direct experiences. This gives rise to a more cautious relativistic analysis concerned with maintaining plurality and puncturing claims of the powerful, often through analysis of texts and discourse.

Modernists (and here we include most labour process and critical theorists) accept the empirical validity of these observations on contemporary society and the inability of previous models based on class analysis, the economics of production and mass political movements to explain current problems. However, they (and we) would argue that this represents a new epoch of capitalist accumulation characterised by globalisation, weaker nation-states, rise of regional and trans-national institutions, class fragmentation and the replacement of Keynesian political programmes by neo-liberal economics (Harvey, 1990). The current state of governance within firms and society may represent a new form of social accommodation, but this is as unstable as previous ones since economic and social power remains uneven and a source of latent conflict. Hence modernists identify resistance and contradictions that may be focal points for subsequent instability, and emphasise inequities and injustice (not least to raise political awareness amongst those affected).

5.3. The Challenge of Praxis in Management Accounting

A strength of critical work is its attention to fissures within contemporary political debate. Following Flyvbyerg (1999), Cooper & Morgan (2005) suggest that accounting should use case studies to demonstrate power in action, and the importance of values and expertise for progressive MA change. Tinker (1991), Sikka et al. (1995), Laughlin (1995) and Neu et al. (2001) also call for greater political engagement, although their proposals for effective action contain important differences, and much of their emphasis is on external financial reporting. MA has been more influenced by action research (Kaplan, 1998; Lukka & Jonsson, this volume) but this tends to be managerial and incremental. However, critical accounting has been timid politically, and we concur that it should be more involved in praxis and political change (Moore, 1991).

Examples of potential praxis in MA lie in a special issue of *Critical Perspectives on Accounting* (2002, 13 (4)). Based on her work on NPM, Broadbent (2002) argues that accounting is an agent of modernism and sectional interests, and purports to be objective when it is actually highly malleable; hence it requires challenge, not least regarding its role in public sector reform. Cooper (2002) claims that academics are cut off from the 'real world', write inaccessible papers for each other, are over-concerned with theory and shun practical engagement, which makes them pessimistic about their own agency and potential for social reform. She takes the academic and political work of Bourdieu as an exemplar for fusing theory and practice in a more optimistic manner. Using Scottish examples, like the Clydebank asbestos sufferers, the campaign to end university tuition fees and the work

of the Centre for Social and Environmental Research, she shows how critical accounting researchers can test their theoretical skills in a more practical arena. Tinker (2002a) recounts the hostile environment for engaged critical research in the US and, like Cooper, argues for engagement in more technocratic debates, if necessary working with corporate sponsors and teaching the less advantaged.

Roslender (1996) when examining work on 'accounting for strategic positioning', claimed labour process research has neglected political involvement in social change in 'a drift towards the understanding of capitalism *for its own sake*', whereas Foucauldian work makes no such aspirations. He calls for more engagement with SMA and its focus on downsizing, customer consciousness and designing product portfolios with greater value added by returning to basic issues concerning empowerment, commodity fetishism, alienation, power and distribution. Morgan & Willmott (1993) similarly argue that critical accounting research may reveal the conditions and consequences of accounting practices and their contribution to social and organisational (re)production but it has limited engagement with policy issues and debates. Whilst recognizing institutional pressures that confine debate, they urge critical scholars to communicate their findings beyond the academic community. Neu et al. (2001) stress the difficulties of doing this, although Tinker (1985), Neu & Therrien (2003), Hammond (2002) and Power (1997) are examples of books designed to reach a wider, politically engaged, public.

The book that comes closest to this in MA is Jonsson (1996). Mouritsen et al. (2002) argue that Scandinavian researchers have long worked with labour organisations, and exhortations to improve organisations and society hold little sway in countries where such engagement is possible and politics operate on consensus and incrementally. They note that Scandinavian connections with Californian universities have produced theory based more on institutionalism and bounded rationality than critical theorising. Thus grandiose theories on the interaction between MA and political change carry little weight in Scandinavia: instead critique based on what is deemed practical and possible is more effective—hence the interest in technology and knowledge formation. However, this neglects the role of ideology in determining what is perceived as practical and feasible.

Other important exemplars of critical theorists in the UK involved in MA praxis are Williams, Shaoul, Froud and colleagues, and Sikka. Froud et al. (2001) show how management consultants are central to SMA developments, especially EVA and shareholder value analysis, which they empirically demonstrate fail to deliver superior performance. Their explanation of managerial enthusiasm for these developments, however, tends to rely on neo-institutional theory, especially the need for managers to conform to social norms (DiMaggio & Powell, 1983) and the latest consultancy promises, which is not entirely persuasive since managers tend to be cynical and suspicious of management fads and fashions. In this sense, labour process theorising provides a stronger basis for explaining SMA and NPM adoptions.

Sikka et al. (1995) argue that the spread of accounting vocabularies and practices in the management of hospitals, schools, universities, charities, trade unions, and the increased power of accounting and its institutions means they increasingly act as quasi-legislators. They call for a (re)consideration of the role of accounting academics/intellectuals, charging they have a responsibility to challenge sectional interests, stereotyped images and inform public debates to encourage more democratic participation. Froud et al. (1998) use capital charging in UK hospitals (an accounting innovation that supports NPM) to illustrate how public policy initiatives are justified without resort to numbers and can be challenged with empirics. They rework hospital accounts to demonstrate that poor asset utilisation was never a major problem, as claimed, and capital charges are likely to disrupt services. They conclude that hospital reforms should be understood in terms of distributive conflict and not inefficiency. Edwards & Shaoul (2003) test whether public–private partnerships, a preferred method of procuring public sector services by the British government, deliver value for money and risk transfer as claimed (rather than representing off balance sheet financing). After examining two information technology partnerships intended to transfer risks from the public to the private sector, they discovered that public agencies, not the commercial partner, bore the risk with additional costs to the public.

Despite such attempts at praxis, we share concerns about its scarcity in critical work. Central figures in critical theorising—Marx, Braverman, Habermas, Bourdieu, Latour and Foucault—are (or were) consciously and actively involved in political change, albeit in different ways. But much critical accounting work lacks explicit engagement with broader political debate and policy, which today often occurs within human geography, socio-economics and cultural sociology. Unlike financial accounting, it is often difficult for MA researchers, especially in private sector organisations, to directly engage in praxis and critique due to access problems. But the lack of broader political engagement is less excusable and lends an air of rarefied academicism to much work.

For example, little critical research exists on the design (or development) of critical management systems and practices within organisations and public policy. An exception is work influenced by Habermas. Laughlin (1987) tries to model an 'ideal speech situation' within organisations, and his later work continues this tradition, but with an emphasis on critique rather than system design. Townley et al. (2003) have argued that strategic and performance measurement systems have potential for designing systems of deliberative democracy and dialogue (see Cooper & Ezzamel, 2006) but few MA proposals have emerged. Perhaps we should turn to suggestions for more emancipated corporate social and environmental governance and accountability practices for a model. For example, Tinker & Gray (2003) argue that moral and historical analyses are mutually indispensable in developing praxis of sustainability. Unerman & Bennett (2004) advocate building a moral consensus using discourse criteria of ideal speech situations to determine social, environmental, economic and ethical responsibilities. Whilst problems in identifying and reaching a wide range of stakeholders, and determining a consensus from a range of potentially mutually exclusive views remain, they argue that the interactivity and wide reach of the internet can help realise the theoretical potential of ideal speech situation debates in practice, and thus facilitate democratic debates leading to a greater equity.

5.4. Contributions of Critical Theorising in Management Accounting

We conclude by highlighting achievements of critical theorising for MA, and what it offers academics and practitioners with different persuasions. We start by returning to the Rushdie quotation. Our review suggests that critical theorising is as relevant today as was in the 1970s and 1980s. The past is indeed another place from where we have all emigrated, but the strangeness and familiarity of 'elsewhere' enables us to re-interpret and re-imagine the current world, which for Baxter & Chua (2003) is one of globalisation, hybridity (i.e. systems that employ a mix, or 'third way' of principles conventionally regarded as distinct) and the growth of networks and alliances. While sharing their vision, for us, the early twenty-first century is also a world of opposites: under- and unemployment versus longer working hours; global resisters versus global integration; individualisation versus collective insecurity; growing disparities of wealth versus opportunities for human creativity; increased corporate influence versus increased suspicion of corporations; increased faith in strategy versus unpredictability and uncertainty. The question therefore remains: what relevance do critical theories have today?

One of their major achievements is recognition of the continuities of the past. 'Elsewhere' has familiarity. We may live in a global age but Hirst & Thompson (1996) claim the world was in many respects more global 100 years ago. What critical theorising in MA seems as familiar is the ongoing struggle of control in the face of resistance. Whether it is 'old' MA techniques like standard costing, or return on investment calculations, or 'modern' developments in SMA or NPM, such calculations accumulate wealth and power in the hands of some and inflict costs on others. Despite their rhetoric of empowerment and lean organisations, most MA innovations seek to enhance shareholder value. Most MA research reinforces this, scrambling to identify techniques for doing so and means of fixing any impediments. Yet the political ideal of a democratic society with access to public services is a distant fantasy for many citizens. MA can contribute to efficiency, which can be admirable, but critical accounting research should steadfastly identify how calculations work and to what effect, not least upon equity and social justice.

A further contribution of critical theorising is the recognition that to understand MA we must often look beyond legal boundaries of the organisation. Important components of the wider context may change but the state, professional associations and ideological shifts in society are enduring, if changing, influences on MA evolution and usage. In so doing, critical theorising identifies the constitutive nature of MA, i.e. how its systems and practices produce and reproduce particular identities and practices within individuals, organisations and societies. Trust, efficiency, normalcy and accountability are the product of accounting calculations and ideas that find resonance at particular historical junctures.

Thus far we have emphasised the familiar and enduring in 'elsewhere', but critical theorising also recognises discontinuities and that 'elsewhere' is always somewhat strange and foreign. Thus, what constitutes MA knowledge is not an inevitable, cumulative, progression of neutral, scientific knowledge, or an inevitable response to competition and technological change. Critical theorising shows how accounting and accountants exert discipline within particular regimes of power-knowledge that change with broader shifts in the nature of capitalism, conditioned by historical legacies from religious, political and state institutions. Transformation associated with struggles, resistance, and consent, albeit often temporary, is tempered by broader discourses and political programmes. Alternatives existed and do so today.

An important way critical theorising has addressed the strange and foreign has been through field studies and explorations of organisational diversity and variation. Labour process, critical theory and post-structural variants have found this is powerful for revealing the detailed effects and possibilities of MA, and it has identified factors such as gender, race, time and space, the social construction of systems within networks of power and globalisation, that are not well attended to by more conventional research.

Finally, throughout this chapter we have stressed that critical theorising has a commitment to human improvement and emancipation. There are embryonic models of substantive change that recognise that MA is a significant organisational language that can foster this. Of course, there are limits to managerial interventions due to conflict and resistance, often from workers but also amongst managers. There are also limits to interventions by action theorists and others wishing to make organisations more democratic and conducive for all: attitudes to change—a product of self-identity—can constrain initiatives and their interpretation. The dialectic of intervention, accommodation and resistance means that 'elsewhere' invariably shifts as organisations interact, change, and crises periodically erupt. What constitutes 'practicality' is not self-evident: conceptions of problems and means of resolving them may be contingent with respect to individuals, technology and the institutions concerned. What is practical is socially constructed and its definition may owe much to distributions of power not only in the economic arena but also in diverse discourses.

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Agency Theory and Management Accounting

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Abstract: This chapter reviews agency theory and its application to management accounting issues. I begin by explaining how agency models are formulated to capture incentive problems caused by moral hazard and adverse selection problems, and discuss the reasons why agency theory models are difficult to solve. I then review agency theory results regarding the properties that make performance measures valuable in a contracting setting and the optimal shape of contracts. I also review the literature on communication, including models where the revelation principle does not apply, so that nontruthful reporting and earnings management can take place. I then discuss multiperiod agency models, which are critical for comparing different accrual-accounting-based measures of performance in motivating investment behavior. The chapter ends by discussing common misconceptions regarding agency theory models and discussing areas for future research.

1. Introduction

This paper reviews agency theory and its applications to management accounting.[1] Management accounting is concerned with measurement and information issues within a firm. This information is used to help evaluate past decisions as well as the attempt to improve future decisions. These decisions include the allocation of resources within a firm, coordination across subunits (broadly defined), pricing, costing, and compensation and incentives. There are a wide variety of ways that this information is provided, including budgeting, product-costing systems, transfer pricing systems, valuation, and performance measurement (including both financial and nonfinancial measures). Agency theory has been one of the most important theoretical paradigms in accounting during the last 25 years. The primary feature of agency theory that has made it attractive to accounting researchers is that it allows us to explicitly incorporate conflicts of interest, incentive problems, and mechanisms for controlling incentive problems into our models. This is important because much of the motivation for accounting has to do with the control of incentive problems. At the most fundamental level, agency theory is used in accounting research to address two questions: (i) how do features of information, accounting, and compensation systems affect (reduce or make worse) incentive problems, and (ii) how does the existence of incentive problems affect the design and structure of information, accounting, and compensation systems?

Agency theory has its roots in the information economics literature. As such, accounting and other information is placed into an explicit decision-making setting. The value of information is derived from the better decisions (and higher profits) that result from its use. Another important carryover from information economics is the idea that the most meaningful way to compare accounting/performance measurement systems is by comparing each system when it is used optimally. The primary way in which agency theory distinguishes itself from "traditional" information economics is its belief that multiperson, incentive, asymmetric information, and/or coordination issues are important in understanding how organizations operate. For example, in order for there to be a role for additional accounting information, it must be the case that the incentive problems being studied cannot be completely resolved via other means. This typically places restrictions on the type

[1]See Baiman (1982, 1990), Kreps (1990), Milgrom and Roberts (1992), Prendergast (1999), Indjejikian (1999), and Lambert (2001) for prior reviews of aspects of agency theory.

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of "other" information that is assumed to be available in the model. It also forces the researcher to explicitly build uncertainty and measurement problems into the model.

The remaining part of this paper is organized as follows: Section 2 describes the basic setup of agency models and Section 3 describes the factors that make agency models difficult to solve. In Section 4, I discuss the characterization of the solution to the model. Sections 5 and 6 discuss in more detail the properties of performance measures agency theory has found to be important and the shape of the optimal contract. Section 7 discusses issues related to communication at the beginning of a period and reporting at the end of a period. I discuss multiperiod issues and agency problems in motivating proper investment behavior in Section 8. In the last two sections, I discuss common misconceptions regarding agency theory and some suggestions for future research.

2. Setup of the Basic Agency Model

In the simplest agency models, the organization is reduced to two people: the principal and the agent. The principal's roles are to supply capital, bear risk, and construct incentives, while the roles of the agent are to make decisions on the principal's behalf and also to bear risk (this is frequently of secondary concern). In order to more easily keep track of who knows what and when, it is often useful to construct a time-line outlining the sequence of events in the model. In the "plain vanilla" principal–agent model, the sequence of events is as follows:

First, the principal selects a performance evaluation system, which specifies the performance measures (or information signals) upon which the agent's compensation will be based on and the form of function that links the performance measures to the agent's compensation. Let s denote the compensation function, and y the vector of performance measures to be used in the contract. Based on this contract, the agent selects a vector of actions $\mathbf{a}$, which could include operating, financing, or investment decisions. These decisions, along with other exogenous factors (generally modeled as random variables) influence the realizations of the performance measures, as well as the "outcome" of the firm, which we denote as x.

We will assume that the outcome is measured in monetary terms. In a single-period model, the monetary outcome is well defined; it represents the end-of-period cash flow or the liquidating dividend of the firm gross of the compensation paid to the agent. For now, we will assume that the outcome x is observable and can be contracted on. After the performance measures are jointly observed, the agent is paid according to the terms of the contract. Note that this formulation implicitly assumes that the property rights to the outcome belong to the principal. A few papers consider the opposite situation in which the agent has the property rights to the outcome by allowing him to keep any "unreported income."

In words, we express the principal's problem as a constrained maximization problem in which he chooses the compensation function (its form and the variables it is based upon) to[2]

Maximize the principal's expected utility (1)

Subject to agent's acceptable utility constraint (1a)

Agent's incentive compatibility constraints (1b)

The principal's utility is defined over the "net" proceeds generated by the firm; for example, the outcome x minus the agent's compensation s. Let $G(x-s)$ denote the principal's utility function. The principal is assumed to prefer more money to less $G'>0$, and be risk-averse or risk-neutral $G''\leq 0$. For a risk-neutral principal, his expected utility is simply the expected net profits of the firm. For risk-averse principals, higher moments of the distribution of net profits are also important. It is common to assume that the principal is risk-neutral.

The net profits to the principal are influenced by the compensation function in two ways. First, there is a direct effect, because each dollar paid to the agent as compensation is a dollar less for the principal. Second, there is an incentive effect, because the structure of the compensation function will affect the actions selected by the agent, which will affect the probability distribution of the gross outcome x. The outcome and the performance measures are also affected by other factors that are treated as exogenous to the model. Let $f(x,\mathbf{y}|\mathbf{a})$ denote the joint probability density of the outcome x and the performance measures $\mathbf{y}$ given the agent's actions.[3] In the simplest setting, the principal and agent have homogenous beliefs about the distribution $f(x,\mathbf{y}|\mathbf{a})$,

[2]In some models, it may also be important to include a floor on the payments made to the agent; for example, the agent's payment cannot be negative, which would imply that the agent is paying the principal. Similarly, in some models it may be useful to explicitly include a constraint, which specifies a maximum payment. For example, the agent's payment might be constrained to be less than the outcome x.

[3]Since the actions a are not random variables (at least not in the simplest models), it is not literally correct to refer to the distribution of the outcome as being conditional upon the actions a. A better way to phrase it is that the probability distribution is parameterized by the actions a.

but numerous papers consider situations in which one party has superior information.

The first constraint requires the principal to offer a compensation function that it is attractive enough to offer the agent an "acceptable" level of expected utility. The second set of constraints, termed incentive-compatibility constraints, represents the link between the contract chosen and the actions selected. Given the contract offered, the agent will choose the actions (and messages if there is a communication dimension to the model) that maximize his expected utility. Including the incentive-compatibility constraints allow us to model the agency problem *as if* the principal is selecting both the contract and the actions, but the principal is constrained to choose a (contract, action) combination that is incentive compatible for the agent. As I discuss in a later section, researchers have had difficulty modeling the incentive-compatibility constraints; a number of different mathematical approaches have been used.

The agent's utility function is defined over both his monetary compensation s, and the actions he selects $\mathbf{a}$. In most of the agency literature, the agent's utility function is assumed to be additively separable into compensation and action components, $H(s, \mathbf{a}) = U(s)s - V(\mathbf{a})$. However, some models assume multiplicative separability, $H(s, \mathbf{a}) = U(s)V(\mathbf{a})$. The most common interpretation of the nonmonetary portion of the utility function is that the agent's actions represent the effort levels he puts into various activities. More effort is assumed to increase the expected outcome, but is personally costly for the agent. In other models, the nonpecuniary return associated with the actions is interpreted as power, prestige, or resources diverted for personal use or consumption.

The first thing an agency model must have is an "interesting" agency problem in it. That is, the model needs to ensure that conflicts of interests are explicitly built into the analysis, and that they are not trivially solvable via other means. For example, if a principal can merely pay the agent a fixed salary and simply ask the agent to select the value-maximizing set of actions, and there is no reason why the agent would not do so, then there is no room for examining the use of accounting measurement systems to motivate or evaluate people. Similarly, if a principal knows what he wants the agent to do, can observe whether this has been done, and can penalize the agent sufficiently if the specified actions have not been taken care of, the agency model is not sufficiently rich to be interesting. Agency theory models are constructed on the basis of the philosophy that it is important to examine incentive problems and their "resolution" in an economic setting in which the potential incentive problem actually exists. Typical reasons for conflicts of interest include (i) effort aversion by the agent, (ii) the agent can divert resources for his private consumption or use, (iii) differential time horizons (e.g., the agent is less concerned about the future-period effects of his current-period actions because he does not expect to be with the firm or the agent and is concerned about how his actions will affect others' assessments of his skill, will affect his compensation in the future), or (iv) differential risk aversion on the part of the agent.

Like most economic models, agency theory models are not intended to be literal descriptions of the world. Models represent abstractions that are designed to illuminate important structure that is hard to see in the "mess of so many factors." Moreover, agency theory models are notoriously difficult to solve. Adding complexity along almost any dimension naturally makes it even less likely that the researcher will be able to solve the model. It is therefore critical that the researcher exercise great care in selecting the features of the model; particularly, in choosing what dimensions of the model are going to be allowed to be endogenous versus exogenous.

Some agency papers have extended the basic model by allowing the agent and/or the principal to obtain information prior to the agent selecting his action. This information could relate to the productivity of different operating actions, the general "favorableness" of the environment, or information about the employee's type (e.g., his skill or his risk aversion). The predecision information could be received before the contract is signed or between the time the contract is signed and the time the agent selects his actions. In these papers, communication of the agent's information via participative budgeting can be studied.

Other papers have modeled multiperiod periods. While many performance measurement issues in accounting can be addressed in a single-period model, most interesting issues involving accrual accounting require a multiperiod setting. In some multiperiod models the analysis focuses on investment incentives, while in others it revolves around dynamic issues in budgeting, updating targets and standards, etc.

Finally, papers have modeled issues that arise when there are multiple agents in the firm. This enables us to examine the role of encouraging/discouraging competition among agents, and the use of relative performance to compare the performance of agents. With multiagent models we can also study the interaction between management accounting and organizational structure, including hierarchies, job design, and task allocation. Multiagent models are also

necessary to studying the role of incentive problems in allocating resources (and costs) among agents, and analyzing transfer pricing between subunits. See Alles & Datar (1998), Baldenius (2000), Baldenius et al. (1999), Magee (1988), Sansing (1999), Smith (2002 a, b), and Wei (2004) for examples of multiperson agency models and cost allocation or transfer pricing problems.

3. What Makes an Agency Problem Hard to Solve?

One of the primary reasons that the agency theory literature is running out of steam is the inability of researchers to set up interesting models that are tractable enough to be solved. There are multiple reasons for this. First, agency researchers typically attempt to solve for the *optimal* contract and combination of performance measures. While this may represent the ideal, there are insights that can be gained from examining less ambitious questions. For example, researchers could compare the incentive properties or efficiencies of alternative "reasonable" contracts. This is common in the operations management literature (see Cachon, 2003; Cachon & Lariveiere, 2005). A second difficulty is that publication standards generally insist on closed-form solutions to the agency model or characterizations of the solution for which comparative statics analysis can be performed theoretically. In other fields, numerical solutions or simulation analysis is a common solution technique. These should at least be considered by researchers in accounting as well.

In addition, in most agency papers, the agent's monetary utility is defined solely over the compensation he receives *from the compensation contract.* This places a large burden on the compensation contract because it is the only source of incentives for the agent in the model. In reality, there are numerous other forms of incentives, including monetary incentives from other sources (i.e., the labor market or takeover market) and nonmonetary incentives (satisfaction, embarrassment, promotion, jail time, etc). This assumption also implicitly assumes that the agent has no other wealth, or that the principal is somehow able to contract over the agent's entire wealth. This allows the principal to decide what risks the agent bears and how the agent's consumption is allocated over time (in multiperiod models). In general, the choices the principal would make for the agent along these lines would not be the ones the agent would make himself. In particular, if the agent has access to insurance markets or capital markets, he may choose to offset or hedge some of the risk the principal desires to impose on him, or borrow against future earnings, etc. To the extent these issues are thought to have an important impact on the incentive problem being examined, the model should incorporate outside wealth for the agent, and should be clear about what opportunities the agent has to reallocate this wealth in response to the contract offered by the principal.

Finally, the second constraint in the agency formulation is not very tractable. In essence, the agency model requires the researcher to solve an optimization within an optimization problem. That is, for any given contract, the agent selects the actions that are best for him. The principal must solve this response problem for each contract he considers, and then optimize over the set of contract parameters. One way to make this optimization easier, popularized in Grossman & Hart (1983), is to assume that there is only a finite set of actions available to the agent. In this case, the incentive-compatibility constraint can be modeled using set of inequality constraints. In particular, a (contract, action*) pair is an equilibrium if it is the case that

$$\begin{aligned}&\text{Agent's expected utility given (contract, action}^*) \geq \\ &\text{Agent's expected utility given (contract, action)} \\ &\text{for each other action in the set of feasible actions} \end{aligned} \quad (2)$$

For example, if there are N possible actions, there will be $(N-1)$ of these inequality constraints in the model formulation.[4] While this modeling approach is guaranteed to work, the setup is not very elegant, and it is often difficult to generate solutions that are simple to express, or to conduct comparative statics on the solution.

The most common approach to try to tractably represent the agent's action choice is to use the "first-order-condition approach." Assuming the optimal effort is in the interior of the action set, the agent's optimal effort choice will be the one at which the derivative of his expected utility with respect to his effort is equal to zero. The agent's first-order condition on effort is

$$\iint U[s(x,y)]\, f_a(x,y|a)\mathrm{d}x\, \mathrm{d}y - V'(a) = 0 \quad (3)$$

The first-order-condition approach is guaranteed to work if the agent's expected utility is a concave function of his action for a contract; in this case,

[4]Some of these constraints will be binding, which means that the agent is indifferent between those two actions given in the contract. When the agent is indifferent over a set of actions, he is presumed to choose the action most preferred by the principal.

there can only be one interior solution to the agent's problem. Moreover, the first-order condition on effort will equal zero at this action.

There is a wide class of models for which the first-order-condition approach works. For example, with linear contracts, it will often work. See Jewitt (1988) and Rogerson (1985) for sufficient conditions to ensure if the first-order-condition approach is valid. However, with more complicated contracts (especially ones that are convex) or models with complicated action implications (where the actions affects both the mean as well as higher moments of the distribution), the first-order-condition approach can be problematic. In particular, for a given contract, there can be multiple actions for which the agent's first-order condition on his action is zero, but only one yields the global maximum expected utility for the agent. Unfortunately, the first-order-condition approach does not guarantee that the optimization program above will select this action.

To illustrate this, consider a commonly used convex compensation form: an option contract. In particular, the contract is $s(x) = \alpha + \beta\max(x - K, 0)$. This corresponds to a salary of α and β options that have an exercise price of K. Assume that the end-of-period outcome x is normally distributed with an expected value equal to $100.0 + a$, where a is the agent's effort.[5] The agent's disutility of effort is $V(a) = 100a^2$, and the agent's reservation level of utility is 1,000.0. To keep things simple, assume the agent is risk-neutral. Then for any given contract, the agent will choose his action to maximize

$$E[\alpha + \beta\max(X - K, 0)|a] - 100\,a^2.$$

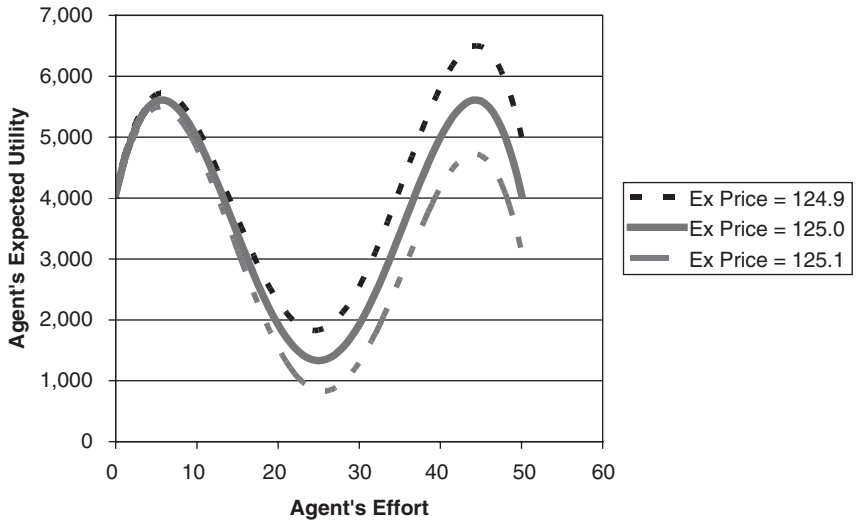
The problem is that with this contract, the agent's expected utility is not a nicely behaved concave function of his effort. To see why this is, note that the increase in the agent's expected compensation as a function of his effort is analogous to an increase in the Black–Scholes value of an option as a function of the spot price of the firm's stock. It is well known that value of a call option is an increasing convex function of the spot price. Similarly, with an option-based contract, the agent's expected compensation in our model is an increasing convex function of his choice of effort. When the exercise price of the option is high, the number of options that must be granted to attempt to implement a given level of effort becomes so high that the convexity of the option's payoff can overwhelm the convexity of the agent's disutility.[6] As a result, the agent's expected utility is not a concave function of his effort.

We illustrate this in Fig. 1, which graphs the agent's expected utility as a function of his effort level for two contracts that are "close" to what would be the optimal contract. Note that in each case, the agent's expected utility is not a nicely behaved concave function of his effort level. As Fig. 1 illustrates, if the principal offers an option-based contract with an exercise price of 124.9 (the upper curve), the agent's expected utility as a function of his effort has two local maxima. The right-most one is slightly better for the agent, and also yields higher expected net profits for the principal. The principal can do slightly better than this contract by increasing the exercise price to 125.0 (the middle curve). Now the agent is indifferent between the two levels of effort that yield the two peaks. Assuming the agent selects the one that is best for the principal given his own indifference, the agent selects the higher amount of effort. If the principal selects a slightly higher exercise price (125.1 which is the lower curve), the agent makes a very different decision. Now the local peak associated with the lower level of effort is strictly better for the agent. However, the effort level that yields the peak to the right gives a higher level of expected profits to the principal. If the agency model was formulated using the first-order-condition approach, this combination of (exercise price = 125.1, effort = 44.16) would appear to be a solution to the principal's problem. It satisfies the agent's first-order condition on effort and yields a higher level of expected profits than what the principal can achieve by offering contacts with either of the two lower exercise prices. However, this effort level is not incentive compatible for the agent given this contract; the agent would select an effort level of 5.54, not 44.16. Therefore, the first-order-condition approach to modeling the agent's effort is not valid for this setting.

Panel B of Fig. 1 also illustrates that the agent's optimal response is not always a continuous function of the contract parameters offered by the principal, and therefore the principal's expected net profits are not always a continuous function of the contract

[5]Since stock price cannot go below zero, we truncate the distribution at zero.

[6]Since the partial derivative of the agent's expected compensation with respect to his effort is bounded above, but his marginal disutility of effort is unbounded above as his effort level gets arbitrarily large, the convexity of the option's payoff will eventually be dominated by the convexity of the disutility function. Therefore, for a given option contract, the agent's expected utility eventually becomes concave for extremely high levels of effort. It is the intermediate levels of effort where the convexity can occur.



A. Agent's Response as a Function of the Exercise Price (Number of Options =10,000)

	Low Effort Peak			High Effort Peak		
Exercise Price	Effort	Agent's Expected Utility	Principal's Expected Utility	Effort	Agent's Expected Utility	Principal's Expected Utility
124.90	5.84	5,728.11	1,049,236.16	**44.46**	**6,500.76**	**1,240,435.56**
125.00	5.68	5,612.93	1,047,983.09	**44.32**	**5,612.93**	**1,241,157.98**
125.10	**5.54**	**5,500.76**	**1,046,786.07**	44.16	4,728.11	1,241,864.65

B. Agent's Response as a Function of the Number of Options (Exercise Price = 125.0)

	Low Effort Peak			High Effort Peak		
Number of Options	Effort	Agent's Expected Utility	Principal's Expected Utility	Effort	Agent's Expected Utility	Principal's Expected Utility
9,998.00	**5.68**	**5,611.16**	**1,047,959.59**	44.30	5,572.54	1,241,173.00
9,999.00	**5.68**	**5,612.04**	**1,047,971.34**	44.31	5,592.73	1,241,165.52
10,000.00	5.68	5,612.93	1,047,983.09	**44.32**	**5,612.93**	**1,241,157.98**

Figure 1. Illustration of the nonconcavity of the agent's expected utility as a function of his effort. A. Agent's response as a function of the exercise price (number of options = 10,000). B. Agent's response as a function of the number of options (exercise price = 125.0)

parameters. For example, in Panel B of Fig. 1, as the principal increases the number of shares in the contract from 9,999.0 to 10,000, the agent's optimal effort jumps discretely from 5.68 to 44.32 (as he moves from one local peak to another), and the principal's expected net profits jump from \$1,047,971 to \$1,241,158.

When modeling problems of this type, researchers must take additional steps to ensure that the "solution" to their model is truly a solution. Numerical verification is one way to do this. Numerical methods could also be used to find the optimal response by the agent for any given contract. Unfortunately, this would render closed-for solutions to the optimal contract impossible.

4. Characterizing the Optimal Contract

In the simplest case, the agent is responsible for only a single-dimensional action: how much effort to supply $a \in A$, where A is the set of feasible actions. We will assume that effort is a continuous variable, and that the outcome is also a continuous random variable.

We can write the principal's problem as

$$\underset{s(x,y),a}{\text{maximize}} \iint G\,[x - s(x,y)]\,f(x,y|a)\mathrm{d}x\mathrm{d}y \qquad (4)$$

$$\text{subject to} \iint U[s(x)]\,f(x,y|a)\,\mathrm{d}x\mathrm{d}y - V(a) \geq \underline{H} \tag{4a}$$

$$a \text{ maximizes} \iint U[s(x,y)]\,f(x,y|a)\,\mathrm{d}x\mathrm{d}y - V(a) \tag{4b}$$

We maximize the principal's expected utility subject to offering the agent an acceptable level of expected utility.[7] The incentive compatibility constraint (eq. [4b]) requires that the action chosen is the one that maximizes the agent's expected utility given in the contract offered by the principal.

Assuming that the first-order-condition approach to modeling the agent's action choice is valid, we let μ be the Lagrange multiplier on the agent's first-order condition on effort and let λ be the Lagrange multiplier on the acceptable utility constraint. The principal's problem then becomes

$$\begin{aligned}\underset{s(x,y),a}{\text{maximize}} & \iint G[x - s(x,y)]\,f(x,y|a)\mathrm{d}x\mathrm{d}y \\ & + \lambda\left\{\int U[s(x,y)]\,f(x,y|a)\mathrm{d}x\mathrm{d}y - V(a) - \underline{H}\right\} \\ & + \mu\left\{\iint U[s(x,y)]\,f_{\mathrm{a}}(x,y|a)\mathrm{d}x\mathrm{d}y - V'(a)\right\}\end{aligned} \tag{5}$$

We characterize the optimal contract by taking the derivative of this problem with respect to s for each possible combination of (x,y). The resulting first-order condition for the optimal contract is

$$\begin{aligned}& -G'[x - s(x,y)]\,f(x,y|a) + \lambda U'[s(x,y)]\,f(x,y|a) \\ & + \mu\, U'[s(x,y)]\,f_{\mathrm{a}}(x,y|a) = 0,\end{aligned}$$

which can be rearranged as

$$\frac{G'[x - s(x,y)]}{U'[s(x,y)]} = \lambda + \mu\frac{f_{\mathrm{a}}(x,y|a)}{f(x,y|a)} \tag{6}$$

Assuming $\mu > 0$, which is generally the case in an agency model that is economically interesting, the optimal contract depends on the performance measure y if and only if the term $f_{\mathrm{a}}(x,y|a)/f(x,y|a)$ depends on y.

5. Important Qualities of Performance Measures

Holmstrom (1979) was the first to identify an important characteristic in determining whether a performance measure is useful to include in a contract: the informativeness criteria. Mathematically, a variable y satisfies the informativeness criteria if and only if the term $f_a(x,y|a)/f(x,y|a)$ depends on y. Intuitively, the informativeness contract says that a variable will be included in the contract if it tells you something about whether the agent took the action the principal wanted. Note that even if the outcome (x) itself is available for contracting, there is still potential value to including other variables in the contract. This is because the outcome is also affected by exogenous random variables, which lead to risk in the compensation contract. Including additional performance measures that are informative allows the principal to reduce the agent's exposure to unwanted risk while still providing incentives to select desirable actions. In evaluating whether a given performance measure is informative, it is important to consider what other information is available; that is, a variable must be incrementally informative. While performance measures that the agent can directly affect (e.g., controllable measures) are likely candidates to be informative, other variables can also be useful. In particular, variables that provide information about the "random component" of the outcome can also be useful because they can help to untangle the effect of the agent's action from the effect of these other random factors on the firm's outcome. The idea of relative performance measurement is an example of the use of the latter type of measures. See Antle & Demski (1988) and Baiman & Noel (1982) for additional discussion of the relationship between informativeness and controllability.

Banker & Datar (1989) delve deeper into the idea of informativeness and show that for a wide class of interesting situations, the informativeness of a performance measure can be decomposed into two factors: its sensitivity and precision. Sensitivity is simply how much the performance measure moves (in expected value) if the agent's action changes. Precision is the inverse of the variance of the performance measure. Note that this variance could be due to "real factors "(e.g., cash flows are highly unpredictable) or "measurement error" (e.g., the contract must rely on an imperfect estimate of what the future cash flow consequences of the agent's actions will be). Other things equal, performance measures with large sensitivity to the agent's actions, but low noise (high precision) are preferred.

In more complicated agency settings, additional criteria become important. In particular, when the agent is responsible for multiple actions, it becomes critical to motivate the right "mix" of actions. This is especially important when the outcome of the actions is not directly observed. In this case, the congruity of a performance measure becomes important.

[7] If there are no constraints on the minimal payment that can be made to the agent or if the agent's utility function is unbounded below as his payment approaches any minimal allowable payment, then the principal can hold the agent to the minimal acceptable utility level in expectation.

Congruity refers to the similarity of the responsiveness of the performance measure to the agent's actions to the responsiveness of the real (unobserved) outcome to the agent's actions. Accounting systems are frequently criticized for their incongruity, which is a key feature in understanding "performance padding," performance measure "myopia," transfer pricing (where multiple subunits of a company affect the overall profitability of a product), etc. Unfortunately, in many situations agency problems of different types will interact; attempts to solve one may make others worse. For example, increasing the sensitivity of pay to performance may make the agent work harder, but it also may induce the agent to become more conservative in his investment decisions.

When multiple performance measures are available, the question of how to combine them to achieve a congruent measure becomes important. The "Balanced Scorecard" (see Kaplan & Norton, 1992) is an example of attempting to put multiple measures into a performance measurement context. Most of the discussion of the balanced scorecard is oriented toward identifying the different dimensions of performance that should be measured (financial measures, customer measures, internal business process, and learning and growth). However, the term "balanced" also suggests that care must be taken in how to weight these dimensions of performance. For example, if all the weight in compensation is placed on the financial measures of performance, the agent's actions will be directed toward improving these measures, possibly at the expense of actions which would improve the other measures but hurt financial performance (at least in the short term). To understand how to weight measures, it is important to try to articulate how different actions map into the performance measures and how these performance measures map into cash flows (particularly future cash flows). In particular, many of the alleged benefits of nonfinacial measures come from the (often unsubstantiated) belief that these measures are leading indicators of financial performance.

Researchers have found that multiaction models have been difficult to solve using the traditional Holmstrom-style agency formulation. It has been popular instead to use the Linear, Exponential, Normal (LEN) model. In this formulation, the generality of the model is greatly restricted by assuming that compensation contracts are linear functions of the performance measures, that the performance measures are normally distributed given the agent's actions, and that the agent has negative exponential utility. This structure implies that the agent's expected utility has a particularly simple structure: reducing to a linear combination of his expected compensation, the variance of his compensation, and his disutilty of actions. This makes it easier to solve the agent's optimal actions as a function of the parameters of the compensation contract. As indicated earlier, this has been a major stumbling block in solving agency models.

See Datar et al. (2001) and Feltham & Xie (1994) for discussion of how to rank performance by their degree of incongruity, as well as how to combine performance measures to minimize incongruity. Similar to the single-action models, even if a combination of performance variables can be found that is perfectly congruent, there is still potential value to including performance measures (or reweighting performance measures) to reduce the agent' exposure to risk in multiple-action models.[8] Therefore, contracts must consider both congruity as well as measurement error in deciding what performance measures to include in the contract, as well as how to weight them.

When the agent has private information regarding the consequences of his actions, agency problems are magnified. Even if the principal can observe the agent's actions directly, he no longer knows what combination of actions is optimal. As in the no private information case, congruency is important here as well. The responsiveness of the performance measures to the agent's actions should match the responsiveness or the real outcome to these actions. However, in this case it is the responsiveness conditional upon his private information that is critical. See Bushman et al. (2000) for additional analysis.

A final important factor that affects the value of a performance measure is its timeliness. Unfortunately, we do not yet know much about this factor. In particular, we do not have many interesting tractable models in which we can compare timely, but noisy measures of performance with less timely, but more accurate measures. See Dutta & Reichelstein (2003) for some analysis of this issue.

6. Contract Shape

To analyze issues regarding the optimal functional form of the compensation contract, we simplify by assuming that the outcome (x) is observable and is the only variable available for contracting. We also assume for convenience that the principal is

[8]In a single-action model, congruity is generally not of concern. Moreover, as described earlier, in a single-action model, there is value to including other performance measures in the contract even if the outcome x, which is congruent by definition, is observed.

risk-neutral. A straightforward modification of Holmstrom (1979) to incorporate limited liability in the contract and other wealth of W for the agent implies that the optimal contract satisfies the following condition:

$$\frac{1}{U'[W+s(x)]} = \max\left[\underline{\lambda},\ \lambda + \mu\frac{f_a(x|a)}{f(x|a)}\right] \qquad (7)$$

where λ is the Lagrange multiplier on the agent's reservation constraint and μ the Lagrange multiplier on the action incentive-compatibility constraint.[9] The parameter $\underline{\lambda}$ determines the payment to the agent for those values of the outcome x where the minimum payment constraint is binding. For those values of x where the minimum payment constraint is not binding, the payment is determined, as before, by the expression $\lambda + \mu f_a(x|a)/f(x|a)$.

Equation (7) shows that the shape of the optimal contract will depend on three factors: (a) whether the minimum compensation constraint is ever binding, (b) the form of the agent's utility function; (c) the function that determines how the agent's action affects the probability distribution of the outcome (through the term $\lambda + \mu f_a(x|a)/f(x|a)$). Moreover, since the agent's incentives are driven by his total wealth, the optimal contract should ideally consider the structure of his other wealth. For example, existing firm-related wealth such as stock, stock options, and pensions, should ideally be considered in determining the optimal contract. See Core & Guay (1999) for an example of empirical analysis that tries to estimate these interactive effects. Equation (7) also suggests that a single contract shape is unlikely to be optimal across a broad class of situations. See Hemmer et al. (1999) for additional analysis of contract shape.

When the limited liability feature of the contract is binding for a range of outcomes (i.e., there is a range of outcomes for which $\lambda + \mu f_a(x|a)/f(x|a) < \underline{\lambda}$), this will introduce a convex feature into the structure of the contract, *ceteris paribus*. To illustrate the other two features affecting the shape of the contract, assume that the agent's monetary utility is a member of the power class of utility functions $U(W+s) = [n(\delta)/(1-\delta)](W+s)^{1-\delta}$ for $\delta \geqslant 0$.[10] Higher values of δ correspond to more risk-averse utility functions. The power class of utility functions provides additional motivation for the requirement of limited liability in the contract (i.e., the power utility function is not defined for negative values of compensation). With this additional structure, the characterization of the optimal contract in eq. (7) becomes

$$W + s(x) = \left[n(\delta)\max\left(\underline{\lambda},\ \lambda + \mu\frac{f_a(x|a)}{f(x|a)}\right)\right]^{\frac{1}{\delta}} \qquad (8)$$

Equation (8) demonstrates that the degree of the agent's risk aversion will affect the shape of the optimal contract. In particular, if $0 < \delta < 1$, the optimal contract is a convex function of the term in the interior brackets in eq. (8). As δ approaches zero (the agent's risk aversion goes to zero), the contract becomes "extremely" convex, *ceteris paribus*. As δ approaches 1.0, the utility function approaches the logarithmic utility function, and the term in the brackets in eq. (8) becomes linear. On the other hand, if $\delta > 1$, the optimal contract is a concave function of this term.

The structure of how the agent's action affects the shape of the probability distribution will also affect the shape of the contract. For example, when the outcome is normally distributed and the agent's actions affect only the mean of the distribution, the likelihood ratio is $f_a(x|a)/f(x|a) = [(\partial E(x|a)/\partial a)/\mathrm{Var}(x)][x - E(x|a)]$, which is linear in the outcome x.[11] There are some settings in which the combination of these factors results in the optimal contract being linear (which corresponds to a restricted stock contract) or piecewise linear (which corresponds to a stock option contract). In particular, if the probability distribution is a member of the exponential family such that the likelihood ratio is linear in x, and the agent's utility function is logarithmic, the optimal contract in eq. (7) reduces to $W + s(x) = \beta[\max(\underline{\gamma}, \gamma_0 + \gamma_1 x)]$. If the minimum payment constraint is not binding for any range of outcomes, the optimal contract will be linear. However, if there is a range of outcomes for which the minimum payment constraint is binding, the optimal

[9] The Holmstrom characterization of the contract assumes that the agent's action choice can be represented using the first-order-condition approach. As demonstrated earlier, this can be problematic when the contract has an option-like structure. Our intent in this section is not to use eqs. (6) and (7) to represent the solution to the principal's problem, but to use it to help provide intuition for how different contract structures will perform.

[10] Hall & Murphy (2002) and Lambert, Larcker & Verrecchia (1991) use the power class of utility functions in their analyses of the cost of options to a firm versus the value of options to executives.

[11] Banker & Datar (1989) show that the likelihood ratio is linear in x for many common distributions such as the truncated normal, exponential, gamma, and chi-squared, which are referred to as the exponential class of distributions.

contract is piecewise linear. The "kink" in the piecewise linear contract can be thought of as the exercise price of the option.[12]

If the agent's actions affect more than the mean of the outcome, which would be the case if he were responsible for investment decisions that involved risk-return tradeoffs, this will also affect the shape of the optimal contract. As before, we assume that the gross outcome is normally distributed with mean equal to $m(a)$, but now we also let the standard deviation of the outcome depend on the agent's effort $\sigma = \sigma(a)$. The functions m(a) and $\sigma(a)$ are assumed to be increasing functions of the agent's actions. Their relative slopes determine the steepness of the risk-return frontier.

Under these conditions, the likelihood ratio in eqs. (7) and (8) becomes

$$\frac{f_a(x|a)}{f(x|a)} = -\frac{1}{\sigma}\frac{\partial\sigma(a)}{\partial a} + \frac{[x-m(a)]}{\sigma^2}\frac{\partial m(a)}{\partial a} + \frac{[x-m(a)]^2}{\sigma^3}\frac{\partial\sigma(a)}{\partial a}$$

This expression is quadratic in the outcome x, and therefore represents an additional reason for why the optimal contract would be convex. The intuition for this result is that the convexity of the contract is used to offset the agent's risk aversion in order to motivate the risk-averse agent to make risk-return tradeoffs more compatible with those desired by the risk-neutral principal.[13]

6.1. Linear Versus Nonlinear Contracts

One criticism of the optimal contracting approach described above is that the contract shape is "too sensitive" to the specific assumptions made regarding the agent's utility function and economic setting in which he will operate. The implication is that the resulting "optimal" contract would not be very robust to small changes in the information environment or the characteristics of the agent. While this could be addressed via comparative statics analysis, an alternative approach is to examine the use of "simpler" contract structures.

As discussed above, simpler contracts—notably linear—have also played an important role in many recent agency papers. This is largely for their tractability. Linear contracts have also been suggested to have numerous desirable properties relative to nonlinear ones. In particular, the merits of linear contracts (in the form of restricted stock) versus nonlinear contracts (stock options) have been widely debated in the business press as well as in academic papers. Many of the exact same issues arise in accounting-based compensation plans, where an option contract can be viewed as a bonus that kicks in once a target level of performance (which corresponds to the option's exercise price) is achieved. Linear contracts have also been suggested to be key ingredient in solving the dysfunctional behavior that surrounds the budgeting process (see Jensen, 2001). I will discuss each of these in turn.

As a simple way to compare some of the features of linear contracts versus option contracts, consider an example in which end-of-period gross stock price (the outcome) is normally distributed with an expected value equal to $100.0 + a$, where a is the agent's effort.[14] For the purpose of this discussion we could also consider the outcome to be accounting earnings or other performance measures. What is important here is the structure of the contract, not the performance measure *per se*. There are initially $N = 10{,}000$ shares of stock. Initially assume the agent is risk-neutral and that his disutility of effort is $D(a) = 100a^2$, and the agent's reservation level of utility is 1,000.0. The agent has zero other wealth, and the contract must provide the agent with non-negative compensation ($\underline{s} = 0$). Given these parameters, the first best level of effort is 50.0, and the principal's expected utility is \$1,249,000 in the first best solution.

Using two examples, Table 1 shows that the number of options required to motivate a given level of effort is a *nondecreasing* function of the exercise price of the option. The intuition for this is

[12]Unfortunately, it is difficult to determine whether this constraint will be binding because the Lagrange multipliers, $\underline{\lambda}_2\lambda$, and μ are all endogenous variables, as is the agent's effort

[13]Note that a convex contract does not, in general, motivate a risk averse agent to become risk-seeking in his decision-making. In particular, for a stock option contract, for the range of outcomes where the option is "in the money", the utility of the agent's payoff is a concave function of the stock price. This will counteract the convexity of the option's payoff as the option moves from "just out of the money" to "just in the money." See Lambert et al. (1991) for an example where a stock option contract can motivate a risk-averse agent to be less risk-seeking in his behavior than would a stock contract that provides him with an identical expected payoff. Ross (2004) provides a more general analysis of conditions under which incentive schemes make an agent more or less risk-averse. In our model, the principal selects the contract to optimally motivate the agent, taking the agent's induced risk preferences into consideration. See Meth (1996) for additional analysis.

[14]As in the previous example, since stock price cannot go below zero, we truncate the distribution at zero.

Table 1. Number of options needed to induce a given level of effort, expected cost, and riskiness of compensation as a function of the exercise price of the option.

Exercise Price	Probability Options Finish Out of the Money	No. of Options Needed to Motivate Desired Effort Level	Expected Value of Agent's Compensation	Standard Deviation of Compensation
A. Desired level of effort = a = 25, standard deviation of outcome = 12				
0	0.000	5,000.0	625,000	60,000
10	0.000	5,000.0	575,000	60,000
20	0.000	5,000.0	525,000	60,000
50	0.000	5,000.0	375,000	60,000
75	0.000	5,000.1	250,004	60,000
100	0.046	5,094.8	127,784	60,128
110	0.183	5,590.7	87,254	61,067
115	0.282	6,268.2	71,205	62,500
116	0.301	6,465.2	68,363	62,953
117	0.319	N/A	N/A	N/A
120	0.366	N/A	N/A	N/A
125	0.399	N/A	N/A	N/A
B. Desired effort level = a = 50, standard deviation of outcome = 36				
0	0.000	10,000.2	1,500,024	360,000
25	0.001	10,002.6	1,250,346	360,006
50	0.008	10,027.4	1,003,040	360,082
75	0.046	10,189.6	766,707	360,767
100	0.152	10,898.4	559,662	364,681
125	0.313	13,222.3	399,211	379,413
140	0.384	16,409.4	326,751	399,396
145	0.395	18,010.5	306,183	408,951
146	0.396	N/A	N/A	N/A
150	0.399	N/A	N/A	N/A
175	0.313	N/A	N/A	N/A

Both the principal and agent are risk-neutral. The outcome (stock price gross of the agent's compensation) is normally distributed with an expected value equal to $100.0 + a$. The agent's disutility for effort is $D(a) = 100a^2$. The first best level of effort is 50.0.

N/A means the desired level of effort cannot be motivated at this exercise price.

straightforward. An option provides no incentive for the agent to perform better in the range of performance for which it is "out of the money." Therefore, the option has to compensate for this by providing more incentive in the range in which it is "in the money." The larger the exercise price (or target) the more options you have to grant (the bigger the bonus has to be) to motivate the same level of effort. See Fig. 2a for a comparison of the shape of stock and option contracts.

More interestingly, Table 1 shows that the cost of the option package is a *decreasing* function of the exercise price of the option. In fact, among all exercise prices for which it is feasible to motivate the desired level of effort, restricted stock (i.e., the exercise price equals zero) is the *most expensive* contract. That is, restricted stock gives up the most value to the agent relative to the effort level it can be used to induce. Intuitively, this result occurs because a restricted stock contract "wastes" value in regions of the outcome where there are low incentives.

That is, the slope coefficient in a restricted stock contract is, by definition, constant over all ranges of the outcome. However, the impact of the agent's actions on the probability of an outcome occurring is *not constant* over all ranges of the outcome. Specifically, in equilibrium a marginal change in the agent's effort has virtually no effect on the probability of very small outcomes (i.e., stock prices near zero). In the example in Panel A of Fig. 1, the restricted stock contract must offer the agent 5,000 shares to motivate the desired level of effort. These shares will pay the agent a large amount of money even if the stock price falls far below expectation. For example, in equilibrium, the expected end-of-period stock price is \$125 if the agent selects the desired level of effort. However,

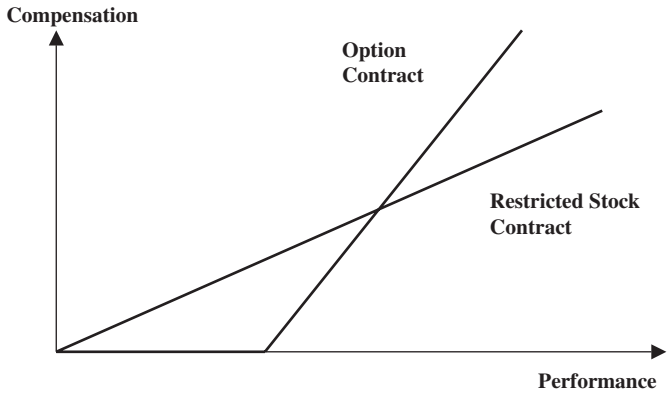


Figure 2a. Linear contract (restricted stock) versus stock option contract.

even if the stock price falls as low as \$50 (which is virtually impossible if the agent is supplying the desired level of effort), the agent still earns $5{,}000 \times \$50 = \$250{,}000$. The principal could offer the agent a contract consisting of 5,000 options with an exercise price of \$50, get the same amount of effort as the restricted stock contract motivates, and save this \$250,000 in compensation costs. This reduces the principal's compensation costs by 40 percent. By offering more options with an even higher exercise price, the principal can do even better.

By offering a contract with a nonzero exercise price (and more options), the principal is able to shift the slope of the contract to the regions of the outcome where the probabilities are more sensitive to the agent's actions. That is, even though an option-based contract offers lower incentives than a restricted stock contract in the lower range of outcomes, it offers much more incentives in higher regions. By properly choosing the exercise price of the options (and number of options), the principal can tailor the contract to optimally tradeoff the cost of the options with their incentives. Essentially, options let you take advantage of "leverage": you can offer more options than shares at the same cost. Moreover, by choosing the exercise price appropriately, they also allow you to tailor the range of outcomes to which this leverage will be applied.

The extra cost of a restricted stock contract presents no problems if the principal can simply offset this by lowering the agent's salary. Many agency models (for example the LEN models) implicitly assume that this can be done to whatever degree is desired because they place no bounds on the contract payments. However, in practice, most contracts have a lower bound on what is a feasible payment. For example, the lower bound on compensation might be zero; the principal cannot force the agent to pay him money out of the agent's own pocket if the outcome is bad. Moreover, even if the principal could extract money from the agent, this would be limited by the magnitude of the agent's personal wealth. Since the personal wealth of agents are frequently dwarfed by the value of the enterprises they are responsible for running, the constraints imposed by limited liability can be very important.

Limited liability constraints will generally prevent the commonly discussed "sell the firm to the agent" solution when the agent is risk-neutral from being feasible. Selling the firm to the agent would give the agent the incentive to operate it efficiently, but it would also transfer all the value to him. The contract must therefore explicitly consider both the incentives generated by the contract as well as the value transferred. This latter consideration is irrelevant in models of unlimited liability, because it can always be handled by the salary portion of the contract.

In fact, with a risk-neutral agent and limited liability contracts, it can be shown for a wide variety of situations, that not only do option-based contract dominate restricted stock contracts, but that they are the *optimal* contact structure. To do this, we adopt the following additional assumptions; (i) the contract's structure must ensure that the agent's payoff $s(x)$, and the principal's payoff $x - s(x)$, are nondecreasing in the outcome x, and (ii) the distribution of the outcome satisfies the monotone likelihood ratio property (MLRP),[15] then the optimal contract will have the form of a stock option (see Innes, 1990).

[15]This condition is commonly assumed in the agency literature. For example, in the classic Holmstrom (1979) paper, the monotone likelihood ratio is necessary to ensure that the optimal compensation scheme is an increasing function of the firm's outcome. The MLRP is a stronger condition than simply assuming the expected value of the outcome increases

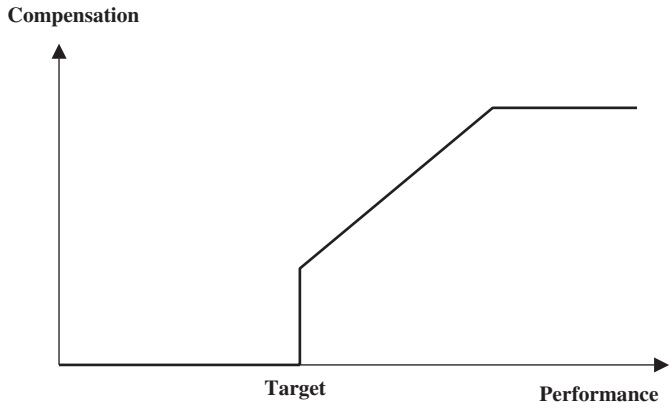


Figure 2b. Common structure for a bonus contract.

In the lower range of outcomes, this contract gives the least amount of incentives allowable (the slope of the contract is required to be non-negative), and in the upper range of outcomes it gives the highest amount of incentives allowable (attempting to further increase the slope coefficient would make the principal's marginal share of the outcome become negative). When the outcome distribution satisfies the MLRP property, incentives are most effective in the upper tail of the distribution, and this is exactly where the option contract provides them.[16]

Another important feature of option contracts documented in Table 1 is their riskiness. Note that as exercise price of the options increase, the riskiness of the agent's compensation also increases. While this is of no concern when the agent is risk-neutral, it lowers the expected utility of a risk-averse agent. In particular, the level of compensation offered to the agent must be increased in order to offset this exposure to risk. Option contracts will be less attractive, *ceteris paribus*, when the agent is more risk-averse. On the other hand, if we expand the agent's actions to include ones that affect both the mean and the variance of cash flows, there are additional benefits to using option contracts. The convexity of the option's payoff to the agent will help to offset the agent's risk aversion, and motivate him to be more aggressive in his investment choices. In contrast, a linear contract will result in the manager being too conservative in his decision-making. See Lambert & Larcker (2005) for more complete analysis of restricted stock versus option contracts.

Contract shape is also thought to impact earnings' management problems and dysfunctional behavior in the budgetary process. Fig. 2b represents the structure of a common bonus contract. Once a target level of performance has been reached, a nonzero bonus is paid, and compensation therefore jumps discretely upward. The bonus then increases continuously until it reaches a prespecified ceiling. Performance above this point results in no additional bonus. Healy (1985) demonstrated that this contract shape gives agents incentive to take actions to reduce their reported performance if they expect to be on the flat regions of the compensation contract in order to "save" this

with the agent's effort; it also implies that higher outcomes are stronger signals that the agent worked hard (see Milgrom [1981] for a discussion)

[16]This result is the "reverse" of the Mirrlees (1974) result. Mirrlees shows that if the outcome is normally distributed and penalties can be unbounded below, the first best solution can be approximated to an arbitrarily close degree through a contract that imposes gigantic penalties on the agent when the outcome is in the extreme lower tail of the distribution. Mirrlees shows that the expected penalties can be made arbitrarily small while still providing the agent with incentive to select the first best solution. Holmstrom (1979) shows conditions where the same result can be achieved using extremely large rewards that are paid only in the extreme upper tail of the outcome distribution. Unlike the Mirrlees and Holmstrom papers, the first best solution cannot be achieved in our model for three reasons. First, the limited liability feature of the model restricts the penalties that can be imposed in the lower tail of the distribution. This eliminates the Mirrlees result as a feasible contract in our model. Second, the magnitude of any reward offered in the upper tail is limited by constraining the number of options granted to the agent to be less than or equal to the number of shares in the firm. This eliminates the Holmstrom result as a feasible contract. Finally, even if the constraint on the number of options is relaxed, we showed earlier in this section that the first best solution cannot necessarily be achieved due to convexities in the agent's expected utility function that arise when the number of options he is granted gets large.

performance for a future period. In contrast, if the agent expects to be on the sloped portion of the contract, he will select actions to increase his reported performance. More recently, Jensen (2001) suggested that the discrete jump in compensation when the agent can achieve the target level of performance gives the agent large incentives to misreport his performance in this area, as well as to take steps at the beginning of the period to get an easy to achieve target.

To my knowledge, there is no theory that suggests why a contract of the form in Fig. 2b is optimal. Jensen (2001) goes even further and argues that this contract form is not optimal. In fact, he argues that linear contracts would solve many of the problems with communication in budgeting, in setting targets, and in managing performance *ex post*. While linear contracts would eliminate the specific type of incentives to manipulate performance near the discontinuities in the nonlinear contract, it would by no means eliminate incentives to manipulate performance. Even under a linear contract, a risk-averse agent's marginal utility will decline as his performance (and therefore his compensation) increases. Therefore, the agent is likely to want to manipulate his performance upward when performance is low and manipulate performance downward if his performance is high.

Another criticism Jensen makes of nonlinear contracts is that the agent has incentives to distort any private information he has in order to achieve easier targets. Since a linear contract has no apparent target level of performance, it may appear to avoid this problem. However, even linear contracts have two parameters (a slope and an intercept), and these would ideally be tailored to the conditions faced by the agent. Therefore, the agent would still have incentives to distort his private information in order to obtain a more favorable contract. Similarly, the agent would also have incentives to distort his private information if it favorably affected the amount of resources (capital or labor) that he receives to help him do the job. In the next section, I discuss research issues relating to the communication of information and earnings management.

7. Communication, Earnings Management, and the Revelation Principle

In most organizations, agents acquire private information about local operating conditions and about the potential profitability of alternative courses of action. Principals often also have private information about organization-wide events, costs of financing, etc. Communication between parties is vital to the success of organization. Unfortunately, knowledge is power, and individuals often have incentives to withhold their private information or distort it for private gain (e.g., to acquire more resources for their use, to obtain easier targets to meet, etc.) Similarly, earnings management is viewed as an activity that is widely practiced by managers. Even though the agency framework seems to be a natural one to use to study earnings management, the agency literature to date has not made much progress in helping us understand how, why, and when earnings management takes place.

The primary obstacle has been the revelation principle. The revelation principle, which was developed in the mechanism design literature (see Myerson, 1979), states that any equilibrium that involves nontruthful reporting (i.e., ones where targets get "padded" or earnings management is taking place) can always be weakly dominated by one where truth-telling is induced. Similarly, any multistage process (the agent submits a tentative message, the principal makes a counter-offer, the agent submits a revised message, etc.) can be duplicated or beaten by a single-stage process in which the agent submits the truth. It is important to recognize that the revelation principle *does not* say that truth-telling comes at zero cost. On the contrary, the principal must design the contract to induce the agent to tell the truth. In general, this will force the principal to precommit to "under-utilizing" the information. That is, the cost of inducing the agent to tell the truth is that the principal cannot use the information as fully as he would if the truthful message did not have to be motivated. In fact, in some extreme cases the principal must promise to not use the information at all in order to induce the agent to report honestly. The revelation principle merely states that the cost (broadly defined) of motivating the truth is no greater than the cost of motivating a nontruthful reporting strategy.

It is only recently that researchers interested in nontruthful reporting have begun to construct models using features that ensure the revelation principle does not apply. To circumvent the revelation principle, researchers must incorporate features that negate its applicability. While this does not guarantee that nontruthful equilibrium will be optimal, it at least opens the possibility. There have been three different ways researchers have incorporated features designed to circumvent the revelation principle.[17] The most straightforward way is to simply exogenously restrict the agent's ability to communicate his information.

[17]See Arya, Glover, & Sunder (1998) for additional discussion

For example, instead of assuming the agent issues an unrestricted report, the researcher assumes instead that the agent's intervention into the earnings process has a particular form. In some papers, the agent can misrepresent the true outcome only within a finite range; in others the range can be increased at some cost to the agent.

Alternatively, some models place restrictions on the principal's ability to use the information; for example, by requiring the principal to use a contract with a prespecified shape (e.g., piecewise linear). Finally, researchers have relaxed the assumption that there is precommitment as to how the agent's report will be used. This last feature is particularly reasonable in multiperiod contracts, where principals and agents might want to renegotiate their contracts (possibly to improve both parties welfare) based on information observed in the first period, including information obtained by the agent's communications.

While being able to renegotiate contracts can be beneficial *ex post*, this often impose costs *ex ante*. The choice of how to time the release of information relative to potential contract renegotiation dates is a relatively unexplored area. Demski & Frimor (1999) suggest that suppressing information can have benefits by preventing costly contract renegotiations, and Indjejikian & Nanda (1999) show that aggregating information before it gets reported to the principal can reduce some of these costs. See Christensen et al. (2003) and Indjejikian & Nanda (2003) for additional analysis of renegotiating contracts over time as it relates to the "ratchet effect": the dynamic updating of performance targets over time.

Many of these papers suggest that providing *no* information at the end of the first period is often the preferred solution. This is the polar opposite of the revelation principle, in which information is fully and honestly communicated. Ideally, future research will be able to identify conditions that bring us somewhere in between these two extremes. That is, nontrivial information would be communicated at the end of the first period of a model, but not complete information. See Feltham et al. (2005) for analysis where intermediate information is used for (potentially) conflicting purposes: to evaluate the agent's first-period action and to help decide what actions should be taken in the second period. It would be interesting to extend this analysis to examine situations where (a) some of the information in the first period comes from a report by the agent (perhaps strategically distorted) and/or (b) the information in the first period is also used to make investment decisions in the second period. In the next section, I discuss incentive issues related to long-term investments.

8. Multiperiod Models and Investment Problems

While there are a number of interesting issues that arise in multiperiod agency models, the one I believe is of greatest interest to accounting relates to the role of lead-lag effects in performance measures. Managers are often alleged to be too short-term oriented in their approach to decision-making. Accountings systems are often criticized for contributing to this problem by being too "backward-looking" and for not capitalizing many types of investments (research and development, advertising, intangibles, etc.). To address these issues, we need a multiperiod model; in single-period models, cash flow and accrual accounting numbers are identical. Despite the obvious importance, not much work has been done on multiperiod models in the agency literature. The reason is tractability problems. In most multiperiod models, numerous technical issues arise that are often tangential to the accounting or performance measurement issues that we would like to focus on as accounting researchers. For example, even with models where everything seems to be independent over time, we have to worry about borrowing and lending, wealth effects, randomization, how the contact parameters in one period depend on realizations from prior periods, the form of the contract, the ability to commit to long-term contracts, etc.[18] Even information signals that would seem to be informationally "meaningless" sometimes play an important role in helping to randomize actions or in coordinating the actions of different parties.

Consider a simple investment decision in which an investment of I dollars today will generate a stream of cash flows over the next T periods, where c_t is the cash flow in period t:

Period :	0	1	2	3	.....	T
Cash Flow :	$-I$	c_1	c_2	c_3	....	c_T

The principal would like the agent to select the project if its cash-flow stream has a positive net present value discounted at the principal's cost of capital. Agency problems arise however, if the agent has superior information about the profitability of the projects. These problems are exacerbated if the agent also has a shorter time horizon than the principal. The shorter time horizon can exist for a variety of reasons: the agent assigns a nonzero probability

[18]See Lambert (1983), Rogerson (1985), and Fellingham et al. (1984) for analysis of some of these issues.

that he will retire, get fired, voluntarily leave, get promoted, etc. before period T. While there can also be agency problems related to differential attitudes toward risk, we will suppress these in order to concentrate on timeliness issues.

Suppose the principal evaluates the agent's performance in each period using the cash flow of that period. Further assume the agent's compensation is linear in his performance in that period $S_t = \alpha_t + \beta_t$ cashflow$_t$. If the agent knows that is how he will be evaluated and then if he believes that he will be capitalizes the investment, the nature of the agency problem changes. A conventional accrual accounting system would depreciate the investment over its useful life. Let d_t be the fraction of the investment depreciated in period t. Then in each period, the depreciation would be non-negative ($d_t > 0$ for all t), and the investment would be fully depreciated by the end of its life ($\sum_1 d_t = 1$) assuming no salvage value at the end. The stream of net income numbers is as follows:

Period :	0	1	2	3	.....	T
Cash Flow :	$-I$	c_1	c_2	c_3	....	c_T
Net Income :	0	$(c_1 - d_1 I)$	$(c_2 - d_2 I)$	$(c_3 - d_3 I)$	....	$(c_T - d_T I)$

with the firm (or as subunit of the firm) for all T periods, the present value of his expected compensation would be $PV(\alpha_t) + PV(\beta_t$ cash flow$_t)$. If the agent discounts future compensation at the same rate as the principal discounts cash flows, and if the agent's slope coefficient is constant over time, then the present value of the agent's compensation is a linear transformation of the present value of the project's cash flows. Under these conditions, the agent will select the same projects that the principal would like. However, if either of these conditions is violated, the agent's choice will not necessarily match the principal's preferences.

Next consider what happens if the agent does not expect to be with the firm for all T periods (or assigns some probability to this possibility). Then the agent's objective will not be aligned with the principal's because the agent will not place enough weight on the cash flows near the end of the project. If these later period flows are positive, this will result in the agent under-investing, or turning down projects which have a positive net present value. The agent could also over-invest by selecting projects, which have a short-term payoff but negative cash flows (disposal or clean up) at the end of their lives.

Next, suppose the agent is evaluated on the basis of net income calculated using conventional accrual accounting procedures. While there are many things an accounting system might do to rearrange the cash flows over time (revenue recognition issues, etc.), I will concentrate on the accounting treatment of the initial investment I. If the accounting system expenses this investment (as it does with many types of investments), then we have all the same problems as discussed above with cash flow as the performance measure. However, if the accounting system If the agent is evaluated in each period on the basis of that period's net income, will he make the right decisions? In general the answer will be "no". In fact, even if the agent remains for all T periods, he discounts his compensation over time at the same rate as the principal discounts cash flows over time, and if the slope coefficient in his compensation is constant over time, he will not view projects identically to the principal. The reason is that while the accounting system ensures that the depreciation stream sums to the initial investment, it does not do so in present value terms. In fact, the present value of the depreciation numbers will be less than the initial investment, which will cause the project to look more attractive to the agent than it does to the principal. *Ceteris paribus*, this will cause the agent to over-invest in projects.

It is possible that this incentive to over-invest will partially counter-balance the factors described above (shorter time horizon), but it is unlikely to be the case that they exactly offset each other. Whether the overall result is that the agent over-invests or under-invests depends on the likely tenure of the agent as well as how well accelerated the deprecation pattern is. Similarly, whether measuring performance using net income results in better investment decisions than using cash flows will also depend on these same factors.

Next, consider the use of residual income, or economic value added (EVA) as is frequently referred to by consulting firms. This concept is also very similar to abnormal earnings in the Feltham–Ohlson valuation framework. The key feature in residual income is the use of a charge for the capital employed. This is not a cash outlay, but represents an opportunity cost of the use of capital. In particular, residual income is commonly defined as net operating profit minus an

appropriate charge for the opportunity cost of all capital employed: $RI_t = NI_t - rBV_{t-1}$.

The calculation of residual income generally begins with the Generally Accepted Accounting Principles (GAAP) – based accounting net income: $Net\ income_t = C_t - d_t I$. Note that this includes the depreciation charge. While it may seem like appending an additional charge for capital might double count the cost of investment, in fact this is a key feature of the residual income approach. In theory, by making the charge for capital based on the accounting book value of the net assets (BV_{t-1}), which is also affected by the accounting policies, the charge for capital corrects for the rearrangement of cash flows into the series of net income numbers. The discount rate (r) used in the calculation is the principal's cost of capital. It is easy to show that the present value of the stream of residual income numbers is equal to the present value of the cash flows. Moreover, this is true no matter what depreciation policy is chosen.

What are the investment incentives if the agent's compensation is based on residual income? In the extreme case described above (the agent will be around for all T periods, his compensation is linear in residual income, and the slope coefficient on residual income is constant over time) the agent will take the right actions. Under these circumstances, the present value of the agent's compensation is a linear transformation of the present value of the project's cash flows. As above, this is true regardless of what depreciation pattern is chosen (including immediately expensing the entire cost of the investment). This result is analogous to results in the Ohlson valuation model, in which valuation can be written in terms of current book value and future residual income. Recall that in this context, clean surplus is the only requirement for accounting-based valuation to work as long as you extend the forecasting horizon to the end of the firm's life.

If the agent will not be present for all T periods, residual income will not work for any arbitrary depreciation method. The proper investment incentives can still be achieved though if the depreciation schedule is chosen properly. The correct depreciation scheme is based on the relative benefits received in a period relative to the whole project. Commonly used depreciation schedules such as straight-line or sum-of-the-year's digits will not generally work because they do not appropriately match the project's cost to its benefits. However, when the deprecation scheme is chosen properly it makes each period's residual income proportionate to the total net present value of the cash flows (which is identical to the total net present value of the residual income numbers). Therefore, it does not matter how long the agent will be around, or how he weights the compensation he receives in different periods. He will select the correct investment decisions.

Unfortunately, the principal requires a lot of information to be able to calculate the depreciation scheme that makes this work. For example, suppose the time-pattern of cash flows has the following form: $c_t = K(I, \theta)g_t$. The scale parameter K depends on the level of investment and on private information possessed by the agent. Note that this parameter affects all of the cash flows proportionately. The second term g_t, determines the time-pattern of the cash flow stream. The principal needs to know the time-pattern of cash flows, but not the scale factor, to make this depreciation schedule work. See Dutta & Reichelstein (1999, 2002); Reichelstein (1997, 2000); and Rogerson (1997) for examples.

If the principal does not know the time-pattern (i.e., the series of g_t terms), we do not yet know much about how residual income schemes perform. It would also be valuable to expand the model to incorporate other interesting (and realistic) features in which the agent has more information about the time-pattern of future cash flows (not just the scale factor). It would be also interesting to examine models in which the principal (and the agent?) learn more about the time pattern of cash flows as time unfolds. In this setting, the depreciation schedule might get modified over time.

It would also be interesting to examine situations where the agent can shift cash flows over time once he has adopted a project, or where the agent could choose between projects that differ by their time pattern or their riskiness. Researchers could also model alternative ways in which the investment projects arise: (a) they are exogenously given (the most common approach); (b) the agent's effort determines the size of the investment opportunity set. The agent could also provide effort to implement the project in each period as well. The agent could also get nonpecuniary returns from making and running larger investments (empire building). See Baldenius (2003) and Lambert (2001) for examples of how nonpecuniary returns affect investment incentives. Finally, it would be interesting to examine situations where larger investments result in projects with riskier cash flows. In particular, how does the distinction between risks that are diversifiable to the principal (but not the agent) versus risks that are nondiversifiable to either part affect things? See Christensen et al. (2002) for analysis of this issue.

An alternative strategy for attacking these problems is to more deeply examine the use of "forward

looking'' performance measures. There are a number of ways to calculate a forward looking performance measure, including deferring some of the investment's cost, by estimating and recognizing the future benefits up front, or by supplementing financial measures with nonfinancial measure, etc.

For example, stock prices are a way to potentially incorporate forward-looking information into contracts. In theory, stock price represents the present value of all future cash flows for the firm. Stock prices are also (theoretically) a great aggregator of diverse pieces of information. This is especially useful if the individual pieces of information would not be contractible. But stock prices aggregate information for the purpose of valuation, not for evaluating the manager, or evaluating the manager's contribution to firm value. Theoretical results suggest that there is value to including variables other than stock price, even if these variables are already ''incorporated'' into stock price Moreover, as we move lower down in the firm, the ability of managers to take actions that have a significant effect on the firm's stock price decreases. This will lower the appeal of using stock price *in lieu* of more local performance measures. See Bushman & Indjejikian (1993), Dutta & Reichelstein (2005), Feltham & Wu (2001), Kim & Suh (1993), and Paul (1992) for analysis of the use of stock price and accounting numbers in incentive contracts. Christensen et. al. (2005) extend this analysis to a multiperiod model, in which the autocorrelation of the performance measures becomes important.

9. Common Misconceptions about Agency Theory

There are many common misperceptions about agency theory and agency theory models. In many instances, these criticisms are more appropriately directed at the specific way researchers have chosen to model agency relationships, not to the agency framework *per se*. The agency framework is quite general, and can accommodate many alternative behavioral or economic factors. For example, it is common to criticize agency theory as assuming everyone is a ruthless, self-interested, mercenary. Of course, it is important that there be some element of self-interest to have an agency conflict worth studying. However, there is nothing in the theory that prevents elements of cooperation or even altruism. In fact, it is common in agency models to assume that if the agent is indifferent between two actions, he will select the one that is in the principal's best interests. More extensive types of cooperation could also be modeled, either between the agent and principal or between agents (teams?) if this was thought to be important to the research question being addressed. There can be different ''types'' of people in the models, including differences as to how cooperative they are, and even uncertainty about what types you are interacting with.

Another dimension of cooperation is the important issue of learning within organizations. Accounting systems are not merely designed to evaluate performance and motivate people, but also to help them learn about profitability and operating conditions in order to make better decisions in the future. Learning can, in principle, help both the principal and the agent. However, this need not always be the case. It would be especially interesting to examine agency applications of the learning model explored in Demski & Dye (1999), where the agent's operating decisions themselves affect the information that is generated at the end of the period. The principal and agent must tradeoff the benefits of ''experimentation'' to help make decisions that are better in the long run versus the cost of making decisions that are in the short run nonoptimal. This tradeoff is likely to be viewed differently between the two parties when the agent has a shorter time horizon than the principal.

Similarly, while it is common to assume that the principal and agent are expected utility maximizing individuals, it need not be the case that everyone has to be ''rational'' in an agency model. In fact, I would be surprised if anyone truly believed agents are super-rational. In capital market studies, we do not require every individual investor to be rational, though we often require their errors to be uncorrelated so that they wash out in aggregate. But within the firm, we do not have this ''diversification of mistakes'' capability. This suggest that studying ''irrationality'' is an important and interesting area to explore in management accounting problems, perhaps even more so in capital markets setting, which has seen a recent explosion of ''behavior finance'' research. Agency models could, in principle, incorporate ''non-Bayesian'' behavior, such as making decisions based on prospect theory. Alternatively, the agent's actions could be modeled as having an unpredictable component to them or exhibiting bounded rationality. I expect that bounded rationality and information processing costs (broadly defined) are the primary reasons for why there is a such high degree of aggregation that takes place in accountings systems. The problem with incorporating these features into agency models is the same as incorporating them into other types of models: the difficulty of being able to solve the resulting model.

Many people mistakenly believe that agency theory assumes that the principal has all the ''power'' in the relationship. This belief comes from the way the

agency relationship is modeled, where the principal maximizes his utility subject to holding the agent to some exogenously specified minimal acceptable level. This minimal level is often interpreted as the expected utility of the agent in his next best employment opportunity, or his reservation level of utility. This formulation suggests that the principal is the one who keeps all the rents from the relationship.[19] However, an alternative interpretation of the agency formulation is that it is merely trying to identify Pareto optimal outcomes. That is, we can view the minimal acceptable level of utility for the agent as already reflecting the bargaining power of the agent. By varying the minimal acceptable level of utility for the agent, we can sweep out the Pareto frontier of achievable combinations of expected utilities of the two parties.

Agency theory has not been good at modeling or analyzing the factors that affect how the profits are split between the two parties. That is, an important area for future research. Power is an important issue in debates regarding corporate governance (e.g. CEO versus the board of directors). One would think agency theory would be a natural framework for addressing these issues. To make progress, we will have to develop models in which the agent's reservation utility is endogenous. It seems reasonable that asymmetric information and transactions cost would be important ingredients in such a model. The former seems easier, in principle, to incorporate. In fact, there are also some agency papers where the agent has asymmetric information (predecision) in which the agent gets information rents; that is, the agent's expected utility turns out to be strictly greater than the reservation level of utility. Moreover, the "extra" utility is endogenous, and explicitly depends on the information structure. Rents are something agents want to protect, and they will fight information systems that could take them away. See Antle & Eppen (1985), Antle & Fellingham (1997), and Christensen (1981) for examples of models where agents obtain information rents.

10. Conclusion

It has always struck me as odd that there is such a large distinction made between management accounting and financial accounting in academia. Very few people teach both or do research in both. Yet at the conceptual level there is a tremendous amount of overlap between the two. Both are concerned with providing information so that decision makers can make resource-allocation decisions. In financial accounting, investors are trying to allocate their wealth across firms, whereas in management accounting, managers are trying to allocate resources across "subunits." In both cases, the information is used to evaluate past decisions as well as to make better future decisions. There are some important differences though. For example, in management accounting, we are also concerned about "dividing up" the results across subunits, not just dividing up the results over time. Similarly, management accounting is concerned with coordinating the activities of subunits within the firm, whereas, outside investors must deal with autonomous firms. Moreover, managers are generally not allocating their own wealth across the subunits, whereas investors are allocating their wealth across firms.

However, I think that the most important difference is that management accounting is not regulated. One might think that this would result in firms being much more creative in their measurement and valuation activities internally than they are externally; yet I am not sure the evidence supports this. Moreover, within the firm there is probably less concern that information provided will be leaked to "competing subunits," so that the proprietary costs of disclosure are smaller. While the level of detail compiled and disseminated is of course much higher within firms than to outsiders, is the complexity or sophistication any higher?

As an example, GAAP is replete with accounting policies that are conservative. Why is not this conservatism undone for internal purposes? Is it simply because of the cost of compiling the data? Or is it because of agency considerations? That is, is conservatism a means of countering managers' optimism or incentive to over-report? Is it simply a way to bias reports and performance measures downward to offset an upward bias already provided by managers? If it is simply a "biasing" technique, why cannot we do this with the compensation contract itself (e.g., the intercept, slope, or target level of performance) instead of reducing the performance measure itself? An alternative view is that conservatism is a form of accelerating the recognition of certain economic activities into the earnings numbers. That is, the accounting number becomes more timely and more informative in this lower range of outcomes. As discussed above, timely recognition of the future period consequences of managerial actions is likely to be a good thing from a contracting perspective. But this is true for both timely recognition of favorable as well as unfavorable events. For example, firms go to

[19]Some papers explicitly assume the opposite power structure; that is, they assume that competition among principals will drive their levels of expected profits to zero. In this case, the agent is assumed to capture all the "excess."

considerable trouble to quantify and value in-process research and development projects obtained via acquisitions. Till now, GAAP has required these to be expensed immediately. Are they also expensed for internal evaluation purposes, or is this information used?

Why do not we recognize events on a more timely basis in both the upper *and* the lower sides of the distribution? If it is too costly to do both, is there a reason why we would prefer to devote resources to the early recognition of unfavorable events first?[20] The managerial accounting literature on variance investigation (do you investigate to obtain more information in the upper-tail or the lower-tail of the distribution) seems relevant here.[21] Alternatively, some have suggested that "good news" could be voluntarily disclosed via other mechanisms than the earnings number. While this argument applies to internal settings just as it does to external settings, it is less clear how this information would be contractible in an internal setting (in an external setting it could become potentially reflected into a contractible measure like stock price). Many informational challenges remain to be solved in both external reporting and internal reporting, and I think both branches of the accounting research literatures could benefit from greater interaction.

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[20]See Ball & Shivakumar (2005), Guay (2005), and Watts (2003a, b), for further discussion of this issue.

[21]See Baiman & Demski (1980), Baiman & Rajan (1994), Dye (1986), Lambert (1985), Verrecchia (1986), and Young (1986) for examples of variance investigation and monitory models in an agency setting.

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Historical Theorizing in Management Accounting Research

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Abstract: This chapter provides a brief introduction to theoretical debates in historical research and their relevance to management accounting studies. It focuses particularly on the role of narrative versus analysis in historical writing and on the interpretation of historical evidence. Using studies of the development of modern management accounting as examples, it shows how standard historical critiques can be applied to diverse explanations of the purposes and effects of management accounting.

1. Introduction

Historical studies have played a conspicuous role in management accounting in recent decades. Particularly in the US, both research and practice were strongly influenced by business histories that presented management accounting as a source of efficiency gains and as a necessary condition of the rise of large firms in the nineteenth century (e.g. Chandler, 1962, 1977; Johnson, 1975; and Johnson & Kaplan, 1987). Particularly in Europe, studies drawing on historical data (e.g. Hopwood, 1987; and Miller & O'Leary, 1987) provided a means of engaging accounting research with post-modern social theories that have been employed in a considerable body of research on contemporary accounting. In general, historical studies have played an increasing role in economics and sociology, which provide theoretical bases for management accounting research.[1] As accountants use economic and sociological theories to explain management accounting practice, they may often be using theories suggested and supported by historical data.

Accounting researchers are frequently less familiar with history as a discipline than with sociology, economics, or psychology. If historical studies significantly influence management accounting research, then this unfamiliarity means that arguments and approaches may be adopted from historical studies somewhat uncritically, without asking the questions that historians would ask of the material. This chapter is intended as a consumers' guide for management accounting researchers who are not historians.

The remainder of the chapter is organized as follows. Section 2 briefly summarizes key developments in historiography. Section 3 describes main themes in research on management accounting history, and Section 4 discusses the implications of major methodological issues in historiography for this research. Section 5 concludes.

2. A Brief History of History

History (like accounting) is a field defined by its subject matter, not by a unique theory or method: it borrows theories and methods from the other social sciences and humanities. Historians, however, are often more eclectic in their borrowing than accountants and more skeptical about the value of a clearly defined methodology. For example, Veyne (1984, p. 89) remarks that "It is difficult to imagine the existence of textbook entitled … *Methodology of History*," and Foucault rejects altogether "the notion that historical practice is reducible to the application of a methodology to a particular field" (Dean, 1994: p. 14)

[1]Striking examples of the rise of history in mainstream economics research include the initiation of a series of conferences on business history by the National Bureau of Economic Research (Lamoreaux and Raff, 1995; Temin, 1991) and the choice of two historians, Robert Fogel and Douglass North, as recipients of the Nobel Prize in economics in 1993. The influence of Foucault's "historical sociology" has also strengthened the role of history among sociologists (Dean, 1994; see also Covaleski et al., 1996).

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(See also Barzun, 1974, for skepticism about the value of methodology from a much more conservative viewpoint.) Historians who are more inclined to make classifications by theory or method are likely to disagree about what the classifications are and who belongs in each (e.g., Elton 1983; and Fogel 1983). They are more likely, however, to agree in identifying major methodological problem areas in historical research. Four problem areas that have recurred regularly in varying forms and combinations since the late eighteenth century are:

(1) The extent to which history aims at making verifiable general statements, somewhat in the manner of the natural sciences, or at understanding and representing unique human experience, somewhat in the manner of the arts or humanities.
(2) The appropriateness of focusing on individuals as opposed to social phenomena (e.g., ethnic groups, states, and organizations).
(3) The role of narrative as opposed to other forms of analysis and presentation (e.g., the appropriateness of telling stories versus testing models).
(4) The existence of an objective ''truth'' about the past and, to the extent that it exists, the means of identifying it.

Historical thought has exhibited a pattern of shifting connections among these four issues, which is briefly recounted below.

The first two issues—the general versus the particular and the individual versus the social—had begun to emerge by the beginning of the nineteenth century. Historians who identified with the Enlightenment, mostly French and British, tended to use history (sometimes of individuals, sometimes of collectivities) as a tool for illustrating the principles of universal human nature. ''Counter-enlightenment'' historians, mostly German, argued in favor of studying the unique experiences of different peoples for their own sake, not as a vehicle for generalization and law-building (Bentley, 1999; Berlin, 1976) Each of these points of view was further elaborated in the course of the nineteenth century.

The nineteenth century also saw the professionalization of history and the development of widely accepted tools intended to identify an objective truth about the past. At the beginning of the century, major historians were men of letters, often philosophers or novelists as well as historians; and gatherers of historical data (documents, inscriptions, etc.) were often amateurs (antiquarians) with neither philosophical nor technical training. During the central part of the century, history became an academic discipline, and professors of history began to replace both men of letters and antiquarians. Literary elegance and philosophical interest lost value as criteria for historical writing and were replaced by knowledge of primary sources and the ability to critique the sources on technical grounds, resolve conflicts, and make a reasonable determination of ''what actually happened.'' For the first time, people became historians by attending graduate seminars, typically modeled on Ranke's seminar in Berlin, which emphasized training in source criticism (Iggers & Powell, 1990). For Ranke, history was scientific because it employed the technical knowledge and rigorous logic of source criticism, but it did not aim at discovering natural laws: it aimed to recover the essentials of a unique past accurately.

Both for Ranke and for other eminent (and more literary) nineteenth-century historians like Michelet in France and Macaulay in England, history was largely the story of unique nations and of the unique ''great men'' (and sometimes lesser individuals) who formed and guided them. This uniqueness of both nations and individuals limited the relevance of generalizing laws. With Marx, however, history regained its ambition to be a science with natural laws, and explicitly a *social* science: Marx's history was not the story of nations and great men, but rather a model of the development of the social relations of production and their effects (Rigby, 1987).

The growth of economic history, Marxist and otherwise, in the nineteenth century brought a strong natural-scientific generalizing orientation to historiography again. The rise of this orientation unleashed a vigorous methodological debate (the so-called *Methodenstreit*) that dominated historical discourse in late nineteenth-century Germany, with widespread echoes in European and American social sciences (Bentley, 1999). This conflict formulated more clearly than before the terms of the choice between the methods of the natural sciences on one hand and the human and social sciences (*Geisteswissenschaften*) on the other. A number of important social-science formulations of these differences date from this conflict, for example, the distinction between nomothetic and ideographic approaches to research (originally defined as ''the general in terms of natural laws'' and ''the singular in historically determined shape,'' respectively (Windelband, 1894)), and the idea that the human sciences proceed by understanding and empathy (*Verstehen* and *Einfuehlung*), that is, by an imaginative recreation of others' experiences, more than by measurement and experiment (Dilthey, 1961).

After the sharp side-taking of the *Methodenstreit*, major streams of early twentieth-century history found their way to different points in the middle

ground between pure natural science and pure humanities. Weber's historical sociology not only rejected the natural sciences as a suitable model for understanding human history, but also criticized Dilthey's notion of *Verstehen*, "a weak descriptive activity based on individual intuitions that would often prove simply aesthetic. Empathy helped historians, but empathy was not explanation." (Bentley, 1999: p. 91) Weber aimed at a human *science*, in which the "ideal type" would serve as an organizing concept or model for explanation.

A different middle ground was occupied in France by the historians of the *Annales* school (named for the journal *Annales*: *Economies, Sociétés, Civilisations*, founded in 1929). The *Annales* historians defined their research, in contrast to their predecessors, as less narrative and more analytical and quantitative. It was also less individual, because it was focused less on political and military events or philosophical and scientific theories (and thus on the "great men" responsible for these events or theories); *Annales* research addressed broad demographic and socioeconomic patterns and "*mentalités*"—widespread patterns of thought that influenced behavior in a given period but were hardly articulated because everyone took them for granted (Bloch, 1953). The *Annales* school influenced history-writing throughout Western Europe and America, especially from the late 1950s through the 1970s (Forster, 1978; Hexter, 1972; Stoianovich, 1976).

Insofar as the *Annales* school provided a synthesis of the mid-twentieth-century approaches to history, that synthesis began to fragment in the 1970s. On the one hand, some economic historians regarded the rather impressionistic quantification of some of the *Annales* research as "not scientific enough," and advocated an approach called cliometrics,[2] exemplified by Fogel's work (Fogel, 1964; Fogel & Engerman, 1974), that is, research based on the formal models and statistical testing procedures common in economics but hitherto rarely used in economic history (Fogel, 1964; Greif, 1997; McCloskey, 1978); on the other hand, postmodern[3] historians (e.g., Jenkins, 1991) found the *Annales* work "too scientific" in its ambition to capture an objectively real past.

Many postmodern historians were influenced by Foucault's work (1970, 1977a,b), which described changes in past systems of "non-formal" knowledge and how these changes in knowledge related to changes in the structure and exercise of power in the society. To some extent, like earlier *mentalité* studies, this work was influenced by structuralist theories that cultural systems, like languages, represent coded systems of meanings. The structuralists, however, tended to believe that there was a correct way of decoding these meanings—an objectively identifiable meaning inherent in cultural systems on which capable researchers would agree. Postmodernists typically disagreed, arguing that alternative constructions of the past were possible and could be judged only by criteria internal to the cultural systems that generated them (Caplan, 1989). Postmodern theorists also, however, shared the skepticism of the *Annalistes* and cliometricians about the overarching "metanarratives" of traditional history, for example, its tendency to organize accounts of the past as stories of the rise of liberty or the rise and fall of a particular nation (Lyotard, 1984). Concerns about the role of narrative led to an increasing influence of literary theory from the 1970s onward (e.g., Clark, 2004; and White, 1973, 1978), among historians who were interested in explaining how narratives are constructed and provide a sense of meaning or understanding.

Historical research since the 1980s has been very diverse (Cannadine, 2002). Some researchers have predicted a "return of grand theory" (Skinner, 1985), a "revival of narrative" (Stone, 1979), or a more fruitful cliometrics, liberated from the constraints of the hyperrational and largely ahistorical economic theory that dominated the 1970s and 1980s (Greif, 1997). One of the most widely followed streams of research has been "micro-history," anthropology-like studies of specific incidents in the lives of ordinary individuals that provide insight into past societies (Darnton, 2001; Davis, 1983; Ginzburg, 1992). It seems likely that methodological positions in history are again in transition.

[2]Cliometrics is named for the Clio, the muse of history in Greek mythology. It provides a clear exception to the general statement at the beginning of this section about historians' distrust of explicit methodology; cliometricians subscribe to the same methodology as empirical economics-based researchers who address present-day phenomena (Fogel, 1983; McCloskey, 1978).

[3]The "postmodern" label is a loosely defined indicator, and some social theorists to whom the label has been applied (e.g., Foucault) have been unwilling to adopt it. It is in common usage, however, to designate a common set of concerns that appeared in the social sciences and humanities from about the early 1970s onward, including a rejection of the possibility of determining a single "true" description or explanation of the world, a concern with power as an influence on intellectual configurations of a culture, and a wish to amplify the voices of marginalized groups in society (Bentley, 1991).

3. Main Themes in Management Accounting History

Debates about management accounting history echo debates in general historiography. For purposes of illustration, this section focuses on one of the topics in management accounting history that has generated particularly strong interest, that is, how "modern" management accounting came into existence in the nineteenth and early twentieth centuries. This research includes several distinct but interrelated themes: the development of cost recording and analysis, the growth of large firms, and the replacement of market transactions by intrafirm transactions, control through accounting systems (rather than, e.g., direct observation), and standard costing and "scientific management."[4] A few other areas have received significant attention as well, such as the diffusion of discounted cash flow analysis (Miller, 1991, Miller & Napier, 1993).

Explanations of how modern management accounting came into existence can be sorted into three main theoretical perspectives: (1) efficiency-based explanations synthesized by Chandler (1962, 1977, 1990) and popularized by Johnson and Kaplan (1987), (2) explanations based on Marxist theories of class conflict between labor and capital (e.g., Bryer, 2000; and Hopper & Armstrong, 1991), and (3) explanations based on postmodern social theory, particularly Foucault's (1977a) delineation of the shift from a physically coercive way of exercising power over others to "disciplinary power" exercised by measuring individual performance and comparing it to norms (e.g., Hoskin & Macve, 1988; and Miller & O'Leary, 1987). Although considerable variety of opinion about specifics exists within each perspective, there is more common ground within than across perspectives about the kind of explanation that is plausible and valuable. A summary of these three perspectives follows, with a concluding note on recent studies that draw from multiple perspectives.

3.1. Efficiency-Based Explanations

Early histories of management accounting (e.g., Garner, 1954; and Solomons, 1952) noted the marked increase in quantity and sophistication of management-accounting activity in the course of the later nineteenth and early twentieth centuries and asked for explanations; Chandler (1962, 1977) provided an influential response. Chandler argued that increases in market size (driven in part by changes in transportation and communication technology) and the invention of high-volume production technology made it potentially profitable to create larger firms that integrated more, and more diverse, activities. But organizations of this form were feasible (i.e., more profitable than exchanges mediated by the market) only if numerous problems of intraorganizational planning and control were solved. The later nineteenth and early twentieth centuries created a steady stream of such solutions, including many modern management accounting techniques. For example, in Chandler's (1962, 1977) view, analysis of the costs of individual processes and products within the firm, the use of standard costs, and the creation of evaluation measures that linked short-term profit with longer-term investment (e.g., return on investment) were effective tools in planning and coordinating production and evaluating increasingly numerous and distant employees.

Chandler's histories of the rise of large firms in the US played an important role in the development of three major branches of management accounting research: the various forms of agency research (see Baiman, 1990, for a review), contingency-theory research, and the studies of product costing that have followed from Kaplan (1984) and Johnson & Kaplan (1987)[5] (e.g., Anderson, 1995; Banker et al., 1995; and Foster & Gupta, 1990). McCraw (1988) and Temin (1991) stress the importance of Chandler's work in turning the attention of economists to questions about organization and contracting. Chandler's (1962, 1977) histories provided an important link between the initial idea of an economic theory of organizations, put forward by Coase (1937), and the development of this idea into an active field of empirical research through transaction-cost economics (Williamson, 1974) and the Rochester or property-rights

[4]These themes have been linked in a variety of ways to larger historical questions about the rise of capitalism and the industrial revolution. The nature of the links depends on historians' definitions and chronological anchoring of the phenomena in question. For example, those who see "sophisticated cost accounting" as already prevalent in the later eighteenth century in Britain (e.g., Jones, 1985) see it as playing an important role in the industrial revolution, while those who see "sophisticated cost accounting" as a late-nineteenth-century American development (e.g., Chandler, 1977) do not.

[5]Chandler (1977), in turn, drew on original research by Johnson (1972, 1975), Garner (1954), and other accounting historians; his contribution was perhaps less in original research than in bringing others' research together in a large-scale synthesis. There are differences of emphasis between Chandler (1977) and Johnson and Kaplan (1987), but both books present the same basic picture of cost analysis moving from direct costs to indirect costs to global return on investment measures as technologies, markets, and organizational forms changed.

literature (see, e.g., Williamson, 1974: p. 132–148, for examples of the use of Chandler, also Klein et al., 1978, and Fama & Jensen, 1983, for use of Chandler's examples directly or via Williamson). Problems of centralization versus decentralization, asymmetric information and divergent motivation, coordination and enforcement costs, and other common themes of the agency literature can be addressed with Coase's transaction-cost framework but are not mentioned by Coase (1937); they are, however, richly illustrated in Chandler (1962, 1977).[6] Contingency theory research in management accounting (see Chenhall, 2006, for a review) addresses some of the same organizational-structure issues and develops Chandler's emphasis on the importance of "fit" between structure and strategy as a determinant of organizations' success in managing the uncertainties of their environment.[7]

3.2. Class Conflict Explanations

While economic-efficiency explanations focus on the potential of the new management accounting for increasing the size of the economic pie, class-conflict explanations focus on its potential for redistributing the pieces. A number of researchers, using Braverman's (1974) labor process theory, argue that the new performance measures and control systems devised in the nineteenth and early twentieth centuries were not—or not only—transaction-cost reduction devices, but also devices to induce more effort output from workers without increasing their pay, and to secure to owners the share of firms' earnings that had previously been taken by internal subcontractors (Armstrong, 1987; Hopper & Armstrong, 1991; Hopper et al., 1987). For example, the creation of standard-based incentive wages sometimes were associated with wage cuts or required workers to produce significantly more output in order to maintain their previous compensation levels (see Nelson, 1995, and Tyson, 1994, for further examples). Hopper and Armstrong (1991) argue that shifts in the relative bargaining power of owners and workers do more to explain the rise and fall of management accounting innovation than do Chandler's (1977) technological or organizational arguments. They point out that the reduction of innovation described by Johnson and Kaplan (1987) coincides with a period of union power that would have made it difficult to engage in such surplus transfers from workers to owners.

3.3. Postmodern Social Theory Explanations

Explanations based on postmodern social theory take issue with efficiency explanations on different grounds. They criticize efficiency explanations for seeing new accounting techniques as "natural" ways of responding to economic opportunity, which therefore require little further explanation once the existence of the opportunity has been identified (Hoskin & Macve, 1988). Consistent with their aim of questioning practices that are held to be natural and to expose as problematic things that are taken for granted (Dean, 1994), postmodernists question the "givenness" of the quest for wealth maximization through increased efficiency. They argue that both the idea of efficiency and attitude toward wealth are historically conditioned phenomena that need to be explained rather than taken for granted. In this view, people did not create innovative performance measures because they had always wanted to be economically efficient and had finally found a technique for fulfilling this wish. Rather, the idea of efficiency itself arose from, or with, the idea of individual performance measurement and norms of performance (Boland, 1987; Hoskin & Macve, 1988).

A number of postmodern explanations of the rise of modern management accounting draw on Foucault's (1977a) identification of a decisive historical shift in the power–knowledge relation in the nineteenth century, from "sovereign power," often exercised through displays of physical coercion, to "disciplinary power," associated with the creation of individual performance measures and the rise of institutions devoted to the surveillance and control of individuals through observation and measurement of behavior. Accounting historians have argued that the rise of modern management accounting is an example of this fundamental shift in ways of thinking and of exercising power (e.g., Bhimani, 1994; Fleischman et al., 1995; Hoskin & Macve, 1988; Miller & O'Leary, 1987; and Walsh & Stewart, 1993). Detailed records had been kept on material usage and machine performance in earlier periods, but examination of human performance (e.g., concern over waste of time rather than waste of materials) was much rarer. Foucauldian historians see the change from measuring and controlling *things* to

[6]This chapter makes no attempt to estimate how much the agency literature actually took from Chandler and how much the similarity in their preoccupations was due to ideas "in the air" at the time. The problem is particularly difficult because Chandler's ideas had been diffused through the business community in the 1960s and 1970s by consultants and may sometimes have returned to business researchers by this indirect path. McKinsey consultants regularly distributed copies of Chandler (1962) to clients (McCraw, 1988).

[7]Donaldson (1987) classifies Chandler (1962) as an early example of contingency theory research, and the strategy-structure fit proposed by Chandler has been a continuing theme in contingency theory research in management accounting (see Chenhall, 2006).

measuring and controlling *people* (how individuals use their time and whether their performance is "up to standard") as the decisive innovation in the creation of modern control systems. Concerns for efficiency were a radically different addition to accounting's traditional concerns with the "fidelity or honesty of the person" (Miller & O'Leary, 1994).

3.4. Multiple Perspectives in Recent Studies

More recent explanations of the rise of modern management accounting appear to draw on multiple theoretical sources rather than to stand rigidly in one of the three camps described above. For example, Bryer (2000, 2005) develops a Marxist explanation of the development of some elements of modern management accounting that (unlike some previous Marxist theorizing) grants a large role to changes in "calculative mentalities." Toms's (2005) explanation of accounting change in the British cotton industry from 1700 to 2000 draws on Bryer's (2000) framework but, more than Bryer and consistent with Chandler (1990), stresses the importance of technological change and market growth that created opportunities for exploiting economies of scale and scope. In addition to integrating efficiency and class-conflict explanations, Toms (2005) also argues for integration of the objective and the subjective and thus for a radical critique of capitalism that (unlike some postmodern critiques) does not take the "… extreme ontological position of objectivity denial." It appears that methodological positions in management accounting history, as in the historical profession at large, are again in transition.

4. Historiographical Critique of Management Accounting History Research

Of the four methodological issues identified in Section 2, two have been extensively treated in the accounting literature: the aim of producing and testing generalizations versus understanding the meaning of unique human experience, and the focus on individual versus social phenomena. The role of these issues in historical studies does not differ essentially from their role in studies of contemporary accounting; they are addressed in other chapters of this volume and will not be examined in further detail here. However, the issue of narrative form has received less attention in accounting research, as have the techniques of source criticism that are particularly characteristic of historical research. This section therefore addresses these two issues, first providing a more extensive general description of them and then applying them to the evaluation of the management accounting research summarized in the previous section.

4.1. Critique of Traditional Narrative

The traditional form of presentation for the results of historical research (as for case studies) is narrative. Narrative is not simply a chronological organization of facts: it is also a principle of selection and emphasis (Veyne, 1984; White, 1973). The historian creates a sense of coherence in a collection of information about a given period or topic by positing a goal that people in that period desired to reach and then recounting their successes and failures on the way to the ultimate fulfillment or frustration of that goal (Veyne, 1984). This goal-oriented (teleological) chaining of events provides a powerful device for structuring information.[8]

However, historical methodology since mid-century has cast a very critical eye on teleological narrative, arguing that it leads to distortions in the choice and presentation of material (e.g., Bloch, 1953; Dean, 1994; and White, 1973, 1978).[9] In a classic critique of traditional historical writing whose themes have been reiterated by many later works, Butterfield (1931) relates narrative distortions to the error of *presentism*: projecting present-day issues onto the past and seeing the present as the end of the story, that is, the goal of the past. Several specific distortions result from proceeding in this way. First, it biases the choice of past events to discuss. Historians who see their own time as the end of the story see past events that appear to lead towards their own present as important or representative or informative, and thus worthy of discussion, while facts and events that do not seem to lead to the present are dismissed as noise. This is likely to be distorting, since the present is not in fact the end of the story, and the facts that are currently dismissed as noise may have been important in the past or may be important in leading to a future that the historian does not see.

Presentism not only biases the selection of what to discuss, but also distorts the representation of those events and individuals that are selected for discussion. In describing the parties to past controversies, the historian tends to compare them with parties to present-day controversies, and to stress the likenesses and omit the differences between analogous past and present controversies (Butterfield, 1931: p. 34; see also Kracauer, 1969, and White, 1978). It is natural, when reading historical documents, to be more struck

[8]Psychological research (Graesser, 1981; Graesser et al., 1980a,b) has shown that reading comprehension and memory is much better for narrative material than for otherwise comparable expository material.

[9]But see Veyne (1984) for a philosophical defense of narrative in history.

by items that seem to echo one's own current professional concerns than by items that do not; but as Butterfield (1931: p. 12) points out, the result of this natural response is often to take items out of context and create misleading analogies. Both the postmodernists' goal of defamiliarizing the past (White, 1978) and Butterfield's (1931: p. 10) claim that "the chief aim of the historian is the elucidation of the unlikenesses between past and present" aim at guarding against this potential bias.

A final criticism that has been made of presentism and the narrative forms that arise from it is that they reduce the quality of explanation of how and why change actually occurs (Butterfield 1931). The dramatic force of the narrative tends to substitute for analysis. In addition, traditional narrative tends to overemphasize individual agency as an explanatory factor: it describes change as occurring because certain people will it and are successful in carrying out their will. Butterfield (1931: p. 46) argues that the problem of explaining why change occurs is not necessarily identical to the problem of identifying the individual(s) responsible for it: the process of change is better described as "a clash of wills out of which there emerges something that probably no man ever willed."

4.2. Alternatives to Traditional Narrative

Much of the objection to traditional narrative arises from its teleological nature, that is, its use of present-day goals as explanations and organizing principles for accounts of the past. Multiple alternatives to teleological narratives have been suggested in recent decades. Some historians, like the cliometricians, have advocated an abandonment of narrative in favor of formal economic modeling and testing (Fogel, 1983). Other historians have retained some elements of narrative, that is, qualitative representations organized temporally, while rejecting the presentism of traditional narrative and its dramatic form (stories which begin with the creation of tensions due to unachieved goals and end with the resolution of these tensions). *Annalistes* and Foucauldian historians offer two different types of alternatives.

The *Annales* school (see especially Braudel, 1972) condemned traditional narratives as *histoire événementielle*: that is, history, which focuses on individual events like battles, treaties, and changes of government, and which seeks the explanation for individual events in other individual events rather than in the broader context. (A business analogy would be explaining a merger between two firms primarily by a key meeting between the CEOs of the two firms, without regard to the legal and economic climate for mergers or the existence of financial institutions that could foster them.) Braudel's (1972) strategy for providing temporally-oriented description without becoming excessively *événementielle* is a division of history into three levels of temporal analysis: the *événement* (event, e.g., the meeting), the *conjoncture* (middle-term factors such as the current economic climate), and the *longue durée* (longer-term factors such as the existence of a legal system that allows the existence of publicly traded corporations).[10] This division is heuristic, not rigidly defined; the explicit inclusion of multiple levels of time is intended as a guard against the hazards of partial and distorted explanations that operate at one level only. Events or conditions at a given time might result from the intersection of unrelated causal processes operating at different temporal levels.[11]

Postmodern historians have also rejected traditional, goal-oriented literary forms. Foucault (1977b), for example, preferring to emphasize the randomness of events, sees history as "haphazard conflicts" without a conclusion. The primary focus of his work is on the *description* of systems of knowledge and power in a given period and their differences from other periods (Foucault, 1970), rather than the *explanation* of change. He rejects the concepts of evolution or dialectical change or any way in which one period's systems of discourse "develop into" those of another period (Major-Poetzl, 1983). In the extreme, such a position maintains that the succession of systems of discourse is unintelligible (Boudon & Bourricaud, 1989): thus this history is more a typology rather than an explanation.

4.3. Critique: Narrative and Management Accounting History

Efficiency explanations of the rise of management accounting are often teleological narratives with an economic flavor, rather than economic theorizing in the strict sense. For example, although Chandler (1962, 1977) provided information of interest to economists, Chandler's own background was in the sociology of organizations more than in economics,

[10]These terms are not usually translated in the English-speaking historical literature. Note also that Braudel's (1972) *longue durée* is perhaps longer than my example here would suggest: it includes factors such as climate and geography.

[11]Some *Annalistes* have seen historical studies not as pure science but as a mixture of science and literary form: the literary element is seen as unavoidable, and perhaps advantageous. LeRoy Ladurie describes history as "a mix of social science on the one hand, and literature, the novel, the cinema, the theatre, and opera on the other" (Bellour and Venault, 1977).

and he rejected economic equilibrium modeling as an explanatory basis for his work (McCraw, 1988). Therefore, in evaluating efficiency explanations, it is relevant to make use of standard historical critiques of narrative and to identify the distinctions between these narrative explanations and more fully developed economic theorizing. Critiques of efficiency narratives come from two sides, which will be considered in turn: first, criticisms based on the typical properties of traditional goal-oriented narratives, and second, economic-model-based criticisms.

The present-oriented, "progressivist" (Dean, 1994) narrative form that is characteristic of the economic-efficiency explanations has been criticized for a potentially misleading degree of selectivity in the choice of what portions of the past to represent and a tendency to carry readers past the gaps in the evidence. Goal-oriented narratives of progress have been described as providing "a more or less closed success story . . . smoothing away all the existing rifts, losses, abortive starts, inconsistencies (Kracauer, 1969)." The more such stories are condensed (as in Johnson & Kaplan, 1987), the more it can leave the casual reader with the impression that management accounting responded smoothly to environmental changes in the more distant past, meeting the information needs of management as those needs arose.

A considerable amount of "noise" is omitted in this story: the numerous firms that might have profited from adopting management accounting innovations but did so only very slowly or not at all, and the active resistance to, or abandonment of, innovations by some firms that had adopted them. For example, Johnson and Kaplan (1987) (following Scott, 1931, and Solomons, 1952) claim that the integration of processes formerly mediated by the market created a need for more detailed internal accounting. Studies such as Pollard (1965) and Garner (1954) provide evidence, however, that the adoption of this accounting at many firms lagged the integration of processes by decades. Owners and managers of early integrated firms complained for many years that they could not get even a rough idea of how much profit they were making (Pollard, 1965). Although record-keeping that allowed tighter control of direct costs was apparently well developed by the middle of the nineteenth century, some reasonably sophisticated and successful firms were still struggling with primitive accounting for direct costs in the early twentieth century (see Wells, 1978, and Levenstein, 1991, for examples). Chandler (1977) and Johnson and Kaplan (1987) use railroads in the mid-nineteenth century as an example of innovative costing, especially Fink's elaborate classification and analysis of costs with different drivers (e.g., volume of freight, number of trains, and length of road). It is easy to take the impression from Chandler (1977, especially p. 120–121) that Fink's kind of analysis became the standard operating procedure for railroads later in the century. However, Chandler offers no specific evidence that this was the case; and Thompson (1989) offers a good deal of evidence that it was not. Thompson (1989) argues that in the late nineteenth and early twentieth centuries, "Railroad entrepreneurs and managers had at best only vague ideas about the consequences of their actions for company profitability."

Even firms that adopted new management techniques sometimes rejected them later. In some cases this was because of active resistance: for example, widespread labor disputes and strikes resulted from the introduction of "scientific management" and standard costing in many firms and, in some industries like autos and tires, led to the curtailment or abandonment of the activities of the industrial engineering departments that were created to implement scientific management (Nelson, 1995). In other cases, innovative and detailed cost reports were dropped or modified more quietly, possibly because management gradually realized that they were not valuable (Yates, 1991).

Historians who disagree with efficiency explanations of the rise of modern management accounting all raise objections to the narrative of progress these explanations provide, but they state their disagreement in somewhat different terms. Chandler (1977) portrays the new management accounting of the nineteenth and early twentieth centuries as the victory of men like Andrew Carnegie, Frederick Taylor, and Alfred Sloan over the problems of coordinating and controlling complex enterprises. In the terms of mid-century historians like the *Annalistes*, however, explanations of this kind are incomplete because they inappropriately reduce a problem of causation to a problem of motivation (Bloch, 1953). Historians influenced by postmodern social theory also regard observed accounting practice as no one's victory: it is an outcome that is "only in part planned, … emerging only partially as the result of intentional and predefined actions… [resulting from] different actors pursuing their interest without full regard for or comprehension of the many forces affecting it (Bhimani, 1993)." Similarly, Miller and Napier (1993), describing the genealogies of management accounting practices like standard costing, identify these practices as "… an assemblage of disparate components that has been put together in piecemeal fashion," as temporary alliances or linkages among interest groups, vocabularies, and ideals moving on different trajectories.

In economists' terms, efficiency explanations are incomplete because they address demand (motivation)

but do not supply issues.[12] Even if it is accepted that there was a demand for efficiency-increasing management accounting techniques in the nineteenth century, the existence of the demand does not insure either *that* the demand will be met or *when* or *how* it will be met. In consequence, motivation or demand explanations are incomplete. Yates (1991) provides a relevant example, agreeing with Chandler (1977) that increased firm complexity created demand for better coordination, but pointing out that it did not necessarily create demand for the *particular* methods of coordination that we see in the late nineteenth-century US. For example, different information-supply conditions, because of different technologies for handling western and Japanese-language documents, led to different solutions for similar problems in the US and Japan. More vertical coordination through written communication was developed in the US. In Japan, in contrast, there was more horizontal coordination through face-to-face meeting because, in the absence of technology like typewriters that could handle Japanese characters, written documentation and communication were more costly (Yates, 1991).

The difference between popular efficiency explanations and full-blown economic theorizing is important, because historians who prefer nonefficiency explanations have sometimes treated the casual economic flavoring of earlier management accounting history as "economics" *per se* and claimed that "economics" has been successfully rejected when in fact only a loosely "economizing" narrative argument has been rejected. For example, in critiquing a set of studies arguing that the "sophisticated" management accounting techniques often thought to date from the later nineteenth century are actually present in English and Welsh firms several decades earlier (e.g., Edwards, 1989; Edwards & Newell, 1991; Fleischman & Parker, 1991; and Jones, 1985), Fleischman et al. (1995) label these studies as instances of "neoclassical economic rationalism," and contrast them with the Foucauldian arguments of Hoskin and Macve (1988) about accounting innovation in the US. However, it is difficult to discern a well-defined economic model underlying these studies, which focus primarily on the existence of particular records or calculations rather than their economic value (see Johnson, 1988, for a critique of Jones). The "neoclassical economic" label seems untenable; and the finding that nineteenth-century British firms' accounting was less innovative than American firms, even though America was an economic backwater relative to Britain, is not precisely a refutation of neoclassical economics, which does not argue that performance measurement arises where national economic growth is greatest.[13]

4.4. Critique: Using Historical Evidence

Various streams of historical research have claimed to arrive at an objective truth about the past. These include the classic event-narratives of Ranke and his followers in the nineteenth century (Iggers and Powell, 1990), some of the earlier *Annales* work (Forster, 1978), and more recently, cliometrics (Fogel, 1983).[14] Other approaches to history have deliberately not made this claim. As noted above, some have described history as a mixture of science and literature: the historian's imagination inevitably imposes form on a preexisting chaos of data (White, 1973) and fills in gaps between the evidence (Bellour & Venault, 1977). Veyne (1984) argues that history can be objective, though not scientific in the sense of testing general laws.

Many postmodernists have altogether rejected the claims of history to be an objectively verifiable reconstruction of the "reality" of the past—a reality with a permanent existence, transcending the changing ways that people think about it. Foucault, for example, doubts that there is such an objective reality (Dean, 1994; Gossman, 1990). In one view, he argued that "truth" is only "a token of the prestige currently enjoyed by this or that privileged discourse…. (there is) no (objective) perspective from which we could criticize or question the discourses currently on offer…" (Norris, 1994). It is not always clear where accounting historians with postmodernist sympathies stand on the philosophical disputes that surround Foucault's work. For example, Miller et al. (1991) state that history is perspectival rather than objective,

[12] Levenstein (1991) observes that demand explanations for changes in accounting techniques are sufficient only if the supply of accounting techniques is stable and perfectly elastic at all times: a somewhat improbable assumption.

[13] Nor does Chandler argue this. Chandler's (1977) argument is not that management accounting innovations arose from a high degree of economic development, but that they arose as a way of solving the problem of coordinating diverse processes within a single organization rather than through the market interface. Such problems may have arisen particularly in the United States *because* it was more economically backward. Because the market network was less dense and efficient in America than in England, bigger savings were available from replacing the (costly) market interface with administrative coordination if the latter could be made to work.

[14] Novick (1988) provides an important account of the ideal of objectivity among historians in America.

but they do not indicate whether all perspectives on management accounting history are to be regarded as equal.

Most historians would agree, however, on the benefits of being conscious of the difference of past from present and not reading historical sources in a naively presentist way. Most agree that context matters to meaning and that explicit discussion of the character of the sources and the "circumstances in which (the) evidence came to be born" is a primary task in historical research (Elton, 1983: p. 88; see also Cipolla, 1991). Historians who intend to be objective have additional explicit concerns about the completeness of the evidence they gather and the correctness of its interpretation. Historical sources of evidence typically present greater problems of interpretation than present-day sources because researchers are less thoroughly familiar with the context of the periods they study than with that of their own times.

The problems of evidence present themselves somewhat differently, depending on the type of history being pursued. For traditional event-focused narratives, the important thing is to establish the details of an event "as it actually happened."[15] In this view, the date on which a key event occurred or the identity of the participants are facts that can be objectively established, at least in principle. Contemporary witnesses often give contradictory reports on these subjects; and it is then the historian's task to decide which report is more plausible. Statistical analysis is not necessarily helpful at this point: background inquiries about the witnesses' knowledge, their motivation to lie, and the consistency of their account with already well-established facts are more important tools. The task was frequently compared to that of lawyers and judges examining witnesses in court (Bloch, 1953; Fogel, 1983; comments by Duby in Bellour & Venault, 1977).

The problems of dealing with historical data were seen in somewhat different terms as historians moved away from *histoire événementielle* toward examination of socioeconomic structures and the structures of knowledge. A key problem, central to much of the *Annales* research, is that the terminology describing economic and social institutions and ways of thinking is both approximate and unstable. It is relatively easy to describe a fact, an *événement*—for example, who holds the office of president of a firm (or country)—and the description is unlikely to be misunderstood. Describing what power the president actually has is likely to be much more problematic. Bloch (1953: p. 167) pointed out that terminology used for describing fluid social realities often suffers from either ambiguity or false precision. Moreover, the terminology in documents does not always change when the reality changes, and the reality does not always change when the terminology does (Bloch, 1953: p. 34, 160).

Another potential source of distortion is failure to understand the genres and conventions that govern the production of historical documents. Without this understanding, it is possible to mistake a piece of boilerplate for sincere personal opinion, to read as factual description what was meant as irony, or to fail to read between the lines in the way that the document's original readers would have done (see examples in Gutman, 1975). Genre and convention are particularly important in interpreting what documents do *not* say. Is a particular event or characteristic (for example, a particular manager's role in decision making) not mentioned because it did not exist, or because its existence was so well known that there was no need to mention it? It is often easy but inappropriate to read present conventions back into past documents: "Historiography is an unceasing struggle against our tendency to anachronistic misinterpretation (Veyne, 1984: p. 138)."[16]

Management accounting history in general has displayed limited sensitivity to the problems of historical evidence. The use of historical sources in efficiency-based explanations of the rise of management accounting has been criticized on two grounds: first, the absence of quantitative evidence to support arguments that are essentially quantitative; and second, the absence of explicit source criticism in the use of qualitative evidence. These same grounds are often valid bases for a critique of nonefficiency explanations as well.

Weis (1978), in a review of Chandler (1977), noted the virtually complete absence of data that would allow readers to judge how much of an economic impact "improved" management techniques had in the late nineteenth and early twentieth centuries. Economic growth during the period was substantial, but it could in principle have resulted almost entirely from changes in demography, production technology, etc., rather than from organizational improvements. The same arguments can be made for firm-level as for

[15] *Wie es eigentlich gewesen*, in Ranke's famous statement of the goal of historical research (see Iggers and Powell, 1990).

[16] See Tosh (2000) for a current discussion of historical methods, and Previts and Robinson (1996) and Previts et al. (1996a,b) for more details on particular historical research techniques relevant to accounting.

economy-level evidence. Chandler (1977) (followed by Johnson & Kaplan, 1987) sometimes cites increases in profits at firms that employed the new techniques; but there is no attempt to determine how much of the profit increase was due to transaction-cost reductions and how much due to increased demand for the firm's products, monopoly power in the market, changes in material input prices, wealth transfers from employees, economies of scale, or new production technology. Chandler's (1977) suggestions of serious planning, coordination, and enforcement problems in loosely organized large firms seem plausible, but clear measures of these transaction costs or the changes in them due to accounting changes are virtually absent.

The absence of specific evidence on how new management accounting information changed business decisions is striking. Too often researchers describe the accounting information and then say it was "surely" used (Chandler, 1977: p. 74) or "could have been" or "may have been" used (e.g., Tyson, 1988) to make more profitable decisions. In some cases, it is shown that owners and managers took a strong interest in cost data; but to show their interest is not the same as to show how the decisions they made with this information differed from the decisions they would have made without it. In other cases, it is shown that decisions depended on cost data, but we do not know whether these were more profitable decisions than would have been made without the data (e.g., Edwards, 1989, and Fleischman & Parker, 1991). An unsupported leap often seems to be made from the fact that accounting information existed to the supposition that it was a key support of optimal decisions. For example, Johnson (1991) claims that the detailed direct costing information in nineteenth-century textile mills focused managers' attention "not only on costs, but also on schedules, inventory levels, safety and employee conditions, and mill productivity." Tufano (1991), commenting on this claim, points out that we do not know how this happened; and more than detailed cost data is needed to achieve these goals.

> Without a better appreciation for how early incentive systems worked, it is impossible to ascertain the impact the quality of data had upon the decision-making process.…People facing multiple objectives must make tradeoffs among conflicting goals. They are guided explicitly by orders from top management, or implicitly through compensation, hiring/firing, or investment decisions made by firms. Johnson's historical evidence tantalizes us by suggesting that managers were instructed to address a wide range of concerns, but stop short of telling us how they made decisions.

Quantitative evidence that would document claims of the link between new accounting and increased profits is probably limited and difficult to interpret. More explicit, in-depth discussions of the extent of the evidence and the problems of interpreting it would be beneficial; and the same can be said of the qualitative evidence used in efficiency explanations of the rise of management accounting. There is very little explicit discussion of the characteristics and limitations of the documents employed; "presentizing" assumptions fill in where evidence is missing; and the principle of selection driving these narratives of progress results in biased selection of evidence.[17] For example, questions of the motivation and knowledgeability of witnesses, of what is boilerplate and what is original observation in the documents, or of what is likely to be unstated in a particular kind of document, are not addressed. One of the apparently important pieces of evidence for Andrew Carnegie's use of cost data in both Chandler (1977) and Johnson & Kaplan (1987) is a Carnegie manager's memoir written some 20 years after the fact and subtitled *A Romance of Millions*. There is no discussion of whether this memoir's rather dramatic assertions about the effectiveness of the cost sheets should be taken at face value. Similarly, the writings of "scientific management" advocates, explaining the efficiency gains their methods yielded, are sometimes quoted at face value, without regard for the fact that the writers were consultants who used their writings to generate business for themselves (Nelson, 1995).

Similar problems arise in some efficiency-based studies that have challenged Chandler (1977) and Johnson & Kaplan (1987), arguing for an eighteenth-century British rather than a nineteenth-century American origin for modern management accounting (e.g., Edwards, 1989; Edwards & Newell, 1991; Fleischman & Parker, 1991; and Jones, 1985). Cost records and cost calculations are called "sophisticated" in these studies and given modern labels (standard costing, return on investment, and responsibility management) with little explicit consideration of what the data meant to contemporaries and where they came from, that is, whether they resulted from

[17] Chandler (1990) uses a much more systematic selection of evidence to address some of the issues raised originally in Chandler (1977) about the growth of large firms; but management accounting plays a much less prominent role in Chandler (1990).

accurate contemporary observation, memory, reasonable estimation, or pure arbitrariness.[18]

The treatment of source documents in postmodernist management accounting history is mixed. Fleischman et al. (1995), for example, include a careful discussion of the accounting records they employ. Some other studies include little explicit discussion of source material, of the kind that many historians regard as fundamental (e.g., Cipolla, 1991; Elton, 1983; and Gutman, 1975). They do not report what sources are available for the period or issue under discussion, or why a particular subset of these sources was selected for use, or what the context and the genre of the documents tell about how they were read at the time and about how present-day historians should read them. Bhimani (1994), for example, discussing the increasing sensitization of mineworkers to economic incentives in nineteenth-century France, quotes several contemporary managers on the value of individual monetary incentives for increasing productivity. In these quotations, managers maintained that they not only had to offer performance-based pay, but they also had to take vigorous action to make it attractive; workers would not be adequately motivated by additional pay unless the firm took steps to educate and socialize them appropriately. Questions historians might ask of these sources include: What are the limitations of using managers' observations as evidence of "workers' subjectivity"? How well-informed were the individuals who are quoted, and what were their ideological biases? Who was the intended audience and what was the specific purpose of the documents quoted? When managers say they succeeded in making the workers docile and productive, might this be self-congratulation for an achievement that was not as great as the writers claimed, or may not have occurred for the reasons they claimed? The writers emphasize their own (apparently benevolent) role in creating industrial discipline through education, incentives, and information on individual performance. This is consistent with Foucault's representation of disciplinary power, but it may understate the role of coercion through market forces (did alternative employment opportunities change during this period?) and police actions by the state in suppressing repeated outbreaks of violence by workers during the period.

[18]See Pollard (1965) for examples of fanciful overhead costing, and Fleischman et al. (1995) for a careful treatment of the data that revise some of Fleischman and Parker's (1991) conclusions. However, McKendrick (1970), in a counter-example to Pollard, is able to show in some detail how costs were calculated and used in business decisions by Josiah Wedgwood.

In summary, attempts to argue either for or against economic-efficiency explanations provide little quantitative evidence to support this point, and in most cases the qualitative evidence has not been deeply interrogated. The challenges of discovering how people actually produced and used management accounting in the past should not be underestimated; but neither should they be unacknowledged or assumed away. A more explicit and extensive engagement with the problems of the historical source material is likely to benefit future research on the history of management accounting.

5. Conclusion

Management accounting history has undergone major changes in the last half-century, which have brought it more into the mainstream of historical discourse. In the mid-twentieth-century histories of management accounting (e.g., Garner, 1954; and Solomons, 1952), the focus is on accounting almost in isolation. Solomons (1952: p. 18) suggests that the rise of management accounting "had much to do with" the increasing scale and complexity of business, but exactly *what* it had to do with these factors remains unspecified. The efficiency explanations synthesized by Chandler (1962, 1977, 1990) provide a much better-specified version of this argument, calling attention to the importance of technological change, market size, and the resulting specific coordination problems of large organizations.

Efficiency explanations are arguably incomplete in their underemphasis on conflict over the distribution of economic surplus, the rise of calculative mentalities, and "supply side" economic issues. In efficiency explanations, owners, managers, and consultants appear to identify and solve management problems almost entirely in the context of their own firms. Government, the press, and the broader movements of ideas at the time play little role. Nonefficiency explanations, in contrast (e.g., Bhimani, 1993; Hoskin & Macve, 1988; Loft, 1986; and Miller, 1991) emphasize that accountants and other managers did not create new performance measurements in an intellectual vacuum. Control through measuring individual performance and analyzing it by comparison with norms or standards was developed in governmental institutions such as state monopolies and the military (Carmona, Ezzamel and Gutierrez, 1997; Hoskin & Macve, 1988) and offices that collected national health statistics (Hacking, 1990) before it was common in firms; and it is sometimes possible to trace the transmission of these techniques from government to private industry (Hoskin & Macve, 1988). Development of new performance measures in both public and private sectors was

intertwined with the emergence of the modern social sciences in the nineteenth century, with their ideas of norms of human performance, record-keeping on individuals, and control through observation and analysis (Miller & O'Leary, 1987). Without this broader movement in the intellectual currents of the time, it is questionable whether owners and managers of firms would have adopted new organizational practices as they did.

In recent years, economic historians have also called for attention to a broader cultural context in the practice of economic history (e.g., Cipolla, 1991; Greif, 1997; and Solow, 1986). In some cases, these historians have also argued against efficiency explanations by emphasizing the importance of random and unique past events in determining the prevalence of current technologies (path-dependent change or "historical lock-in," theories; David, 1986 and Arthur, 1994). These studies are grounded in a methodological standpoint that is different from the postmodernists'—more convinced of the possibility of objectivity, more concerned with predictive generalizations—but also substantially different from prior economic historians, whether Marxists, *Annalistes*, or cliometricians. The influence of this "new economic history" on management accounting history remains to be seen.

Whatever questions future management accounting historians ask, and whatever approach they take to answering these questions, their research can benefit from explicit attention to the nature and limitations of the source material employed, following the model of mainstream history (e.g., Bloch, 1953; Cipolla, 1991; Elton, 1983; and Gutman, 1975). High-quality historical research avoids anachronistic readings and gives full weight to the absences and ambiguities in information provided. A thorough knowledge of the social context of source documents and the contemporary conventions of language and genre is needed to make a reasonable estimate of what historical documents convey.

History suggests that management accounting practice is swept by periodic waves of enthusiasm for particular topics and techniques—for standard costing and scientific management, for participative budgeting, accounting-performance-based compensation, or refinements of overhead allocation (See, for example Blinder, 1990, on the historic ups and downs of performance-based compensation systems.) The long-term perspective provided by well-conducted historical research can help us to understand how these waves of change advance (and recede) through the economy and thus how management accounting practice takes the form we observe at any given point in time, including the present.

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Management Accounting and Sociology

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Abstract: After a long period of neglect, the roles of accounting in shaping the economy are currently being rediscovered by sociologists (Callon, 1998; Fligstein, 1990; Granovetter, 1985). This neglect is curious, in so far as accounting was accorded a pivotal role at the outset of the sociological enterprise. The writings of Weber in particular placed accounting at the heart of 'rational' capitalistic economic activity. Yet the initial and bold pronouncements concerning accounting that played an important role in shaping the sociological imagination at the beginning of the twentieth century were followed by virtual silence on the part of sociologists for approximately half a century. This chapter reviews the different ways in which accounting has been given a wider sociological significance across the twentieth century. The first section considers briefly the work of Max Weber in the early twentieth century, and the link established in his writings between accounting and rationalisation. The next section considers a subsequent stage, with a markedly different focus, namely the emergence of a substantial literature on budgeting in the 1950s and 1960s. The following section examines a further stage, characterised by the elaboration of a range of methodologies from approximately 1980 onwards that had as their concern to analyse the social and organisational aspects of accounting. The final section considers one particular strand of the recent economic sociology literature, that which concerns the calculative capacities of agents and their embeddedness in social networks. A concluding section summarises the paper and offers some suggestions for ways of building on the links between management accounting research and sociology.

1. Introduction

After a long period of neglect, the roles of accounting in shaping the economy are currently being rediscovered by sociologists (Callon, 1998; Fligstein, 1990; Granovetter, 1985). This neglect is curious, in so far as accounting was accorded a pivotal role at the outset of the sociological enterprise. The writings of Weber placed accounting at the heart of 'rational' capitalistic economic activity, while those of Marx accorded accounting a central role in the development and reproduction of capitalist social relations. Yet the initial and bold pronouncements concerning accounting that played an important role in shaping the sociological imagination at the end of the nineteenth and the beginning of the twentieth century were followed by virtual silence on the part of sociologists for approximately half a century. It was not until the 1950s that the interest of social scientists in accounting resurfaced,[1] to be followed in the 1960s by the burgeoning of 'behavioural accounting'. It was only in 1976 that accounting at last had a journal—*Accounting, Organizations and Society*—dedicated to exploring its organisational and sociological dimensions.

This chapter reviews the different ways in which accounting has been given a wider sociological significance across the twentieth century. The first section considers briefly the work of Max Weber in the early twentieth century, and the link established in his writings between accounting and rationalisation. The next section considers a subsequent stage, with a markedly different focus, namely the emergence of a substantial literature on budgeting in the 1950s and 1960s. Heavily influenced by theories of group dynamics, this literature focussed primarily on management accounting in an intra-organisational setting. The following

[1]See, for instance, Argyris (1952) and Dalton (1959)

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section examines a further stage, characterised by the elaboration of a range of methodologies from approximately 1980 onwards that had as their concern to analyse the social and organisational aspects of accounting. The methodologies developed and applied here included those that focus on the institutional environments of accounting, the political economy of accounting, ethnographic approaches and a concern with the networks within which accounting is embedded. The final section considers one particular strand of the recent economic sociology literature, that which concerns the calculative capacities of agents and their embeddedness in social networks. A concluding section summarises the paper and offers some suggestions for ways of building on the links between management accounting research and sociology.

2. Accounting and Rationalisation

Max Weber, writing in the first two decades of the twentieth century, considered accounting to be at the heart of the rationalisation of society under capitalism. Weber rejected the idea that capitalism was a matter of greed or acquisitiveness. Instead, he argued, capitalism should be understood as the continuous pursuit of profit by means of 'rational, capitalistic enterprise' (Weber, 1930, p. 17). Economic action, according to Weber, is capitalistic in so far as it depends on an expectation of profit through the utilization of opportunities for exchange. And this 'rational' pursuit of profit required as its counterpart calculations in terms of capital. The modern, rational organisation of capitalistic enterprise would not have been possible, Weber argued, without the calculative practice of bookkeeping.

Rationalisation provided the overall theme for Weber's sociological project. This multidimensional rationalisation of the conduct of life was termed *Lebensfuhrung*. Weber was concerned with the conditions that gave rise to and enabled the spread of the 'specifically modern calculating attitude' (Weber, 1978, p. 86). Accounting, in the sense of both budgetary management and capital accounting, was central to his analysis of the sociological conditions of economic activity. He argued that money is 'the most ''perfect'' means of economic calculation' (Weber, 1978, p. 86), that is, 'formally the most rational means of orienting economic activity' (Weber, 1978, p. 86). Calculation in terms of money, rather than its actual use, was the mechanism by which rational economic provision could be conducted, and capital accounting was the form of monetary accounting peculiar to rational economic profit-making.

Weber defined an economic enterprise as 'autonomous action capable of orientation to capital accounting' (Weber, 1978, p. 91), and stated that 'this orientation takes place by means of ''calculation''' (Weber, 1978, p. 91). To this extent, he placed a concern with calculation at the heart of a sociological analysis of economic activity. Calculation was the crucial mediating machine, located mid-way between rational profit-making enterprises and the opportunities available to them. Double-entry bookkeeping, according to Weber, was 'the most highly developed' (Weber, 1978, p. 92) form of bookkeeping, in so far as it permits 'a check in the technically most perfect manner on the profitability of each individual step or measure' (Weber, 1978, p. 93).

Weber's arguments were complemented by those of Sombart who put forward a similar albeit stronger argument concerning the relationship between double-entry bookkeeping and capitalism. Sombart argued not only that rational calculation was important to the capitalist enterprise, but also went so far as to speculate whether it was double-entry bookkeeping that had given rise to capitalism. The plausibility of this proposition is less important than the pivotal role and sociological significance it gave to economic calculation. It accorded economic calculation a central and formative role in economic activity, rather than a subsidiary role. Together with the arguments of Weber, Sombart helped establish a link between accounting and sociology that has continued to the current day. Accounting was identified as a proper object of sociological analysis.

Prior to Weber, Marx had also signalled the importance of the relationship between accounting or bookkeeping and capitalism. In an oblique reference to the imaginary world of political economy, Marx remarked in Volume I of *Capital* that one of the first tasks of Robinson Crusoe on his desert island is to keep a set of books (Marx, 1974a, p. 81). In Volume II of *Capital*, where Marx deals with the costs of circulation, namely those associated with the transformations of the forms of capital from commodities into money, and from money into commodities, he addresses the issue of the labour-time expended in bookkeeping. A part of the variable capital has to be used, he argued, to ensure that the process of circulation can continue. Bookkeeping is depicted as a deduction from the productive process, albeit an essential part of the circulation process. The machinery of the office, which includes labour power, thus mirrors the movement of value through the productive process (Marx, 1974b, p. 136). In so far as capital seeks its own reproduction, this deduction from what Marx regarded as the real process of production is an essential part of the capitalistic process. And as the production process becomes ever more social in

character, and loses its individual character, bookkeeping becomes ever more necessary.

Marx did not accord accounting as central a role as did Weber. Nonetheless, when placed in the context of a theory of value and the concept of mode of production, Marx gave accounting an important place alongside other political interventions in the relations of production. In Marx's writings, accounting is accorded a macro-structural role, both shaping and reproducing the nature of capitalist relations of production. To this extent, Marx and Weber occupy a similar terrain. For both, accounting helps define the social and economic relations that define a society. Thus did the interrelation between accounting and sociology commence. However, little was to be made of these beginnings until the 1950s and 1960s when 'behavioural accounting' began to emerge.

3. Management Accounting, Sociology and the Analysis of Groups

Following the writings of Weber and Sombart, there was little or no interaction between the disciplines of accounting and sociology until the 1950s. When a sociological concern with accounting did resurface in the 1950s, the focus had shifted from a macro-level concern with processes of rationalisation and accumulation to a more micro-level concern with groups, group dynamics and the role of accounting in them. One can mark the shift by reference to Argyris' (1952) seminal paper on the impact of budgets on people. Argyris examined what 'budget people' think of budgets and how factory supervisors think differently about budgets. He combined a study of accounting practices with a sociological concern with groups. Rather than taking groups as given and self-evident, he described the interaction between people and budgets as one of the *creation* of groups. If management puts increased pressure on individuals, he argued, groups are likely to form. These groups can in turn help absorb the increased pressures placed by management on individuals. Once formed, such groups can persist even after the initial pressure to produce them has disappeared.

In proposing that the interaction of people and accounting practices be understood in this way, Argyris was drawing on two decades of research in sociology that had substantially re-focussed the discipline since the late nineteenth and early twentieth century. From 1930 onwards, groups and their dynamics became a major preoccupation for social scientists. The boundaries between social psychology and sociology became blurred, and social scientists found groups everywhere. The character of Elton Mayo is central to this change in ways of analysing the relational life of the enterprise. The studies conducted under his supervision at the Western Electric Company's Hawthorne Works in Chicago between 1927 and 1932 illustrate the transformation. These studies had a clear conclusion: the dynamics of groups explain changes in industrial output more successfully than changes in the physical environment. Further, the relations among individuals, and between an individual and his or her work, should no longer be considered explicable in terms of a bundle of physiological attributes. The enterprise can be viewed as a social system, and interpersonal relations and group dynamics are at the heart of this social system.

A number of other influential administrative theorists endorsed and extended this sociological analysis of groups and their importance within the firm. As early as 1918, Mary Parker Follett had sought to sketch out a role for the modern corporation within a democratic polity, arguing that the modern corporation should be the principal arena within which a group ideal of democracy could be realised (Follett, 1918). Her position was simple: There is neither individual nor society, but 'only the group and the group-unit—the social individual' (Follett, 1918, p. 21). Two decades later, Chester Barnard remarked that 'the most usual conception of an organisation is that of a *group* of persons…' (Barnard, 1938, p. 68). He argued that the 'system of interactions' is the basis of the group, and that formal organisation should be regarded as 'a system of consciously coordinated activities or forces of two or more persons' (Barnard, 1938, p. 73). World War II and its immediate aftermath provided a 'laboratory' in which group relations could be studied in their depths and details (Miller, 1986).

In the 1950s and 1960s, the concept of the group became a central preoccupation for the rapidly expanding discipline of sociology. Sociologist Homans (1951) was the first to attempt a theoretical synthesis based on the concept of the group. A range of influences as diverse as Freudian theory, Kurt Lewin's social psychology and the sociometry of Moreno fuelled the growing interest in the study of the small group. The contribution of Homans was to attempt to draw these diverse strands together and to work towards a general sociological theory that would make the group the starting point for the study of social relations.

Alongside the theoretical synthesis being attempted by Homans, sociologists were busy examining issues such as absenteeism, staff turnover, morale, productivity and industrial conflict as problems of group relations. A 'wildcat strike' was analysed by

Gouldner (1954) in terms of a 'general theory of group tensions'. The interrelations between individuals, or 'inter-relatedness' as he described it, was the focus for Gouldner's concerns. The painting of toys in an assembly line situation could just as readily be understood in terms of group dynamics and intergroup relations, as Strauss (1955) demonstrated. Strauss depicted the factory as a social system made up of mutually dependent parts; and Dalton (1959) proposed that cliques, small groups of persons with a common interest, could be the indispensable mechanisms for promoting, stabilising and resisting change.

This line of reasoning was reinforced by a number of writers on the other side of the Atlantic. Bion (1946) coined the idea of the 'leaderless group' as a way of analysing the location of the individual within a complex of interpersonal relations. Jaques (1951) depicted industrial conflicts between managers and workers as manifestations of underlying problems of group relations. In place of an industrial relations model of bargaining, he proposed a psychotherapeutic one that he termed 'working through'. And even accidents at work came to be defined as matters of group relations. Rather than viewing accidents in terms of a dangerous physical environment to which individuals were exposed, they were understood in terms of legitimate forms of withdrawal from the work situation.

'Behavioural accounting' is the label used to describe the wave of studies that appeared from the late 1950s onwards, and which built on these developments in the sociological analysis of groups. Located at the point of intersection of sociology and accounting, behavioural accounting examined in differing ways the interrelations between accounting and group relations. In an early paper directed more towards sociologists than accountants, Dalton (1959) showed how pressure to meet cost targets, when combined with reward schemes based on success in meeting such targets, can result in the distortion of records. Drawing on theories of decision-making (March & Simon, 1958) and the ideas of 'human relations' writers such as McGregor (1960), Likert (1961) and Herzberg (1968), behavioural accounting consolidated the focus on group relations within organisations.

The organisational and behavioural aspects of budgeting became a central preoccupation of researchers across the 1960s and early 1970s. Becker & Green (1962) extended the concerns of Argyris with the group dynamics of budgeting processes. They examined the interrelations between the cohesiveness of work groups and the acceptance of budget goals, and the impact of this interrelation on outcomes. A highly cohesive work group with a positive attitude towards the budget goal would be likely to yield maximum output, while a similarly cohesive work group with a negative attitude towards the budget goal would result in a slowdown of production. As with Argyris' study, group process and dynamics appears to be the key factor in explaining the budget process. Hofstede went one step further by depicting the budgetary process as a game that people play for their own sake. Although Hofstede found some evidence that participation in the budgetary process was positively associated with motivation to meet budget targets, the results were mixed. Participation appeared to be a necessary but not sufficient condition for high budget motivation. Target levels needed to be realistic, and the attitudes of senior managers was also important. The key ingredient, however, was identified by Hofstede as the 'game spirit' with which managers entered the 'budget game'.

This line of reasoning was extended significantly by Hopwood (1974), who drew explicitly on sociological and administrative theories of groups and organisations. He problematised the link between participation and budgeting, arguing that participation can mean almost anything to anyone and adding that much of the debate had turned inquiry into dogma. Hopwood re-focussed the debate by identifying three distinct ways of using budgetary information in the evaluation of managerial performance. He identified a 'budget constrained' style, a 'profit conscious' style and a 'non-accounting' style. Empirical evidence indicated that both the 'budget constrained' and 'profit conscious' styles of evaluation resulted in a higher degree of involvement with costs than the 'non-accounting' style. Only the 'profit conscious' style, however, succeeded in achieving this involvement without defensive behaviour or undue tension and worry on the part of the managers in charge of the cost centres. The 'budget constrained' style often resulted in manipulation of accounting reports, incorrect charging to budgets, delays in carrying out repairs until the money was available in the budget and a general deterioration in the relationships between managers and those to whom they reported.

Two decades of research into the behavioural aspects of budgeting and related evaluation mechanisms transformed the discipline of accounting. In the process, the interrelation between accounting and sociology was altered permanently. Accounting was no longer to be perceived as a purely technical process, but was to be viewed as organisational and behavioural. What this meant, however, was soon to change in line with developments in sociology and the wider social science environment.

4. Accounting as an Organisational and Social Practice

If behavioural accounting was firmly established by the mid-1970s as a way of posing sociological questions about accounting practices, its focus was almost exclusively focused on processes that occurred within organisations. The agenda outlined by those such as Weber, Sombart and Marx, and that sought to analyse the interrelations between large-scale social change and accounting change, had been almost entirely supplanted by a concern with groups and group dynamics.

The need to remedy this by reinstating the macro-level analysis of accounting was set out clearly by Hopwood (1974). He argued that the processes by which groups influence and control the accounting function within organisations are matched by pressures arising in the wider social and economic environment. To the extent that much contemporary accounting reflects the ethos of capitalism, so too would one expect the forms and philosophies of accounting to change in line with changes in the social and political environment. He reinforced this point in 1976 in an editorial in the first edition of *Accounting, Organizations and Society*. He spoke there of an 'urgent need for research which can provide a basis for seeing accounting as both a social and organisational phenomenon' (Hopwood, 1976, p. 3), arguing that studies of power, influence and control should complement studies of the behavioural aspects of accounting within organisations.

It was to be a few more years, however, before things began to change. In 1978, Hopwood could still comment that there had been little research that addressed the wider social and political influences on accounting. The more micro-level focus characteristic of the North American research tradition continued to dominate, in contrast to the more macro-European approaches focusing on questions of organisational sociology and the broader structural and environmental influences.

Even as late as 1980, a sociological analysis of accounting that could blend successfully micro-level and macro-level concerns remained largely an aspiration. Indeed, it was not even clear what concepts and issues would guide such a research agenda. Some suggestions, however, were put forward in 1980 in an influential paper that sought to identify the roles of accounting in organisations and society (Burchell et al., 1980). A wide range of hitherto neglected issues should, it was argued, be brought within the purview of accounting researchers, and the basic premise on which accounting was analysed should change. Rather than seeing the technical dimensions of accounting as independent of the social dynamics, they should be seen as interrelated. Just as Argyris had argued that accounting practices can create groups, so too it was argued can accounting create other social forms. The role of accounting in creating organisational visibility, in creating particular patterns of organisational and social management, and in creating structures of power needed to be addressed. The analysis of accounting within organisations should be connected explicitly with the analysis of more general forms of economic and social management. Accounting should, that is to say, no longer be conceived as a purely organisational phenomenon. The earlier tradition of sociological enquiry concerning accounting, as embodied in the writings of Marx and Weber, was appealed to as having identified issues worthy of systematic study. Processes of rationalisation should be addressed, as should the mythical, symbolic and ritualistic roles of accounting. Studies of the organisational roles of accounting should be complemented by studies of the societal roles of accounting.

From 1980 onwards, things began to change. The range of methodologies drawn upon by researchers broadened, as did the focus. Institutional structures and processes, and their interrelations with accounting practices, were given increasing attention. Across the following two decades, the interactions between sociology and accounting altered. The sociological analysis of accounting came to be located more within the discipline of accounting, and in the process the concepts used and the definition of the object of attention itself altered. No longer was it simply a matter of applying pregiven sociological concepts to accounting. Rather, the concepts themselves were developed in close connection to the calculative practices of accounting. The discipline of accounting became more reflective, and itself contributed to the wider development of the social sciences.

Four strands of research contributed to this expansion of the domain of accounting research: first, a concern with the *institutional environments* of accounting; second, a *political economy* of accounting; third, an *ethnography* of accounting and fourth, the study of the *networks* within which accounting is embedded.

The ground was already laid within sociology and organisation theory for the analysis of the institutional environments of accounting. In the late 1970s, the study of the institutionalised 'myth structure' (Meyer & Rowan, 1977) of rationalised societies had emerged. Meyer and Rowan argued that prevailing theories neglected a concern with the legitimacy of rationalised formal structures, as distinct from day-to-day work activities. In so far as rationalised and

impersonal prescriptions attribute a social purpose to technical activity, and specify the appropriate manner in which to pursue this activity, these rationalised prescriptions were worthy of study in their own right. Terming such prescriptions 'myths', their importance stems from the extent to which they become institutionalised, that is to say taken-for-granted ways of achieving organisational ends. Such myths, Meyer and Rowan argued, become binding on particular organisations and shape the development of organisations and societies.

The myths of the accountants thus took their place alongside those of doctors, lawyers and others. Whether it was a matter of a particular category of cost or the broader ceremonial role attributed to financial values in a rationalised society, myths, organisations and rationalisation were to be linked. Echoing some of Max Weber's formulations, formal organisations were depicted as being driven to adopt practices and procedures defined as rational. The conventions of modern accounting, the vocabularies of personnel experts and the labels of the organisation chart are mechanisms by which organisations come to be linked to their institutional environments. To the extent that organisations incorporate practices defined as rational within their institutional environment, it was argued that they increase their legitimacy and survival prospects. The rules embodied in such practices then become binding on the organisation. The formal structures of organisations thus come to reflect the myths of the institutional environment, rather than the demands of the work activities of the organisation.

Viewed in institutional terms, accounting is understood as one of the mechanisms through which organisations come to incorporate rational conceptions of ways of organising. Accounting is just one of many such practices in contemporary societies, albeit a highly significant one in a number of contemporary western societies. It provides a set of techniques for organising and monitoring activities, and a language with which to define and delineate organisational goals, procedures and policies. Accounting performs a ceremonial function that helps legitimate an organisation among its 'users', whether these be participants within the organisations, stockholders, the public or regulatory bodies such as the Securities Exchange Commission. Instead of presuming only efficiency effects, the adoption and diffusion of particular accounting practices can be studied with regard to their roles as rational institutional myths. At a societal level, one can study how the amount of accounting done in a particular society or organisation is determined by its environment, rather than by the intrinsically necessary technical work processes.

A major new research agenda was opened up by this focus on the institutional environments of accounting. The links between an organisation and its environment were accorded a central place in the analysis of accounting. Researchers within accounting were encouraged to look beyond the organisation and to see changes within the organisation as dynamically linked with changes in the wider environment. Accounting lost some of its apparent uniqueness in this view, and became part of the cultural apparatus of a society. Budgetary practices within an organisation were no longer viewed as a matter only of group dynamics and games among the participants. They could be viewed in terms of the articulation, enforcement and modification of societal expectations of acceptable budgetary practices during a period of organisational decline (Covaleski & Dirsmith, 1988). Questions such as how this occurred, to what purpose, and from whom and where such expectations arose could be directed to a range of actors beyond the organisation. The increasing dominance of finance personnel in the control of large corporations could be explained by pointing at changes in the strategy and structure of organisations, changes in anti-trust laws and the mimicking of firms in similar environments (Fligstein, 1990). A shift in intra-organisational power relations is viewed as a result of events within the organisational environment, and as a result of the way in which key actors within organisations define their problems. A range of further studies drew more loosely on the institutional perspective (Ansari & Euske, 1987; Berry et al., 1985; Espeland & Hirsch, 1990), and demonstrated the importance of linking changes in accounting practices within an organisation to the demands and expectations of the institutional environment.

A *political economy* of accounting also drew attention to the importance of addressing the macro-environment within which organisations exist, and did so in ways that drew upon and extended the writings of Marx and later writers. Political economy writers emphasised the conflicting political and economic interests at stake in accounting, and the importance of addressing such interests both within and beyond the organisation. They placed particular emphasis on the ways in which power relations, which are historically specific, are shaped by and in turn shape accounting practices. The image of accounting as a technically neutral and objective practice was rebutted sharply by political economy writers. Accounting was viewed instead as a partial and interested language and practice, one that represents and reinforces the interests of particular occupational groups and classes.

The scene had been set for a renewal of interest in political economy issues by the publication of *Labor and Monopoly Capital* (Braverman, 1974). This was an intellectual call to arms to those interested in understanding changes in the productive process and in the occupational structure of the workforce that had occurred across the past century. For, as Braverman stated, little had been added by political economy writers to the analysis of such issues since Marx's death. Braverman pointed particularly to the emergence of a new stratum of clerical workers in monopoly capitalism, and emphasised that although clerical workers had existed in the nineteenth century, this new stratum was fundamentally different both in terms of social status and their role within the productive process. He vividly charted the growth of a new class of worker whose sole task, he argued, was the increasingly complex one of representing value in monopoly capitalism. He argued that entire new industries had emerged, such as banking and insurance, in which 'the productive processes of society disappear into a stream of paper' (Braverman, 1974, p. 301). Monopoly capitalism, according to Braverman, devotes ever more resources to accounting for value, to the point at which the labour expended on such processes begins to approach or even exceed the labour used in producing the underlying commodity or service. The growth in the amount of accounting carried out in monopoly capitalism, according to Braverman, is not just a function of increasing complexity. It is a matter also of trust or the lack of it. A presumption of dishonesty, 'the first principle of modern accounting' (Braverman, 1974, p. 303), gives rise to the immense duplication that is at the heart of double-entry bookkeeping. And if distrust is the norm, then auditing, cast by Braverman with deliberate irony as a 'profession of honesty', is called forth to certify to outside parties the truth of the financial records. Out of all these differing demands, Braverman argued, emerges a vast paper empire which appears as real as the physical world, and which comes increasingly to dominate it.

Within accounting, a number of writers developed and extended the political economy approach, albeit with differing emphases. The changing form and content of *Annual Reports* were linked to changing strategies of capital accumulation (Neimark, 1992; Neimark & Tinker, 1986). A 'social critique of accounting' was proposed, coupled with a proposal for an 'emancipatory accounting' (Tinker, 1985, p. 201). Other writers in the same tradition drew less directly from the writings of Marx and more from recent political economy approaches. Variations in modes of regulation of accounting practices were linked to variation in the institutional and political structures between countries (Puxty et al., 1987). The roles of accounting in industrial relations and wage determination negotiations were addressed (Bougen, 1989; Bougen et al., 1990). The dominance of accounting controls over the labour process in the UK were explained by reference to the 'collective mobility project' of the accounting profession in the UK, and the dominant position it has achieved within the 'economic functions' of the global function of capital (Armstrong, 1985, 1987). And the differential spread in the US and the UK of practices such as standard costing, budgeting and performance reports were examined using a historical-comparative method. A number of further studies were conducted drawing broadly on the principles and concepts of political economy. The interaction between state actions and the distributional consequences of accounting policies were examined (Arnold, 1991), as were the links between cost accounting techniques and attempts to control the labour process. More recently, the importance of using concepts of class, ideology and social structure in analysing labour relations, and a factory reorganisation programme in particular, has been reaffirmed (Arnold, 1998; Froud et al., 1998).

A different agenda, one that can be labelled an *ethnography* of accounting, also emerged in the early 1980s. The concern here was with the meanings and perceptions of the actors who develop and use accounting practices in localised settings. The conditions and consequences of accounting in specific organisations provided the focus here. The 'lived experience' of individual actors was addressed through case analyses that emphasised the symbolic use of accounting for individuals (Boland & Pondy, 1983). An understanding of how accounting practices contribute to the production and reproduction of organisational life was the aim of such research (Roberts & Scapens, 1985).

An ethnography of accounting seeks to understand what was said, done and understood in a particular situation. A focus on the changing relations between volumes and costs in advanced manufacturing (Jonsson & Gronlund, 1988) allows one to understand how practices and procedures are worked out in local settings. In so far as new ways of accounting have to be understood and made sense of, an understanding of accounting change in a particular organisation can similarly be facilitated by referring to the meanings people attach to the social world (Nahapiet, 1988). The emergence of a new accounting based organisational culture can be analysed using an interpretive or ethnographic frame (Dent, 1991). The fabricating of budgets (Preston et al., 1992), and the influence of the

inspection and review processes of the British Inland Revenue on internal accounting processes (Preston, 1989), can highlight the chains of reasoning involved. An ethnography of three hospitals can help us understand how and why new accounting numbers are produced, and how the social linkages among a relatively small group of people enables this to occur (Chua, 1995). Meanwhile, the process of 'becoming' a professional accountant (Power, 1991) can be viewed as analogous to that of the 'moral career' of the mental patient (Goffman, 1961). More generally, one might say that most behaviour, even within the sphere of the market-driven economy, is deeply embedded in networks of interpersonal relations (Granovetter, 1985).

The fourth agenda is focussed on the networks within which accounting is embedded. As with all three of the previous themes identified, this grew out of developments within the wider social sciences as well as from attempts to address intellectual challenges identified by accounting researchers. In so far as previous research within accounting had sought to analyse and explain the links between accounting and the environment, a dualism had formed: On the one hand there was the environment, on the other the organisation. In place of such a dualism, a number of writers began to explore more dynamic and process-based ways of explaining the interrelations between organisations and their environments. Burchell et al. (1985) called for researchers to analyse the interpenetration between accounting and society. Instead of two mutually exclusive domains—accounting and society—attention was focussed on the specific practices and institutions in which the accounting category 'value added' appeared. In this interpretation, the environment is not external to accounting but 'passes through' it, and accounting in turn shapes and modifies the social. Burchell et al. examined three 'arenas': accounting standard setting, the management of the national economy and the industrial relations system. The 'accounting constellation' was the particular social space where these three arenas intersected and intertwined, a network or assemblage of intersecting practices, processes and institutions. The 'value added event' is a field comprising a very particular set of relations established between institutions, economic and administrative processes, bodies of knowledge, systems of norms and measurement, and classification techniques. In a related manner, although drawing on different reference points within sociology, Robson (1991) set out explicitly to apply and extend this approach to a study of accounting standard setting in the UK. Drawing upon the writings of Latour (1987, 1988), he focussed on discursive processes of accounting change and the concept of translation in particular. Accounting change occurs, Robson argued, when a particular group or institution is able to successfully enrol other actors in their proposals by incorporating and translating the interests of others into the solutions proposed. In this process, problems are defined as shared, alliances formed, arguments mobilised, and the interests of other groups, parties and institutions enrolled towards a common interest.

These four research agendas clearly do not exhaust the sociological analysis of accounting across the past two decades or so. They serve, however, to indicate the extent to which accounting researchers have redefined the domain of accounting research by drawing on and contributing to sociological research. In the following section, the revival of interest in economic calculation among sociologists in the past decade is considered in greater detail.

5. Agents, Networks and Assemblages of Calculative Practices

The recent rediscovery of the economy by sociologists has taken a particular form. The focus has been on the ways in which calculating agents embed economic processes in social networks. An early contribution by Polanyi (1957), which argued that the economy should be viewed as an 'instituted process', provides an important reference point for this literature. Polanyi spoke of 'the transcending importance of the institutional aspect of the economy' (Polanyi, 1957; cited in Granovetter & Swedberg, 1992, p. 34), and argued that it is the instituting of economic processes that integrates them and gives them unity and stability. Polanyi identified three forms of integration—reciprocity, redistribution and exchange—and argued that their integrating effect is conditioned by definite institutional arrangements. Integration, according to Polanyi, means something more than the aggregation of individual behaviours and interactions.

Three decades later, and in a similar vein, Granovetter (1985) argued that economic behaviour is 'embedded' in a network or system of social relations. Sociologists since Weber had, he argued, cut themselves off from a large and important part of the European tradition, as represented particularly by Max Weber. For that tradition, economic action is viewed as only one category, albeit an important one, of social action. Interlocking directorates among firms, industrial purchasing, subcontracting relationships, intra-firm audits and transfer pricing are identified by Granovetter as examples of the important role played by webs of social relations in shaping economic behaviour. Most economic behaviour, according to

Granovetter, is closely embedded in networks of personal relations. Rather than view these relations as merely causing friction within an otherwise rational market process; such relations were seen by Granovetter to be central and amenable to sociological analysis. Careful and systematic attention is required, he argued, to the actual patterns of personal relations through which economic transactions are carried out.

More recently, Callon (1998) has addressed the issue of embeddedness, with particular respect to the interrelation between the economy as a thing and economics as a discipline. Arguing that economics as a discipline shapes rather than observes the economy, Callon's arguments are broadly consistent with those of many accounting researchers across the past two decades.[2] If accounting practices and concepts shape ways of organising economic processes within and among organisations, it is consistent to expect a similar interrelation between the discipline of economics and the formation of actual markets. Whereas accounting researchers have tended to focus on particular calculative practices or ideas, Callon's focus is on the more general issue of the calculative capacities of agents. According to Callon, calculating is a complex calculative practice that involves tools and inscriptions. Also, calculating is viewed as intrinsically linked to the networks within which agents are entangled. Appealing explicitly to Granovetter's notion of embeddedness, Callon argues that the calculative capacities of agents are inseparable from the network of social relations in which they are situated. The agent is not immersed in a network viewed as a context or an institutional environment. Rather, agents and networks are considered to be two sides of the same coin. The ability of agents to calculate is wholly dependent on the network of relations within which the agent is immersed. This attempt to avoid the distinction between macro- and micro-, as well as the notion of context, is consistent with earlier writings in the accounting literature discussed above. Equally consistent is a focus on the intrinsic links between calculative agents and networks.

6. Conclusions

This paper has examined the recent rediscovery of the economy and economic calculation by sociologists. It has outlined briefly the curiously punctuated history of a sociological concern with management accounting across the 20th century. Initially central to sociology at the beginning of the twentieth century, accounting disappeared from view for approximately half a century. When accounting was 'rediscovered' by social scientists in the 1950s and 1960s, the concern had shifted from a macro-level concern with rationalisation processes to a micro-level concern with groups and group processes. From 1980 onwards, and within the accounting literature, a further shift occurred. Accounting researchers sought to understand and analyse the links between accounting practices within organisations and broader institutional and social pressures. Most recently, there has emerged a concern with the ways in which economic processes are shaped by agents who embed them in social networks. But the primacy attributed to the concept of network, the notion that networks are webs of interconnected agents and the emphasis on the role of economics in shaping the economy raise a number of further issues for accounting researchers that are worth noting.

First, if a history of the construction of markets and market organisations is yet to be invented, this should commence with an analysis of the concepts and practices through which such a domain is formed. Rather than presume and begin with the role of networks in connecting agents, we should focus on the historically and geographically variable practices that make calculation possible. For it is these practices that make it possible to intervene, to act upon and alter the capacities of individuals, entities and processes, to transform them and achieve specific ends. It is through calculative practices that we can affect the type of world we live in, the way in which we understand the choices open to organisations and individuals, the way in which we manage and organise the activities of others and ourselves. Accounting researchers should attend to the complex interplay between ways of calculating and ways of managing social and organisational life. A history of the formation of markets and of the economy should commence with the heterogeneous practices and ideas that have made organisational life calculable.

Second, rather than presuming that the discipline of economics shapes the actual economy, we should examine empirically the complex of knowledges and practices that reflect on and intervene in economic life. To study the economy 'as a thing', we should not necessarily take economics as a starting point. We should consider instead the relations among the disparate disciplines and practices that have helped shape the economy in its modern form. Accounting, actuarial science, applied psychology, engineering, finance and operations research are just some of the disciplines we should be considering. Clearly, a number of these disciplines have important interrelations with economics,

[2]For a summary of these debates, see Miller (1994). See also: Miller & O'Leary, (1994a, 1994b, 1998, 2002); Miller & Rose, (1992).

and in some cases have borrowed extensively from economics (Miller, 1998). It is the assemblages that form among a variety of concepts and practices, the variable boundaries between them and the interventions that they make possible that we should attend to.

Third, we should pay attention to the links between calculative practices and the programmes they seek to operationalise. We should consider the ways in which calculation is endowed with a significance that extends beyond the immediate tasks to which it is put. Within individual organisations, the calculation of costs can be linked to much wider concerns, such as national competitiveness and the perceived need for benchmarking. Rationales such as decision-making, responsibility and efficiency can give meaning to apparently mundane tasks such as budgeting and variance analysis. And, on a much broader scale, the language of markets can help transform the boundaries between the private and the public sector, and call forth an avalanche of numbers produced by a variety of calculating machines. Liberalism and neo-liberalism are not just models for the conduct of economic activity, but for the whole of social life. The concept of the market provides a rationale not only for the exchange of goods and services, but an idea and an objective for transforming citisens and institutions that had previously operated according to very different logics. Whether it is a matter of the delivery of health and social care, and the boundaries between them, or the monitoring and evaluation of the police and probation services, ways of calculating are intrinsically linked to wider political concerns. Our understanding of these processes and interactions is still very limited, both empirically and theoretically. However, there is increasing acceptance of the contributions that can be made by researchers working at the interface of management accounting research and sociology. By building on these existing links, we can enrich both management accounting research and the discipline of sociology.

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Doing Qualitative Field Research in Management Accounting: Positioning Data to Contribute to Theory

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Abstract: In this chapter, we argue that theory, method, methodology, and knowledge gains in qualitative field studies are intertwined through the ongoing hypothesis development in the field. We develop our argument through a discussion of specific qualitative field studies in management accounting. We emphasise in particular the distinctive role of theory in qualitative research as relating to expression of a subjective reality more than clarification of an objective one. In considering this subjectivity, we discuss the ways in which the doing of qualitative research brings to bear discipline on the researcher allowing us to assess the trustworthiness of their accounts. The intention is to develop a more appropriate basis for judging the plausibility of qualitative field studies than notions borrowed from positivistic methodology.

1. Introduction

Doing qualitative field studies in management accounting is not a question of method but one of methodology, understood as a general approach to the study of research topics (Silverman, 1993).[1] Qualitative and positivistic researchers share many methods. Both may visit organisations in their chosen field, collect and analyse documents, calculate statistics, conduct interviews with practitioners, and perhaps even observe them at work. What distinguishes the qualitative field researcher is a particular way of knowing the field. Qualitative field researchers agree that '[s]ocial reality is emergent, subjectively created, and objectified through human interaction' (Chua, 1986: p. 615). For them, the methodological and theoretical task is to *express* the field as social[2] and not simply *describe* or *clarify* it to the reader as if part of a given nature. Doing qualitative field studies is not simply empirical but a profoundly theoretical activity.

With qualitative methodology goes an acknowledgment that the field is itself not just part of the empirical world but is shaped by the theoretical interests of the researcher. A study of, say, the role of management accounting in the transformation of a railway company may focus on organisational discussions and processes (Dent, 1991). A different frame for the study may define the field by connecting the organisational arena (Burchell et al., 1985) to national policies for changing the relationship between the public and private sectors (Ogden, 1995) or to the government of the economy through the refashioning of the citizen as worker (Miller & O'Leary, 1994). This means that the definition of the field is profoundly theoretical. The practice of doing qualitative field studies involves an ongoing reflection on data and its positioning against different theories such that the data can contribute to and develop further the chosen research questions. Data are not untainted slices of objective reality but aspects of recorded activity that a study finds significant for theoretical reasons.

The theoretical work through which qualitative field studies engage data with interesting research

[1]We draw on Silverman's (1993) usage of the term qualitative in relation to methodology, which, in the management accounting literature, has, with minor variations, also been referred to as naturalistic, holistic, interpretive, and phenomenological. It stands in contrast to a positivistic approach to research.

[2]Unlike actor network theorists (Latour, 1987; Law, 1991) we are here using the term social reality to connect with the long-standing methodological discussion in accounting research and to distinguish our position from positivism.

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questions eludes most positivists. For them, qualitative field studies can seem to be mere storytelling, at best useful for exploring issues and creating tentative theories that can later be tested by "proper scientific methods." Perversely, there are qualitative field researchers who share the underlying misconception of theory. They sidestep much of the engaging between data and research questions and turn "mere storytelling"[3] into a badge of honour: 'Let's tell the world our rich stories of complex social life (and leave it at that)'. Those clichés of qualitative field studies have generated an unhelpful dynamic that obstructs a discussion on the possible roles of theory in management accounting research more generally.

Drawing on notions of research validity familiar from the evaluation of positivistic studies, qualitative field studies are frequently asked to justify their findings in terms of research protocols designed to eliminate researcher bias. A central part of our argument in this chapter is that methodological and analytical checklists for good qualitative field research are at best indirectly helpful and potentially counterproductive. As the logic of a specific research project unfolds, it raises specific methodological questions and theoretically valid possibilities, which we discuss with reference to individual field studies.

Novices to qualitative field studies may believe that they have great freedom to choose definitions and develop interpretations of their data. In reality, however, the task of connecting data and theory to compelling research questions is a source of great discipline. As a meaningful context that is structured by diverse participants acting within political, economic, social, and material arrangements, the field is not open to the researcher's favourite explanations (Campbell, 1988). Reflecting on decades of fieldwork, Geertz (1995) went further and suggested that the field functions as a '[…] powerful disciplinary force: assertive, demanding, even coercive' (p. 119). As he put it, the field is 'insistent' on the logics of its specific functioning. With those logics the researcher's theorising must engage.

Equally, however, the clichés of qualitative field studies overlook that those studies have the potential to contribute more directly to the testing of ideas. Chapman (1998), for example, engaged qualitative analyses of organisational process and strategic uncertainty with statistical analysis of social network data. Four comparative cases (Eisenhardt & Bourgois, 1989) were presented. Drawing on Galbraith's (1973) theory of organisational information processing we see through the combination of the statistical analyses and interview excerpts that dialogue played a vital role in management control systems' ability to support performance under conditions of uncertainty.

In this chapter, we are principally concerned with the ways in which data, theory, and research problems are brought together in research practice; a topic that has received relatively little attention in the literature (cf., Ahrens & Dent, 1998; Baxter & Chua, 1998; Covaleski & Dirsmith, 1990; Marginson, 2004). Seeing that such bringing together is highly specific to individual research projects, it is useful to illustrate our argument with reference to a variety of specific studies.

> […] [T]he methodological writings which most sociological researchers seem to find most useful tend to be those which are grounded in particular research projects rather than general surveys of methodological techniques (Bloor, 1978: p. 545).

In this way, we ground in particular management accounting research projects[4] our discussion of the manner in which abstract methodological requirements can be put to concrete use, seeking to initiate a discussion of qualitative management accounting fieldwork practices as a first and foremost theoretical endeavour.

In the remainder of the chapter we offer, first, a definition of qualitative field studies, emphasising the distinction between methodology and method and delineating our notion of the field as a research domain. We then develop further our discussion of the field as it presents itself to the qualitative researcher in practice around Hastrup's (1997) notion of the contact zone. We outline how qualitative field studies can make theoretical contributions by giving insight into how images of specific social realities may infuse action and relate this to the ability of qualitative field studies to express the processual character of accounting. Those theoretical discussions serve as a basis from which to develop a reassessment of validity and reliability for qualitative field research and a discussion of sources of discipline for the researcher.

[3]We use the term 'mere' to distinguish such passing comments in conferences and workshops from sophisticated analyses of narrative (e.g., Bruner, 1990; Czarniawska, 1997).

[4]We do not hold up those studies as unique or ideal types. Throughout this paper, we draw on them as illustrative of the specific challenges we discuss. We draw substantially on examples from the field of management accounting. However, our theoretical and methodological arguments hold more generally.

Table 1. Basic concepts (adapted from Silverman, 1993, pp. 1–2).

Concept	Meaning	Relevance	Example
Theory	A set of explanatory concepts	Usefulness for addressing the research question	Agency theory, functionalism, management control theory, symbolic interactionism
Domain	A space in which data is collected	Usefulness for addressing the research question	Field, CRISP tape, historical archive, internet
Methodology	A general approach to studying research topics	Usefulness for addressing the research question	Qualitative methodology, positivism
Hypothesis	A testable proposition	Validity	Relationships between management accounting & strategy
Method	A specific research technique	Fit with theory, hypothesis, methodology, and domain	Interviews, observations, questionnaires, conversation analysis

2. What is a Qualitative Field Study?

In seeking to define qualitative field studies it is first helpful to lay out five basic research concepts central to the practice of research; namely, theory, domain, methodology, hypothesis, and method, and consider their interrelationships (see Table 1).

We explore in turn some of the choices that the five basic concepts offer to researchers and discuss their practical implications. For our definition of qualitative field research, we rely only on the two basic concepts of methodology and domain: *Qualitative field studies collect data in the domain 'field' and employ 'qualitative' methodology*. In our discussion of these concepts, we are mindful of Van Maanen's warning of the dangers of separating qualitative and positivistic methodologies. Even while there are important differences about which we should be clear,

> [w]e must not make too much of these distinctions, however, for they are heavy with evaluative freight and lead to rigid conceptual categories devoid of nuance and shared features. Quantitative [positivistic] research is not the evil twin of qualitative [in terms of methodology] research (Van Maanen, 1998: p. xii).

> Some principles that guide much qualitative work include a focus on meaning, the use of analytic induction, maintaining a close proximity to data, an emphasis on ordinary behavior, and attempts to link agency to structure through accounts based on the study of events (routine or otherwise) over time. But, as with most recipes for social practices, exceptions are the rule (Van Maanen, 1998: p. x–xi).

2.1. Methodology

The methodological literature has variously referred to qualitative approaches as naturalistic, holistic, interpretive, and phenomenological (Tomkins & Groves, 1983). The attribute 'qualitative' is a question of methodology, the general approach taken to the study of a research topic, which is independent from the choice of methods, such as interview, observation, or questionnaire (Silverman, 1993).

Qualitative methodology offers an alternative to positivism, which makes the ontological assumption that 'empirical reality is objective and external to the subject' (Chua, 1986: p. 611) with the epistemological corollary that it can be studied through objective categories and verified by empirical scientific methods. Positivistic accounting researchers are frequently unaware of the possibility of social reality's emergent, subjective, and constructed properties—constructed possibly in response to their own theories (Cohen & Holder-Webb, in press; Hines, 1988, 1991).

As with natural scientists, for positivistic accounting researchers it is frequently the case that 'problems of *methodology* are reduced more to ones of *method*' (Tomkins & Groves, 1983: p. 366, emphasis in original). We do not argue that positivistic accounting researchers imagine they have unmediated access to objective reality, but merely that they believe in its existence. The pursuit of positivistic research is thus replete with implications for the thinking about methods because given a certain research question, aspects of an objective reality could in principle be studied better or worse with different methods.

The conflation of method with methodology means that ontological assumptions remain unrecognised as assumptions. We see the distinction between

method and methodology and the theoretical potential that it affords for defining research questions and notions of research trustworthiness as central to much of the miscommunication between qualitative and positivistic researchers.

2.2. Method

Specific research methods might be used for different methodologies. The interview, for example, might be mobilised towards qualitative or positivistic ends depending on the notion of reality that they are supposed to explore. The potential for working with different 'metaphors' of the interview as a method for either expressing social reality or clarifying objective reality is an area that has been subject to considerable debate and controversy (see Alvesson, 2003, for a detailed discussion). In terms of our discussion here, the important point to note is that the epistemological support for the validity of any particular exchange between the interviewee and interviewer is bound up with questions of methodology together with the theory and hypothesis to which it is intended to speak.

For example, the interview might be intended as a diagnostic effort to uncover an objectively defined and hypothesised form of budgeting. Alternatively, the interview might be seen as an ongoing exchange in which the researcher actively works to understand (and test that understanding of, cf. Holstein & Gubrium, 1995) the ways in which different interviewees comprehend the nature of management control in relation to their work.

Defining qualitative field studies with reference to qualitative methodology allows us to focus on the qualitative researchers' strategies in the pursuit of knowledge, rather than simply the tools that they commonly use. This is appropriate because the management accounting literature contains a number of multimethod field studies combining questionnaires and interviews (e.g., Birnberg et al., 1990; and Ittner & Larcker, 2001). Chapman (1998) combined interviews on budgeting with a questionnaire-based social network analysis. Marginson & Ogden (2005) strengthened an impression about a particular function of budgets within one organisation, formed through interviews, by way of a questionnaire survey in this organisation. Just as statistical methods may be used in qualitative field studies, positivistic studies may rely on interviews. Davila (2000) presented some preliminary cases based on interviews in order to inform his subsequent statistical testing of a series of hypotheses relating to the nature of management control systems in new product development.

Another positivistic field study (Malina & Selto, 2001) researched the balanced scorecard for the distribution function of a US manufacturing company relying entirely on analysis of interviews. The positivistic leanings of the researchers shone through their concern to identify all the factors that would affect 'the balanced scorecard's effectiveness'. The paper referred to balanced scorecards and their effectiveness as objective realities, rather than context dependent constructs. Since Malina & Selto were not convinced that the existing management control and organisational communication theories had identified all those factors, they initially

> […] preferred to gather data more freely and let the respondents' natural, undirected commentary support, deny, or extend the theories (Malina & Selto, 2001: p. 61).

They carried out a series of semistructured interviews, and then analysed them in order to statistically test various hypotheses concerning the nature of the balanced scorecard in their case organisation. Even though they were interested in understanding organisational process and to an extent meaning, their efforts to uncover the objective reality of the functioning of balanced scorecards, relying heavily on '*ex ante* theoretical constructs' (p. 62) of objective communicative effectiveness, locates their field study firmly in the positivistic tradition.

2.3. Theory

Like Malina & Selto (2001), positivistic research frequently relies on functionalism. We would, however, not want to mix methodology with theoretical choices. By theory, we mean an orienting set of explanatory concepts, such as agency theory, functionalism, institutional theory, management control theory, or symbolic interactionism. Even though many qualitative studies have drawn on institutional theory and symbolic interactionism and have been critical of functionalism, a number of qualitative field studies show functionalist leanings (e.g., Ahrens & Chapman, 2004; Granlund & Taipaleenmäki, 2005; and Malmi, 1997). Likewise, Jönsson's (1992, 1998) work (see also Jönsson and Grönlund, 1988) used qualitative methodology and showed an enduring concern with improving the functioning of organisations.

Moreover, events in the field may best be explained with reference to multiple theories. Ansari & Euske (1987), for example, distinguished technical–rational, socio-political, and institutional uses of accounting based on a literature review and compared those theoretical perspectives with the uses of a uniform cost

accounting system for large repair and maintenance facilities of the US military. They found that the three uses of accounting systems suggested by their literature review can in practice be complementary. For example, different users (and uses) fulfilled the criteria of different theories, and the use of a system could over time drift between the expectations of different theories.

2.4. Hypotheses

Regarding the uses of hypotheses we note that positivistic studies are often written up as tightly proscribed, testing a priori hypotheses developed from the extant literature. In contrast, qualitative methodology seeks to explore aspects of social order that are not objectively real but are instead subjectively created through the interaction of actors, rarely mentioning the words hypothesis or testing.

Where no hypotheses are spelled out in qualitative field studies, this does not represent a wilful rejection of accountability and rigor in research but is frequently a consequence of studying situations and questions in which the uses and meanings of management accounting are fluid. For example, Ahrens (1996) was suggestive of nationally specific uses of accounting that emerged from his fieldwork, without spelling them out in detail as analytical categories. The fieldwork data remained highly embedded in the field context. As a result, the categories with which that study structured the data were very context specific, having arisen from observations in individual organisations but alluding to more widely spread practices.

When hypotheses are discussed, they tend to be presented as subject to ongoing development, depending on the progression of the fieldwork. For example, Covaleski & Dirsmith (1983) described their initial attempts to gather data on hospital budgeting, drawing on the categories suggested by Swierenga & Moncur (1975). This framing proved unhelpful for understanding the responses of the nurses whom they interviewed because it did not address what they perceived as relevant issues. Covaleski & Dirsmith (1983) then developed a reading of their field data, which led them to draw on institutional theory. They used it as a way of demonstrating that the concerns of the nurses whom they interviewed could be understood simply not as idiosyncratic, personal views on the uses of accounting but as a class of response that had a systematic relationship to the field context. They tested their emergent hypotheses through a statistical analysis of a specially developed questionnaire.

Both positivistic and qualitative field researchers often obtain deep insights over prolonged periods of time through their work in the field (Anderson & Widener, 2006). The actual work on hypotheses during positivistic field research is often much more flexible and sensitive to organisational context than can be gleaned from the formalised description allowable in the published study. Hypotheses that were derived from the extant literature may be discarded or refined after a few field visits. Initial data may be suggestive of different management accounting theories to which a contribution can be made. Over prolonged engagement with the field, the positivistic field researcher may develop a familiarity that would not usually be described in the published study but may well inform the development of hypotheses and the preparation of the data, and this is something which positivistic fieldworkers are often happy to discuss during their research presentations. Familiarity with the field and its actors may enable the positivistic field researcher to obtain or construct very rare, very detailed, or otherwise remarkable kinds of data that may in turn be instrumental in refining her hypotheses.

Convention notwithstanding we see no reason why qualitative studies should not be presented as testing hypothesis (e.g., Chapman, 1998; and Marginson & Ogden, 2005) or why positivistic studies need keep silent regarding their ongoing hypothesis development during fieldwork (Davila, 2000). The key point of distinction is not the presence or absence of hypotheses, but the intent of a study to shed light on certain aspects of the field that are held to be objectively real or part of social reality.

2.5. Domain

The domain is the last of our five basic concepts for a definition of qualitative field studies. The field as a domain can appear deceptively simple because it seems to appeal to a given empirical space, such as the site of a factory, when in fact the shape of the field depends on its usefulness for answering the research question. The field's promise of affording the collection of what is often referred to as 'naturally occurring data' (Marshall & Rossman, 1989: p. 10), for example, what the researcher can see during a factory visit, does not refer to a theory-free empirical realm. The phrase naturally occurring data emphasises the immediacy with which the researcher can experience the data. The process of data collection in qualitative field research depends on the perceptions and observations of the researcher, and not solely on structured research instruments such as questionnaires and psychometric tests. However, where, how, and when the researcher exposes herself to such data is determined by theoretical and methodological considerations.

Compared to other forms of research that involve interaction with humans, such as field experiments and laboratory experiments, for example, qualitative field studies hold greater potential for open-ended interaction between the researcher and researched. The researcher has less control over the researched, but has the opportunity to learn from their unprompted actions (mindful that she can never exclude an observer effect (Roethlisberger & Dickson, 1949)). This can result in a great variation of data, ranging from the highly structured (e.g., structured interview, weekly reports from accounting systems) to the highly unstructured (e.g., unstructured interview, observation of chance encounters between organisational members). A characteristic of qualitative field studies is the potential for linking structured and unstructured data. Unstructured data can be indicative of widespread tendencies that can be probed in the course of the research.

Ahrens (1997), for example, showed how British management accountants in a number of organisations routinely questioned the commercial acumen of the work of line managers, in contrast to German management accountants. The finding was triggered by an observation of one conversation between two management accountants and two sales managers in a British brewery in which the management accountants were very critical of the sales managers' handling of an account. Subsequent analysis of existing field notes and further structured questioning of managers and management accountants in different organisations supported the initial impression and yielded further detail as to how British management accountants tended to question line managers and why this tendency existed. The finding was a result of ongoing hypothesis development and testing during longitudinal qualitative fieldwork.

The immediacy of experience, the potential of open-ended interaction between the researcher and researched, and the mix of structured and unstructured data all underline the significance of the researcher's theoretical work to prevent her from being overpowered by the volume and complexity of field data. The field often draws the researcher into its interactions, unlike other context-rich domains such as the historian's archive or the worldwide web's virtual record. In the field, people engage with each other, objects, ideas, accounting systems and metrics, and occasional fieldworkers. As interviewer, observer, participant observer, or a combination of these, the researcher joins the groups that populate the field. She is frequently asked to explain (and defend!) her initial thoughts about the field and, being confronted with the interlocutors' current theories, notices that she is not the only theorist in the field.

Actors in the field are—depending on the specific motivations that grow out of their particular practices—also developing, testing, discarding, or refining suitable theories that help them understand the logic of the social systems within which they work. For example, Quattrone & Hopper (2005) noted the difficulties of ERP consultants in understanding the objectives of the Japanese head office management who wanted ERP to improve financial reporting consolidation and not reengineer business processes. Consultants, European subsidiary managers, and Japanese head office managers were all engaged in diverse efforts at theorising the technical, organisational, financial, and other consequences of ERP implementation. Managers in Briers & Chua (2001) were theorising uses and effects of ABC. Managers in Roberts (1990), Mouritsen (1999), Ahrens & Chapman (2004) and other studies were theorising uses and effects of different approaches to control. Organisational members in Dent (1991), Llewellyn (1998), Kurunmäki (1999), and other studies were theorising ways of relating accounting expertise to other bodies of organisational knowledge. The qualitative field researcher seeks to articulate organisational members' theories-in-practice and their motivations as well as the ways in which they relate to observed activities in the field.

Actors in the field may additionally offer advice, for example, on whether the research should be pursued in depth or in breadth: 'You want to speak to [colleague X]', who may work in the same or a different unit of the organisation or, indeed, belong to a different organisation altogether. Greater depth gives additional insight into the details of organisational processes. This was Dent's (1991) strategy in his railway study and Roberts's (1990) approach to the study of the takeover of an ailing manufacturing company by an acquisitive financial conglomerate. Both studies are exemplary in a number of ways but they also contain hints that their authors could justifiably have defined the field with greater breadth. The events in Dent (1991) were influenced by national privatisation policies. The events in Roberts (1990) provoked a public response against asset stripping.

The fact that neither study pursued those lines of inquiry underlines the productive character of theory in connection with the definition of the field. More broadly defined fields may go hand in hand with more socially oriented research questions and theories (e.g., Miller & O'Leary, 1994; and Ogden, 1997). Those possibilities also show that the presence of choice over theories and the boundaries of the field

are disciplined by the engagement of research questions, data, and theories. The alternative outlooks that Dent (1991) and Roberts (1990) could have generated with reference to different theories and field definitions would not have altered the truth of the existing studies, for the ripples of government policy and public opinion could be clearly read in the responses and activities of individuals within the organisations as they were reported in the published studies. However, the more broadly defined fields could have added to our insights into social objectifications of the themes of privatisation policies and asset stripping.

2.6. Summary

Both qualitative and positivistic field studies are systematic articulations of sets of statements that can variously relate to explaining, predicting, and prescribing social phenomena. Explanation seeks to establish a relationship among the dimensions of a social phenomenon, prediction seeks to predict this relationship, and prescription addresses social problems by suggesting ways of intervention under certain conditions (Reynolds, 1982). The basic model set out by Libby (1981) in Fig. 1 emphasised prediction but its relationships are equally applicable to explanation.

It would be wrong to simply associate positivism with prediction and qualitative methodology with explanation. Prediction without explanation is the hope that past correlations hold in future. Insofar as a nuanced understanding of an organisation's accounting practices enables the researcher to explain its origins and detailed functioning under certain circumstances, it also enables her to predict what organisational members will do or say next. In his study of the role of accounting in the cultural transformation of a railway company, Dent (1991) noted how successive rounds of analysing field notes improved his understanding such that '[…] subsequent data became predictable' (p. 711). Likewise, Miller & O'Leary (1998: p. 710) emphasised the 'foresight' that can be gained from longitudinal, in-depth fieldwork. Prediction and explanation are not opposites, but are complexly intertwined in both qualitative and positivistic management accounting research.

The mechanistic appearance of the relationships between concepts and data in Fig. 1 should not distract qualitative researchers from the fact that they too tend to seek to engage concepts with their representations of the field. Also, to anticipate a comment from qualitative field researchers, the relationships between concepts A and B (Libby, 1981) need not be unidirectional. Luft & Shields (2003: p. 200) pointed out that qualitative field studies tend to emphasise that management accounting is not easily classified as only a dependent or only an independent variable—it tends to be more complexly implicated in the unfolding of events as both cause and effect of changes. Management accounting can be altered to bring about profound changes in previously stable organisations, which may lead to subsequent changes in accounting (e.g., Hopwood, 1987).

The writing of qualitative field studies that manage to convey this implication of management accounting in the unfolding of events is difficult. In Silverman's (1993: p. 1–2) terms, qualitative field studies must achieve "fit" between theory, methodology, hypothesis, method, and domain in order to contribute to the literature. Fit indicates the successful conclusion of that process. It says little about the process itself, and whilst the choices of domain (the field) and methodology (qualitative methodology) define a qualitative field study, a good study does not simply spring from those choices. Rather it is the outcome of ongoing theoretical repositioning together with redefinitions of the concepts used within qualitative methodology, the development of new and discarding of old hypotheses, changes to the method, and redrawing of the boundaries of the field. The purpose of those adjustments is the forging of the kinds of

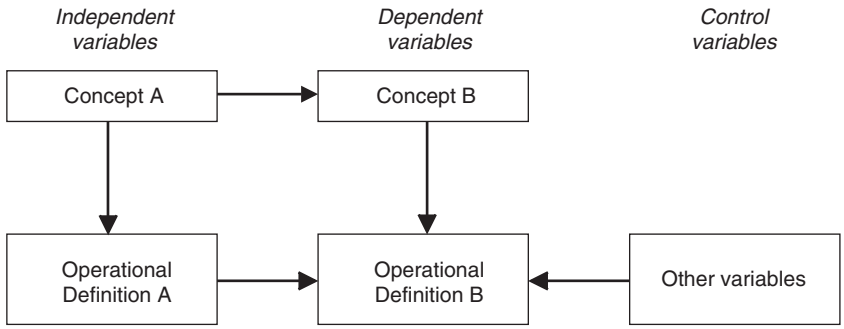


Figure 1. The predictive validity framework (Libby, 1981).

connections between research questions and data that can make a contribution to the literature.[5]

3. The Field as 'Contact Zone'

For qualitative field researchers, the field as a social reality can only be made sense of if it is defined with reference to theories that can illuminate its activities. It is not an objective reality "out there" and ready to be portrayed in the best (most faithful) way (Geertz, 1995). The qualitative study of a field thus requires close engagement rather than objective, distanced capture. It also means that researchers' insights into the field are limited to the particular sites, issues, and people with whom they manage to engage closely, what Hastrup (1997) called 'the contact zone'. Hastrup's notion of the contact zone delineated a particular relationship that field researchers can develop with the social realities lived by others. This relationship is, in turn, suggestive of a way of theorising the motivational force that the images of those social realities can have on actions in the field.

How a field researcher is to know the field and how such knowledge is to relate to the knowledge that the actors in the field have of their own activities has been a longstanding topic of debate in anthropology. Hastrup's summary of this debate emphasised the theoretical and political failure of "othering," that is, the portrayal of the inhabitants of distant fields as caught up in highly particular (and peculiar) life worlds whose motivations remain ultimately incomprehensible to the observer (cf., Moore, 1996). The result would be a divided and, usually, hierarchical world. She equally cautioned against claims of researchers being able to adopt the "native's point of view" as if the objective of qualitative field studies was to fully empathise with a worldview that could be said to define a particular field.

Cultures are characterised by practices and material arrangements that enact diverse worldviews, sentiments, and power relationships. Recent debates in anthropology have suggested that cultures are too complex to be simply characterised by descriptions of native worldviews. Critics of Geertzian readings of "culture as text" (e.g., Geertz, 1973, 1983) have pointed to the danger of taking systems of meaning as the "'real" and irreducible ground of history' (Biernacki, 1999: p. 63) and hiding insights into conflict and the workings of power behind a veneer of beautifully ordered systems of meaning that are first and foremost textual (Asad, 1983; Fox, 1991; Roseberry, 1982).

This is, however, not to deny some analytical role for observers' ability to imagine aspects of unfamiliar cultures. Management accountants in one country may be tempted to 'other' colleagues in foreign countries and their accounting practices, especially when they are asked to cooperate with them following cross-border mergers or acquisitions (e.g., Ahrens, 1996). Upon further reflection they are, however, often able to suggest some reasons why other practitioners may act in unfamiliar ways and what might be done (on both sides of the cultural divide) to change practices to ease cooperation. In such contexts, accounting practitioners become theorists of the social reality as part of which unfamiliar accounting practices function. In trying to understand what they see as the field of unfamiliar practices, they move into a contact zone of their own. The idea of practitioners' limited insights into aspects of each other's practices in the field follows from the notion of the contact zone (Hastrup, 1997). Within the space of the contact zone field researchers can only ever hope to understand parts of their defined field of inquiry that they seek to access through their activities in the contact zone.

The active nature of the field researcher's insights into the goings on of the contact zone has led Hastrup to characterise it as a practice in its own right, one that seeks to express the practices of the actors in the field. She made the classic anthropological claim (e.g., Bloch, 1991; Evans-Pritchard, 1956; and Malinowski, 1922), that the researcher can only obtain adequate knowledge of cultural practices by engaging in those practices. The character of social reality in the field is sufficiently inarticulate, the linkages between manifold sentiments, knowledge, and practices sufficiently subtle and complex to necessitate a learning by doing as the natives do.

> Field work has been defined in various ways, but it boils down to *living another world*. There is, of course, a lot of systematic work involved, a lot of method and questioning, but the essence of fieldwork is to learn another world by way of experience (Hastrup, 1997: p. 356, emphasis in original).

Experience is her shorthand for the mainly non-verbal communication of cultural complexity and subtlety.

[5]Fit in the way that we use it here is more encompassing than the notion of theoretical saturation familiar from grounded theory (Glaser & Strauss, 1968) because theoretical saturation indicates the point at which theory has sufficiently been built up from the data to terminate the fieldwork. Fit, by contrast, refers to an achievement at the end of the writing process of each publication that arises from a piece of fieldwork. This means that the process of achieving fit continues so long as there is an ongoing dialogue with peers about that fieldwork.

Accounting is not a discipline known for the widespread use of ethnography (e.g., Jönsson & Macintosh, 1997; and Power, 1991). Whereas anthropologists have traditionally spent months and years living, observing, and questioning in their fields, accounting researchers have tended to spend much less time in organisations. This does not mean that they can only ever hope to achieve a superficial understanding of accounting practices. One reason for this is their familiarity with the social realities of organisations. Often anthropologists spend months just learning the language of "their people" before they can turn their attention to the intricacies of social interaction. Once the anthropologist is familiar with the context, the study of a certain ritual can be completed in a few days, for example, during a return visit to the field. Likewise, an accounting researcher can often understand organisational uses of certain management accounting and control systems fairly quickly.

Secondly, when we are thinking about exposure to the field, it is important to remember its constructed nature. In important ways, accounting academics can be part of the field that they study, for example, through the education of current and future practitioners, as commentators on accounting practices, organisational consultants, or advisers to professional institutes (Cohen & Holder-Webb, in press; Robson et al., in press).[6] Many elements of that which accounting researchers seek to understand when they visit an organisational site is already known to them.

Practices of the actors in the field need not necessarily be tied to particular organisations. Fields may be defined as national practices of novel accounting techniques, such as value-added accounting (Burchell et al., 1985). Here important actors were institutions: the government, the professional accounting institutes, the trade unions, and the employers federation. Similarly, Czarniawska-Joerges & Jacobsson (1989) was a qualitative study of budgeting practices and national politics in the Swedish public sector that was not focused on any one site in Sweden. It reflected on a field of which the researchers had long years of experience such that they could, amongst other things, contribute to our understanding of budgeting, public administration, reform, and culture.

4. The Field as a Window on Accounting: How Images Infuse Action

Hastrup's (1997) notion of the contact zone helps to clarify what the options for defining the field are and in what relation the field stands to the researcher. Turning to the kind of knowledge that the qualitative field researcher in management accounting can hope to generate, it is useful to critically consider the old-fashioned anthropological adage of understanding the "native's point of view." On the face of it, it appears to suggest empathy with the actors in the field as a key objective of qualitative field studies. Whilst empathy can be useful to the researcher, it is insufficient as a research objective in its own right.

> The purpose of exposing oneself to alien lifestyles, then, is not simply to understand another society, even if this is the first step. The people who live there already are masters of understanding—if tacitly and practically. The goal of anthropology is not to recast what is self-evident for others, but to achieve a general theoretical comprehension of those processes by which a world and its values become self-evident in the first place. Beyond the understanding of local or cultural knowledge, there is an ambition to produce theoretical knowledge, that transcends the singular instances. The interest is not so much an uncovering of particular images of the world as it is an understanding of their motivational force in the daily life of people (Hastrup, 1997: p. 358).

The idea that the objectives of qualitative field studies should be more theoretically demanding than developing general understandings of another society, again underlines the practical nature of culture. To decompose culture into lists of character traits is altogether too cerebral (see,e.g., Baskerville's [Baskerville-Morley, 2005; Baskerville, 2003] critique of Hofstede's, 1980, nomothetical approach to culture) and leaves the actors in the field without agency. It says nothing about the interactions between those traits or the ways in which they can be enacted and changed through practice.

[6] A question frequently raised in relation to consulting and interventionist research is that of bias (c.f., Jönsson & Lukka, 2006). From our perspective, interventionist accounting research simply implies specific constraints on the shape of the contact zone. We can imagine interventionist accounting research might yield greater understanding of particular aspects of the contact zone (e.g., related to the sponsors) whilst hindering others. However, the usefulness of any one contact zone depends on the research problem. In this sense the contact zone in interventionist research is not different from that in other forms of qualitative field research: Not everything can be studied at once. It is the researcher's job to craft a contribution out of an engaging of research problem, theory, and data. With regards to the debates on whether interventionist researchers can conduct unbiased field research our analysis here suggests that such concerns are implying that the researcher is negligent or dishonest, rather than representing a substantive critique of research design.

Perhaps the more difficult aspect of Hastrup's (1997) argument, however, lies in the 'ambition to produce theoretical knowledge, that transcends the singular instances' (p. 358). From the accounting literature too we are familiar with the so-what question that greets the enthusiastic field researcher's presentation of the particular understandings of "her" actors in the field. Why did it matter that BusinessPrint's CEO sought to conceptualise the manufacturing process and the relationships with customers and subcontractors in his organisation through a financially oriented information system (Mouritsen, 1999)? Because it produced a particular solution to the pursuit of flexibility and in the process suppressed alternative organisational practices that favoured a more direct engagement with the workforce. Why did it matter that the management accountants in the German breweries studied by Ahrens (1997) did not question the sales managers' strategies of dealing with customers as did the management accountants in British breweries? Because it showed the effects of a particular understanding of how accounting knowledge relates to other forms of organisational expertise that was common in the field of German companies and was reinforced through the education of German management accountants (Ahrens & Chapman, 2000).

These are two examples of specific organisational and cultural models of the functioning of accounting in organisations and society. They offer particular context-specific answers to the question of the motivational force of particular understandings, or images, of accounting for organisational activity. This question of how accounting infuses action is a central concern for the management accounting qualitative field studies literature and one of the main theoretical reasons why accounting researchers seek to express practices of the field. They work from the assumption that the field is an emergent social reality open to diverse interpretations of its participants and observers (and not an objective reality suitable for positivistic inquiry) and that this social reality can be studied through the contact zone. As the '[…] theoretical language of anthropology thus brings the manifest reality of the contact zone to discursive effect' (Hastrup, 1997: p. 367), so the theoretical language of qualitative field studies in management accounting develops the conceptual significance of diverse images that capture the ways in which accounting infuses action.

The diversity of images and actions that can thus be related is impressive. For example, accounting can manifest new organisational realities of resource constraint and a focus on financial returns, mixed with an emphasis on entrepreneurial behaviour (Dent, 1991; Roberts, 1990), it can provide the impetus for fundamental changes in the conception and exercise of organisational and social control (Hoskin & Macve, 1986, 1988; Miller & O'Leary, 1987, 1994) and provide a focal point for the fabrication of new forms of organisational control (Preston et al., 1992), it can spur operational improvements by line managers as well as defensive behaviour (Vaivio, 1999), it can provide temporary *ad hoc* support for the review of product portfolios (Briers & Chua, 2001), it can also provide the battle ground for redistributions of power and control in public sector organisations (Kurunmäki, 1999) and offer a forum for unending discussion about resource allocation (Bower, 1970).

The researcher's skill in showing how accounting infuses action lies to a large part in the positioning of the data to make a theoretical contribution because the 'infusing of action' must refer to some activity of theoretical concern. Otherwise the researcher is confronted with the so-what question. At the heart of qualitative management accounting field research practices lies the engagement of a multifaceted understanding of the field with management accounting theory. Through this engagement rich data (Ahrens & Dent, 1998) that is often generated through interviews and observations is gradually thinned out and positioned just so that the researcher's key theoretical points can be convincingly presented within the confines of a journal article.[7]

Ragin (1992) describes this process using the term casing.

> In short, ideas and evidence are mutually dependent; we transform evidence into results with the aid of ideas, and we make sense of theoretical ideas and elaborate them by linking them to empirical evidence. Cases figure prominently in both of these relationships (Ragin, 1992, p. 218).

Such careful matching of data with theory is not *per se* particular to qualitative field research. It is akin to what Joel Demski called 'preparing the medium to answer the question' when reviewing the state of management accounting research during his plenary talk at the GMARS conference in Michigan, 2004. The point of casing is not to cynically retrofit hypotheses to some convenient (but loaded) data but to creatively test the contours of the contribution that

[7]We recognise that journal articles impose a highly specific form on qualitative field studies. Seeing that accounting is a predominantly journal based discipline (Ballas & Theoharakis, 2003) we address our comments to the publication of qualitative field studies in this format.

theoretically motivated research projects can make to knowledge.

5. Events as Process

Casing to show the theoretical significance of events in the field is supported by a processual definition of field events. The emphasis on process in management accounting research has a long tradition (e.g., Burchell et al., 1980; Covaleski & Dirsmith, 1986; and Robson, 1991). However, we are here concerned with a specific use of the term processual.

> What I am advocating here is not a study of processes, as if it were empirical stretches of events. It is the processual in every event that is my concern (Hastrup, 1997: p. 354).

The implication is that qualitative field researchers should not recount sequences of activities in the field and then label them 'activity-based costing' (ABC), for example. Instead they should organise their description of what went on in the field such that the reader can understand the specific ways in which particular actors interpreted and went about practicing ABC from the description itself.

Consider Briers & Chua (2001) as an example of how a qualitative field study can bring out the processual in the event of ABC through description. Briers & Chua described the implementation of an ABC system in an Australian aluminium factory as a process of building a coalition or a network that could develop a suitable ABC concept for this factory. They described the involvement of global academics and consultants, and the efforts to relate their ideas and blueprints to the local networks of actors in the factory and the company and their agendas and priorities. The study emphasised how an accounting concept like ABC, in its various appearances as theoretical concept, technological system, administrative tool, etc., can shape the relationships between diverse actors, internal and external to the organisation, and thereby, influence their possibilities for constructing and pursuing specific lines of action. Like Dechow & Mouritsen (2005), Briers & Chua (2001) explored the relationships between the technical aspects of accounting and political processes in organisations, but at the same time, their narrative highlighted the possibilities for localising a global phenomenon.

A different take on the processes of localising management accounting was offered by (Jones & Dugdale, 2002) who sought to unearth the processes of conceiving of and popularising ABC as a concept and management tool not just in particular organisations, but globally. They showed the processes through which ABC was made to capture the imagination of a diverse population of academics, accountants, managers, etc., stretching the concept of the field beyond any one organisation or group of organisations, to encompass a field of generalised discourses and practices.

What distinguished the descriptions of Jones & Dugdale (2002) and Briers & Chua (2001) as important examples of processual analysis was that they did not ask 'do people use ABC?' and 'why do they keep using ABC?' but instead 'what do people have to do to be recognised as using ABC?' and 'what else besides the organisational practices of ABC contributes to their shaping?' Their concern lay with the ways in which ABC was assembled as a practice, socially, organisationally, and technically.

Qualitative field studies in this vein often belong to the still emerging stream of actor network theory (ANT) (Latour, 1987; Law, 1991) literature in accounting research. Being concerned with the heterogeneous assemblages of humans and non-humans that make up organisations and the diversity of efforts required to maintain them, ANT studies offered an outlook on control that did not take for granted that organisations were entities with organisational cultures, shared meanings, interlocking routines, etc. Instead, ANT highlighted the constructed nature of organisations and organisational control. For example, Preston et al. (1992) aimed in their qualitative field study to witness the fabrication of management budgeting in the UK National Health Service. They entered the field before notions of responsibility accounting had become firmly established in day-to-day practices. They reported in detail the attempts of different actors to attach their particular interests to this emerging form of responsibility accounting, which simultaneously acted to shape those interests.

Analysing, in this manner, management accounting phenomena as processual affairs, things that come into existence by virtue of certain procedures, routines, agreements, etc., shows how the knowledge produced by good qualitative field research can go beyond simple statements about the relationships between variables. Because of their concern with process, qualitative field studies are characterised by a flexibility to respond to new insights from the field by developing, testing, and discarding or refining suitable theories. Through their specific ways of engaging data and analytical categories and, very often, of arranging data to become suggestive of analytical categories, qualitative field studies can frequently question common sense notions of management accounting phenomena.

Images infuse action insofar as wider organisational and social meanings are connected with accounting through process because actors in the field refer to those meanings in the processes of creating and practicing accounting. Describing something as processual is a theoretical achievement, because the processual analysis of accounting identifies processes through which specific accounting definitions are established in the field.

6. Process, Interpretation, and Meaning

On the face of it the definition of events through process appears to focus the qualitative field researcher's attention on the specific meanings that accounting has for actors in the field. Qualitative field studies have often been associated with a quest for meaning (Czarniawska-Joerges, 1992). Management accounting practices can be characterised by highly context-specific interpretations and functionings (Burchell et al., 1980; Hopwood & Miller, 1994) and the unearthing of local meanings and uses of management accounting has often been regarded as central to the task of the qualitative field researcher (e.g. Ahrens & Dent, 1998; Hopwood, 1983; Preston, 1986). Studies of management accounting as enacted systems of meaning, in particular, have sought to explore the usefulness of conceiving accounting as a symbol that structures the ongoing day-to-day organisational action (e.g., Ahrens, 1996; Czarniawska-Joerges & Jacobsson, 1989; and Dent, 1991).

Qualitative field studies avoid 'thinning out' the data beyond the point where it loses its specificity and becomes bland. This is mainly because 'thin' data have little to say about the processual character of management accounting phenomena. Embracing specificity is important for qualitative field studies because the nature of the theories entertained by the experts whom we study in the field is highly context specific. We know that medical doctors cannot often afford to discard the details of their observations of symptoms by forcing those symptoms into a summary diagnosis. Instead they move from the symptoms directly to treatments (Starbuck, 1993). More generally, experts are able to act imaginatively upon their observations without articulating overall rationales of action (Dreyfus & Dreyfus, 1988). The nature of their expertise lies in the ability to *act* upon their environment. The same applies to those working with management accounting.

More recent accounting research has, however, been suggestive of alternative approaches to meaning. Here, again, the contribution of qualitative ANT field studies has been noticeable in emphasising the fleeting nature of meaning. They underlined the fact that different organisational participants sought to use accounting for different ends and that their meanings of control changed with changing network coalitions and objectives (Briers & Chua, 2001; Quattrone & Hopper, 2005).

Another minimalist approach to meaning has been developed in qualitative management accounting field studies inspired by the governmentality literature (e.g., Hoskin & Macve, 1986; Hoskin & Macve, 1988; Miller, 2001; Miller & O'Leary, 1987; Miller & Rose, 1990). It offers interesting alternatives to current practices in qualitative field studies that have not, so far, been widely explored. For example, Miller & O'Leary's (1994) study of management accounting and new manufacturing largely ignored the meanings of accounting for organisational members and instead located the role of management accounting in processes of organisational change in its programmatic origins. That is to say, management accounting was treated as a tool for contributing to the solutions to much-debated problems that had given rise to large change programmes in the case organisation and other contemporary organisations.

In seeking to convey through their fieldwork the possibilities of inserting management accounting into a series of programmes designed to bring about fundamental organisational change, Miller & O'Leary (1994) sidestepped a number of difficulties often associated with qualitative field studies. For example, the interviews in this study were not presented as if they could offer the reader glimpses of 'what the organisational members 'really' thought' and what accounting meant for them personally. They were treated as having institutional significance, of telling the 'official story'. The case company, Caterpillar Inc., was described based on interviews with senior executives and union representatives, published company documents, and newspaper articles. The facts of the case were that Caterpillar Inc. incurred large financial losses, communicated with the capital markets about ways of reorganising manufacturing to become competitive, spent in excess of $2 billion on a series of change programmes, dramatically changed factory layouts and manufacturing management and control systems, and devised new management accounting practices in the process. The subjectivity of the organisational members in the field and the subtlety of their context-specific expertise (Dreyfus & Dreyfus, 1988) were irrelevant to the findings and the study minimised the significance of the subjectivity of the researchers. Any unconvinced reader could be directed to the data, including published articles and company documents, much as such a reader could be shown the data of a positivistic field study.

This is not to say that interpretation became unimportant in Miller & O'Leary's work, squeezed out, as it were, by the sheer force of the facts. Rather, the task of interpretation focused on the broader social context in which the events at Caterpillar Inc. unfolded. The contested (Arnold, 1998; Miller & O'Leary, 1998) claim was that the programmes at Caterpillar Inc. represented a highly specific response to much more general concerns about the competitiveness of US manufacturing. Like the ANT literature, Miller & O'Leary (1994) also emphasised the temporary nature of the assemblages of managerial practices of which management accounting could become part. They offered a further reminder for field researchers not to take for granted stability in management accounting systems, their uses, and organisational roles.

7. Re-assessing Validity and Reliability in Qualitative Field Studies

The question of the reliability of research is not easily separated from validity. Reliability has been introduced to social research through the use of research instruments, such as questionnaires, in positivistic studies. Valid measures are always reliable but not vice versa. Just like a reliable thermometer may in a number of trials always show 80 °C for boiling water, a reliable measure may be measuring something consistently but not be valid. The question of reliability takes on a different significance in qualitative field studies that are not characterised by the use of research instruments (even though they may use them) but are instead propelled by a mix of structured and unstructured data.

Notions of validity that were developed to evaluate positivistic studies of objective reality are unsuitable for qualitative field studies, which assume that '[s]ocial reality is emergent, subjectively created, and objectified through human interaction' (Chua, 1986: p. 615). Objectifications of social reality are context specific. Actors in the field can, and do, strive to undo their history and invent new concepts, images, and ways in which they want them to infuse action. Valid and reliable accounts of the role of accounting in social reality cannot pretend to study this reality without reference to the agency of actors in the field and independently of the researcher's theoretical interest.

This means that the question of replication studies in qualitative field research is inappropriate since

> [w]e should not expect identical results when two observers study the same organisation from different points of view, or when they study different substructures within a large organisation. What we have a right to expect is that the two descriptions be compatible, that the conclusions of one study do not implicitly or explicitly contradict those of the other (Becker, 1970: p. 20).

It is our experience that the process of research entails a continuous back and forth questioning of interpretations and discussion of recorded field data akin to the stylised presentation in Pinch et al. (1989). Ultimately, however, in qualitative field studies matters of reliability and validity cannot be sensibly distinguished.

Insights into an objective reality are not available in social research. A case might, therefore, be made that qualitative field studies that explore the complexities of organisational action should be allowed to simply speculate about the organisational and social roles of accounting. Alternatively, one might argue that qualitative field studies should be inspirational rather than exacting (DiMaggio, 1995). Whilst pointing towards interesting potentials of qualitative field studies, neither argument is entirely convincing to us. First, qualitative field studies that concentrate on complexity and inspiration still need to be grounded in some knowledge of the field and they need to conclude with some reference to the field. The question remains: do they say valid and reliable things about the field? Secondly, to limit qualitative field studies to the study of the intricate and the inspiring would unduly exclude normal science (Kuhn, 1996) approaches from qualitative field studies. This is not to privilege normal science, but do we really want qualitative management accounting field studies to become the exclusive preserve of creative mavericks?

Patterns of causality are of interest to both qualitative and positivistic researchers. Luft & Shields (2003) observe that '[c]ausal model forms describe qualitative narratives as well as statistical models', (p. 191). However, the application of causal models is different in qualitative and positivistic field studies. In positivistic research, the emphasis lies on identifying the 'key variables' underlying a phenomenon and testing whether they hold over a large number of observations. The scientific power of positivistic research lies in the identification of a small number of variables that affect outcomes over a large number of cases. The researcher has done well when she has identified a valid relationship between constructs.

Qualitatively oriented research, in contrast, conceives of social reality studied in ways that are not easily captured by key variables. The theory of a qualitative field study

> […] must include reference to mechanisms or processes by which the relationship among the variables

> identified is generated (Hammersley & Atkinson, 1983: p. 20).

in order to avoid what Mills (1959) called 'abstracted empiricism'. It frequently focuses on the validity of specific phenomena, an understanding of which depends on nuanced descriptions of the phenomena themselves, the processes that define them, and the (changing) contexts in which they are situated. The qualitative researcher works on the assumption that organisational activity is meaningful in practice (Hastrup, 1997). She has done well when she has developed a convincing account of the ways in which meanings and purposes relate to patterns of activity.

A popular question in this context has been whether qualitative field studies can gain validity if their data are 'triangulated' (Yin, 1984). Triangulation works if you are out on a boat trying to get a fix on your position. Measure the direction of three lines of sight to three different fixed objects on land, draw the three lines on a map, and the (hopefully very small) resulting triangle on the map tells you where you are in the water. With reference to qualitative field studies what methodologists like Yin (1984) call triangulation could not be further from this process of determining a position. Triangulation in Yin's terms is a metaphor for the corroboration of evidence for certain assumptions about the object of study. But all that Yin's triangulation has in common with position fixing is the presumption of an objective reality. Whereas the boat really does swim on a two-dimensional water surface, qualitative methodology sees organisations as multidimensional social realities without regular surfaces and a priori reliable bearings. What data the researcher needs to make an argument about an organisation depends on the argument. Further data can support or question the relations made between the initial data and the argument. It is, however, misleading to call such support triangulation because it suggests that some certainty has been gained in the capture of an objective reality.

> Validity is subjective rather than objective: The plausibility of the conclusion is what counts. And plausibility, to twist a cliché, lies in the ear of the beholder (Cronbach, 1982: p. 108).

Generally, we can say that triangulation is a problematic concept for the conduct and assessment of qualitative field studies. We need to make our studies 'plausible' or, to use a term frequently referred to in qualitative field studies, 'trustworthy' (Covaleski et al., 1998).

> Thus, our work should not be seen as an exhaustive, authoritative, passive record of an objective reality; rather, we, as well as our provisional account, are part of their social construction of a subjective reality that may prove of limited value over time and space. Because we recognised the interplay between trustworthiness and subjectivity, in our narrative we attempted (1) to preserve the many striking stories told by participants to demonstrate that our accounts represent their interpretations of their experiences, but also necessarily to bring into play our own imaginations (Van Maanen, 1988: p. 102, 1995); (2) to retain some modesty, in that ours are but provisional interpretations of disciplinary practices and social processes, power, and knowledge, and our narrative should be seen as "tacking back and forth between" (Van Maanen, 1988: p. 138) the two fluid "cultures" involved in research—Big Six firm members and researchers; and (3) to express our interpretations as "impressions" gained from the fieldwork, which may diverge from those of other researchers (Van Maanen, 1988, 1995) (Covaleski et al., 1998: p.308).

The plausibility of Covaleski et al. (1998) is a complex effect that does not simply rely on observing the correct antidotes of threats to validity such as '(1) observer-caused effects; (2) observer bias; (3) data access limitations; and (4) complexities and limitations of the human mind' (McKinnon, 1988: p. 37). McKinnon recommended that it is possible to counter these threats to the validity of field studies through three strategies: spending more time in the field, using multiple methods and observations, and controlling one's behaviour as a field researcher (p. 39).[8] She raised some important problems and ways of dealing with them but she did not develop a notion of validity that was suitable for ways in which qualitative field studies contribute to management accounting knowledge.

Could one doubt the plausibility of Covaleski et al.'s (1998) study because they did not specify the

[8] Malina & Selto's (2001) emphasis on making the coding procedure of their interviews auditable followed the agenda for adapting the concerns of instrument-focused social research to field studies outlined by McKinnon (1988). By giving much information on their paper's inter-rater reliability, for example, they sought in particular to avoid charges of researcher bias. They sought to provide comfort with respect to the objectivity of their methods so that they could speak to their interview data with the abstract categories of the extant literature. They carefully addressed each of the links in Fig. 1, delineating theoretical relationships in the form of hypotheses and explained in great detail the analytical process through which they transformed semi-structured interview transcripts into analytical operationalisations of their theoretical variables.

theory for their analysis prior to entering the field and, once the fieldwork was concluded, could choose from a vast number of theories to make sense of their observations? In other words, did they make up a convenient story that would not stand up to more thorough questioning? Positivistic researchers have tended to criticise case study research for its lack of degrees of freedom.

> The caricature of the single-case study approach which I have had in mind consists of an observer who notes a single striking characteristic of culture, and then has available all of the other differences on all other variables to search through in finding an explanation. He may have very nearly all of the causal concepts in his language on which to draw. That he will find an "explanation" that seems to fit perfectly becomes inevitable, through his total lack of "degrees of freedom" (Campbell, 1988: p. 377).

Campbell has been prominent amongst those who found small sample work scientifically unsound. He argued that the study of a single case broke the rule governing the explanations of positivistic researchers whereby the formula or theory of explanation must have a smaller number of parameters than data points to be explained.

Later on in his career, however, Campbell felt that he had,

> […] overlooked a major source of discipline […] In a case study done by an alert social scientist who has thorough local acquaintance, the theory he uses to explain the focal difference also generates predictions or expectations on dozens of other aspects of the culture, and he does not retain the theory unless most of these are confirmed. In some sense, he has tested the theory with degrees of freedom coming from the multiple implications of any one theory (Campbell, 1988: p. 378).

The field researcher's prior knowledge disciplines her interpretation of new observations. When thinking about a specific phenomenon and its possible explanations, the fieldworker puts the observation that gave rise to the conceptualisation of that phenomenon in the context of other observations. This means she is unable to explain her observations in any which way.

> […] almost invariably the social scientist undertaking an intensive study, by means of participant observation and other qualitative commonsense approaches to acquaintance, ends up finding out that his prior beliefs and theories were wrong.…this is an important fact… It shows that the intensive cross-cultural case study has a discipline and a capacity to reject theories which are neglected in my caricature of the method (Campbell, 1988: p. 380).

For example, Covaleski & Dirsmith (1990) offered a detailed account of the development of the process of fieldwork and theorising through which they rejected their initial theorisation of budgeting practices in a hospital (Covaleski & Dirsmith, 1983). The process of developing alternative understandings of the organisational functionings of the budgeting process was disciplined by their readings of the wider literature. Theory helps the author structure masses of data and communicate its significance at the same time as it helps construct that significance. Even though detailed insight into organisational processes is necessary to inform a good field study, there is always more going on than the researcher can observe and report in a publication. A good field study, therefore, requires a problem to be addressed and a theory that can frame the problem such that the fieldwork can contribute to the ongoing debate. The problem may point the researcher towards a particular theory, which in turn suggests the collection of certain data, which, as Covaleski & Dirsmith (1990) pointed out, may lead them to rephrase the original problem and think differently about the appropriate theory. 'Theorizing [in field research] is about moving from the general to the local to the general […]' (Baxter & Chua, 1998: p. 80). Problem, theory, and data influence each other throughout the research process. The process is one of iteratively seeking to generate a plausible fit between problem, theory, and data.

This iterative process is subject to three main sources of discipline. First, the readers' knowledge of the extant literature imposes a disciplinary context (Campbell, 1988) that checks for the plausibility of the relationships developed from the fieldwork. In this respect, our reading of the literature also reinforces Humphrey & Scapens's (1996) call for field study researchers to pay greater attention to the wider implications of each other's work. Secondly, with reference to the discipline of the field, we assume that, just as in positivistic studies, the researcher does not make up a story and suppress inconvenient data. Such an investment of trust by the reader is not unique to qualitative studies. The readers of positivistic accounting studies, routinely take on trust the claim that the full dataset is available, when in tests of this assumption this has not been the case (Hartmann & Moers, 1999, p. 308). The third reason is that the significance of the theoretical contribution is ultimately judged by the reader. Often, qualitative field studies set out to 'apply' a particular social theory and conclude that theorist X is also applicable to

accounting. In and of themselves such findings are banal. What is required is a delineation of the specific ways in which theorist X contributes to our understanding of management accounting.

8. Conclusions

By showing the relationship between qualitative field study observations, area of scholarly debate, and theory, the observation and analysis of organisational process can be structured in ways that can produce theoretically significant contributions. Single examples from the field can be of general interest (Silverman, 1993) and still remain grounded in their specific context. The specificity of theorising in qualitative field studies is one of their key characteristics and strengths.

Underlying our argument is a notion of theory that is first and foremost a vehicle for understanding and communication. We would regard many epistemological debates, for example, distinctions between theory as covering laws, theory as narrative, or theory as enlightenment (DiMaggio, 1995), as too detached from the activity of theorising. A well-theorised qualitative field study would certainly be built around a plausible narrative, but it can also enlighten and make reference to covering laws that order many individual observations made in the course of the fieldwork. DiMaggio's distinctions remain secondary to the task of outlining how the key challenge of structuring and understanding of data through theory can be met. More generally, the oftentimes stilted opposition between different theories and different methodologies distracts the researcher from the task of organising field data into a meaningful contribution.

> Learning about rival 'armed camps' in no way allows you to confront field data. In the field, material is much more messy than the different camps would suggest (Silverman, 1993: p. 203).

Since there are limits to the number of factors that can be considered in one study, the selection of factors and the method of analysing them as they appear in the final publication are the results of scholarly debates with colleagues and reviewers in which the location of the study in a specific literature is always a key decision. Specifically, in qualitative field studies, what observations are deemed necessary for discussing particular organisational processes and raising specific theoretical concerns depends on the readers' appreciation of the context of the observations in the field and the intellectual context in which field observations are mobilised. Theory cannot but be productive (and not simply revealing). Even though things can be independent of theory, descriptions of them are always dependent on it (Rorty, 1980).

Our discussion of the roles of theory in qualitative field studies recognises the suggestiveness and speculation involved in the process of theorising as much as its dependence on established theory. To generate findings that are of interest to the wider management accounting research community, the qualitative field researcher must be able to continuously make linkages between theory and findings from the field in order to evaluate the potential interest of the research as it unfolds. This ongoing engaging of research questions, theory, and data has important implications for the ways in which qualitative field researchers can define the field and interpret its activities.

However, this apparent flexibility has been a cause for suspicion in the positivistic accounting academic community. Drawing on notions of validity and reliability familiar from their own work, positivistic accounting researchers have frequently found qualitative field studies wanting. In this chapter we argue that this is due to a failure to appreciate the significant distinction between method and methodology, and so to develop more appropriate bases for evaluating the plausibility of qualitative field research. We see this mutual misunderstanding and suspicion across the methodological divide as unhelpful for the field. Positivistic and qualitative studies 'deserve' each other (Van Maanen, 1998: p. xii). Without the specifics of qualitative studies, the general assertions of positivistic research would be hollow. The specific investigations of qualitative research question and refine the general statements of positivistic studies.

The doing of qualitative field studies is a disciplined process. As well as the ongoing questioning of her own ideas, the field researcher works in a zone of contact with the field (Hastrup, 1997) in which members of the field challenge and confront her with their own theorising of their practices. The researcher is subsequently confronted with reviewers and then a wider readership. The beneficial effects of these sources of discipline are highlighted in a recent study by Brown (2005) in which he found a correlation between acknowledgements and the presentations of earlier drafts and the likelihood of publication and subsequent impact.

Like other practices, the doing of qualitative field studies is difficult to articulate. One can point to the golden rules, but, at the heart of it lies a problem of transformation. Out of data, snippets of conversations and formal interviews, hours and days of observation, tabulations of behaviours and other occurrences, must arise the plausible field study. Just as we think that a strength of qualitative field studies

lies in its capacity to study the practice of accounting as process—by asking what organisational members have to do to be recognised as practicing particular accountings—we have sought to orient our discussion of the doing of qualitative field studies around the process of research. Instead of drafting a checklist of good practices we have tried to illustrate with examples some of the ways in which the doing of qualitative field research is disciplined. Through our discussion in this chapter we have sought to develop an appropriate basis for discussing the contribution of qualitative field studies to management accounting scholarship.

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Doing Quantitative Field Research in Management Accounting

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Abstract: This chapter provides practical guidance to management accounting researchers on the design and execution of field studies that use quantitative data analysis to test or build theory. We discuss common purposes for conducting field research and provide a brief overview of the accomplishments and failings of recent field research in management accounting. We then turn to the "doing" of quantitative field research, discussing practical considerations related to the role of theory; site selection; and data identification, collection and preparation. Finally, we reflect on how field research practices may be amended to address some of the criticisms of prior field research.

1. Introduction

Management accounting is "the process of identifying, measuring, accumulating, analyzing, preparing, interpreting, and communicating information that helps managers fulfill organizational objectives" (Horngren et al., 2002: G6). Information generated by management accounting work "…guides management action, motivates behavior, and supports and creates the cultural values necessary to achieve an organization's strategic, tactical, and operating objectives" (Atkinson et al., 2001: 577). These statements hint at the degree to which management accounting is socially constructed. There are few rules for how management accounting must be done. Rather, management accounting takes place in a specific organization at a specific point in time to meet unique needs for management control and decision support.

The design of management accounting work is guided by economic principles; however, the social context of the firm and the mutability of management accounting suggest that other social sciences (e.g., sociology, psychology, political science) offer equally compelling explanations for observed practice. Other social sciences have a stronger tradition of field research than does economics. Consequently, it should come as no surprise to management accounting researchers that a more complete understanding of complex social phenomena requires more direct, substantial interactions with organizations and their members.

In earlier times it was common for accounting research journals to publish mathematically elegant, optimal economic solutions to common management accounting problems; solutions that were typically acknowledged to be impractical due to high computation or implementation costs. Plummeting costs of information technology have precipitated many changes and innovations in management accounting; however, few of these changes were anticipated by the earlier research literature. Although there remains a strong tradition of theoretical research aimed at identifying optimal (typically in relation to economic objectives of the firm or the manager) management accounting practices, many researchers have adopted a stance of seeking to understand the antecedents and correlates of simpler management accounting practices that are widely used.

A variety of research methods have facilitated this objective in management accounting and it is not our intent in this chapter to advocate the use of field research methods. We assume that there is widespread agreement on the value of studying management accounting in its organizational and social context (e.g., Hopwood, 1983; Kaplan, 1983, 1984) as evidenced by increased use of field research methods (Merchant & Van der Stede, 2005). Nor is our intent to provide a

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review of field research in the management accounting literature[1] or a compendium on field research methods.[2] Rather, our objective is to provide practical guidance to management accounting researchers about important considerations in the design and execution of field studies that use quantitative data analysis to test or build theory. Accounting researchers' formal training rarely extends to the field (Bennis & O'Toole, 2005; Shields, 1997; Young, 1999). This chapter contributes to the literature on field research methods a discussion of issues that confront the management accounting researcher who aims to use quantitative analysis of data obtained in the field for rich description, for theory building, or for theory testing.

Although this chapter examines quantitative field research it is important to note that "field research" is the research method, while the qualifier "quantitative" simply refers to the numeric nature of the data that are analyzed or the nature of the analysis to which data are subjected. This qualifier is not meant to imply that qualitative data are not analyzed. Even when quantitative data are central to the research, qualitative data are ever-present because field research necessitates understanding the data and data generating processes in situ. As a result, the reader will find it useful to consider this chapter in conjunction with chapters on qualitative field research (Ahrens & Chapman, 2006) and action research (Jonsson & Lukka, 2006). Moreover, since quantitative data may be obtained in the field from a variety of sources, the chapters on survey research (Van der Stede et al., 2006) and archival research (Moers, 2006) are also recommended.[3] Although this chapter contains material that overlaps with these chapters and with other papers on field research methods, we have attempted to distinguish this chapter by giving disproportionate attention to issues that arise in using data for quantitative analysis.

The chapter is organized as follows. Section 2 defines "quantitative field research" for purposes of this chapter and discusses common purposes for conducting field research as they relate to analysis of quantitative data. Section 3 provides a brief overview of the accomplishments and failings of recent field research in management accounting. Section 4, the central message of the paper, discusses the "doing" of quantitative field research. Here we discuss practical considerations related to the role of theory; site selection; and data identification, collection, and preparation. We also reflect on how field research practices may be amended to address some of the criticisms of field research. Section 5 concludes with summary remarks and personal observations on the future of field research in management accounting.

2. Quantitative Field Research: Meaning and Purpose

2.1. What Do We Mean by Field Research?

Field research is defined differently by different authors. Birnberg et al. (1990) define field research in relation to its "… natural settings that are not created for the sole or primary purpose of conducting research." Ferreira & Merchant's (1992) definition of field research requires that the field researcher experience direct and in-depth contact with members of the organization and that the field research project be informed by insights that emerge from ongoing contact between the organization and the researcher. Ferreira and Merchant further require that field research rely on interviews and direct observations as the primary data source; fieldwork used to refine mail surveys or to enhance *ex post* interpretation of findings does not qualify. Other studies distinguish field research from its close cousin, case study research, on the basis of the number of organizations involved (Eisenhardt, 1989; Hagg & Hedlund, 1979). Yet another widely held view is that field studies are essential for developing hypotheses and building theory, but that other tools are more effective for testing theory (e.g., Yin, 2003). While they do not preclude theory testing in their definition of field research, Ferreira & Merchant (1992: 24) find that for published field research in management accounting "the most common purpose of field research has been theory development."

For purposes of this chapter, we concur with Birnberg et al. (1990) and Ferreira & Merchant (1992) that field researchers must have direct and in-depth contact in the natural setting with members

[1]For such a review the reader is referred to: Ferreira & Merchant (1992), Merchant & Van der Stede (2005), and Shields (1997).

[2]Excellent discussions of field research methods are available in the extant management literature (e.g., Eisenhardt, 1989; Glick et al., 1990; Huber & Power, 1985; Jick, 1979) and in the management accounting literature (e.g., Ahrens & Dent, 1998; Atkinson & Shaffir, 1998; Baxter & Chua, 1998; Lillis, 1999; Young, 1999).

[3]To the extent that the field setting is used in the tradition of quasi-experimental methods to study a natural experiment (e.g., an analysis of the effects of a particular intervention, such as the introduction of pay-for-performance) the reader may also benefit from reading the chapter on experimental methods (Sprinkle & Williamson, 2006). Examples of field experiments include Hunton & Gibson (1999) in their study investigating whether group discussion facilitates the implementation of an accounting system and Maher & Marais (1998) who performed a simulation based on a field experiment of costing activities in a hospital setting.

of an organization. We place no restrictions on the number of organizations studied in the field. Indeed, we believe that the distinction that has been made in the management literature between case and field research contains an implicit assumption that the firm is the appropriate unit of analysis. Field research is portrayed as improving upon case study research because of the opportunity to consider firm-level variation and to generalize results (albeit in a limited statistical sense) to more than one firm. However, management accounting research covers a broad array of questions for which different units of analysis are relevant (e.g., individuals, work teams, organizational sub-units). Thus, we conclude that it is arbitrary for management accounting researchers to define the unit of analysis for field research in the abstract without consideration of the research question.[4]

Related to this point, we do not rule out theory testing in field research. Understandably, if the unit of analysis is the firm and field research costs escalate with the number of firms studied, most field research will tend toward theory building rather than theory testing. This is consistent with Yin's (2003) observations and with Ferreira & Merchant's (1992) characterization of published field research. However, when a lower level of analysis (e.g., individual or work team) is warranted, it is quite possible that theory testing may be accomplished in the field using fewer firms and at reasonable cost.[5] Whether a theory can be tested in a field setting with only a few organizations depends on the unit of analysis of the theory and whether higher order effects (e.g., firm, industry, or economy-wide effects) are correlated with the lower-level effects of interest.

We do not limit our definition of field research to studies that rely solely or even primarily on interviews and observations. While we agree with Ferreira & Merchant (1992) that limited fieldwork done *only* to support the development and refinement of a mail survey does not qualify as field research, we do not rule out surveys as a means of collecting data within a field research project.[6] Similarly, we do not rule out the use of archival data in field research if an understanding of the data is derived from direct and in-depth contact with members of the firm.[7]

We agree that a consequence of continued contact with the organization is likely to be refinement of theory. Indeed, discovery research that develops grounded theory is defined by an organic relation between fieldwork and research output (Eisenhardt, 1989). However, as noted earlier, we do not limit our definition of field research to studies aimed at theory development. While we agree with Ferreira & Merchant (1992) that even studies aimed at theory testing benefit from continued interactions in the field (e.g., improved understanding of data generating processes leads to better constructed tests and variable measures), we do not view dynamic adaptation of the theory to be tested to be necessary.

In sum, our definition of field research is somewhat more inclusive than some prior studies. We accept the importance of sustained interactions with organizational members in the natural field setting and we admit the possibility that researchers may need to adapt in response to these interactions, but we reject restrictions on the objective of the study (e.g., theory testing versus theory building), the mode of data collection, and the number of firms studied.

2.2. What Do We Mean by Quantitative Field Research?

Field research is a research method and we do not further constrain its definition by the nature of the data that are collected, the unit of analysis, or the research objective. However, the focus of this chapter is *quantitative* field research, and this qualifier is related to these constraints. Webster's

[4]It is equally problematic for researchers to ignore the nested structure of data and the possible effects of higher order variables in studies of lower levels. Nested data require careful articulation of theory; specifically, whether mixed (also termed, "multi-level" or "hierarchical") models are needed to avoid misspecification errors.

[5]Anderson & Young (1999) is an example of testing theory related to a model of individual satisfaction with an accounting system using 265 individual respondents in two firms that together covered 21 cost systems, while Anderson et al. (2002) provide an example of testing theory related to 21 work teams in the same two firms.

[6]For example, Chenhall (1997) combined a survey of 39 divisional managers with on-site fieldwork that included both direct observation and interviews. Although the survey provided all of the data for the empirical analysis, we consider the study to be field research owing to the intensity of organizational involvement.

[7]Moers' (2005) study is a good example of an archival field study. A company provided Moers with an archival dataset containing information about employees and their compensation. However, the rich descriptions of the field site and the incentive plan and the interview data that corroborate interpretation of the results clearly inform the analysis. The paper and its conclusions would be quite different if the company had simply handed over the archival data without permitting the researcher to interact intensively with the data generating process and its employees.

New College Dictionary (2001) defines quantitative as

> 1.a. expressed or capable of expression as a quantity. b. of, relating to, or susceptible of measurement. c. of or relating to number of measurement.

Thus, quantitative field research might be defined as field research that employs data that are measured and expressed numerically. However, this definition does not suit our purposes. For the same reason that it is difficult to imagine quantitative field research that is devoid of qualitative data from the researcher's observations of practice and discussions with managers, it is equally unusual to find qualitative field research in management accounting that gives no consideration to the numeric accounting data. Consequently, since our goal is to discuss practical implementation issues for a subset of field research that places unique demands on the researcher, we define "quantitative field research" in relation to the *nature of the analysis* to which the data are subjected. Specifically, we focus on field research that uses data that may be represented numerically and are of a quantity and quality to support empirical analysis using parametric or non-parametric statistical methods.

We rejected the idea that field research should be defined in terms of the number of firms studied. However, if we define quantitative field studies in terms of statistical analysis tools, then we implicitly require multiple observations on the relevant unit of analysis. Depending on the research question, this may imply the need for multiple time periods, multiple individuals, multiple teams or other organizational units, or multiple firms.

While empirical analysis of numeric data is commonly used in theory testing, we do not constrain our definition of quantitative field research in this manner. Although we found few examples of this in published management accounting research (in our search, only Abernethy & Lillis (1995) used analysis of numerically coded interview data in theory building), there is no reason to rule out a Bayesian approach to quantitative data analysis (e.g., data mining) as an important component of grounded theory development in the future.

Our definition of quantitative field studies removes from consideration studies that use numeric data primarily to corroborate or extend interview data[8]; however, we do consider studies that transform qualitative data into numeric data (e.g., coding the contents of interview transcripts) for further statistical analysis. Stated differently, although we restrict our attention to studies that employ statistical methods of analysis on numeric data, we do not restrict ourselves on the basis of the source of the numeric data. We consider three sources of numeric data as follows: (1) *measured data*, which are authentic numeric data in the native state in which it is captured by the organization or individual (e.g., company records used in a field study by Banker et al., 2000); (2) *latent data that are derived from measured data* (e.g., as in Ittner et al., 1997); and (3) *latent data that are measured through researcher intervention* (e.g., coded interview data as employed by Abernethy & Lillis, 1995; survey data as employed by Epstein & Widener, 2005; and coded observations as employed by Anderson et al., 2002). We distinguish different sources of numeric data because they are associated with somewhat different field research challenges.

2.3. The Use of Quantitative Data Analysis to Achieve Different Purposes

The purpose of field research—whether quantitative or qualitative in data orientation—is to describe a practice, to build theory, or to test hypotheses (Yin, 2003). A common progression in building systematic knowledge involves first careful observation and description, followed by theory development, and then testing the theory in different settings to determine its relevant domain. Below we consider the uses of quantitative data analysis for field research with different purposes.

Descriptive studies describe practice, striving to do so (as much as possible) without imposing a priori a specific theoretical lens and with the researcher having no "stake" in the merits or flaws of the practice in question (Atkinson & Shaffir, 1998). Patell (1987), which describes a computer manufacturing process, is a good example of a descriptive field study. Graphic representation of numeric data is often important to rich description of management accounting practices (Tufte, 2001; Tukey, 1977); thus, although we do not focus on descriptive field studies *per se*, we expect our discussion of data collection to be relevant to researchers whose objective is careful description of management accounting practice.

[8]For example, Kennedy & Widener (2005) use interview data, direct observations, and some archival data to investigate how lean manufacturing affects organizational structure, traditional accounting practices, and in turn, management control practices. However, the primary basis of the paper is qualitative interview data. The quantitative

(*footnote continued*)
archival data and direct observations are used to establish validity, triangulate results, and improve reliability of the study's findings. Therefore, we do not consider this study to be quantitative field research.

Studies that develop theory often follow a grounded theory approach (Glaser & Strauss, 1967). Anderson (1995b) and Abernethy & Lillis (1995) are examples of grounded theory development in management accounting research. Anderson (1995b) employs both qualitative and quantitative data but does no quantitative analysis, so is not the subject of this chapter. Abernethy & Lillis (1995) convert qualitative data into coded numeric responses for quantitative analysis, the subject of this chapter. Glaser & Strauss (1967) is the definitive "how-to" book on grounded theory. They develop techniques for surfacing previously unseen patterns in interview and observation data that bear a strong resemblance to methods of exploratory (numeric) data analysis associated with the seminal work of Tufte (2001) and Tukey (1977).[9] Although we discuss exploratory data analysis for such purposes as diagnosing measurement error and identifying outliers, we refer the reader to these seminal works for guidance on using exploratory data analysis for developing grounded theory.

Field research that tests theory often employs quantitative analysis to determine whether central tendencies in numeric data are broadly consistent or inconsistent with theoretical predictions.[10] The data may be collected through a variety of methods including surveys (e.g., Anderson & Young, 1999; Foster & Gupta, 1990), interviews (e.g., Anderson et al., 2002), or archival data (e.g., Anderson, 1995a; Anderson & Lanen, 2002; Moers, 2005); however, consistent with our definition of field research, data collection should be accompanied by sustained, direct contact with key members of the organization. Atkinson & Shaffir (1998: 63) propose that field studies that test theory should meet four conditions:

1. The conditions of the test should be consistent with the underlying assumptions or axioms of the theory.
2. The test should define clearly and with good reason the test results that support the theory and the test results that would contradict the theory.
3. The test should be unbiased in the sense of providing a reasonable probability that it could uncover evidence that could confirm or contradict the theory.
4. The test should define and measure accurately the artifacts for the theory's variables.

In subsequent discussions we consider how researchers can enhance the likelihood of meeting these conditions.

3. Twenty Years of Management Accounting Field Research: Accomplishments and Shortcomings

Three seminal papers that were published in the 1980s are widely associated with contemporary field research in management accounting. Hopwood (1983: 302) argued that accounting had divorced itself from the organization and called for more research on the design and use of accounting systems within the context of an organization, saying that "…much more needs to be known of the ways in which accounting reflects, reinforces or even constrains the strategic postures adopted by particular organizations." At approximately the same time, Kaplan (1983, 1984) argued that innovative cost accounting and management control practices were invisible to traditional academic research, which tended to study "central tendencies" in large populations. He argued that field research was the most effective means of studying "outlier organizations" that develop innovations in management accounting. Both of these authors share a concern that important management accounting research cannot be accomplished from a distance—because the phenomena of interest is deeply impacted in the organization and because many research-worthy organizations are a "needle in the haystack."

In light of the confluence of opinion in the 1980s about the need for field research in management accounting, it is useful to reflect on how researchers have responded. Several studies consider this question. Ferreira & Merchant (1992) review 82 articles that meet their definition of field research and were

[9]These numeric methods are forerunners of what today is termed "data mining," in which patterns and relationships in data are obtained endogenously (i.e., the search for patterns is not guided by theory) and refined over time using approaches such as neural network theory. While other fields of business, such as consumer marketing, that are characterized by vast quantities of data (e.g., individual consumer purchases) have made use of these approaches, to date we have not observed this in management accounting research. At present the data demands of such methods do not seem to match the most common units of analysis for management accounting research.

[10]Although field research is often targeted toward exemplar organizations (Kaplan, 1983, 1984; Van der Stede & Merchant 2005) this does not obviate the value of studying "central tendencies" within these organizations. For example, Anderson (1995a) studied the mean effects of product heterogeneity on costs in three production facilities that employed different "focus" strategies, within a single firm that is considered an exemplar of world class manufacturing in textile production.

published during the period 1984–1992.[11] Young (1999), responding to Kaplan's concern about accounting failing to keep pace with manufacturing innovations, reviews the progress of field-based accounting research in the manufacturing setting.[12] Merchant & Van der Stede (2005) identify 261 field studies in management accounting published in 14 general and topical accounting research journals during 1981–2004, but conclude that the vast majority of field studies are published in four journals (AOS, EAR, MAR, and AAAJ) that are published outside of North America.

Ferreira & Merchant (1992) evaluate the quality of field research in management accounting by comparing the 82 studies to a set of fieldwork standards (Bruns & Kaplan, 1987) and categorize the papers according to their subject matter, research design, data presentation and interpretation, and practical implications. They conclude that published field studies in management accounting have explored interesting questions, usually in conjunction with emerging and innovative practices, and that most of the studies have progressed from description to testing or developing theory. Young (1999) concurs, finding that field research has contributed to testing and developing theories, identifying new research questions, informing other research methods, and clarifying the limitations of research conducted using public data with no participation of organizational members or in a laboratory setting (with or without participation of organizational members). Merchant & Van der Stede (2005) conduct a survey of revisions to leading accounting textbooks during the same period. They trace the five major areas of innovation in management accounting practice to research that had its genesis in the field and conclude that field research has been exceptionally valuable at producing "usable knowledge" as compared to other research methods during the last 20 years.

In spite of these contributions, field research is not without weaknesses. Ferreira & Merchant (1992) attribute problems with field research to poor research design, poor data presentation, and flawed data interpretation. While many of these challenges are particularly acute for qualitative field research owing to the nature of the data, the methods of data analysis, and the publication process (Baxter & Chua, 1998), we also consider these criticisms in our discussion of strategies for designing and executing quantitative field research. Ferreira and Merchant also criticize field studies as being inadequately connected to prior research literatures. For example, in failing to select sites that differ in controlled ways from previous studies, each field study can easily become a "one off" study that does not contribute to a stream of research and cumulative knowledge. This indictment applies equally to quantitative and qualitative field studies and we consider its implications in our recommendations.

Using a smaller set of primarily North American journals, Shields (1997) finds that the field research method has a low frequency of use; 10 out of 152 articles published during the 1990–1996 period used field study methods.[13] However, he agrees with Hopwood and Kaplan that field research has specific advantages in developing theory from exemplar or "outlier" organizations and in providing preliminary small-sample evidence. He posits that the lack of published field research stems from inadequate skills in conducting field research, a dearth of colleagues from whom to obtain feedback and with whom one might collaborate, long research cycle times that are in conflict with short-tenure clocks, limited access to field sites, and editorial biases against field research. Differences between the findings of Merchant & Van der Stede (2005) and Shields (1997) seem to implicate editorial policies as particularly influential.

Young (1999), who reaches conclusions similar to Shields (1997), advises those who are interested in conducting field research to seek senior researchers for guidance, to take formal courses to acquire skills in field research techniques (e.g., interviewing, survey development, and unobtrusive data-gathering techniques), and to cultivate relationships with practicing managers. More recently, Bennis & O'Toole (2005: 99) trace broader failings in management education to failings of the research community. They criticize the form of scientific method commonly employed by management scholars for involving "minimal time in the field discovering the actual problems facing managers" and conclude that, "…because they are at

[11] Ferreira & Merchant (1992) review papers published in the journals: AAAJ, AOS, TAR, BRIA, CPIA, JAE, JAAP, JAR, JFE, JMAR, and MAR. In addition they include two monograph series and a collection of field research papers published by the Harvard Business School. If the Harvard Business School collection and the monograph series are excluded, 36 published studies remain.

[12] Young (1999) did not include a review of specific articles, but rather included several articles to illustrate his points.

[13] Shields (1997) sample of articles was drawn from the journals: AOS, TAR, CAR, JAE, JAR, and JMAR. Using a broader set of journals, including many published outside of North America, Van der Stede & Merchant (2005) find 81 studies that employ field research methods in a set of 427 published management accounting papers during the period 1990–1996.

arm's length from actual practice, they often fail to reflect the way business works in real life." Unfortunately, Bennis and O'Toole are less optimistic than Young or Shields that extant academic institutions have the means or motivation to support scholarship that is more connected to the practice of management. While we share all of these authors' concerns about institutional forces that limit the attractiveness of field research, in this chapter we adopt a less ambitious, but still important focus of improving management accounting researchers' field research skills.

4. Key Decisions, Choices, and Contributions of Quantitative Field Research

Before proceeding with a discussion of practical considerations in conducting quantitative field research, a caveat is in order. In the sections that follow, we illustrate our arguments with reference to many field research studies published in top accounting journals as well as recent working papers.[14]

Table 1 categorizes the field research papers that we use to illustrate our arguments according to the nature of the data analysis and the paper's research purpose. As noted earlier, we do not provide a comprehensive literature review; although we use a variety of examples, we rely heavily on our own research. One reason for this is that it is often difficult to discern the fine points of fieldwork from published accounts thereof. This is also true in our own research, and many of the examples that we share are not evident in the published papers. Regrettably, many subtle challenges of field research—from site selection, to data collection, to data analysis—are expunged in the publication process. (An exception is Young & Selto (1993), who document the challenges that they encountered in the field.) There are many fine examples of field research that we have not referenced; however, we reiterate that our intent is to discuss quantitative research methods and not to review all field research.

4.1. Role of Theory

As we have already intimated, the purpose of field research conditions the role of theory. The characterization of theory as being unformed or changing dynamically tends to be applied in descriptive and theory-building research. Eisenhardt (1989: 536) illustrates an extreme view in her discussion of how to build theory in the field when she states, "theory-building research is begun as close as possible to the ideal of no theory under consideration and no hypotheses to test." Other authors describe a dynamic relation between field research and extant theory, ranging from advising researchers to have no *ex ante* theoretical expectations to suggesting that researchers be informed about competing theories, but open-minded to discovery of new theory (Baxter & Chua, 1998; Shields, 1997). While Ferreira & Merchant (1992) define field research in terms of whether the research design adapts as researchers gain more knowledge from the field, they also criticize field studies as being inadequately linked to the research literature and failing to contribute to a cumulative body of management accounting knowledge. Thus it is clear that even if theory-building field research is not conditioned by theory, there must be some *ex ante* rationale for expecting grounded theory development in the selected field setting to add to our understanding of what is broadly defined as management accounting. Moreover, regardless of what mechanism(s) the researcher uses to define (and periodically redefine) the boundaries of observation, numeric data and the possibility of using exploratory data analysis should be fully explored. We refer the reader to classic works by Glaser & Strauss (1967), Tufte (2001), and Tukey (1977) for guidance on developing grounded theory using exploratory data analysis.

If the field study's goal is theory testing, then the success of the project depends critically on the linkage between the theory and the test. Theory serves to define the appropriate research setting and unit of analysis, to identify key variables and key informants, and to specify the form of the empirical test (e.g., model specification, identification of parameters of interest, identification of appropriate statistical analysis tools). Related to this point, theory serves to define data—both qualitative and quantitative—that are necessary to permit the researcher to rule out competing theories or to disconfirm theory. Thus, in quantitative field research, theory precedes and conditions all aspects of the field project.

That said, even in field research aimed at theory testing there is an important dynamic element. In our experience, the dynamic, emergent element of quantitative field research occurs not in the selection of theory *per se*, but in the early stages of the project when the researcher must take care to understand organizational processes and their relation to theory. A vivid example of this is found in Anderson & Lanen (2002), where the authors spent many hours talking with managers to learn about the process routings that different customer orders took through

[14]We searched AOS, TAR, CAR, JAE, JAR, JMAR, MAR, and top journals in other management fields for examples of published field research studies and reviews of field research methods.

Table 1. Categorization of management accounting field research papers cited.

Paper (yr)	Nature of Data						Primary Objective of Paper	
	Analysis of qualitative data without transforming to quantitative data[a]	Analysis of quantitative, measured data[b]	Analysis of quantitative, latent data constructed from measured data[b]	Analysis of quantitative, latent data that are measured through researcher intervention[b]			Theory building	Theory testing
				Coded interview	Survey	Coded observation		
Abernethy & Lillis (1995)				X			X	
Anderson (1995a)		X	X					X
Anderson (1995b)	X						X	
Anderson & Lanen (2002)		X	X		X			X
Anderson & Young (1999)			X		X			X
Anderson et al. (2002)		x	X	X	X	X		X
Anderson et al. (2000)	x	X	X					X
Banker et al. (2002)		X						X
Banker et al. (2000)		X						X
Banker et al. (2001)		X	X					X
Bhimani (2003)	X				X			X
Campbell et al. (2005)		X	X					X
Chenhall (1997)					X			X
Davila (2005)		X		X	X		x	X
Davila and Wouters (in press)	X	X						X
Epstein & Widener (2005)	X	X			X			X
Foster & Gupta (1990)		X						X
Foster & Sjoblom (1996)	X	X			X			X
Glick et al. (1990)				X	X		X	X

Ittner et al. (1997)		X	X					X
Ittner et al. (2003)		X						X
Joshi et al. (2001)		X	X					X
Kennedy & Widener (2005)	X					X		
Lanen (1999)		X	X					X
Lillis (1999)	X					X		
McGowan & Klammer (1997)				X				X
Moers (2005)		X	X					X
Patell (1987)	X					X		
Sedatole (2003)		X						X
Selto et al. (1995)		X		X				X
Wouters et al. (1999)				X				
Young & Selto (1993)		X		X				X

Note: This table includes all field research papers cited and classifies them according to the nature of data used in the study and the primary objective of the study. A large 'X' indicates the primary source of the *analyzed data*, while a small 'x' indicates the secondary source of *analyzed data*.

[a]May use quantitative data to triangulate or to establish construct validity, but the quantitative data are not the primary basis for achieving paper's objective.

[b]May use qualitative data or quantitative data of different origins to triangulate or to establish construct validity, but these additional data are not the primary basis for achieving paper's objective.

the firm's order entry process. Detailed process knowledge was not obtained all at once. Invariably small detours and exceptions were omitted when managers described "how things worked." However, based on their understanding, the authors used exploratory data analysis to reveal properties of the data that did not conform to their understanding of the process (e.g., the variance of a variable was too large, the mean of one variable thought to be systematically less than another was not found to be so). When confronted with anomalies, the managers quickly identified idiosyncratic processes that had not been previously mentioned. In earlier interviews the managers had unconsciously described "central tendencies" in an effort to help the researchers "see the forest"; however, proper variable definitions and tests required a more detailed understanding of common variants.[15] Knowledge of the complex order entry process emerged over a period of a year with many cycles of interviews and exploratory data analysis. Although the theory that the authors sought to test (on the moderating effect of information technology on costs of product complexity) was unchanged, the emergent understanding of the data generating process was critical to the quality of the data and proper specification of the tests (Atkinson & Shaffir, 1998).

Another important part of theory selection that needs to be brought into any discussion of quantitative studies relates to measurement theory. One condition for successful theory testing is the fidelity with which the measured variables represent the variables of the theory. In how many studies does the theory and literature review seem utterly disconnected from the empirical analysis because the variable measures do not correspond to the theory? In the end, even if the researcher finds "significant" results, the reader does not believe that the theory has been tested.

Atkinson & Shaffir (1998) discuss one manifestation of this problem that arises when people with different perspectives describe something. For example, an avid snow skier may characterize snow according to subtle properties that are entirely alien to a researcher who views snow in meteorological terms. In this case, although the field participant and the researcher use common words, they may unwittingly speak at cross-purposes and spurious conclusions might be drawn from research based on the data. In our experience this is a common problem when management researchers listen to managers and hear the jargon and idiosyncratic language of research. (Consider for example how a practicing manager uses the phrase "transaction cost" as compared to how students of transaction cost economics interpret these words.) While this is perhaps to be expected in the collection of qualitative interview data, we have found it equally challenging in quantitative field studies—as when labels that companies assign to measured data do not correspond to academic definitions or when survey questions inadvertently use language that has special meaning inside a company that differs from general use. For example, in our work in manufacturing settings it is common to require measures of production capacity and capacity utilization in economic analysis. We have found that it typically takes several conversations as well as extensive exploratory data analysis for the researcher to be able to relate a company's measure of capacity to economic notions of, for example, theoretical capacity, normal capacity, actual capacity, and peak load capacity. Abernethy et al. (1999: 8) summarize these points, saying "… the discriminating ability and power of empirical research is affected not only by the quality of the underlying theory and statistical analyses *but also the nearness to which proxies measure theoretical constructs* [italics added]."

Young & Selto (1993) is an example of researchers conducting an open-minded search for data on "performance." Their objective was to identify and measure performance improvements associated with implementation of just-in-time manufacturing methods. During the first 6-months in the field, they identified six different archival measures of performance appropriate for their site: cycle time efficiency, yield rate, defective rate, production schedule adherence, product cost efficiency, and number of manufacturing process problems. Instead of simply asking the firm for accounting data (for example) as a proxy for performance, the researchers took care to explore how company participants viewed performance and sought all possible manifestations of performance in the native measurement systems.

Anderson and Young (in the project that eventually yielded Anderson & Young, 1999; Anderson et al., 2002) employed a spreadsheet to facilitate the linkage of theory and variable measures. Early in the design of the research project the authors constructed a spreadsheet with key theoretical constructs in the leftmost column. Each subsequent column represented a

[15]In this example, the managers fully understood the process in all of its complexity and simplified their original description in a somewhat misguided effort to help the researchers. In other cases, complex processes may be difficult to explicate. When this is the case, the researcher may iterate between depicting the data and discussing the data with managers as a means of eliciting more impacted, tacit knowledge about complex processes.

different mode of data collection (interview, observation, survey, archival records) and the cells contained the names of specific people, organizations, or information systems thought to have data on the variable in question. The contents of the cells changed in the course of the project as new data sources were discovered and others were determined to be less valuable than originally believed. However, the basic "map" connecting theory to multiple sources of related data was unchanged and gave visibility to an important challenge in theory testing—the need to search for disconfirming evidence and the opportunity to reduce measurement error through multiple measures and multiple sources. As in the case of Anderson & Lanen (2002), Anderson and Young's operative theory—on organizational change, individual motivation, and the economics of new cost management techniques—was relatively unchanged throughout the project. What was in constant flux was the effort to translate key theoretical constructs through appropriate site selection, variable measures, and identification of key informants (e.g., randomly selected hourly employees, specific work teams, specific managers, all managers at a given level).

In sum, theory is emergent in field studies aimed at grounded theory development and is a strong preconditioning factor for field research aimed at theory testing. However, even theory testing requires dynamic adaptation of the researcher. Once the theory is identified, quantitative field studies aimed at theory testing must grapple with pragmatic issues of research design, data collection, and analysis in an effort to ensure that the tests are aligned with the theory. Considering these issues early in the design of the research program enhances the likelihood of meeting Atkinson & Shaffir's (1998) second and fourth conditions for successful theory testing: that the theory be sufficiently defined to allow *ex ante* specification of what results support and contradict the theory, and that appropriately defined and measured variables are employed to ensure that the test is aligned with the theory. As we have attempted to illustrate, the process is rarely sequential or linear.

4.2. Site Selection

Selecting a site suitable for theory testing occurs simultaneously with the practicalities of ensuring that data exist to allow the proposed hypotheses to be tested. A sequence of (1) identifying (opportunistically) a site where researchers can obtain access, (2) searching for data, and (3) selecting a theory to test is generally not recommended. However, it is naïve to assume that the reverse sequence is likely. Practicalities are such that research only rarely progresses linearly from theory to identifying the properties of an ideal site, to negotiating access to that site, and to discovering data that meet all of the researcher's needs. In some field research, it may be possible to unearth latent data through interviews, direct observations, and surveys. However, if the researcher is interested in using archival data that are measured and captured by the firm, then site selection requires a simultaneous evaluation of the availability of measured data.

Large-scale studies that use public data typically seek to study equilibrium relations. In contrast Ferreira & Merchant (1992), Kaplan (1983, 1984), and Shields (1997) argue that field sites are best selected for being an "outlier" that offers promise of revealing something new or innovative that is not widely present in the overall population. Outliers may be identified by reputation, self-selection, or referrals, as firms that are arguably well run and which are in equilibrium[16] with respect to the use of a particular management accounting tool of interest, or by opportunistic (e.g., with respect to access) selection. The latter, of course, can be problematic, as the site precedes the research question.

Chenhall (1997) and Davila (2005) are excellent examples of selecting a group of firms that are in equilibrium with respect to a certain feature of interest. For Chenhall (1997), it was important to obtain an adequate sample of firms that practiced total quality management techniques and used manufacturing performance measures to evaluate managerial performance. The chief executive officers of a random sample of 100 manufacturing firms were contacted and asked to participate in the project. Ultimately, Chenhall was able to create a sample of 39 firms split between those that used manufacturing performance measures to evaluate managerial performance and those that relied on other measures. This example illustrates an approach to identifying multiple field research sites that resemble an ideal "profile" that is derived from the theory to be tested.

Another example of a field study that selects a large number of firms that are distinct with respect to certain characteristics is Davila (2005). Davila wanted to study emerging management control systems. Obviously there would be little power in studying a cross-section of firms found in the Compustat database, since relatively few would be at the

[16]Or in the case of longitudinal case studies, the research design may use a quasi-experimental approach of studying an interrupted time series in which differences in two equilibrium (e.g., pre- and post-management accounting change) are considered. Banker et al. (2002) provide such an example.

emergent stage of interest. Thus Davila purposefully restricts his sample to firms that are less than 10 years old, but that have more than 10 employees. This enables him to study control systems that are emerging in young, growing companies that are large enough to need formal control systems. To generate a large enough sample of firms (95) to enable empirical testing Davila capitalized on the disproportionate representation of small, young, technology-oriented firms in California's Silicon Valley. Similar to Glick et al. (1990), the trade-off involving firm choice is often made for pragmatic reasons.[17]

Two examples from our experience are associated with finding a single, "exemplar" organization for study (Anderson, 1995a; Anderson & Lanen, 2002). In Anderson (1995a) the author first identified an interest in studying the impact of product mix complexity on manufacturing performance (including cost). With the help of senior faculty advisors, three different firms that were known to have introduced a focused manufacturing strategy to at least some manufacturing sites were identified and visited. One emerged as the most suitable when data availability and the history of the introduction of the focus strategy was considered.

In Anderson & Lanen (2002), the authors became involved with the firm when the company's top manufacturing manager sought to understand the impact of product mix complexity on manufacturing performance. The company was committed to an involved relationship with educational and research programs of the university, and had identified product complexity as a topic of interest.[18] A senior faculty member in operations management who was aware of Anderson (1995a) facilitated introduction to the company. However, in spite of the aligned interests of managers and researchers, extensive plant visits and interviews at six production facilities revealed that the data generated in the factories were too aggregate and imprecise to support empirical analysis that would extend the literature on complexity costs. In contrast, the "backoffice" operations of the firm were information-technology intensive. Interviews with managers revealed a belief that product complexity was having far greater effects on white collar work than on factories, where flexible automation had created excess capacity in virtually every plant. Thus the project mutated from studying the effects of product complexity on the shop floor to studying the effects of product complexity (and the moderating effects of technology) on backoffice operations.

The first example is of a linear search for a firm that permits testing of a rather specific theory. The success of this approach owes much to the extensive network of practicing managers to whom senior faculty mentors had access as well as to the willingness of these colleagues to help the researcher find and gain access to an exemplar organization that permitted powerful tests of the theory. Thus, we concur with Young's (1999) counsel that young aspiring field researchers ally themselves with senior faculty and administrators who know and are involved with practicing managers.

The second example of site selection is much less linear, but is also far from purely opportunistic. As in Davila (2005), the authors enjoyed access in part because of existing relations between the firm and the University. The firm pre-qualified itself as exemplary with respect to its success in developing and delivering a diverse mix of products to the marketplace; however, on closer inspection data limitations narrowed the domain where theory testing would be likely to produce meaningful tests of the performance effects of product mix complexity. However, data are not a sufficient starting point for a field study. Had this domain not offered an opportunity for research that would contribute to an extant literature (e.g., on the impact of information technology on backoffice operations and cost structures of service functions), the researchers would not have proceeded in spite of the wealth of data. This point highlights an important consideration in avoiding what Ferreira & Merchant (1992) describe as a failing of field studies to contribute to extant research streams. Specifically, as the project adapts dynamically to emergent factors, is the researcher still persuaded that the resulting study will contribute new knowledge that is interesting? Sometimes emergent factors so seriously undercut the quality of the test or the incremental contribution of the work that the researcher should abandon the project.[19]

Studies such as Chenhall (1997) and Davila (2005) that test theory at the firm level are somewhat rare among quantitative field studies since large-sample

[17] Davila (2005: 230) also leveraged local ties of his university and of senior colleagues since he states "the study builds upon a larger research effort initiated in 1994 known as the Stanford Project on Emerging Companies."

[18] Anderson and Lanen were not involved in this initial identification of the company's research interest. It emerged through the company's involvement in the Tauber Manufacturing Institute of the University of Michigan.

[19] Unfortunately researchers are no less susceptible than managers or gamblers to the lure of sunk costs, and as a result we probably have more "exploratory" descriptive field studies than were even initially conceived as such.

field studies are difficult to manage both in terms of time and access. An important consideration involving site selection for quantitative field research is whether the sample is large enough to afford adequate statistical power. Ferguson & Ketchen, Jr. (1999: 388) note that "most effects in the social sciences are small effects." During the research design stage, the researcher must determine the proper unit of analysis for the theory being tested, and then assess the probability that they will be able to detect a small effect. If the theory is at the level of the firm, the researcher should consider whether they can create a large enough sample to rule out a possible explanation of no findings due to low statistical power. Sometimes opportunities arise to test theory using organizations (e.g., divisions, departments) within the firm. This may allow the researcher to negotiate access at the firm level, while gaining access to multiple sites that offer the statistical power needed to perform quantitative field research. Lanen (1999) provides a good illustration of this research design. His study investigating the impact of the introduction of performance measurement plans was wholly set within one company. However, he obtained data for 55 plants, and cross-sectional variation among the plants corresponded to important theoretical propositions about the predicted effects of the plan.

A more common manifestation of theory testing using field data involves selecting one firm that is appropriate for the theory being tested, with a lower level of unit of analysis. For example, Sedatole (2003) investigated the measurement of quality within a single medical services firm. The appropriate unit of analysis for testing theory was the medical procedure. Therefore, Sedatole sought a firm that had a reputation for high quality (so that the measurement properties of alternative quality measures would be particularly meaningful to the firm), and that retained archival measured data for each procedure. For Banker et al. (2001) the unit of analysis was the employee. In a firm that implemented a performance-based incentive plan they were interested in investigating whether the performance plan induced both effort and selection effects. In other words, did the performance-based incentive scheme attract better employees, and were the employees motivated to work harder and increase productivity? Epstein & Widener (2005) investigate a decision that takes place within a community and collect survey data at the level of a household, creating a sample of approximately 1,500 respondents.

Although it is relatively rare owing to the demands that long-term projects place on faculty members, we close this section with an excellent example of a longitudinal quantitative field study.[20] Glick et al. (1990) provides a thorough discussion of field site selection that illustrates many of our points. The purpose of their study was to both develop and test a theory of organizational change using empirical analysis. The researchers selected a cross-section of firms that was large enough to provide adequate statistical power. To enhance their ability to distinguish industry and firm effects, they limited their study to several industries but included many firms from each industry. While they acknowledge that the preferred approach to site selection would have been random sampling of firms from a known population, practical considerations of time and travel costs caused the research team to recruit companies that were located near their Universities. By capitalizing on connections with the university they further enhanced the likelihood that the company would participate.

As important as site selection is, longitudinal field research depends critically on the ability to retain sites in the study for the duration of the project. Glick et al. (1990) proposed to visit and collect data from managers every 6-months for a 2-yr period. They employed several techniques to enhance their retention of companies for the duration of their study including: sending regular professional newsletters and project updates to participants, being respectful of the participants' limited time, and scheduling interviews at the convenience of the participants. Remarkably, effective use of selection and retention techniques allowed the researchers to collect data from 153 organizations at four different points in time during a 2-yr period.

In sum, the researcher pursuing a quantitative field research study must consider various factors when selecting an appropriate site including the availability of data, the appropriateness of the company for the study, the appropriate unit of analysis, and whether adequate statistical power is likely to be obtained for testing the theory. For quantitative field studies that have theory testing as a goal, careful site selection is critical to meeting the first and third conditions that Atkinson & Shaffir (1998) require of successful theory

[20] More common, though still demanding is the approach adopted by Anderson & Young (1999). In this study multiple research sites within a firm were selected based on their years of experience with a particular management accounting practice. Although the data are collected at approximately a single point in time for a cross-section of sites, longitudinal questions (e.g., the effects of system maturity on the model of system satisfaction) may be studied indirectly when the sites are grouped into sub-samples based on system maturity.

testing in the field: that the conditions of the test (i.e., the setting, the unit of analysis) are consistent with the axioms of the theory, and that the test provides reasonable probability (i.e., power) to confirm or contradict the theory.

4.3. Data Identification, Collection, and Preparation

4.3.1. Overview of Data

No discussion of data collection for quantitative analysis can proceed without first identifying the natural state of the data; specifically, whether the data are measured or latent. We define *measured* data as the native data that are present in the organization and visible to management before the arrival of the researcher. Examples of measured management accounting data include accounting records (e.g., costs, budgets, variances) and measures of individual or organizational performance (both financial and non-financial).

We define *latent* data as the data that are present but invisible in the organization; they await the researcher's measurement tools. Although individuals may be aware of the data as a matter of intuition or expertise, the data are not systematically part of the visible spectrum of management accounting information. Latent management accounting data include data that the researcher may derive from pre-existing measured data. For example, a researcher might use as a proxy for "goal ratcheting" a measure of the extent to which goals increase when prior performance exceeds or meets goals as compared to the extent to which goals increase otherwise. Mathematical manipulation of existing quantitative data is used to create new quantitative data. Joshi et al. (2001) use existing quantitative data on steel firms to create variables that proxy for the price of capital and capital stock. Campbell et al. (2005) use exploratory factor analysis on demographic data collected by their research site to identify two variables that proxy for the income and population levels of the neighborhoods surrounding their retail store locations. The researcher might also work from existing qualitative data to create quantitative data, as in the case where researchers perform content analysis of existing company documents (Anderson et al., 2000; Lillis, 1999). An important consideration when this approach is employed is the reliability and consistency of judgments reflected in the coding. Typically two or more independent judges are employed and the researcher reports measures of inter-rater reliability to allow the reader to assess the quality of the coded measures.

Latent data also include data that the researcher must unearth or reveal through direct measurement intervention. Examples of measurement interventions include: interviews,[21] direct observation, and surveys. With these approaches, the researcher seeks to measure systematically latent constructs that are not otherwise readily accessible. Unlike measured data, or latent data that are derived from measured data, latent data that the researcher brings to light may be altered by the researcher's measurement intervention. That is, the measurement process itself may alter the "true" latent data that the researcher seeks to capture.[22] It is important to note that this may be true even absent problems in interview or survey methods that introduce measurement error or bias (Atkinson & Shaffir, 1998; Birnberg et al., 1990). The very act of interviewing, observing, or surveying may bring to the fore information that the respondent had never considered, or had not considered in a particular juxtaposition, causing the respondent to form new, different opinions than were held prior to the interview or survey.

It is easy to see how concerns about measurement intervention (as well as the potential adverse effects of poorly executed interview or survey methods) may cause reviewers and publishers to be more comfortable with field research that makes relatively greater use of measured data or of latent data that are derived from measured (quantitative or qualitative) data. However, a preference for one type of data or one approach to data collection ignores a far more important, often unique opportunity in field research; namely, the opportunity to obtain multiple measures of each construct using multiple sources. We are not the first to remark on the importance of multiple data sources[23]; however, we find relatively little evidence

[21]Although interviews need not be used to produce quantitative data (e.g., Lillis, 1999), for purposes of this chapter, we consider the opportunity that coding interview transcripts offers for transforming qualitative data into quantitative data.

[22]In the management literature, it is common to refer to the "Hawthorne Effect" as evidence that any changes to a process that involves human participants will be associated with both real process outcomes and affective changes in employees. When the process change involves the human participant being observed or evaluated by another person, the change in behaviour is referred to as "reactivity." In the physical sciences, the Heisenberg uncertainty principle is commonly cited as evidence for the effects of measurement on any process.

[23]Birnberg et al. (1990) discuss the value of using multiple research methods to address a single research question. Yin (2003: 14) specifically defines field research as including "multiple sources of evidence." Ferreira & Merchant (1992) discuss a hybrid approach in which a particular mode of data collection is employed exclusively at different stages of the research.

of researchers responding to this call. Moreover, we are particularly troubled by the degree to which field studies, the setting in which multiple methods should be the norm, have failed to capitalize on the opportunity to collect a more complete mix of quantitative and qualitative, measured and latent, pre-existing and revealed data for management accounting research.

Table 1 classifies the field research studies that are referenced in this chapter according to the nature of data used in the study and the study's primary objective.[24] Several studies use both quantitative measured data and survey data, and to a lesser extent, some studies combine interview data with quantitative measured data or survey data. What is not apparent in this classification (or in most of the published papers) is whether different sources of data are being used to "triangulate" and corroborate the validity of specific variables. Atkinson & Shaffir (1998: 61) identify four common strategies for enhancing construct validity, one of which is developing alternative measures for the same phenomena. In doing so, researchers can determine whether both sets of data support the same conclusion—a form of triangulation.

Bhimani's (2003) study on an implementation of a management accounting system illustrates the point. During a 3-yr period, Bhimani conducted interviews and reviewed public and corporate archival documents in order to document the organizational culture of his research site and to determine how certain elements become embedded in the newly implemented management accounting system. He conducted surveys in order to collect data and empirically test how the culture affects the success of the implementation. Although Bhimani exploited his field site location and gathered three different types of data (observations, interviews, and survey data), each type of data was used for a different research purpose; as far as we can tell from the published paper, the data were not used to triangulate or corroborate the constructs.

Banker et al. (2002) provide a contrasting perspective on data that are used to rule out alternative theories and to ensure that the test has reasonable likelihood of confirming or contradicting theory. For their empirical tests they relied exclusively on measured archival data, primarily from manufacturing reports and accounting records. They used observations and interview data mainly to rule out the need to control for certain variables. In one example, they created a laundry list of employee policies related to promotions, recruitment, incentives, etc. that could potentially affect their empirical tests. The authors used interview data to conclude that measurement of these variables was not needed since there was no variation across plants.

A final example is Davila & Wouters (2005). They use interviews and measured archival data to investigate budgeting practices. They begin their analysis by first addressing their propositions using descriptive, qualitative evidence. In doing so, they capitalize on the field research method to provide rich description and vibrant, telling quotes that describe the organization and the budgeting process. Davila and Wouters then follow the qualitative analysis with a quantitative analysis that draws on measured archival data to provide statistical evidence on their propositions.

In summary, there are several examples of field studies that use multiple sources of data, which enhances credibility in the results. As Foster & Sjoblom (1996: 56) note in discussing their use of multiple methods, "Use of three research methods enables us to increase the reliability of the inferences drawn from our Solectron research and to develop a richer platform from which to conduct further research on quality improvement drivers." Although we agree that multiple data sources are important, we also urge researchers to use multiple measures of a particular variable from *different sources* to enhance construct validity.

The natural state of the data that are needed for the research question will determine what data collection tools are necessary as well as the most likely set of analysis methods to employ. However, this overstates the case, because at times it is possible to identify good proxies for latent data in measured data, and similarly, there are opportunities to create latent data from measured data. Researchers also often substitute latent data that emerge from measurement interventions for measured data and for latent data that are created from measured data, as for example, when survey respondents are asked to report otherwise unverifiable performance or are asked to opine on matters that are measured or measurable using pre-existing data. This approach to data collection has proven the most difficult in publishing field-based research. As might be expected, it opens the researcher to questions about the likely effects of measurement intervention and is often associated with concerns about endogeneity and circularity that are not easily addressed. In such cases, the

[24]Unfortunately, as part of the review process, details of the field site and colorful contextual information gained during interviews and observations are often removed from the paper due to space limitations and due to tastes of reviewers and editors. This makes it more difficult to precisely segregate studies based on methods—archival versus survey versus field studies.

researcher must make every effort to obtain measured data, if not for use in the analysis, then to validate the data collected through surveys or interviews.

In summary, we argue that the most important question is not how to obtain a quantitative measure for each construct that is demanded by the research question, but how to obtain many measures for each construct (which may include multiple respondents to an interview or survey) and how to obtain measures that have different natural states (which requires supplementing interviews and surveys with measured data or latent data derived from measured data). Together these approaches increase the likelihood of quantitative field research meeting Atkinson and Shaffir's fourth condition for theory testing: that variable measures represent with high fidelity the constructs that are critical to the test of the theory.

4.3.2. Collecting Measured Data in the Field Setting

Although the researcher is not involved in the construction of measured data, the researcher still has an important role to play in assembling an appropriate database and in preparing the data for use. Even when the data are archival accounting records, the researcher must typically make important selections from a large database of potential measures. Although the temptation is to "take everything," this only delays the careful culling of important measures. Moreover, the researcher often learns in later analysis when unusual relations are observed that the variable that had a particular label does not indeed measure the construct of interest. Atkinson & Shaffir (1998: 44) quoting Gusfield (1995) say: "Data that do not stay close to the events, actions, or texts being studied are always suspect…What Geertz called 'thick description' is the ideal, not always achieved but always to be aimed at." Furthermore, if we are trying to understand management accounting in its natural context, then we need to understand the key actor's interpretation and perception of the situation.

To that end, we have found that at this stage it is best if the researcher can work on-site with someone with firsthand familiarity with the data, the data generating processes, and the database structures. By employing exploratory data techniques it often becomes clear that certain data fields are incomplete, are labeled in a misleading way, or do not represent the variables of interest. If the work cannot be done on-site, it nonetheless requires a period of intense communication between the researcher and a person at the firm with detailed understanding of measurement practices and of electronic database structures. An example of this is a customer survey dataset with which we are currently working that contains in excess of 500,000 records, 75 variables, and spans a 5-yr period. It took almost 6 months of working with the company to gain a complete understanding of the data structure, the variables, and changes to the database that have occurred over time. When careful work is done to fully understand archival data during data collection, it eliminates a lot of "tea-leaf reading" of anomalous results later in the process. It also, typically facilitates a deep understanding of the data generation process that may facilitate discovery of other questions that the data are capable of addressing.

A somewhat unique opportunity when measured data are employed is the possibility of longitudinal analysis.[25] Ittner et al. (1997), in their study of activity-based costing, provide an illustration of a longitudinal study that uses measured data. Using time-series data on monthly cost, revenue, and operations, the authors generated insights about the relation between the cost hierarchy classifications and costs. These relations are often hard to detect in cross-sectional studies where variances are averaged out of the sample. Banker et al. (2000) also conduct a longitudinal study using measured data. A unique feature of their longitudinal design is the use of a control group and a treatment group. They investigate performance implications of an incentive plan that was implemented in the managed hotels of a hotel chain, but not in its franchised stores.

Longitudinal analysis brings a different challenge – namely, ensuring that the data have been collected and used consistently over time. It is important for the researcher to determine whether what is measured has changed over time (e.g., as when accounting classifications change or boundaries within the organization change). For example, in the survey database discussed above, we found that record locations in the layout of the data fields changed over time. We also found that even when the survey questions were consistent across time, sometimes the scale changed (e.g., a change from a 5-point to a 7-point scale, or a change of endpoint "anchors" for the scale). In

[25]Although interviews and surveys may also be administered at different points in time, this is a somewhat rare research design owing to the cost and challenge of obtaining involvement of mobile human subjects over time. For an example of a longitudinal study that involved administering surveys at multiple points in time see Bhimani (2003). He administered a survey to the same respondents one year apart in order to capture before and after responses regarding the effects of an implementation of a management accounting system.

addition to the content and structure of the data, it is also important to consider how the *use* and *visibility* of the data has changed over time. So for example, perhaps product quality has been measured consistently over time; however, at some point it became part of a top management report, where previously it was strictly used at lower levels of management. Relatedly, perhaps the measure has had consistent visibility; however, during a portion of the time period it was linked directly to compensation. Archival research that is not associated with sustained direct contact with the data generating process is unlikely to uncover these issues that can seriously compromise empirical tests.

4.3.3. Collecting Survey Data in the Field Setting

Although many of the same caveats of mail surveys are applicable to surveys conducted in the field, there are several practical matters that researchers must consider related to timing, disclosure, construct validity, and response bias. If a survey is used to collect data in the field, researchers must consider the timing of the survey in relation to the timing of other fieldwork. For example, if the researcher combines interviews with a survey, which should come first? Should the survey precede the more personal interaction with informants, or follow it? Studies that are predominantly survey-based, may prefer the survey to be informed by the interviews. The interviews set the stage and define terminology so that survey respondents are "ready" to efficiently provide responses (Ferreira & Merchant, 1992). Often there is an iterative process with data collection alternating between interviews and various stages of development, refinement, and use of the survey instrument. For example, McGowan & Klammer (1997) wanted to investigate employee satisfaction with activity-based costing and recognized that employees in different roles (i.e., champions, sponsors, beneficiaries of ABC) would hold different views. Since they included all types of employees in their sample, they first interviewed top managers at their four research sites to identify appropriate respondents and then administered the survey. Selto et al. (1995) spent numerous days gathering data, interviewing employees, and observing the internal mechanisms of the plant prior to devising a survey using an established organizational assessment instrument meant to capture contingency-type variables. Using knowledge gained during their preliminary visits, the researchers adapted the survey to fit a modern technology firm. This was followed by a pre-test on several groups of plant workers and managers to ensure that the language was meaningful for their particular research site. Following another revision, the researchers implemented the survey. Young & Selto (1993) informally interviewed workers early in the study, and then pre-tested their survey instrument with several managers and two focus groups of laborers. The survey was revised and administered, at which time the researchers realized that many of the survey respondents were not fluent in English. In hindsight, Young and Selto acknowledge that they would have used simpler language if this had been known.[26]

Often, surveys are used to collect data that can be tied to established constructs that are relatively easy to communicate, while interviews allow for broader coverage of concepts that are ill-defined or difficult to explicate. For example, Abernethy & Lillis (1995: 245) state

> We adopted this form of data collection [semi-structured interviews], as the link between manufacturing flexibility and control system design has received relatively little empirical attention. At the time of the study there were no established measurement instruments that had been subjected to sufficient psychometric assessment for us to be confident in either the measures' reliability or their validity. Difficulties with using arms-length questionnaire measures to capture these constructs continues to be a challenge for research in this area.

So another conceptualization of the linkage between surveys and interviews is to use surveys and interviews to measure completely different data. One might use the survey to collect the more easily measured and defined items, leaving the interview to cover more complex concepts. An example of this approach is Davila (2005), who captured the firm's business strategy through an interview with each CEO, while he was able to capture data on the management control system using a survey. Alternatively the two methods can overlap in the data collected to permit assessment of construct validity and to allow more detailed perusal of issues related to causality and time-series behavior that a single survey administration would have difficulty detecting in cross-section (Anderson & Young, 1999; Lillis, 1999).

Another consideration in sequencing different modes of data collection from a single informant is that the sequence may affect responses and introduce unwanted bias. By doing a survey first, the interview

[26]Although Young & Selto (1993) developed their survey using an iterative approach, they noted that access was restricted and they were unable to complete as many iterations with the survey on-site as they would have liked.

can be done more efficiently since the respondent will already understand the researcher's interests. The interview can take the place of open-ended questions on the survey. If one assumes that surveys suffer less from respondent reactivity, the sequence of "survey first, interview second" may be less prone to the researcher affecting all of the data in undesirable ways. However, if the researcher includes complex concepts in the survey, it becomes more compelling to use the interview first as a means of building shared understanding of key concepts. Then the survey can be used to elicit respondent opinions related to the concepts with some assurance that measurement error has been mitigated. In this manner the strength of having researcher involvement to explain complex issues is harnessed, but at the cost that undesirable researcher effects could influence both the survey and the interview.

In gathering survey data in the field the researcher must also consider whether the survey respondent will be granted anonymity or whether identities will be disclosed. Granting anonymity means that there will not be a direct link between interview data and survey data; thus, construct validity cannot be assessed for each respondent. However, the trade-off is that in some environments creating distance between the researcher and the respondent is desirable for eliciting truthful and open responses. For example, Selto et al. (1995: 672) noted that "the level of discord was palpable" at their field site. Although laborers expressed their sentiments informally when managers were not present, the guarantee of anonymity to the laborers that completed the surveys may have helped ensure more truthful responses.

Surveys can also be used to supplement archival data; thus, researchers need to consider opportunities to establish construct validity with survey data and measured data. Since the survey data typically are drawn from multiple observers while the archival data may present a single measure that applies to the entire organization, researchers must decide how many survey respondents are needed and who will be adequately informed about the phenomena in question. So for example, if the archival data are accounting costs and survey questions are directed towards interpretation of accounting cost data, it may not be reasonable to survey every employee of the organization, or even every member of the management staff. In this case, one survey response from the CFO or Controller may be preferable to 10 responses from randomly chosen managers with limited knowledge of and exposure to accounting data.

Finally, when data are collected using surveys in the field the researcher must consider the distribution mechanism. Survey administration is always fraught with concerns about response bias and response rate, and there are methods for mitigating these concerns for mail surveys (e.g., Dillman, 1978). However, researchers performing a quantitative field study should consider how these methods might need to change when the survey is administered from the more familiar context of an involved researcher. For example, working within the organization the researcher may have the opportunity to distribute the survey using company communication vehicles such as intracompany mail and intranets. This may enhance the response rate by demonstrating that the survey has been authorized by an authoritative, respected "sponsor" of the study (Dillman, 1978). It may also make respondents more willing to complete a long survey because they see it as benefiting their specific company. However, while increasing the rate of response it may diminish the quality of response if employees are guarded in their response or distrust promises of anonymity and/or confidentiality. In this case, the researcher may be better served with a distancing mechanism—such as using a third party web hosting service or public mail. Alternatively, the researcher may decide to administer the survey in person. This has several desirable properties since researchers can mitigate one common criticism of surveys—that an unknown and/or unwanted person completed the survey. In addition, if respondents are allowed time during their work hours to complete the survey they may infer that the survey is more important than they might otherwise. Selto et al. (1995) used this latter approach by administering the survey to 406 direct labor operators and 19 managers in person during working hours. The worker survey contained 81 questions while the manager survey contained 92 questions, each of which took 45 minutes, on average, to complete. Although the workers completed the survey in person, the researchers guaranteed anonymity to the laborers and confidentiality to the managers by not capturing any identifying marks or names on the survey instrument.

4.3.4. Collecting Interview Data in the Field Setting

For the purposes of this chapter, we are most interested in interview data that the researcher intends to code, turn into quantitative measures, and use in statistical analyses. Therefore, we consider interview data from this limited perspective and draw on two examples in the accounting literature.

Davila (2005) coded interview data in order to measure the firm's business strategy. Both the founder and the CEO were "asked to describe the

distinctive competence of the firm.'' Two research assistants coded the responses in order to develop indicator variables that captured five different types of business strategy. The description indicates that Davila triangulated on the respondents (two respondents) and the coding process (coded by two researchers); however, the published paper is not clear on many matters. This is consistent with Baxter & Chua's (1998) and Ferreira & Merchant's (1992) criticism that published field research often provides inadequate description of the research methods and data on which the conclusions are based (see also Lillis, 1999). Although the amount of description is often subject to limitations placed by the reviewers and/or journal, more description on the coding of the qualitative data for quantitative use would be informative to the readers.[27]

Certainly measurement error exists in latent variables, especially when constructed from qualitative data. The primary concern for researchers using this technique is to reduce measurement error and reduce the need for readers to place trust in the researcher. While the use of multiple respondents provides increased construct validity when they are in agreement, Davila (2005) provided no description of how these multiple responses were used. For example, were they used to corroborate each other? And, if so, how were any differences reconciled? In other words, what if a CEO in the Davila study indicated that the strategy was technology leadership while the Founder indicated that the strategy was to enhance existing technology? As noted earlier, the use of several independent coders is also desirable; however, Davila does not disclose the inter-rater reliability or the policy for resolving differences. Researchers must determine *ex ante* how they will implement a coding scheme. Will the coding scheme be informed by literature or will the scheme ''drift'' as the coders' progress through the data? In the Davila study, were certain keywords and terms specified in advance and coded as a particular strategy or did the coding scheme emerge from the data? It is certainly more efficient to be guided by underlying theory; however, often the use of this research technique is driven by the fact that there is little established theory.[28] Moreover, if the coding scheme is allowed to drift, then it becomes an iterative process involving both coders and the independence of the rating is jeopardized. A better alternative is to involve a third person to recode the data after the coding scheme has been agreed upon. This person's coding can then be used to establish inter-rater reliability.

We recommend that when researchers use interview data to create numeric data they provide the readers with a roadmap of the coding schema. This will help reduce the absolute trust that readers must place in researchers. Abernethy & Lillis (1995) provide an excellent illustration of such a research protocol. Due to a lack of suitable and available constructs to measure both flexibility and integrative liaison devices, the authors chose to use a semi-structured interview approach and code the interview data into constructs. They produced inter-rater reliability metrics since each interview protocol was coded by both researchers. In addition, they included the coding schema in the paper for the readers. The researchers turned the semi-structured interview data into Likert-scale questions ranging from 1 to 5, which were subsequently used in statistical analyses.

Another important part of measurement error is that the coding of qualitative data is always subject to bias introduced by the researcher both during the interview and when coding the data (Lillis, 1999). Huber & Power (1985) identifies four sources of bias (or inaccurate information) in interview data: (1) the respondents have a motivation to provide biased information, (2) result of perception and/or cognitive limitations on the part of the respondent, (3) informant does not possess adequate information, and (4) the researcher is not eliciting information properly. Atkinson & Shaffir (1998) note that respondents may change their behavior or alter responses in order to be helpful to the researcher (i.e., tell them what they want to hear), to present themselves more favorably, and due to concerns regarding confidentiality. Interviewers must be aware that their presence, alone, can trigger these potential biases and attempt to minimize intrusive behavior and respondent bias as much as possible.

Abernethy & Lillis (1995) and Davila (2005) employ several techniques to mitigate this bias. The use of a semi-structured questionnaire is necessary, especially when multiple researchers might interview different respondents. For data that will be used in quantitative analysis, it is important that the same question be asked, in the same manner, to all respondents to ensure that the raw response data is available to code. It is important that the ''right'' person in the organization be selected as an informant (Huber & Power, 1985). The coding scheme, as

[27]Davila (2005) used qualitative analysis in a very limited manner to create one strategy variable. This limited use probably contributed to the lower level of description in the research design.

[28]Malina & Selto (2001) present an excellent discussion of coding procedures that are also applicable to coding qualitative data for use in quantitative analysis.

discussed above in conjunction with the Abernethy & Lillis (1995) study, is critical. Researchers must ensure they not only understand the coding scheme, but understand how it will translate into a quantifiable variable, and also ensure that the measured variable will reflect the theoretical definition of the variable. The use of multiple coders to both establish reliability and review the interview transcripts for inconsistencies is an absolute necessity and can also help reduce bias (Abernethy & Lillis, 1995).

The interview method is a powerful technique for gathering latent data that are amenable to quantitative analysis. Unfortunately, it does not appear that many researchers exploit this type of data although it can be very useful to establish construct validity, to triangulate findings, and to measure variables that are not well-defined.

4.3.5. Summary of Data Identification, Collection, and Preparation

Jick (1979) presents an interesting and informative discussion of various forms of triangulation and how to mix qualitative and quantitative data. He (1979: 602) states, "There is a distinct tradition in the literature on social science research methods that advocates the use of multiple methods." Quantitative researchers are urged to draw on qualitative observations to validate and interpret results, and clarify unexpected findings (Jick, 1979). And, indeed, we can find examples throughout the literature where this happens including Ittner et al. (2003) in their study on subjectivity in reward systems, Joshi et al. (2001) in their study estimating hidden costs of environmental regulation, Wouters et al. (1999) in their study of operational measures, and Foster & Sjoblom (1996) in their study on quality drivers. But we want to urge field researchers to push the envelope on the use of multiple methods (i.e., measured archival data, survey data, and interview data). Instead of using multiple methods simply to round out the picture, researchers should attempt to obtain measures for each construct from more than one source.

5. Conclusion and Personal Observations

Field researchers have the potential to make a significant contribution to the field of management accounting (Hopwood, 1983; Kaplan, 1983, 1984; Young, 1999). Field research offers academics the chance to go inside an organization and gain first-hand knowledge of organizational practices and processes. Important objectives for field research include studying outliers, providing small-sample evidence, and investigating anomalies and innovative practices (Shields, 1997). Furthermore, by definition, field research provides the field researcher with a rich set of data in its natural context. Atkinson & Shaffir (1998: 47) point out that studies designed to either develop or test a theory "attract the most attention" in management accounting literature and Young (1999) notes that field research is well-suited to these purposes. We agree with Ahrens & Dent (1998: 33) that, "To obtain better understandings of how management accounting functions in practice, field studies that bring the messy world of organizations closer to the reader are needed." While quantitative field research is particularly well-suited to testing theoretical predictions, we believe that more powerful use of numeric data in quantitative analysis would benefit all forms of field research, whether aimed at description, theory building, or theory testing.

Both Hopwood (1983) and Kaplan (1983, 1984) made strong calls for developing closer relationships with organizations, peering inside organizations, being able to describe innovative practices and processes, and developing and testing theories. Recent reviews of the research that emerged from these calls for field research (e.g., Ferreira & Merchant, 1992; Merchant & Van der Stede, 2005; Young, 1997) are optimistic about the state of management accounting research and the contributions of field research to "usable knowledge." However, they also agree that researchers need better training in field research methods. This chapter responds in part to that call by discussing key decisions and choices that researchers must consider in designing and executing a field study that has an aim of testing theory using quantitative analysis. We provide illustrations of key decisions and choices from the literature.

We emphasize the importance of theory and the role it must play early in the project. Although, we encourage researchers to be open-minded, especially in pursuing and developing multiple methods and measures of variables, we also argue that for field research that aims to test theory, the theory must be well-defined before powerful empirical tests can be constructed. Another early and critical decision that the researcher must make is the selection of the field site. In order to undertake a successful quantitative field study it is imperative that the researcher evaluate data availability and choose sites and informants that provide a powerful test of the theory. Finally, we discuss the importance of proper measurement in the field and the advantages a field site can offer in terms of combining data from multiple methods in triangulating variable measures.

Although quantitative field research makes heavy demands on the researcher, we have found it both personally and professionally rewarding. We do not

advocate it for all researchers. The academy benefits when many research traditions thrive and when researchers gravitate to questions and methods that suit their skills and talents. In working with doctoral students, we typically tell students to first find a question that interests them and then to consider the strengths and weakness of alternative research methods. Only if field research offers compelling advantages over other methods, if there is a reasonable expectation of gaining access to organizations or individuals that will provide data for a powerful test of the theory, and if the student is passionate about working in organizations and is willing to bear the uncertainty associated with field research and its publication should it be pursued. Regrettably, perceived uncertainty is often the deciding factor that biases against protracted involvement with firms (Bennis & O'Toole, 2005).

A distinguished colleague who does empirical financial accounting research once warned that field research was a "very risky" career strategy. However, for the researcher who is committed to understanding management accounting in its natural setting, an obvious response is that other paths are far more risky, if by risk we consider both the likelihood and the magnitude of innovation associated with plowing the well-turned field of public accounting data versus collecting private data from a promising site that is chosen to enhance the power of the test or the likelihood of revealing new theoretical relationships. When questioned about the wisdom of a doctoral student doing a single substantial piece of field work as compared to several smaller empirical studies using public accounting data, a senior faculty member who built his reputation on field research confided—"It's okay to put all your eggs in one basket, but you better take exceptional care of that basket." Although many of the recommendations that we offer are "obvious" (though regrettably, not so obvious that we avoided the problems that ensue from neglecting them), our goal in this chapter has been to enhance the care that is taken in field research, and thus to enhance the effectiveness of researchers applying field research methods. We have drawn heavily on our own experiences to offer practical guidance to those who contemplate a program of quantitative field research. We hope that in sharing our observations and experiences we enable others to improve upon the craft of field research in management accounting.

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Comparative Management Accounting Research: Past Forays and Emerging Frontiers

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Abstract: This chapter has three aims. It first examines the methodological orientations and assumptions of perspectives evident in the existing body of comparative research in management accounting. Second, it discusses methodological possibilities offered by approaches deployed in evolving noncomparative accounting research as well as methods used within wider-based social science investigations. Third, the chapter assesses certain contemporary changes taking place in work environments and organisational spaces and addresses associated issues of conceptual and methodological relevance to comparative management accounting scholarship.

1. Introduction

Cross-national management research has been of interest to scholars for over four decades. Many writers in the area consider that national differences in management practices need to be anticipated and managed in order to achieve more effective international commercial operations (Adler, 1991; Farmer & Richman, 1965; Graves, 1978; Haire et al., 1966; House, 2004; Triandis, 1983; Trompenaars, 2003). A few commentators view managerial differences across countries and cultures as barriers to interactions which can create confusion and need to be controlled or even limited (Ferraro, 1994; Hall, 1995; Seelye & Seelye-James, 1995). Other management scholars regard the variety of managerial styles across enterprises globally as a source of core competitive advantage whose understanding can confer cross-border alliance benefits (Doz et al., 2001; Gibson, 1994; Schneider & Barsoux, 1997) and enhance corporate performance (Harris & Moran, 1987; Hoecklin, 1995; Morosoni, 1998; Sheridan, 1995; Wilkins & Ouchi, 1983). Analyses of cross-country variations in managerial styles have led some commentators to consider differences as 'problems' in need of 'solutions' in the form of adaptive practices, adjustment possibilities and the development of intercultural skills (Earley & Singh, 2000; Holden, 2002). Adopting this problems/solutions stance to perceived cross-country managerial differences has spurred the growth of professionalised intercultural training and the advent of a 'culture-shock prevention industry' (Hannertz, 1992, p. 51).[1]

Many areas of management have been researched in cross-country comparative terms. Some investigations have focused on management control diversity and management accounting systems and practices. These writings have differed in intent, theoretical frameworks adopted, appeal to established and nascent social science methods, as well in terms of how they have contributed to methodological debates within the international comparative management literature more generally. This chapter seeks first to discuss a variety of conceptual and methodological perspectives adopted in past research and considers the wider methodological issues they raise. The chapter then explores emerging possibilities, which show potential for the further development of comparative management accounting research in the area. Different theoretical underpinnings captured by different investigatory enterprises are identified so as to both, demonstrate the connections between the research perspectives adopted and the observations recorded, and to identify methodological possibilities for engaging in comparative international management accounting research in ways that presently remain uncharted. This necessarily engages a consideration

[1]As demonstrated by businesses such as www.cultureshock-guides.com.

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of ongoing transformations in evidence across societies and organisational spaces.

The chapter begins by addressing different methodological arguments critically but without prejudice to alternative research paradigms. It identifies convergence-based perspectives, contingency-focused analyses, culturalist methods, institutional and interactionist frames of reference and historico-theoretical approaches to comparative research. It then discusses ongoing changes taking place in and around organisational structures and corporate pursuits to demarcate aspects of present-day cross-comparative thought, which may, in some contexts, necessitate reconsideration. Some of these changes relate to alterations in the social, economic, technological and institutional climate impinging upon organisations and their domains of activities. This last section focuses particularly on the influencing effects of internet technologies, digitised communication systems, novel organisational forms and shifting cross-national enterprise configurations on comparative management accounting research.

2. The Wealth of Notions

The recent literature on comparative management studies expresses lack of general agreement on how to carry out research in the field. This is in spite of a century of exploration around the notion of culture in anthropology and decades of comparative research efforts within the domains of psychology and sociology. Reviews of methodological issues in cross-cultural management research are indicative of the continuing absence of theory capable of explaining the relationships among culture, human behaviour in organisations and the outcomes of organisations (Boyacigiller & Roberts, 1984; Redding, 1997; Tayeb, 2001). Comparative management research has recurringly been criticised for not yielding sufficient insight because of methodological hurdles (Ajiferuke and Boddewyn, 1970; Budde et al., 1982; Lackman et al., 1994; Redding, 1997; Roberts, 1997). Many critiques of comparative management research indicate that the notion of culture is essential in any cross-national analysis but that the problem lies in the concept of culture being interpreted in different ways by different researchers (Nasif et al., 1999; Sackmann & Phillips, 2004; Tayeb, 1994). Roberts (1997, p. 8) states that 'culture is still a reality to be explained and as such cannot yet explain other realities'.

In assessing writings in comparative management, it is important to note that ontological precepts and epistemological predilection delimit what scholars will characterise as failings of comparative management research (Bhimani, 1999). For instance, Lim and Firkola (2000, p. 138) pose the question: 'How can culture be used as an independent variable to explain a dependent variable when researchers do not even have a clear understanding of the independent variable itself?' Such questioning presumes a particular conception of organisational processes and contingencies and ways of studying phenomena. Similarly, Lowe (2001, p. 314) remarks in relation to 'culture-bound' comparative management studies that they are often 'ethnocentric and mistakenly interpreted as universally applicable'. This perspective also presumes a quite specific conceptual logic in casting the problematics of some comparative management studies. Any criticism of comparative management research reflects partiality in intellectual positioning (Boland & Pondy, 1983). Ontological assumptions and conceptions of human nature define the critics' view of the social world 'and lead researchers to interpret the world from one perspective rather than from another' (Morgan, 1983, p. 21). Consequently, the following discussion identifies the intellectual assumptions of the comparative management accounting research perspectives reviewed.

Early comparative research in management was concerned with understanding differences in practices and styles across different countries. This focus coincided with the rapid expansion of US businesses into foreign countries, which led to particular questions, centring on the development of other economies and the manner in which US business interests could be advanced, to be asked. As Sackmann & Phillips (2004, p. 372) note: 'Research was guided by the quest for identifying universally applicable dimensions that would help managers navigate in different countries while doing their work'. Methodological approaches guiding early comparative management research appealed to scientific empiricism. If what was sought was to have measurements reported within a paradigm of quantitative research, then scales had to be constructed and made operationalisable. These had to be universally applicable. Methodological positivism was thus the most evident mode of investigatory approach.

Possibly, the expansion of US companies into other countries contributed to the development of foreign economies and the export of a cultural lifestyle, which was standardisable (Ritzer, 2004). The paradigm implicitly embedded in early cross-national studies gave credence to theorisation that presumed the convergence of societies over time. More diverse appeal to alternative intellectual positioning was to follow only later. Research in comparative management thus initially viewed international variety as diminishing as societies converge and become more

alike. The epistemological and ontological posture was highly particular and one which fitted the time- and space-specific objects of early writings in the area. This perspective is discussed next.

3. Convergence and Determinism

Cross-national differences are, within convergence-based research, seen as being suppressed as supranational forces of change take hold. Some scholars argue that broad environmental factors such as the process of industrialisation and the degree a society finds itself in along a notional trajectory of industrialisation influence organisational structure and management practices in a standard manner (Dore, 1959; Dyas & Thanheiser, 1976; Harbison & Myers, 1959; Haire et al., 1966; Inkeles, 1960; Kerr et al., 1960). Such a characterisation of societal transformation is underpinned by the argument that contingencies of market diversification, technical adaptation and interorganisational dependencies compel organisations to limit their internal administration and arrangements to a small set of functional possibilities enabling their survival. The argument that contingencies remain imperative across social, economic or political systems whilst progressively moulding organisational functioning marginalises the relevance of nation-specific influences.

Some scholars have claimed that a 'logic' forces industrial organisations to adopt particular specialisms of function and forms of organising. In this spirit, Harbison & Myers (1959, p. 44) have noted that

> … organization building has its logic which rests on the development of management and there is a general logic of management development which has applicability both to advanced and industrializing countries in the modern world.

Organisations for example may manifest greater specialisation and sophistication of managerial controls whilst managers become more 'professionalised'. Complex organisations experiencing growth may witness authority relationships undergoing a shift from being highly formal to becoming more participative with a concomitant decentralisation of organisational structure over the long term. Such a trajectory of industrialisation downplays the effects of nation-specific factors since the transformation associated with ongoing industrialisation is seen as taking place irrespective of national context. Any notion that nationally rooted cultural forces have an influence is restricted to effects, which alter the pace rather than the direction or conditions of change. The possibility that cultural strains could emerge to any significant and sustained degree in the genesis of organisational structuring is seen as remote. The logic of industrialism thus supports a macro-social 'culture-free' view of changes in organisational structuring, which essentially remains impervious to context.

Given that in broad terms, industrialising nations arguably witness comparable organisational structural changes, organisations consequently evolve with an existing likeness. Cross-national organisational differences within the logic of industrialism perspective then become reflective of the extent of industrialisation rather than of any deep-rooted element of national distinctiveness. Over a period of time, organisations across national boundaries are expected to become more alike. A level of sustained convergence befalls organisational configurations evidencing the pre-supposed homogenising effects of industrialisation.[2] As Jamieson (1983, p. 80) notes, early comparative management scholars adopted a stance, which inhibited the explicit consideration of nation-specific forces in explaining business behaviour:

> … management theory maintained that all the evidence pointed in the direction not of cultural diversity, but of convergence—that the basic principles of management were universal.

Just as the argument has been advanced that the industrialisation process leads societies and systems adopting modern technologies, managerial methods and modes of organisational control to become more similar rather than dissimilar, so the impact of globalisation featuring widely in contemporary management writings also presumes convergence effects (Hickson et al., 1979; Kogut & Gittelman, 1997; Lachman et al., 1994). The growing internationalisation of markets and the virtual dissolution of cross-organisational boundaries in terms of globalising enterprise activities are regarded as 'the latest version of the ''convergence'' scenario' (Warner, 2003, p. 3).

4. Contingencies Unbound

If indeed, the processes of industrialisation and globalisation exhibit converging influences, then the

[2]Researchers belonging to the political-economy school (Clegg and Dunkerley, 1980; Hill, 1981; Littler, 1982) likewise suggest that contradictions within capitalism generate broadly similar trends in the management and structuring of the labour process. Economic organization across countries under such circumstances are expected to exhibit similar tendencies toward the encroachment of managerial control over the conduct of work, toward the de-skilling of workers through the simplification and standardization of tasks, and towards the displacement of labour.

argument might be taken to also hold at the more micro-organisational level in terms of technological, market, strategic and other contextual variables' interdependencies with organisational structuring (Hickson et al., 1974, 1979; Hickson & McMillan, 1981; Lammers & Hickson, 1979; Pugh et al., 1969). Such is in effect the contingency theorists' posture on the stability of relationships between contextual elements and organisational structure variables. As such, 'imperatives' (Hickson et al., 1974, p. 64) between contextual variables and structural elements '… take effect whatever the surrounding societal differences'.

The contingency view assumes that contextual factors such as technology, dimensions of task environment and organisational size which are seen as affecting dimensions of structure are objectively differentiable from other elements of the environment within which they exist. Moreover, knowledge of these contextual factors is assumed to enable management controls to be purposefully designed. The characterisation of homogenising forces represented by context-structure linkages as being objectively determinable and the conception of management controls as being instrumentally functional form basic assumptions of the contingency perspective. The contingency view thereby presupposes that homogenising forces are objectively examinable and that management controls can be purposefully constructed. Adopting an objective stance to homogenising forces accords organisational processes characteristics that may be studied by methods that do not explicitly differentiate between 'the distinctive nature of the social in contrast to natural phenomena' (Knights, 1990, p 514). The relationships between organisations and their environments are seen in terms of the need to survive and certain functional imperatives are regarded as underlying the functioning of organisations which influence the structuring of systems of management control and accounting within and across nations (Belkaoui, 1994; Carr & Tomkins, 1998; Catturi & Riccaboni, 1996; Saudagaran & Diga, 1999).

The positioning of the contingency view is positivistic to the extent that it relegates the role of social elements to prioritise conceptions of natural phenomena. It assumes the instrumental potential of accounting mechanisms and management control essentialism (see Alvesson & Willmott, 1996; Burrell & Morgan, 1979; Hopper & Powell, 1985). The contingency literature in management control research is at a stage where broad preliminary observations have been made by reviewers on the results and implications of this body of research (Chapman, 1997; Chenhall, 2006; Covaleski et al., 1996; Dent, 1990; Macintosh, 1994; Macy & Arunachalam, 1995; Otley, 1980).

The methodological focus of contingency-based studies is generally on broad features of organisational structure and control. Organisational characteristics such as degree of centralisation, formalisation, specialisation and overall form and their associations with other contextual variables are considered macroscopically rather than in terms of how structure becomes operationalised. Contingency research does not seek to explore relationships between organisational participants, processes of mutual accommodation or modes of behaviour in the shaping of formal organisational structuring. If such factors are regarded as affecting the social bases of formalised dimensions of organisations, then contingency research will not delve into the societal conditioning of national specificism. This may explain why contingency theorists have generally ignored the role of culture (Nath, 1986). Where such a role is acknowledged, contingency theorists relegate culture, however defined, to having residue effects rather than as exhibiting primary forces of influence on management styles and organisational configurations. Contingency theorists tend to show more caution than writers on the logic of industrialism to the extent that whilst they presuppose parallel contingencies between contextual variables and organisational structural features, they do not allude to such contingencies as being comparably distributed across nations (Child, 1981, p. 313).

Negating the specificity of behavioural and social relations and according precedence to deterministic functional relationships between structural elements and organisational effectiveness precludes consideration being given to the existence of culturally rooted preferences at play which potentially underpin observed organisational forms and dimensions (Bhimani, 1999). In contrast to contingency theoretic explanations, an equally positivistic paradigm has also informed a very large body of academic studies concerned with comparative questioning which rests on explicitly culture-based explanations of observed cross-country differences. Culture-based research on organisational variety counters approaches, which rest on notions of context-free functionalism. This is discussed next.

5. Positively Cultural Analyses

Appeals to a 'culturalist' perspective have been made in the management control literature and more broadly, in an attempt to explain detectable regularities of structuration in organisational phenomena. There is much systematic evidence suggesting that the

pursuit of formally identical tasks or goals takes place in dissimilar ways from one national society to another (Erez & Earley, 1993; Harris & Moran, 1987; Harrison & McKinnon, 1998; Heller et al., 1988). Ascribing such variations to differences in modal personality structures or to the interplay of dissimilar sets of core values which are thought to affect work motivation and propensity and to favour one method of control over another, offers the potential of making nationally specific responses to problems of structuration of internal accounting controls in the workplace identifiable. Such an enterprise assumes that actors influence structure because they have internalised core-cultural values, which are shared extensively enough by virtue of their membership in a wider national society. Researchers in international management accounting variety have in the recent past adopted notions of cultural values which emphasise that they are reflective of mental programmes, filters and mindsets underlying motives, beliefs, goals, traits and social ideals. Such interpretations of culture convey the same general sense of meaning as Tyler's (1871) early definition of culture:

> … that complex whole which includes knowledge, belief, art, morals, law, custom and any other capabilities and habits acquired by man as a member of society.

In addition to conceiving of culture in terms of mental attributes, researchers interested in exploring the interrelationships between organisational control systems and culture have also tended to view culture as a determinant of human action and hence of the environment. This is referred to as the 'ideational' perspective. This view is in contrast to seeing culture as being environment-dependent—the 'adaptive' model. In her study of control and culture in the USA and Japan, Snodgrass (1984, p. 28; see also Birnberg & Snodgrass, 1988) remarks that:

> The ideationist approach to culture takes us from a specific concern for what culture *is* to a concern for what culture *does* … this position gives us an indication of how a cultural influence may become manifest in an organizational process.

Regarding cultural dimensions as being manifested at different levels of organisational activities and structures including accounting systems characteristics has led to a profusion of studies by accounting scholars which adopt empirico-specific methodologies as investigatory techniques. Reviews of accounting and culture-based studies focus therefore primarily on the contributions of positivistic theories in the area (Baydoun & Willet, 1995; Belkaoui & Picur, 1991; Chanchani & McGregor, 1999; Harrison & McKinnon, 1999). Most models proposed in the literature for advancing culture-based accounting research have tended to focus principally on the potential of nomothetic methods which emphasise systematic protocol and technique in gaining knowledge of the social world (Belkaoui, 1990; 1994; Birnberg and Snodgrass, 1988; Fechner & Kilgore, 1994; Gray, 1998; Perera, 1989). This may have mobilised a continued profusion of studies opting for positivistic research modes. Chanchani & MacGregor (1999) for instance divide their review of accounting contributions to the "cultural relevance literature" into the pre- and post-Gray (1989) literature. They point to only a handful of pre-1988 studies as adopting 'anthropological' methods and identify no post-1989 ideographic studies that provide a focus on subjective and individual accounts of actions and events. Patel (2004, p. 61) notes in this regard that cross-cultural research in accounting would benefit from "complementing the quantified dimensional based cultural measures with relevant historical, sociological and psychological literature". But such complementation remains rare.

The notion that human action and the environment is determined by cultural values a priori provides the basic premise underpinning much comparative management control research resting on pre-quantified cultural dimensions. Hofstede's (1980, 2001, 2003) questionnaire-based study of employee values and perceptions of the work situation within one large multinational organisation is among the most extensive of its type. Hofstede (1987, p. 8) sees the results of his study as having significance for accounting control research:

> The less an activity is technically defined, the more it is ruled by values, and thus influenced by cultural differences … Accounting is a field in which the technical imperatives are weak … so we can expect accounting systems to vary along national cultural lines.

The results of his study have been used by various researchers as a basis for undertaking cross-cultural comparative analyses of management control practices (see Chanchani & MacGregor, 1999; Harrison & McKinnon, 1999; Patel, 2004 for reviews of these studies). Such analyses adopt a stance akin to that taken in early cross-national studies of management practices (England, 1978; Granick, 1978; Graves, 1978; Hickson, 1993; Lincoln et al., 1981; Ouchi, 1981; Tannenbaum et al., 1974), which have treated culture ideationally, attributing to it the reason for the differences identified.

Whilst Hofstede's findings have clearly led to very extensive scholarly application of his results and his work generally has had a significant influence on management studies, it has been noted that:

> A national culture just cannot be reduced to a collection of independent dimensions but corresponds rather, to an array of traits revealing a measure of coherence. Some being more fundamental and stable … others more susceptible to change (D'Iribarne 1989, p. 273).

Hofstede's concept of culture has also faced much criticism recently relating to the circularity of reasoning in his cross-national investigatory concepts, the conceptual integrity of his research methodology and most fundamentally the presumed synchronicity of nation states with ethnicity (see Baskerville, 2003; Baskerville-Morley, 2005; Heidenreich, 1991; McSweeney, 2002a, b; see also Hofstede, 2002, 2003; Schench, 1989; Schollhammer, 1969). Lowe (2001, p. 315) notes that Hofstede fails to recognise that:

> Functionalism as the dominant and "cherished" scientific paradigm in social science, is an intellectual sub-culture rooted in the philosophical traditions of neo-liberal, nationalist, Western, industrial culture.

The culturalist perspective is objectivist in its view of homogenising forces and the notion that dimensional cultural measures can be appropriated from empirical observations. It assumes that the social world and its alleged structures can be regarded as being empirically verifiable. Formal methodological instruments used in the natural sciences are, under this approach, seen as amenable to investigation within a frame of reference allowing attempts to locate, explain and predict social regularities and patterns and their effects on management control structuring.

The ideational perspective adopted by researchers interested in the role of culture in influencing management control practices raises a variety of important methodological issues. Difficulties arise in that the definition of culture must be sufficiently precise to allow a delineation of the elements of national culture, which are seen to influence aspects of the functioning of organisations. Yet it must also remain sufficiently general so as to retain cross-national relevance. Attaining an appropriate balance between specificity and generality in defining cultural elements is a difficult task. Elaborations of cultural characteristics face the risk of being too limiting to allow an explanation of the full complexity of culture's role in the shaping of particular practices or of being too broad. A precise characterisation of features taken to constitute culture runs the danger of becoming ethnocentric in that pre-specifying explicit cultural dimensions may enable empirical verification but may also culturally bias a research study (Bhimani, 1999). Conversely, identifying broader dimensions of culture may yield an excessively general appreciation of cultural presence within enterprise activities.

The conceptually problematic tension between the general and the specific engages methodological issues, which polarise nomothetic approaches at one end and ideographic perspectives at the other. This polarisation is one which has raised issues germane to the study of both accounting controls (Ahrens, 1997; Ahrens & Dent, 1998; Dillard & Becker, 1997; Hopwood, 1987a; Miller & Napier, 1993) and of other socio-structural phenomena (Abrams, 1982; Burke, 1980; Child & Tayeb, 1981; Giddens, 1979; Kiser & Hechter, 1991; Whitley, 1984).

A further difficulty arises in that the salience of designated elements seen as central to culture at the time of the study must be established. Measures of ready-identified dimensions obtained from one study and applied to another face the risk of temporal anachronism. Perhaps more importantly, the ideational perspective as adopted by management accounting researchers only probes the existence of pre-defined cultural elements without examining whether these elements also inhabit other social processes, institutional systems and aspects of societal change. Such an approach can only shed limited light on the role of culture in giving rise to cross-country differences if non-accounting related organisational processes let alone extra-organisational activities have not been examined to ascertain the presence of the cultural factors under study. Moreover, it raises questions as to how far ideational notions of cultural influence can be methodologically upheld in the absence of counter-analyses of adaptive effects.

Exploring the cultural embeddedness of organisational accounting systems should seek to demonstrate the degree of coherence or consistency in cultural elements. The plausibility that some alleged cultural tendencies have a core influence vis-a-vis others which may be more peripheral is evident in the emerging comparative management literature (Bates et al., 1995; Lachman et al., 1994; Saffold, 1988). This is however, not investigated to any appreciable degree in research efforts concerning the interface between culture and management accounting systems. Likewise, exploring the origins of cultural roots and the historical influences, which might set one society apart from another is not prioritised in nomothetic research (Hopwood, 1987b, 1996). Value systems in modern societies tend to be differentiated into those that are long-standing and others which are of a more

recent vintage (see Hobsbawn & Ranger, 1983). The culturalist perspective ordinarily does not, identify as a primary objective, the exploration of the basis for the internal heterogeneity of values, which tends to be a feature of many modern societies. Persistent heterogeneity among business systems seems nevertheless characteristic of many societies (Whitley, 1991, 1992a). Enz (1986, p. 174) has noted that '… some societies may be monocultural while others are multicultural' whilst Tayeb (1994, p. 432) remarks that individual nations are '… usually very far from homogeneous'. Similarly, Schneider (1989, p. 157) develops the argument that '… many nations are multicultural and many cultures are multinational'. Corporate cultures have also been regarded as having a '…unifying effect'' across borders (Mueller, 1994, p. 409) given the expanding role of multinational corporations in the global economy. Collective groupings can develop within a nation and internalise and reconfigure a specific ethos of dynamism, which then manifests more centrally within one region as opposed to others. Splinter cultures within societies may ultimately undermine any notion of geographically and/or nationally definable sets of core-cultural values (Garreau, 1981; Scott, 1992). The possibility that '… societal heterogeneity dramatically influences the viability of cross-national comparisons' (Enz, 1986, p. 187) is thus important to acknowledge.

Equally so, cultural pluralism can emerge from institutional forces and structural influences which recur across different nations eliciting forces of change which render collective groupings of regions or industries more prone to evidencing a strong level of cultural trans-nationalism. Moreover, trans-border configurations may share significant values setting them apart from other possible strata within national societies or geographical boundaries but uniting them across frontiers. Individuals may develop cohesiveness whereby common values become shared across dissipated spaces and dispersed physical environments.

Such issues remain to be addressed in cross-national management accounting research informed by the culturalist perspective. No doubt, past culturalist research has advanced our understanding of culture and its impact on management accounting systems. But within the management literature generally, very little has been documented about the causes of observed similarities and differences in practices across nations (Adler, 1983; Kelley & Worthley, 1981; Miller, 1984; Nath, 1986; Negandhi, 1983; Sekaran, 1983). For comparative management accounting research to advance, it has been noted that more attention needs to be given to the complexity and diversity of culture (Harrison & McKinnon, 1999) and the underpinnings of observed diversity (Bhimani, 1996). Calls continue to be made for '…a multiple methods approach to and perspective on, research into culture and management accounting' (Harrison & McKinnon, 1998, p. 115; see also Patel, 2004; Shields, 1997). This chapter turns now to a perspective adopted in the study of cross-national organisational arrangements which tackles some concerns with the approaches discussed above whilst also developing an alternative mode of theorising cross-national variations in organisational arrangements and, in particular, in relation to management accounting practices.

6. Institutional Effects and Societal Differences

Methodological difficulties and conceptual obstacles abound in investigations of the cultural conditioning of management control systems. One conceptual approach to the study of relatively permanent elements, which inhabit industrial organisations has been referred to as the 'societal effects' approach (Maurice et al., 1980, 1992; Sorge & Warner, 1986; Sorge & Maurice, 1993; Sorge, 1983). In the face of evidence which suggests that characteristic patterns prevail across organisations within one country in relation to another, this view recasts substantive theories of the evolution of advanced industrialism in terms of society-specific features overarching organisational particularism without ceremonising universal influences and relationships espoused by convergence theorists nor giving particular precedence to culturalist explanations of organisational configurations and control structures. The starting point for the societal effects perspective is to abandon the search for forces external to specific societies, which might be seen to have a bearing on organisational forms and practices. The approach concerns itself with:

> … how the nature of organisations reflects the institutional features of the society in which they are located (Lane, 1989, p. 28).

The approach gives primacy to the idea that relatively permanent systemic features specific to a given society influence organisational forms and practices. It calls for abandoning any attempt to discover extra-societal forces affecting organisations and rejects the notion that universal elements condition social forms in advanced societies. The approach accepts that cultural factors may have a 'mediating influence' (Maurice, 1979, p. 46) but regards management and businesses as having different institutional foundations in different societies. Key institutions may

include the financial system, the legal system, the state and the family. This accords with institutional writings whereby the view is held that institutions proffer a nation and its economy distinctiveness in its social organisation (see for instance Orru et al., 1997; Whitley, 1992a, b; Wilkinson, 1996).

Whilst much remains to be learned about how institutions are formed and the processes whereby they affect organisations (Tolbert & Zucker, 1996), a focus on the nation-specific logic of both social and cultural heritage may imply divergence rather than convergence of organisational practices (Joynt & Warner, 1996; Warner & Joynt, 2002). But cross-national studies of enterprise differences tend to reveal relative rather than absolute extremes. Thus the notion of 'soft' rather than 'hard' divergence has been noted on the basis of empirical evidence from national comparative investigations (Braun & Warner, 2002; Warner, 2000, 2002).

The societal effects approach recognises the existence within workplaces of extensive networks of particularistic relationships obstructing the pursuit of formal goals (Brossard & Maurice, 1974). The argument can be made that the development of societally specific institutionalised populations of organisational forms and practices is linked to the preeminence of particular economic niches. This is evidenced by cross-national comparisons of societal factors and systems of control activities in organisations including structural elements underlying the interaction of people at work, systems of recruitment, the nature of qualifications, levels of supervision, and the extent of hierarchisation (Maurice et al., 1980; Maurice et al., 1986; Sorge & Warner, 1986). The societal effects approach emphasises the interdependence of structural dimensions. The approach's institutionally grounded focus recognises that cultural values and disposition affect individuals' behaviour in different ways. Accounting systems designers within organisations do not simply create systems which are fully reflective of their intended ideals in practice (Hopwood, 1987b). Rather, planned structures have both intended and unintended as well as immediate and long-term effects upon the perspectives and expectations of organisational actors.

The societal approach overcomes some of the problems presented by the ideational perspective of culture. It recognises that institutions influence forms of behaviour for actors, and that actors also modify institutions through their actions. As such, this perspective does not deny the existence of complex interdependencies between cultural elements and environmental factors. Rather than surmise about culture on the basis of value orientations, the societal perspective focuses on examining and differentiating between organisational actions and work activities in different national contexts and essentially '… taps culture relative to actions' (Lane, 1989, p. 36). This approach thereby overcomes the difficulties entailed in having to identify a priori, cultural value orientations among individuals and to establish the form and extent of their existence in organisational practices.

Of particular value is the societal effects approach's recognition of linkages between organisational elements and extra-organisational factors. For instance, the complexity of control systems is seen to be associated with '…the mix of qualifications, skills and training available to designers of control systems' (Rose, 1985, p. 69). Limits are set on how work-tasks can be designed, supervised and executed given that a low-skill workforce might be perceived to require more elaborate and rationalised sets of work tasks and more systematic supervision. Control practices including accounting mechanisms might thereby be influenced by the deployment of new groups of recruits which in turn are influenced by external institutional systems of education and training. Such a view leads to at least a partial erasure of the conceptual boundary line between organisations and their environment. If a degree of stability is a characteristic of wider institutions, then such characterisation might also be taken to infuse 'solutions' to prevailing institutional circumstances.

Ultimately, organisations within common groupings can be argued to exhibit similar key structural properties. Just as national labour force characteristics might shape organisational controls, so might the role of bodies such as trade unions and training agencies. Thus, behind a general correspondence between say pay-levels and qualifications might reign a consistent societal effect. Ultimately, what is sought is the identification of stable features of the social and organisational environment which underlie and shape the overall strategies of organisational actors or which affect the content of organisational controls and accounting practices. The approach probes the existence of societally specific forms and devised organisational structures and a loose form of equifinality in terms of how far the resolution of common problems takes place through differentiated and societally specific forms across different nations.

The societal effects perspective does not negate culturalism. It is arguable that culture and institutions will influence different aspects of management and organisation. Contextual factors such as size and technology viewed as influencing variables in more universalistic explanations and cultural dimensions in the ideational literature may not, on their own, offer

sufficient explanation according to more recent adaptations and operationalisations of the institutionalist perspective (see Warner, 2003). Child & Warner (2003) consider that cultural inputs on individual attitudes and behaviour can have pervasive influence within organisations. There may be impacts on the motivational consequences of managerial practices and styles, norms of communication, the conduct of meetings, the willingness to take individual responsibility and modes of conflict resolution (D'Iribarne, 1991). Systems of corporate ownership, governance, accountability, collective bargaining and reliance on formal contracts within and across organisations, which provide a focus on institutional characteristics, can complement culture-based impacts. One might thus alter the formulation of 'low context' explanations which focus on material resources such as technological or economic factors to favour 'high context' explanations characterised by ideational and institutional components concomitantly (Child, 2002).

What seems clear is that a variety of patterns are to be found in societies rather than a single one. Dominant patterns exist within a band of variety. Performance is associated not with the match between specific task contingencies, strategies, organisation and human resources, but the capacity to link up distinct and conceptually opposed task contingencies and strategy elements. Indeed, performance arises from the combination of what has been conceived of as distinct alternatives: cost leadership *and* differentiation in the product range; production efficiency *and* product quality; flexibility *and* productivity improvement; economies of scale *and* scope; mechanistic *and* organismic forms; and vertical integration *and* responsivity. Sorge (1991, p. 184) argues that 'wider societal arrangements have an important function within this framework … they allow actors to combine seemingly contradictory or conflicting elements'. Child & Warner (2003) note that in China managers who have internalised values such as individualism as a Western personal characteristic may at the same time, continue to value traditional Confucian concepts such as collective responsibility. As such, economically central organisational patterns vary in structurally significant detail among mature industrialised countries. Beyond this, it is not evident along any conventional measure of economic efficiency or effectiveness that one particular national pattern is more viable than another.

The societal effects perspective is concerned with the systematic analysis of 'choice-constraint dialectics'(Sorge & Warner, 1986, p. 13) rather than with notions of unidirectional causation subscribed to by the contingency and culturalist frameworks discussed above. It does not prioritise the ontological view that goal definition precedes means selection or that choice finds legitimation *ex ante* rather than *ex post*. Under conditions of social change, organisational structuring is seen as emergent and is sought to be analysed in the context of societal, economic and institutional influences, which form a 'complex tangle of impacts' (*ibid.*). The societal effects perspective takes a halfway stance between unidirectional determinism and total constructivism whereby human creativity is seen as unbounded and any organisational arrangement is possible such as to vitiate the plausibility of correspondence relationships. It stresses both the partial autonomy of the human mind as well as partial dependence on the objectivised world. Correspondences between organisational phenomena and societal structuring exist within a complex set of contingencies that reflect emergent patterns.

In disconfirming the defining elements of simplistic versions of organisational universalism and in refuting the convergence thesis, the societal effects approach indirectly posits divergence among capitalistic countries. Such a stance acknowledges Malinowski's dilemma (Malinowski, 1944) of whether a test for the convergence of societies is plausible in the face of the theoretical posture that societies are non-comparable?

Both ideational-based studies and societal effects analyses increase our understanding of some of the possible forces underlying diversity in organisational arrangements, control structures and potentially, management accounting systems across different enterprises in different national contexts. But these perspectives do not address certain important questions about the interplay between control systems and the homogenising effects posited. Montagna (1987, p. 27) comments in relation to accounting research drawing on Hofstede's (1980) quantification of cultural value dimensions that 'the lack of emphasis on the social dynamics of culture limits the utility of their analysis of the relationship between culture and accounting'. This represents a common problem with the majority of existing comparative studies of management accounting systems. Few studies for instance, heighten our appreciation of the processes by which wider social phenomena become embedded in accounting practices, or shed light on the manner in which internal accounting processes come to exhibit specificisms discernible in their broader social context. Likewise, questions about the inertia and dynamism of homogenising forces in altering, shaping and mobilising particular accounting systems remain largely unanswered. This arises because exploring the roots of national distinctiveness as to management accounting systems is not prioritised in this research.

7. Interactionism and Neo-Institutionalism

A significant criticism levelled at comparative empirical investigations of management practices and organisational features centres around the relativistic position that a common observation language is not possible to achieve in the study of social phenomena (Mingers, 2004). Geertz (1973, p. 5) takes the view that

> Believing, with Max Weber, that man is an animal suspended in webs of significance he himself has spun, I take culture to be those webs, and the analysis of it to be therefore not an experimental science in search of law but an interpretive one in search of meaning.

Meaning must be contextually understood rather than analysed. As such, the comparative npanalysis of social systems and institutions might be viewed as being inimical to systematic modes of assessment. If it is accepted that the meaning is contextually determined and that the meaning of phenomena under study is contingent on interactions between organisational actors, then ascribing universal relevance to control categories across nations may be regarded as questionable. Viewing management accounting systems as enacted offers a conceptual stance to exploring how they might be embedded in collective systems of thought rather than as emerging from a process of rational adoption of cultural values that are deemed pervasive. Cultural influence may in effect, be considered as a subjective phenomenon that emerges during interaction between individuals (Triandis, 1983, 1995). It is in this sense embedded and enacted. In the context of management accounting systems, such a view of cultural conditioning is compatible with the notion that accounting controls do not necessarily arise from purposive actions or conscious design (Silverman, 1970). Formal elements of management accounting systems can be reflective of wider social elements whilst being deeply embedded in them (Ansari & Bell, 1991; Meyer, 1983).

The proposition that organisational structures can be emergent and enacted appeals to a position whereby human behaviour might be seen to derive sense and meaning from the interaction between actors and their social context. In contrast to placing emphasis on the plausibility that management controls and internal accounting systems can be shaped deterministically, such a stance adheres to a less ambitious potential

> … the interactionist view makes it possible to avoid the "reification fallacy" of orthodox economic thought (Zan, 1995, p. 270).

The notion that structure results from pre-defined design and intended action is less tenable within an interactionist frame of reference as assumptions that remain semi-conscious are viewed to influence how organisational actors as part of groups perceive, think and feel (Geertz, 1973; Schein, 1985, 1996). Patterns of judgment become aligned with actors' subjective interpretation schemes and certain perceptive repertoires of cognition remain whereas others are eschewed (Weick, 1977, 1979). The role of conscious management decision-making in producing outcomes regarding organisational accounting system arrangements is thus limited. Social understandings derived from the interplay between organisational actors influence formal elements of management accounting controls in implicit ways (Ansari & Enske, 1987; Ansari & Bell, 1990, 1994; Meyer & Rowan, 1997). Choices are made but derive from intuition and semi-conscious norms of obligations and preferences. Cross-national studies of management accounting systems within this frame of reference cannot be considered within a de-contextualised deterministic and mechanical imagery of causality. Accounting structures by themselves are not given an epistemologically privileged status that subsumes purpose and predictability. This is in contrast to the majority of international investigations of management accounting systems where establishing purpose and predicting form has generally not been regarded as being problematic.

A number of cross-national comparisons of management accounting systems suggest that focusing on the universal aspects of organisational structuring (the etic view) such as degree of decentralisation, formalisation, standardisation of procedures etc. reveal little of the underlying causes and consequences of observed differences and similarities (see Child, 1981). Conversely, a concern with locally meaningful elements '… emphasising the insider's view and interpretation of the world' (Punnett & Shenkar, 1994) (the emic perspective) is more conducive to delineating a role for semi-conscious, unarticulated rationales; whereby management accounting controls are seen as enacted rather than purposefully structured. In this light, the interactionist perspective may be viewed to be specifically focused toward subjectivism and emphasising enactment rather than purposefulness.

Whilst at the level of structural configurations, cross-national investigations may suggest similarities; for instance, in relation to task-environments (Tayeb, 1988), human resource problems and decentralisation (Lincoln & Kalleberg, 1990), configurations tend to be achieved in different ways '… depending on the

particular socio-cultural characteristics of the society' (Tayeb, 1994, p. 440). The interactionist perspective suggests that environments define and legitimate organisational structures aiding in their creation and maintenance.

The notion that structure results from pre-defined design and intended action is not favoured within interactionism and new institutionalism frames of reference as organisational actors are viewed as making assumptions that remain semi-conscious. Patterns of judgement become aligned with actors' subjective interpretation schemes and certain frames of perception remain whereas others are eschewed (Weick, 1977, 1979). Rather than considering organisational arrangements as adaptive solutions to problems of utility maximisation and opportunism, repetitive elements of organisational structures are sought to be explained by reference to their taken for granted nature and their perpetuation in structures that are to some extent self-sustaining. Although individuals within organisations make an array of choices on an ongoing basis, they also continuously seek guidance from the experiences of others in comparable situations and by reference to standards of obligation (Smirchich, 1983). Individuals 'associate certain actions with certain situations by rules of appropriateness' (March & Olsen, 1984, p. 741). Such rules arise from the process of socialisation, on-the-job training, education and observed norms of deference to convention. The role of conscious management decision-making in producing outcomes is thus limited.

The proposition that organisational structures can be emergent and enacted appeals to a position whereby human behaviour might be seen to derive sense and meaning from the interaction between actors and their social context. Social understandings derived from the interplay between organisational actors influence formal elements of management controls including accounting systems in implicit ways (Meyer, 1992). Choices are made, but derive from intuition and semi-conscious norms of obligations and preferences (Schein, 1996; Smircich, 1983). Cross-national studies of management systems cannot, in this light, appeal to a de-contextualised and mechanical imagery of causality, which presumes purpose and predictability as given. The comparative analysis of social systems, institutions, and organisations entails developing an understanding of context-specific meanings and priorities.

If it is accepted that the meaning is contextually determined, and that the meaning of the phenomena under study are contingent on interactions between organisational actors and their inter-relationships, then ascribing universal relevance to control categories across nations must be questioned. Viewing management accounting systems as enacted offers a way of exploring how they might be embedded in collective systems of thought, rather than as emerging from a process of rational adoption of core normative values that are deemed pervasive. In this light, the structuring of management accounting systems cannot arise purely from purposive actions or conscious design, but rather may be viewed as reflective of wider social elements as well as being deeply embedded in them (Ansari & Bell, 1990).

Whilst at the level of structural configurations, cross-national investigations may suggest similarities; for instance, in relation to task-environments (Tayeb, 1988), human resource allocations (Smith, 1992), and levels of decentralisation (Lincoln & Kalleberg, 1990), their modes of realisation may differ '… depending on the particular socio-cultural characteristics of the society' (Tayeb, 1994, p. 440). The interactionism and new institutionalism perspectives suggest that the legitimacy of particular organisational structures is not predicated on notions of rational adaptation to organisational contingencies in the 'technical-instrumentalities mode' (Donaldson, 1995, p. 80). Standard operating procedures become institutionalised through law, custom, professional ideologies or doctrines on effective management. Specific practices may flow from

> … organization to organization, sector to sector and even country to country … Ultimately, they are taken for granted by individuals and organizations as the right way to do things (Meyer & Scott, 1992, p. 2).

Although these early efforts are laudable, they offer limited insight into the historical rootedness of observed management control practices. In part, this is because carrying out investigations that are concerned with how shared typifications and standard cognitive models vary across societies, but are shared within nations, requires extensive investigatory effort. There is nevertheless little doubt about the potential that these research perspectives offer to explain the basis of organisational structures or practices across different contexts. But their ability to explicate change is, however, less evident.[3] If relationships exist between cognitive effects and organisational structure, one might ask by what mechanism can alterations in systems of control be explained? How can the dynamic between interaction among

[3]See Scapens (1994) for a discussion on evolutionary versus revolutionary change processes within an 'institutional economics' framework.

organisational actors and structural features of their organisation be understood? If taken-for-granted beliefs and widely promulgated rules serve as templates for organising, what ensues when differing institutional rationales challenge one another? How do strong local logics of cognition interfere with those that are more widely dispersed?

Within cross-national studies of management accounting systems, attention might be given to examining ways in which institutional meanings are constructed and to exploring the mechanisms by which they penetrate local settings. Such a stance stresses on not only the delineation of similarities and differences but also the exploration of how organisational actors become enactors of social rules (Boyacigiller & Adler, 1991). Organisations within a nation may adhere to institutionalised modes of operations which may vary from those in another nation. Conversely, transborder institutionalising forces may diminish observable differences. Powell and Di Maggio (1991, p. 10) suggest that interactionist perspectives shed light on the existence of semi-conscious cognitive influences on organisational structuring but that a clearer understanding of the basis for collective choices can be derived by investigating the historical provenance of cultural outlooks within which they are embedded. The next part of this chapter considers a particular historico-theoretical perspective which also gives rise to a specific conception of control permeating accounting systems structure.

8. Unraveling the Origins of Specificity

To understand how and why organisations across nations are similar and different, an explanation for the 'processes whereby organisations might be infused with national distinctiveness' (Child, 1981, p. 305) would seem desirable. For national distinctiveness to be regarded as stemming from a society's past, links between historical events and social effects must be made evident. This necessitates an examination of the dominant values and enduring normative attitudes and their shaping by historical, social, political and economic changes. Ultimately, such ties must be established before claims about the existence of national strains and management accounting specificity can be made. Establishing such links with the past is not unproblematic (Hopwood & Johnson, 1987; Loft, 1995; Luft, 1997; Miller & Napier, 1993).

Different approaches to historical analysis exist. Historicists may attempt '… to establish "what happened next" to see if it has the "feel" of a pattern, a process, or a series of accidents and contingencies' (Mann, 1986, p. 503). Their explorations should stress on the complexity, uniqueness, and contingency of historical events. The position might be taken that it is more appropriate to determine '... how *this* man, *this* people or *this* state became what it is' (Gadamer, 1972, p. 116) as opposed to '… how men, people or states develop *in general*' (*ibid.*). Such a view then points to the question of whether one can go beyond seeking to explicate how '*this* organisation' or ' *this* management accounting system' came to be what it is. Seeking a more generalist explanation for perceived collectivities must come first to terms with whether the specificity of an organisational context can embed elements of commonality with other organisations which do not carry across borders. Historicists would suggest that parts cannot be analytically removed from wholes and that historical events being complex and unique cannot support a role for general theorising about causal effects (Duby, 1980). Such a view is reminiscent of Malinowski's dilemma and is inimical to the enterprise of comparing different societies. Comparative history has in effect, been said to be '… an oxymoron to a true historicist' (Kiser & Hechter, 1991, p. 12).

It is often noted that diffusion and imitation connects societies across time and space (see Powell & Di Maggio, 1991). The problem of 'connection' is not limited to 'contamination' across time but also across contexts and needs to be addressed in cross-national analyses seeking to be historically informed. Action may be regarded as having a connection with the past and as providing a basis for that which follows:

> … there has never been a total breach, an absolute discontinuity … or a non-contamination… between the past, even the very distant past and the present. Past experiences continue into the present, adding to it (Braudel, 1977, p. 46).

Similarly, social anthropologists support a role for history to understand the present. Sahlins (1985, p. 34) for instance, states that

> … different cultural orders have their own modes of historical action, consciousness, and determination—their own historical practice.

Consequently, '… culture is precisely the organization of the current situation in the terms of a past' (*ibid.*, p. 155). Child (1981, p. 329) also stresses that

> … the pattern of past action within a nation, particularly as reflected in its institutional development, should draw attention to contemporary cultural products which are likely to be relatively persistent in nature.

The view that history can be drawn upon to explain the present has been the basis for pioneering studies

of the national rootedness of management practices and organisational forms (Abegglen, 1958; Crozier, 1964; D'Iribarne, 1989; Gallie, 1978; Locke, 1996). This view has been given support by a number of recent cross-national research studies of organisations. Possibilities for gaining an appreciation of the homogenising factors acting upon systems of management control in particular national contexts have also found support. Accounting research has extensively focussed on describing past practices (Armstrong, 1994; Hopwood & Miller, 1994; Miller & O'Leary, 1987). Some historiographical examinations have sought to explore how the past has led to the specificity of contemporary accounting practices. Foucault's (1961, 1966, 1975) works have, over the past two decades, featured in many accounting investigations seeking to understand the underpinnings of particular practices (Barker, 1998). His writings on the history of systems of thought have been concerned to '… understand the present as a product of the past and as a seedbed for the new' (Sheridan, 1980, p. 82). Seeking to identify enduring forces which become manifest in political, economic and institutional events and changes allows researchers to assess possible conditioning influences on practices and permits a deeper understanding of their institutional origins and source of sustenance.

Rather than explaining the actions of particular individuals, exploring the underpinnings of systems of thought help clarify what particular individuals might have shared with others of their time. Of relevance is the examination of the origins of modes of consciousness, the conditioning elements of human subjectivity and the regularity of forms of thought in particular contexts. In such scholarly enterprises, the concern is to understand

> … the coexistence of different systems of representations in the same society, in the problem of how new ones come into being, and in the ways in which cultural models move down the social scale (Burke, 1980, p. 77).

and to explore

> … the collective mentality that regulates, without their knowing it, the representations and judgements of social subjects (Chartier, 1982, p. 23).

In order to understand forms of rationality and the particularity of systems of thought as well as '… long-range trends in the alteration of the structure of the psyche' (Hunt, 1986, p. 217), Foucault has investigated how networks of institutions and practices have imposed specific forms of subjectivity on individuals. He attempted to shed light on how and why a practice is constructed in its specificity and how that specificity is anchored to other social practices. His objective was also to excavate the hidden forms of regularity not accessible to consciousness and to '… grasp the implicit systems which determine our own most familiar behaviour without knowing it' (Foucault cited in Megill, 1979, p. 492).

Broadly, 'new' historians have been concerned to investigate the internalised conditionings that escape conscious knowledge and cause a group or a society to share a system of representation and a system of values without the need to make them explicit. Such a perspective assumes management accounting to be operative within a framework of individual subjectivity acting as '… systems that quietly order us about' (Foucault cited in Megill, 1979, p. 493). The espousal of particular truths creates invisible self-willed controls within individuals and thereby renders possible the existence of particular and compatible management accounting practices.

Within this perspective, the peculiarities and characteristic specificities of particular management systems of control including internal accounting practices cannot be seen as deviations from a more correct universal form. Rather, organisational controls and internal systems of accounting are taken to be contextually determined by the nature of the individual's subjectivity and the specific social conditioning of the organisation. Ultimately, a particular mode of organisational functioning and regulation is influenced by effects shaping the social nature of both the individual and the organisation. The emergence of self-controls among individuals and the historical process underlying the social construction of the normative organisation have to be appreciated before an understanding of nationally specific underpinnings of international variety in management accounting can be developed.

Under this view, to understand the historical basis for the structuring of management accounting systems, it is necessary to examine conditions generating truth and to investigate the history of the 'objectification' (Foucault, 1981, p. 5) of elements which come to be taken as axiomatic within the domain of management practice in a given context (a defined collectivity or a nation say). In this light, the collective or national specificity of management accounting systems may be discerned by examining the genesis of conceptualisations of truth which alter, affect and influence the social space within which subjects and organisations exist. Seeking to appreciate the emergence of notions of truth represents a basis for better grasping management accounting system specificity across different contexts (Bhimani, 1994a,

b; Hopwood & Miller, 1994). Investigating ways in which truth-making mechanisms alter current practices can help clarify the many contingencies of accounting form, including subjectivity-based dependencies. Understanding modern-day changes and their implications for the potential of existing comparative methodologies is of growing interest to scholars. The chapter next considers this issue.

9. Shifting Domains of Comparison

Within the comparative literature in management (Adler et al., 1986; Alasuutari, 1995; Archer, 1994) and management accounting more specifically, the assumption that culture equates with nation has been recurringly questioned (see Baskerville-Morley, 2005; Lowe, 2001; McSweeney, 2002a, b). This is said to be particularly so given that developments in the spheres of technology, societal structures, modes of communication and economic systems over the past five years have altered the ways in which organisations are designed and how they operate (Bhimani, 2006). Partly as a consequence, how individuals interact, is fast changing. This further constrains the notion that culture can be equated with national boundaries. Different domains of activities, collectivities of interaction and networks of exchange can culminate in distinctive structures of interface and transient structural regularities. Some scholars have consequently posited the idea of 'multiple cultures' as a paradigm for cultural research (Boyacigiller, 2004). Sackmann & Phillips (2004, p. 378) note that organisations can be 'home to, and carriers of, several cultures' in that

> … cultures may be separate from each other, overlapping, superimposed or nested, or interacting with each other … a multiplicity of cultural groups may develop, existing and co-existing within organisational settings.

The following new workplace realities bring into question the appropriateness of comparative research methodologies used in past investigations:

- Technological developments have altered workplaces and work activities and accelerated the process of globalisation whereby work can be undertaken irrespective of time and can be shifted to coincide with diurnal activity changes internationally. Work processes and organisational arrangements have themselves changed enhancing the likelihood of multi-cultural teamwork formation (Soderberg & Holden, 2002).
- Novel communications media now allow global information exchange. The collection, analysis and dissemination of information has transformed the pace, mode and impact of intelligence generation and ways in which interactions take place (Avgerou, 2003).
- Political processes have altered in that, where silence had traditionally prevailed, choices and opinions can now be articulated and heard. Ethnic, religious and regional identities have grown stronger (Child et al., 2005; Friedman, 2005).
- Economic changes including the formation of unions and resource allocation agreements take place in a globally more comprehensive manner (De Jong et al., 2005).
- The social fabric of societies has altered as is evidenced by the rise of individualism, ego-centrism and diversity in values and value sets (Hendry, 2005).
- Organisational structures have shifted whereby international, multinational, global and multinational forms emerge and disappear rapidly and strategic alliances and hybrid organisations gain durability and stability as alternative sustainable organisational options (Child et al., 2005).

These issues raise questions as to the methodologically most apt manner for operationalising comparative research where domains as to what can be compared continuously shift. Changes associated with the advent of digital technologies, new economic forms and a wider diversity of information exchange platforms and structures affirm the need to re-address comparative investigatory approaches. This includes functionalist contingency-based explanations of regularity, ideational notions of shared particularities, the role of influencing forces of change within neo-institutionalist and interactionist theorising as economic spheres of activities get re-defined, and the manner in which deep roots of specific forms of rationalising organisational practices extend. Thus, modern organisational practices create the need for new meanings as to what might be regarded as enduring, shared and contextually situated and thereby necessitate novel approaches to comparative assessments.

10. Discussion

Knowledge concerning comparative research methodology in management accounting is in a continuous state of evolution. Whilst a body of comparative research in the area has been documented, it has largely drawn upon methodological frames of reference applied in other areas of management research that have been subject to heavy criticism over a period of over three decades. Methods stemming from universalist and functionalist perspectives provide research avenues but are not unproblematic. The

ideational-culturalist perspective, whilst appealing to notions of the social dependency of management accounting controls, finds roots in a deterministic frame of logic, which retains the narrow pursuit of methodological objectivism as its principal intent.

Efforts within the 'societal effects' mode of research focussing primarily on studying organisational arrangements is seen to have produced very fruitful comparative results in terms of both extent of analysis and substantive methodological underpinnings. This perspective is rigorously framed within a body of theoretical propositions lending focus and analysability. Interactionism and new institutionalism have equally robust research traditions that originate in the organisational sociology discipline. Their focus of analysis is on organisational actors' subjectivity and their contextualised conceptions of social reality, which are regarded as shaping the enactment of management controls thereby enriching the potential ontological diversity within which cross-national research can be framed. Although comparative management accounting research has not been guided by these perspectives in any sustained manner at present, our understanding of how organisational practices can be explained by analysing collective-subjective dimensions is growing (Bhimani, 1999; Hopwood, 1996).

The essay has suggested that 'new' historical conceptualisations open up the possibility for an epistemologically substantive approach to engaging in comparative cross-national management control research. The new historical view to exploring the conditions underscoring management control specificity at the level of collectivities not only draws upon an extensively argumented case for exploring ways in which rationales emerge (Miller et al., 1991), but theoretically also encapsulates a notional frame of reference for understanding accounting practices within the context of human subjectivity. This lends plausibility to comparative research which positions itself alongside a growingly established body of accounting control research that attempts to offer an understanding of the present in terms of the past (see Covaleski et al., 1996; Dillard & Becker, 1997; Hopwood & Miller, 1994; Luft, 1997).

The approaches to comparative investigations in evidence in the management accounting literature and within wider social science writings offer many opportunities for continuing to advance the field. But it is also clear that modern-day organisations are faced with a variety of novel forces of change. In part, such change is tied to the growing pervasiveness digital technologies and new information production and transfer possibilities which affect organisational techniques, structures and social action and thereby, potentially influence every facet of management accounting practices. Such effects are the product of cross-context transfers of ideas and practices and themselves generate the need for more complex methodologies to permit their workings, significances and specificities to be better understood within comparative investigatory agendas.

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Analytic Modeling in Management Accounting Research

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Abstract: This chapter examines analytic or modeling-based research, but with an emphasis on the broader perspective of viewing research as a portfolio of investment projects. I stress three keys to good modeling: primacy of the research question, preparation of the model, and the Ralph test. I also identify dominant themes in the recent literature.

This chapter focuses on modeling in management accounting research. In this context, modeling refers to the representation of a concept or process, while analytical refers to the use of deductive logic. On the surface, this takes us into the realm of "research method." But, you will see, I step lightly on this subject and concentrate on the more fundamental issues of interpretation and assimilation.

In particular, this is not a tutorial or a survey.[1] Rather, it is an invitation to reflect, to put modeling in its proper perspective. Following some background remarks aimed at research methods I discuss what I consider to be the three keys to good modeling: primacy of the research question, proper preparation of the model, and what I call the "Ralph test." From there I turn to dominant themes in the literature: hyper versus muted rationality on the part of the present and implied actors. Some concluding remarks round out the chapter.

1. Background Remarks

Research refers to diligent, systematic inquiry. In its broadest sense accounting deals with particular institutions, such as formalized measurement and reporting inside a firm, an audit firm *per se*, care and feeding of financial information aimed at an organized trading market, and so on. Accounting research, then, refers to diligent, systematic inquiry into institutional regularities. It is a social science exercise in which we use the window of accounting institutions to study behavior, at both the organizational and individual levels. In broad terms we study such things as (1) organizational arrangements, including divisionalized structures, alliances, and allocation of decision rights; (2) decision methods and frames; (3) evaluation and compensation, including costing systems; (4) governance structures; and (5) the comparative advantage of the accounting system with its elaborate, nested controls, and professional management. Moreover, we do this in a variety of settings, real and imagined, using a variety of methods.

Regardless, the overriding concept is to focus, laser-like, on the issue at hand. This necessitates a focus on first-order effects.[2] The more subtle nuances are purged from the analysis. When studying an ABC implementation we do not identify precisely the firm's technology (e.g., via estimation of a translog model using industry data), nor do we delve deeply into the implementation team's psychological profile. Similarly, when studying managerial compensation we abstract from an overwhelming array of information

[1]The Christensen and Feltham (2003, 2005) volumes are the starting point for anyone interested seriously in the topic. Recent reviews commissioned by the *Jouranl of Accounting & Economics* (Vol. 31 and 32) should also be consulted, along with appropriate chapters in this handbook. Christensen & Demski (2002) is a particular favorite.

[2]Viewing research as constructing or estimating a Taylor series approximation is a useful metaphor. In turn, management accounting research is accounting research in which management's behavior is a first-order concern. Notice how we now merge into the realm of auditing or financial reporting improprieties!

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flow, tax, and implicit factors. Sims (1996, p. 105) is particularly insightful when he states: "Advances in the natural sciences are discoveries of ways to compress data concerning the natural world—both data that already exists and potential data—with minimal loss of information."[3]

Successful examples of understanding this art form include option pricing, where transaction costs are ignored; the personal cost term in an agency model, where consumption at work, as in Stafford & Cohen (1974), is surrogated by a generic personal cost assumption; or an ABC model where a variety of cost drivers are used as a substitute for identifying the underlying commodity space, as in Christensen & Demski (1997) or Debreu (1959). Moreover, one should not think reliance on first-order effects is confined to modeling. Empirical compensation studies, such as Gibbons & Murphy (1992), or experimental evaluation studies, such as Hackenbrack & Nelson (1996), come to mind.

Two implications follow. First, no research exercise is perfect. Moving from the research exercise to the issue under study always focuses on first-order effects and therefore always carries an error term. A model is not going to be perfect (though we certainly hope its logic is), just as the presumed controls in an experimental investigation are not going to be perfect. Errors are always present. Get used to it!

Some errors are, of course, egregious. In good research, however, second-order errors are tolerated because pushing them to the background helps us focus on the issue at hand. This is Sims's compression idea at work.

The second implication is less comforting: we know very little about how to sort among potential error patterns. This is the art dimension to good research. The ageless adage is appropriate: I will tell you when I see it! Study of art history is essential for the budding fine artist, just as study of accounting research history is essential for the budding accounting researcher. Yet I fear we give short shrift to the art of doing good research, including the importance of extended study of our own "art history."[4]

Of course, the Blackwell theorem has something to say here. We know (e.g., Blackwell's classic "Comparison of Experiments") that one research program is better than another if the errors in the second can be modeled as if they are statistically equal to the errors of the first plus noise.[5] To paraphrase, suppose there is an uncertain state of the world or forthcoming event that will take on one from among a given list of possible events or states. Denote the possible events or states by the set $\{\theta_1, \theta_2, \ldots, \theta_m\}$ for some $m > 1$. In turn, an experiment or information source is available. It will result in one possible observation from among the set $\{z_1, z_2, \ldots, z_n\}$ for some $n > 1$. The probability that observation z_i is observed if state or event θ_k is true is denoted by π_{ik} (for $k = 1, \ldots, m$ and $i = 1, \ldots, n$ of course). Now suppose a second experiment or information source is also possible. It will result in one possible observation from among the set $\{\hat{z}_1, \hat{z}_2, \ldots, \hat{z}_{\hat{n}}\}$ for some $\hat{n} > 1$. The probability that observation $\hat{z}_j$ is observed if state or event θ_k is true is denoted as $\hat{\pi}_{jk}$. Think of this as a choice between experiment Π, the first, and experiment $\hat{\Pi}$, the second.

It turns out that experiment Π is as good as experiment $\hat{\Pi}$ regardless of remaining details if and only if there exist real numbers $b_{ij} \geqslant 0$ for $i = 1, \ldots, n$ and $j = 1, \ldots, \hat{n}$ such that (i) $\sum_{j=1}^{\hat{n}} b_{ij} = 1$ for all $i = 1, \ldots, n$ and (ii) $\hat{\pi}_{jk} = \sum_{i=1}^{n} b_{ij}\pi_{ik}$.

Unfortunately, most research options are noncomparable in the Blackwell sense. For example, would you rather study pricing behavior in an experimental market or by estimating a structural model using actual pricing data; or would you rather assume Bertrand or Cournot competition in your model? This is why the art side of the equation is so important. It is also why I, personally, am quick to admonish those who advocate a particular method or style of modeling.

Lingering somewhat longer on the soapbox, the error fact combined with the Blackwell observation, ensure that various research exercises are best thought of as complementary attacks on the issues at hand. Trade among method specialists is essential. Moreover, just as modern finance taught us to think in terms of portfolios

[3]Closely related is Ijiri's (1971) treatise on the theory of aggregation. Likewise the Heisenberg Uncertainty Principle guarantees limits to the power of observation in the physical sciences, just as we know people respond to the way they are measured.

[4]Pursuing the art history metaphor, a wide variety of literature reviews has been published, though none is a sufficient statistic for the underlying work: see Baiman (1982, 1990), Demski & Kreps (1982), Johnson & Kaplan (1987), Shields (1997), and Vollmers (1996).

[5]See Blackwell (1951), Marschak and Miyasawa (1968), and Cremer (1982). This was subsequently discovered to also hold the key for identifying when one random variable is "more risky" than another, for example, Rothschild and Stiglitz (1970). So, at the risk of sounding apocryphal, one research exercise is better than another if it is less risky. Think about it.

and an efficient frontier, we would benefit from a portfolio view of accounting research, one where individual researchers and the research community focus on the entire portfolio of research and the importance of being on the efficient frontier.

2. Keys to Good Modeling

Now, just as we look for structure in poetry or in the impressionism movement, let us look for structure in the application of the research art form. Doing so, however, requires a caveat. There is no recipe, no algorithm that, if followed faithfully, will produce good research. Rather, we are in the realm of a poorly understood art form. What follows, then, are some personal, suggestive, and possibly useful observations.

On the surface, the structure of a research exercise is amazingly simple: we specify the relationship between some independent variables and a dependent variable. Think of this, tentatively, as $y = f(x)$, where y is the dependent variable of interest, say someone's expected utility or profit, social welfare, or a vector of marginal cost estimates, and x is a set of independent variables. f, of course, is the specified relationship.

Typically we partition the independent variables into those that are controllable, say x_c, and those that are uncontrollable, say x_u. This gives us the expression

$$y = f(x_c, x_u) \tag{1}$$

In this fashion we sharply distinguish the exogenous, the uncontrollable, x_u, from the endogenous, the controllable, x_c.

To illustrate, x_c might be an individual's action and x_u a Savage-style state variable that encodes the fundamental uncertainty. f, in turn, is the expectation of the individual's utility with respect to his subjective probability measure; and y is the individual's resulting expected utility. From here, suppose the individual has the option to select $x_c \in X_c$. We then formulate his choice problem as a seemingly straightforward maximization as

$$y^* = \max_{x_c \in X_c} f(x_c, x_u) = f(x_c^*, x_u) \tag{2}$$

The preferred option, the best choice, here denoted by x_c^*, is the one that maximizes the criterion function, resulting in a maximum value of that function, denoted by f^*. For later reference the role of x_c^* as a maximizing choice is denoted as

$$x_c^* \in \arg\max_{x_c \in X_c} f(x_c, x_u)$$

Alternatively, y might be a vector of marginal cost estimates for a multiproduct firm, x_c a tentative production schedule, and x_u a set of shocks to the system. f is now some specific product-costing method, say some elaborate ABC procedure.

Continuing, a variable being controllable begs the question of controllable by whom. This calls for more partitioning. Now partition x_c into x_{c1} and x_{c2}, where x_{c1} is controllable by one individual and x_{c2} is controllable by a second individual. The two individuals might face simultaneous choices, respectively, of $x_{c1} \in X_{c1}$ and $x_{c2} \in X_{c2}$. Paralleling eq. (2), but with the introduction of idiosyncratic evaluation measures and hopefully obvious notation, the pair $x_{c1}^* \in X_{c1}$ and $x_{c2}^* \in X_{c2}$ reflect equilibrium choices if each is a "best response" to the other in the sense that if one selects his equilibrium choice the best the other can do is select his equilibrium choice:

$$x_{c1}^* \in \arg\max_{x_{c1} \in X_{c1}} f_1(x_{c1}, x_{c2}^*, x_u) \tag{3}$$

and

$$x_{c2}^* \in \arg\max_{x_{c2} \in X_{c2}} f_2(x_{c1}^*, x_{c2}, x_u)$$

Alternatively, as in, say, an agency model the first player's choice might be observed by the second player before making his choice. Think of x_{c1} as the evaluation and compensation specification along with action choice instructions and x_{c2} as the subsequent action choice. The first player now faces the following constrained choice:

$$y^* = \max_{x_{c1} \in X_{c1}} f_1(x_{c1}, x_{c2}, x_u)$$

subject to

$$x_{c2} \in \arg\max_{x_{c2} \in X_{c2}} f_2(x_{c1}, x_{c2}, x_u)$$

In turn, we might envision multiple agents, double moral hazard wherein the first player must also constrain his own choice so that its eventual execution is incentive compatible. And with slightly more imagination we can encompass repeated or multiperiod settings, agent replacement, explicit information structures, implicit and explicit contracts, renegotiation, and what have you.

It is the general pattern, however, that should not go unnoticed. We work with some detailed relationship between independent and dependent variables. Of course, specifying the variables and their relationship is what provides the key to successful representation; and it is here the analogy to good art takes on its full meaning.

2.1. Primacy of the Research Question

The beginning point of a research project is the question that is to be explored, if not answered. We face an indescribably rich set of possible questions, and it behooves us to select carefully the ones in which we

are going to invest. We study broadly various aspects of research and development and the importance of informed, imaginative project selection, yet we seemingly take a casual view of asking the right question, of selecting the best project, when it comes to our own research. A good question, in my judgment, is one that is interesting and potentially important, one that can be explored in depth if not answered, and one for which the researcher passionately wants to know the answer.

Some questions are just not very interesting. Examining how a manager uses a particular information source, without controlling for other information sources, is just not very interesting. The sources interact, and this is likely to be a first-order effect. Value relevance studies merit a similar comment. Building a model, where we can control the interaction by assuming there is no other information source, allows us to answer the question; but learning the answer is hardly worth the resources consumed in ferreting it out. Similarly, studying how cash compensation varies with various performance measures is not very interesting; compensation comes in many forms and is spread across many periods. Without controlling for substitutes, including time of delivery, we focus on a question that is simply not important, because it has not been framed in a total compensation framework. Likewise, examining decentralized management through coordinated choices in a transfer pricing setting where we assume each manager blindly maximizes the expected value of his division's income is not very interesting, because it ignores the effect of well-designed evaluation and compensation arrangements—including performance shares or options, access to a bonus pool and promotion prospects—might have on the performance of the arrangement. The same can be said about minor variations on a well-examined theme.

Other questions are interesting and potentially important but, so far, well beyond our reach. The role played by compensation consultants, both at the individual firm and across an industry comes to mind. Here we have repeated play, changing, renegotiated if you will, trade arrangements, anticipation thereof, and the potential for herding on particular arrangements. Similarly, the time at which a firm would find a major ABC style intervention worthwhile is a fascinating question. But this entails a conscious decision to disrupt the information cues and terms of trade in an organization, and to do so in a way that consumes serious resources, disrupts established relationships, and what have you.[6]

Finally, an important question that can be explored seriously will likely be treated to second-class imagination and effort if the researcher himself is not passionately interested in the question. Good academic research moves us forward, stretches our understanding, and expands our horizon. This requires skill, luck, and tenacity.

2.2. Proper Preparation of the Model

The second key to good analytic research in management accounting is proper preparation of the model. Glance back at eq. (1). With a question in mind we structure controllable and uncontrollable variables in such a way as to shed light on the question. The comparative advantage of modeling work, of course, is internal validity. This translates to the admonition: never ask a model a question it has not been prepared to answer. For example, there is little point to formulating a model under presumed certainty and then asking what information is "needed" to implement that model. Certainty presumes you know the parameter values in the model! Similarly, using presumed certainty to examine transfer pricing policies amounts to asking the model how to organize production while simultaneously assuming the answer is common knowledge.[7]

The dual to this adage is if a model is well prepared to answer a question it follows that the underlying issue arises naturally in the model. If cost allocation is the issue, the model should exhibit some demand for cost allocation in the first place; if performance evaluation is the issue, the model should exhibit some demand for performance evaluation; and if costing is the issue, the model should exhibit some concern for marginal cost estimation. Similarly, as in Hansen (1998), if cost-reduction incentives are to be linked to competition, the well-prepared model exhibits both uncertainty and competition; and, as in Gigler & Hemmer (2001), if management's disclosure policy is at issue the model should be founded on endogenous communication. Likewise, a model well prepared to analyze pricing heuristics should, presumably, step beyond monopolistic settings, as in Balakrishnan & Sivaramakrishnan (2002), and embrace entry, exit, partial substitutes, and product innovation, though we are now pushing on the frontier of tractability.

Regardless, representation is the workhorse here. Typically we assume individual behavior can be represented by expected utility maximization. Literally, we assume the individuals behave as if they have identified a preference measure and maximize its

[6] Anderson & Young (1999) and Anderson et al. (2002) as well as Demski et al. (2004).

[7] Milgrom (1981) provides an axiomatization of common knowledge.

expectation with respect to an identified probability measure (Kreps, 1988 and Savage, 1954). Notice, however, this also commits the analysis to Bayesian information processing at the individual level.

We also encounter frequent use of the Revelation Principle, another representation device, wherein the equilibrium in a formal game can be represented as if the players exercised fully revealing, incentive-compatible communication (Myerson, 1979 and Harris & Townsend, 1981). Here, however, we commit the analysis to settings where the underlying message space or language costlessly tolerates full communication, where incentive arrangements are optimal, and where commitment is unquestionable.[8]

Suppose, then, we take the view that earnings management take place when management knows the underlying details but opportunistically misreports those details. It then follows that a setting where the Revelation Principle applies is particularly ill-suited for the study of earnings management, simply because the model, by design, is not prepared to host equilibrium opportunistic garbling of the known, underlying information, in any serious fashion. Arya et al., (1998) use this observation to categorize studies of earnings management according to which of the legs of the Revelation Principle they violate, and thereby begin with a well-prepared model.[9]

2.3. The Ralph Test

A third key to good modeling is what I call the Ralph test. I have long thought research and teaching are interdependent. And a useful exercise is to stylize a research project, the author is irrelevant at this point, to the point it can be brought into the classroom. Is the central question in the research project of any classroom importance? If not, it is not very likely that the original research project was well conceived. Similarly, is the answer that the research provides to this central question of any use? If it is so hypothetical, say, that it leads to vacuous classroom exploration it is, again, not very likely the original project was well conceived.

Our research is, recall, a social science exercise in which we use the window of accounting institutions to study behavior. The classroom, in my mind, provides the acid test of whether our research is fulfilling this promise.

3. Dominant Themes in the Literature

The analytic modeling literature addresses a wide variety of questions, is predominantly economic in nature, and, again speaking in generalities, takes an aggressive or muted approach to rationality. This divergence goes back to pioneering work by Simon and Muth in the 1950s. (Sargent, 1995, Sheffrin, 1996 are excellent sources.) Though both were working on the same broad class of problems, understanding trade arrangements, Muth stressed hyper-rationality in his insistence on self-fulfilling expectations, while Simon stressed muted-rationality, in his insistence on cognitive limitations. This distinction persists.

Performance evaluation is a case in point. Holmstrom's (1979) model, having been well prepared by capitalizing on the transformation of variables inspired by Mirrlees, asked an optimal contracting model how it would use additional information.[10] This exposed a flaw in the controllability folklore, and also led to Gjesdal's (1982) demonstration that the Blackwell extension to a contracting setting is decidedly one-sided. But, just as when we invoke expected utility representation we thus commit the model to Bayesian processing, and when we invoke unconstrained contracting we thus commit the model to extracting every nuance from the full vector of contractible variables. No prisoners are taken, so to speak. The model is cognitively unlimited in exploiting all contractible variables.

A similar route is taken when we wed unrestricted contracting with (opportunistic) earnings management, or even contract renegotiation. Contracting in such a setting is fully endogenous; earnings management is, well, fully orchestrated, anticipated and sustained as equilibrium behavior.

The other side of this coin is the linear contract (actually, affine contract) industry where we expressly limit the contract form. Examples are provided by Christensen et al. (2005), Feltham & Xie (1994), and Indjejikian & Nanda (1999). Here we are asking vastly different types of questions, questions aimed at understanding specific, exogenous limitations on contract

[8]Staying on the subject of representation, notice that the aforementioned Blackwell theorem is a statement about our ability to represent the outcomes of an experiment.

[9]Demski et al. (2004) provide a model in which opportunistic garbling is designed into the information structure *per se*, by the manager devoting effort to making his "numbers" biased in his favor, as opposed to biasing what he already knows; and Dutta & Gigler (2002) model "window dressing" in this fashion.

[10]This is another illustration of the importance of preparing the model to host the question at hand. Spence & Zeckhauser (1971) employed the usual state-act-outcome formulation, which proved intractable. Mirrlees (1999), in a famous working paper that was published decades later, provided a change of variables that set the stage for Holmstrom's work.

form, in the interest of tractability or lip service to transaction costs. But the answers are remarkably different. We even wind up with a demand for redundant performance statistics simply because they increase the contract space. Hemmer (2004) is particularly eloquent in pointing this out. It also turns out that unintended opportunism can be efficient in this setting, because it too expands the contracting arrangements.

The unfettered contracting approach puts all transaction and cognition issues in the realm of second-order concerns, just as the linear contracting approach puts them on the shoulders of an explicit, highly active (in the model) resolution. Work in both areas is likely, in my opinion, to move us forward. In a larger sense, this returns us to themes begun by Muth and Simon. Sargent (2001) describes how blending these themes helped us understand macroeconomic issues and effectively guide policy. And calls for mixing, though rare, can be found close to home, for example, Covaleski et al. (2003) and the early work of Charnes & Stedry (1964). It is important to remember the portfolio perspective!

4. Concluding Remarks

Research and instruction in accounting both strike me as too aggressive in partitioning the subject, and presuming interaction effects are second order. Holding forth on the subject of modeling in management accounting is a case in point. Management accounting, broadly conceived, is concerned with accounting-related questions wherein management's behavior is a first-order concern. This quickly brings us to the world of auditing, not to mention financial reporting as well (e.g., Dye, 2002). Similarly, modeling is but one method, and interactions among methods are the very essence of collective mature research programs.

That said, *any* research project (in accounting or otherwise) should, in my opinion, reflect primacy of the underlying research question, proper preparation of the medium (model, data, experiment) to host the question of interest, and, of course, the ultimately pragmatic Ralph test.

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There and Back Again: Doing Interventionist Research in Management Accounting

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Abstract: Interventionist research is not unobtrusive since the researcher deliberately seeks to make an impact on the world in order to gain knowledge. In this Chapter we examine the fundamental nature of interventionist research in management accounting, its philosophical anchoring, variations, and forms of output. We also give brief illustrations. The distinguishing character of this kind of research is the need for the researcher to cross the border between the etic (outsider) and the emic (insider) perspectives—there and back again. This shift between differing logics provides opportunities for new insights since the researcher wants to achieve solutions that work in the field and come back with evidence of theoretical significance.

1. Introduction: What is Interventionist Research?[1]

The literature on methods for case studies in management accounting is considerable today (e.g. Ahrens & Dent, 1998; Atkinson & Schaffir, 1998; Baxter & Chua, 1998; Berry & Otley, 2004; Ferreira & Merchant, 1992; Hägg & Hedlund, 1979; Hopwood, 1983; Kaplan, 1998; Keating, 1995; Lukka, 2005; Scapens, 1990, 2004). These authors have examined, in particular, the nature, process, outcomes, and evaluation criteria of such studies, and they have identified various specific forms of them. Case studies have been defined in a number of ways, and with varying accentuations, but the core features of such studies include that the researcher is directly involved with the actors, systems, or processes in the field and that she uses the conventional ethnographic methods—observation and interviews, most often in combination—supported by the study of archives, in collecting her empirical research materials. Studies could concern one particular case, compare cases, or study a phenomenon related to particular cases.

Interventionist research should be viewed as one form of such case studies.[2] However, similarly as case studies *per se*, interventionist research is a cluster of research approaches, where the researcher herself is more or less deeply immersed with the object of study, and this is often viewed as posing methodological problems. Using unobtrusive research methods has been considered a natural aim for all researchers, and this is easy to achieve from the distance, but difficult when the researcher works directly in the field. In interventionist research, this inescapable feature of case studies—that of becoming immersed—is translated to its key strength (e.g. Argyris et al., 1985; Lewin, 1946/1948; Lukka, 2000; Schein, 1987; van Aken, 2004a). Hence, the most notable common denominator of interventionist studies is their deliberate use of active participant observation

[1] We have discussed whether to use the term action research here since it probably is the best-known version of interventionist research. Drawing on Kurt Lewin's dictum 'One of the best ways to understand the world is to try to change it' (Argyris, et al., 1985, p. xii), we could point to clinical research, action science, design science, or the constructive research approach as possible candidates. We have chosen to use interventionist research as the generic term.

[2] In principle, interventionist research does not need to limit itself to applying the case method only, but in practice this appears to be the case.

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as a research asset.[3] In this sense, interventionist research is a kind of field experimentation where the researcher, not having complete control over the design of the experiment, seeks to determine the experimental situation through observation, acts on that situation in concert with the host organisation, observes process and outcome, and analyses findings in view of the relevant literature.

The distinction between the *emic* and *etic* perspectives, introduced by the linguist and anthropologist Kenneth Pike in 1954 (Pike, 1954) plays a significant role in all analyses of case study methods, and particularly so in the context of examining the interventionist approaches. Pike (1954) first developed this dichotomy as referring to the distinction between unique sounds of a particular language and universal sounds in human language in general. However, later he expanded the scope of this distinction to refer to two different viewpoints for the study of human behaviour overall (Pike, 1967). Accordingly, the emic viewpoint results from studying human behaviour from inside the system, while the etic viewpoint refers to studying it from the outside, the latter being unavoidably the initial approach for everyone to examining an alien system.[4]

In interventionist research the researcher is an active actor in the real-time flow of life in the field, and therefore the researcher is bound to adopt, or at least consider, the emic perspective to the issues at hand. Such a perspective means to become an 'insider' in the sense that the researcher is seen as a competent and trustworthy member of the world where she is doing the fieldwork. This is not only in order to understand the meanings and actions of the actors in the field, but it also makes her able to communicate and act together with them—otherwise the researcher will be regarded as a tourist in the field, and actors will communicate with her by 'child talk'. However, being successful from the emic perspective is just halfway through: The researcher also needs to link her findings to a theoretical frame, i.e. to make a theoretical contribution. The etic perspective is a 'must' in all types of academic studies, but it is often seriously underplayed in interventionist research projects, where efforts tend to focus on anecdotes about results on the emic level. While the role of theory is and should be a debated issue in interventionist research, a balanced use of the emic and etic perspectives in our view is of crucial significance to justify the use of this research method.

Admittedly, it is a demanding undertaking to do good interventionist research in management accounting. In our efforts to portray this time-consuming but rewarding research approach we will first draw some demarcation lines and point out varieties of interventionist research, and thereafter we will discuss the philosophical basis for stressing the shift between emic and etic perspectives in interventionist research. We will then give an account of what we think are the characteristics of interventionist research well done, and present some examples, before we discuss the outputs of this kind of research. Obviously there are problems with research where the researcher herself plays such a prominent role. These problems are discussed before we conclude with a summary argument for good interventionist research. We write this chapter because we believe that there is great potential for theoretical progress in this kind of research.

2. Demarcation Lines and Variations of Interventionist Research

Much of the methodological debate in management accounting is related to the differences between positivism and its alternatives (Burrell & Morgan, 1979; Jönsson & Macintosh, 1997; Tomkins & Groves, 1983). This debate has been especially notable in the method literature of case research, in which it has been argued, for instance, that we can conduct both positivist and interpretive case studies (Berry & Otley, 2004; Scapens, 1990). The issue of the researcher's intervention during her research project with the studied organisation(s) has been overshadowed by this concern with methods of data collection and analysis. Most often it has been routinely assumed—at least implicitly—that a case researcher is trying to avoid or minimise intervention during the project, or that she should do that (cf. Lukka, 2005). As mentioned, the distinguishing aspect of interventionist research is the very intention to achieve some desired result in the field, so this (implicit) assumption has to be replaced by a view of the intervention as the setting up of an experiment in the field.

[3] In his discussion of innovation action research Kaplan (1998) describes a process starting with picking up ideas and constructions from practice, then going on with a diffusion process, in which academics like himself can serve as active facilitators. In contrast, our focus is on the production of original solutions adapted to the actual situation of the host organization. That successful constructions may be generalised and diffused to other sites is a different kind of process.

[4] The emic vs. etic dichotomy has during the course of time emerged in a number of varying meanings, see Headland (1990). The 'experience near' and 'experience far' dichotomy developed by cultural scientist Clifford Geertz (1983) essentially means the same as the emic/etic distinction, cf. Dent (1991).

Our central thesis is that especially case researchers in management accounting have an *option* in this regard, which should be appreciated. Hence, it is their call to choose to conduct either interventionist or non-interventionist case research. While non-interventionist research in management accounting has clear and well-documented merits, there are also particular advantages that can be gained by adopting the interventionist approach. Our position is that interventionist research has the potential to be meaningful from the empirical, situation-specific viewpoint as well as from a more general, theoretical perspective. In the following we will briefly address the core differences and similarities between interventionist and non-interventionist case research in management accounting.

2.1. Interventionist vs. Non-Interventionist Research

Non-interventionist case research tends to focus on formulating, understanding (making sense of), and explaining management accounting issues on a conceptual level. The development of these understandings and explanations may have different kinds of theory connections. The primary target of the research can be to illustrate, refine, or test prior theory, or—in the case of weak or non-existing prior theory in the area—construct new theoretical frames or propositions (explorative case research) (Keating, 1995; Lukka, 2005). In order to make a contribution to theory, the findings of non-interventionist case research need to be translated—i.e. generalised—so that their meaningfulness in other contexts can be captured by the reader (Lukka & Kasanen, 1995).

Non-interventionist case research is typically of the *ex post facto* type: The researcher examines what, how, and why something has taken place at the case site in the past. In this sense it has a lot in common with historical research. Partly for this reason—even though every case researcher is surely aware of the triplet of data collection methods including observation, interviews, and analysis of archives—non-interventionist case researchers tend to collect their data primarily through interviews, supported by the analysis of archives, while the role of observation tends to be small. However, there is a continuous call for longitudinal case research (Hopwood, 1983; Van de Ven, 2004), and when such calls are heeded (not too often), the researcher normally is in the position to examine her cases simultaneously as things occur.[5] Then interviews tend to lose position as the dominating data collection mode it has in *ex post facto* studies and different forms of observation methods—even video filming—may come into use.

Interventionist case research has many similarities with non-interventionist research, briefly described above. Also interventionist researchers aim at a meaningful conceptualisation of the phenomena they encounter in the field, understanding (making sense of) what is going on in the case, and at developing explanations. The theoretical targets include similar options, and attempts toward theory contribution require translation of the findings to a more general level (Lukka & Kasanen, 1995) in both approaches. The major differences relate to the fact that an interventionist researcher is directly involved with something that is going on in the case and she does not try to avoid having an effect—instead vice versa: she applies intervention as one of the research assets. The *ex post facto* type of case study typical of the non-interventionist approach is not even an option for the interventionist researcher for she simply has to conduct her study—or at least the central parts of it—along the flow of life of the case. True, also an interventionist researcher can conduct interviews and analyse archives, and normally she does. But as opposed to non-interventionist case research, observation in the participant mode dominates the collection of empirical research materials in interventionist research. Hence, an interventionist researcher conducts her empirical research predominantly *in vivo*, as it were.

The core difference related to the time dimension between interventionist and non-interventionist research has a lot of significant implications. Similarly as for the non-interventionist researcher, it is crucial for the interventionist researcher to gain a good understanding about what is going on in the case organisation, but for the latter this is just a *starting point* for further inquiry. An interventionist researcher, just if she has managed to gain a good access to the case, gets a possibility to learn a lot more during the participant observation period, which follows the initial phases of the fieldwork.

The key advantage of interventionist research is the opportunity to collect more subtle and significant data than what can be accessed through more traditional research methods. Interventionist research is not just theorising 'grounded in the data', but it means being 'grounded in action'. One of the most important reasons to conduct interventionist research is to overcome the weaknesses of research where subjects do not have to commit to action in their own organisational life and to shape a future that they will have to inhabit themselves. Interventionist researcher gets an opportunity to examine what participants actually say and do in circumstances, which really matter to them, as compared to what they might say or do hypothetically

[5]Of course also longitudinal case research can, at least in principle, be of the *ex post facto* type.

(Eden & Huxham, 1996). According to Argyris & Schön (1974), this means getting an understanding of subjects' 'theory-in-use' rather than their 'espoused theory' (see also Argyris et al., 1985).[6] To put it in other terms, interventionist research approaches offer the researcher a lot of potential to gain emic understandings of what is going on in the case organisation.

While the strength of the intervention can vary, typically an interventionist researcher participates in a change process, which may lead to a new bundling of things together—construction of new realities—jointly with people working in the case organisation. Often interventionist research has a clear orientation to solve practical problems. The researcher will be able to enter another realm than that of academic knowledge: the realm of practical reasoning. Being able to do this successfully means that she is viewed as a seriously taken participant in this process, and if so, she will be treated and talked to like 'one of us'.

Particular advantages of the interventionist research include that the examined issues bear practical relevance almost by definition and that there are normally not much recollection problems since the core issues analysed take place simultaneously with the study. While the participant observation dominated phase of the research process requires an element of commitment—which generates a risk of the researcher 'going native' and thereby rendering her theoretical conclusions biased—the final parts of interventionist research projects tend to be similar to those of non-interventionist studies: analysing the materials the fieldwork has produced, with an aim of developing a theoretical contribution. This means analysing—unbundling—the issues that were at stake when the new reality was constructed during the fieldwork.

It is important to understand that many of the issues, which are often viewed as potential handicaps in non-interventionist case research, are no more serious in the case of interventionist studies. Explanatory variables are no less controllable in interventionist studies – probably the opposite – given the fact that interventionist studies always have a tendency toward field experiment. Both interventionist and non-interventionist studies are practically impossible to replicate by any other researcher, and typically not even by the same researcher.

It can be argued that as the change projects, around which an interventionist researcher typically conducts her research, shake the *status quo* of the organisation, the interest- and power-driven politics of organisational change disturb getting fully reliable data from those concerned. However, while this threat is surely worth keeping in mind, an interventionist researcher is not likely to be in an inferior position as compared to a non-interventionist researcher, who examines management accounting change. In fact, it is again more likely that the opposite is true, given that an interventionist researcher enjoys a relative advantage of getting deeper into the organisational realm due to her direct involvement in the daily life of the target organisation.

2.2. Alternative Forms of Interventionist Research

Interventionist research, with certain substantive variation, can be encountered in several disciplines, often under differing labels, and within disciplines there may be variation across geographical or cultural areas. These approaches include, most notably, action research, action science, design science, clinical research, and constructive research.[7] Some of these have been used in management accounting research, too.

Action research should be viewed as the origin of all interventionist research in the area of social sciences, and therefore below it is used as a reference point when depicting the key features of various streams of interventionist research. The term 'action research' was coined, and the core principles of this approach were first suggested, by social psychologist Kurt Lewin in the 1940s (Lewin, 1946/1948). He viewed action research as an approach, which uses change experiments in order to simultaneously solve 'real' problems in social systems and contribute to the basic knowledge of social science. Later a number of various ideas regarding what action research should try to accomplish, and what not, have been suggested, and some of them differ considerably from the original ideas of Lewin. For instance, it has been argued that Lewin was actually a positivist as he so strongly subscribed to the aim of developing theory through action research, did not stress the more fundamental social tensions in his change experiments, and viewed the researcher as somebody who played the primary

[6]'Espoused theory' refers to a theory individuals claim to follow in their action, while 'theory-in-use' can be inferred from their actions (see Argyris et al., 1985, pp. 81–82; cf. Kaplan, 1964).

[7]This list is not a complete one. The French academia of business studies knows, for instance, 'rational modelling' as an interventionist research approach, which integrates operations research and organisation theory (see Hutchel & Molet, 1986). For comparison, in philosophy there is the 'philosophising outdoors' approach, introduced by Schipper (2003), dealing with how a philosopher can use her special skills in close co-operation with practitioners in the field. He distinguishes between three modes of interaction having varying degree of intervention by the philosopher.

role in the action research process (e.g. Hart & Bond, 1995; Kemmis, 1988; cf. Kuula, 1999). These comments are often made in a critical vein, as in many sub-streams of action research its anti-positivist potential has been regarded as the major point of this type of research (Kuula, 1999). In management accounting, action research has been applied particularly by Sten Jönsson with his Ph.D. students and colleagues in Gothenburg.[8]

Clinical research refers to such interventionist research, where the major focus is placed on addressing and solving the problems of the client organisation—an analogy from the medical sciences of curing a patient applies well for these studies. This becomes well articulated by Normann (1975), who depicts clinical research as a therapeutic process emerging as a dialogue between the personnel of the target organisation and the researcher. While it can be said that all interventionist studies have a clinical element, in the distinctive stream of clinical research the 'curing the patient' aspect is strongly emphasised with the cost of largely overlooking theoretical issues (e.g. Schein, 1987). In this sense clinical research can be viewed as such variant of action research, which considerably stresses the problem-solving and change aspects of the endeavour. To our knowledge there are no published examples of clinical research (in the narrow meaning of the notion) in management accounting.[9]

Action science is a stream of interventionist research suggested by Argyris et al. (1985). They define it as promoting learning in the client system and contributing to general knowledge (p. 36). As the authors strongly emphasise the latter element and their view that action science can fulfil the strictest requirements of scientific rigour, this stream of interpretive research can be viewed as a variant of action research at the opposite end of the continuum when compared to clinical research. This interpretation is supported by the fact that Argyris et al. (1985) view Kurt Lewin, the founder of action research, as the first true action scientist (p. 7)! While action science largely shares the ultimate aims of the 'mainstream' to push our knowledge forward by academic research, it offers a radically different way to this new knowledge in its focus on understanding, and intervening in, the world genuinely from the perspective of the actors in the field. As far as we know, there are no published management accounting studies applying specifically this stream of interventionist research.

Design science is another, just recently suggested stream of interventionist research introduced by van Aken (2004a, 2004b). It takes its starting point from the claimed utilisation problem inherent in current academic management research, seeking to form a prescriptive-driven alternative to the explanation-driven 'normal' way of conducting management studies. In its attempt to develop 'field-tested and grounded technological rules', this stream has much similarity with the 'conditional-normative' research methodology (CONAM)[10] suggested by Mattessich (1995): the idea of (management or accounting) theory as a collection of prescriptive constructions. While design science comes in certain ways close to action science, its notion of theory differs from that inherent in the latter. van Aken (2004b) uses the recent accounting dissertation by Andriessen (2003), dealing with the valuation of intangible resources, as an illustrative example of design science research.

Finally, there is the *constructive research approach*, developed by a few Finnish accounting researchers in the early 1990s (see, e.g. Kasanen et al., 1993; Labro & Tuomela, 2003; Lukka, 2000, 2003). This stream of interventionist research seeks to find a balance between the problem-solving oriented practical starting point of the interventionist studies and their potential for theoretical contribution. Through strong intervention, the researcher—jointly with members of the target organisation—develops a new construction, tests its usability, and draws theoretical conclusions based on this process. Fundamentally this stream of interventionist research comes close to the original ideas of Lewin (1946/1948) on action research as well as to action science, described above. There are a few recent studies in management accounting, which have explicitly used this stream of interventionist research (Degraeve et al., 2004; Labro et al., 2005; Malmi et al., 2004; Puolamäki, 1998, 2004; Tuomela, 2000).

As emerges from the above, the boundaries between the various streams of interventionist research are blurry. Most of them define themselves in relation to the original action research by Kurt Lewin, and none of them has actually distanced very far from his core ideas. Therefore we can argue that the various streams of interventionist research form a cluster of research approaches, which have a characteristic of 'family resemblance' (Wittgenstein, 1953).

[8]A concise and helpful presentation of these studies, applying the method of 'modest intervention', is provided by Jönsson (1996). See also Jönsson (1999).

[9]True, the line between clinical research and consulting is blurry.

[10]CONAM derives from 'Conditional-Normative Accounting Methodology' (Mattessich, 1995).

3. The Philosophy of Doing Interventionist Research

The unique essence of intervention is the entry, by an outsider, into the realm of practical reason. Furthermore the entry is with the intention to improve, in some sense, the functioning of the host organisation. The academic researcher, a producer of texts presenting 'justifiable beliefs' (rational arguments for why we are justified in considering a certain claim true), meets the practitioner, the producer of action in response to the question 'What should I do now?'. The concerns differ, and the likelihood of communicative misunderstanding (Habermas, 1981) is non-trivial. Asking 'Am I justified in believing this statement to be true?' is fundamentally different from asking 'What should I do now?' The management accounting researcher entering the field of practice will have to deal with this age-old philosophical bridging problem of first reaching an understanding of the practical situation, initiating action together with practitioners, and then returning to the realm of pure reason (classical rationality) with a report on the results that makes sense to those who were not there (Agar, 1986).

In order to understand what is at stake when we do interventionist research in management accounting, we need to try to entangle the ontological implications of observing, and, indeed, intervening in the context of action (or practice) as the ethnomethodologist have urged social scientists to do since the late 1960s (Coulon, 1995; Garfinkel, 1967). In order to achieve this, we have to find a way to articulate the difference between the two approaches to rationality, which in a sense corresponds to the difference between the emic and the etic perspectives, in a way that seems relevant to the management accounting researcher. Since classical rationality has priority in the academia, and the reader is likely to be familiar with it, we will spend our main effort on practical reason and the connotations of applying this approach. Then we will discuss the crossing of the borders between the two and how translations might be possible.

The problem with practical reason is that somebody seeking an answer to the question 'What should I do now?' is likely to use deliberation (Searle, 2001), a thought process where both the appropriateness of ends and the efficiency of means are considered simultaneously. This cannot be reconciled with the classical definition of rationality as Searle (2001) demonstrates convincingly.

The model that we as academics seek to emulate is Aristotle's syllogism. If we only can boil down our problem to the form of the syllogism, we can be certain of our conclusion because the form provides the guarantee:

Socrates was a man	A is a B
All men are mortal	All Bs are C
So, Socrates is mortal	So, A is a C

The conclusion is certain, and it does not depend on content of the premises (it might be about A as well as about Socrates). Already Descartes (1950/1637, p. 11) pointed out that the syllogism does not say anything about the world:

> …[that] as far as logic was concerned its syllogisms and most of its other methods serve rather to explain to another what one already knows,… than to learn new things.

Toulmin (1958) develops this argument further in his development of jurisprudence as the model for substantial arguments, i.e. arguments about the world. The fact that Descartes' own method (scepticism, reductionism, and positivism) came to be so successful, and the core tenet of Modernity (Toulmin, 1990), is a slightly different matter (even if it is part of the quest for certainty through 'straight thinking'). Still it might be useful to look closer at what it is that makes the syllogism attractive to the academics. The trick is, as we know from school, that the middle term is accepted as universally valid. Just if we can get 'the other' to accept the universal validity of the middle term, the conclusion follows and 'the other' is persuaded. In economic sciences the middle term is often an assumption about how unknown people behave (e.g. opportunistically) or what goals they have (e.g. utility). If we can get 'the other' to accept that people care only for themselves—if we can make her accept the universal validity of the middle term in the syllogism—we can even make the form of the syllogism work for us and deduce, for instance, that more regulation will make markets free (due to the regulation of procedures, actors play within the rules of the game). We should be aware, then, when our colleagues want to formalise their arguments into something that cannot be denied, that the middle term is the battleground. The counter argument, which Milton Friedman is reputed to have used successfully in Chicago, is the question 'How do you know?'. We know that our models require decision makers to be rational and opportunistic, but how do we know what it is like in the field of practice we are studying?

But we know, do not we, that in organisations it is different than in markets: We want people to act in cooperation for the good of something larger than themselves. We want them to apply 'practical reason' and ask themselves 'What should I do now?' or rather 'What should a person like me do in a situation like this?'. 'What is appropriate?' Then we need to consider who we are (or want to be), what the situation is, what ends are appropriate in this situation, and what means will lead to the desirable ends.

We have to accept the fact that practical reason is different from the classical rationality model and that the difference cannot be bridged over in the way Kant did (Searle, 2001, 190pp.) by claiming that we have a 'feeling of pleasure' when we do our duty (it is an act of egoism after all!). If Kant were right, then the middle term in the syllogism would be 'He who wills the ends wills the means'; if we are committed to the goal then we are committed to an effective means too. We can easily imagine consequences, which would be absurd. We clearly do not get rid of the flu by suicide, and if the bus is too crowded, we do not reduce crowdedness by starting to kill fellow passengers. All action is not appropriate, even if it follows from deduction (given a suitable middle term). Lindblom (1959, 1965), Hirschman (1970), Crozier & Friedberg, (1980), Bourdieu (1990), and March (1994) have argued convincingly for this and we need no further evidence to accept this claim.

Practical reason is different. It deals with taking action and assuming responsibility for the consequences (which is completely different from deducing that a statement is true or 'significant'). When considering going into action we first deliberate and arrive at a 'prior intention' (Searle, 2001), then we have to apply our free will to initiate action (thereby 'causing' things to happen and presumably assuming responsibility for the consequences), and maintain intention-in-action skilfully until the action is done. Because we initiate action, we also 'cause' the consequences. Therefore our action must be justifiable in terms of the appropriate goal set for the situation as we diagnose it. Since appropriateness plays a significant role in our deliberations, we often act against our true desires, i.e. for the good of the company or as a caring parent. A large part of our deliberations, thus, generate desire-independent action. We keep promises even if it is inconvenient and avoid behaving opportunistically in order to maintain trust. How does the practitioner do this deliberation—considering ends and means at the same time?

Lynch (2001, p. 140) claims that the practice among researchers to describe this in terms of implicit or tacit knowledge is not a satisfactory solution since it uses pure logic to practices:

> Accordingly, the human (or, in some cases, nonhuman) practice in question is made out in the image of scientific method, and the agent is endowed with theories, hypotheses, heuristics, protocols and decision rules, but methodological inquiry (the analysis of the method) is the analyst's and not the agent's prerogative. This (…) reopens the gap between formal methodologies and situated practices by means of the very effort to close it.

It was concerns like this, and the ambition to base sociological theorising on observable data, rather than speculative assumptions about cognition, that initiated ethnomethodology in the late 1960s (Garfinkel, 1967). The 'ethno' stands for the interest in how competent practitioners accomplish their work. From this developed what is now called 'The practice turn in contemporary theory' (Schatzki et al., 2001). This 'turn', taking its philosophical inspiration from Wittgenstein (1953), is visible in many areas, from social theory's interest in the agency-structure problem (Giddens, 1984) to culture studies (Lyotard, 1988) and psychology (Harré & Gillett, 1994) seeing language as discursive activity rather than structuralist, and to theory of science and technology (Pickering, 1995) conceptualising science as activity as opposed to representation. The common themes in these approaches to practice are that they see the phenomena under study as occurring within and as part of fields of practices and that they develop accounts of practices and treat the field of practices as the place to study the nature and transformation of their subject matter (Schatzki, 2001, p. 2). Interventionist management accounting studies should be seen as part of this movement.

The key consequence of accepting appropriateness (March, 1994, p. 58) as the perspective of action is that the view on decision-making has to shift. Instead of being a calculative, optimising activity, it is seen as deliberation on good, situated arguments for action. It follows that we have to be alert to justification (and excuses) in context. We need to study the particular—the solution to this problem in this situation—and this is what we observe and deal with as interventionist researchers. Individual actors as well as collectives communicate, and interpret, these arguments in context. They make sense of information (or rather data) by contextualising it. Deliberation concerning the question 'What should a person like me do in a situation like this?' means developing a good argument for action. People communicate by forging

words into promises, commands, assertives, expressives, and so forth (Austin, 1975/1962; Cooren, 2000; Searle 1969). In organisations, the opportunities for production of such communicative objects overflow since managers spend most of their time in meetings (Jönsson, 1998)—even if they consider meetings ineffective (Carlson, 1951; Mintzberg, 1973; Tengblad, 2002). The problem with the traditional speech act theory (Austin, 1975/1962) is that we can no longer assume that the speaker's intentions are transferred to the hearers without loss. The critique waged by Derrida (1988) and others demonstrated that the meaning of an utterance is worked out by the hearer through the application of a context, frame of reference, vocabulary, narrative—whatever term used, in a particular situation. In the same manner, when practical managers use information generated by a 'management tool', they use it in a situation as they perceive it and they act in that situation. This is a fact that cannot be eliminated by generalising assumptions. The manager asks 'What should I do now?' and acts accordingly. It is this particular justification for action here and now that becomes available for observation and intervention when the interventionist researcher enters the realm of practical reason, and it is action under such circumstances that she becomes engaged in.

The dimension added when we realise that it is 'the others' who determine the meaning of an utterance is that we have to concern ourselves with the frames 'others' use if we want to be effective communicators. We have to be aware of what is appropriate in constructing as well as judging action. 'They' use 'norms of appropriateness' (March, 1994), and we, as interventionist researchers, need to be members of the team in order to get access to the situation.

3.1. Membership Work

'A person like me in a situation like this' implies that the decision maker reasons from a conception of identity (me) and is aware of the fact that others judge that identity in context. As social beings, people want to be members of something, if nothing else the group of competent practitioners. It is by acting accordingly that we signal our will to membership, and the others accept our acts as indicators of that membership. We do 'membership work' (Munro, 2001) by attending to our identity and by aligning our acts with the mission of the group we are members of. If I want to appear as a competent controller, I can only allow a certain vocabulary in explaining the deviation from budget. The cost centre manager who says that the cost of raw material has increased is safe, but the one who says that he worried so much about his wife being ill that he could not concentrate on his job is likely to be under suspicion for some time.

Aligning one's acts is not only in form (like proper turn-taking in conversation), but also contributing to the mission (quest) of the group, i.e. one's acts make sense in relation to the team's current quest. They make sense 'in a situation like this'. When I am comfortable with my membership, it becomes part of my identity. I will present myself to others as a member of group X. When the other members have accepted me as member, I may make commitments on behalf of the group. The others are bound by my promises. That is why I have to be careful to act appropriately. When we act in context we are social beings. This is what an interventionist researcher has to be able to deal with in order to be successful.[11]

3.2. Implications for Interventionist Research

Once across the border between the pure logic of academic discourse and the deliberative actions of fields of practice, the interventionist researcher, now in a different field of practice, has reason to ask 'What should a person like me do in a situation like this?'. The main problem then is how to get access to the actual, genuine discourse of agents in that field. Hastrup (1997), discussing the current crisis of anthropology, which she describes as a crisis of relevance rather than of representation, claims that anthropology today is not mainly a study of 'other' cultures but a matter of theorising the contact zone between cultures. Positioning oneself in relation to this zone is a strategic decision for the researcher. To take up the position as 'the radical other' means to invite eccentricity. Hastrup argues for viewing anthropology as a practice and thereby open the inquiry of theorising 'the dynamic zones of social life' (Hastrup, 1997, p. 354). She proposes that fieldwork, being paradigmatic to anthropology, should be done as 'living another life'.[12] The researcher should try to become an insider in order to get access to the discourse on action among members of the field. The outsider (radical other) will be looked upon as a 'tourist' and be talked to as such. The insider will be considered as a member and, as such, included in discourse, which in turn gives access to 'deliberation' (as described by Searle, 2001)—or practical reasoning. In order to be accepted as an insider, the researcher has to demonstrate an understanding

[11]Of course the risks are always there, like 'going native' to the extent that events of theoretical significance are not recognised, or to assimilating to 'group think' (Janis, 1972) to the extent that critical voices are not heard.

[12]Hastrup (1997, p. 358) argues that 'In order to really know culture, one has to ''suffer it'', as it were'.

(even if it is critical) of the field of practice that is seen as such by the members. It is precisely due to this that an interventionist researcher needs to adopt the emic perspective in some of the critical parts of her study.

If it is accepted that interventionist research means entry into the realm of practical reason, but that reporting results is to be done in the academic realm of pure reason, there is a translation problem. The problem in the mind of the observed practitioners may be 'what to do now', while the problem of the researcher is a 'justifiable belief'. Hence, to act according to the core rules of the academia, eventually the researcher has to move back from the emic perspective to the etic one. Rationality (deductive logic) should be present in both realms, but it is embedded differently (action and discourse, respectively). The main criterion for inclusion of evidence in a context of action is reasonableness rather than classical rationality. This means that it must be expected that members argue what immediate action goals are appropriate in this situation as well as what are the means that will lead to fulfilment of those goals. Such deliberation is particular (not universal), local (not global), and timely (what to do now?) (Toulmin, 1990). Furthermore it is likely to be oral, and as such, not completely orderly. Only after the relevant group or person has made up their/her mind about action can a coherent case for the chosen action be made in writing, including only those arguments that are deemed relevant for making the case (Toulmin, 1958). The context of problem solving usually encountered in interventionist research includes misunderstandings, faulty information, dead ends, and differences in priorities as well as less skilful argumentation. This requires a 'thick description' (Geertz, 1973) to do justice.

But thick description rarely constitutes a theoretical contribution even if it may give rise to 'ontological discovery'—like the fact that there is variety in understandings between members of a team (in spite of shared information or shared values). In order to render the findings a contribution to the relevant current discourse in the management accounting research literature, the results must be reflected in that literature to make the contribution visible.

If we consider a study where the intervention has taken the form of a new construction, two types of theoretical contributions are open (Lukka, 2000, 2003). Firstly, the new construction in itself may be a contribution to the design knowledge in this area. This will require that the researcher is able to show how the new construction has contributed to a desirable practical result in the given situation. Such a contribution may assume the status of a design rule that is of interest to practitioners because it works and to fellow researchers because it may constitute a starting point for further testing. In addition, the relationships that have been made visible in explaining why the construction worked or were used in designing the construction (*ex ante* and *ex post*) may provide building blocks in further constructions.[13] Interventionist research is an arena for applying as well as developing the theoretical knowledge about structural and process features emerging in the case, and this feature brings us to the second kind of theoretical contribution. In addition to the primarily pragmatist test of truth, i.e. whether the construction works or not, one normally has an opportunity to test simultaneously the underlying positive relationships as well. While the first-order pragmatist test leans on a pragmatist notion of truth, which is holistic in nature, the examination of the positive relationships embedded in the construction is a matter of more a traditional correspondence notion of truth. It is precisely for this reason that interventionist research may be considered an integrative attempt in using basic knowledge input in a research process of an applied nature that returns to the basic knowledge in the analysis.

For these two reasons, and because an interventionist study inevitably includes very few cases, mostly only one, it is a necessary requirement for the interventionist researcher to be, possibly, more conscious of the research procedure whereby the data to be analysed are collected than the appliers of many other research approaches.

4. Conducting Interventionist Research

We have argued that a signifying aspect of interventionist research is the move between the pure logic of academia and the practical logic of the field. Furthermore, we have argued that the interventionist approach implies that the chosen path towards knowledge is that the researcher tries to influence the host organisation towards improvement. The intervention has the form of a field experiment (albeit with varying intervention force), which bundles variables that may be affected. The interaction between variables is largely uncontrollable—however not less so than in a piece of non-interventionist research. After the empirical part of the study, the ambition is to conceptually unbundle the variables in order to make patterns recognisable and further research efforts more precise. In other words, an interventionist researcher seeks to reduce the complexity of the practical situation by trying to change it and then trace patterns of change by applying a kind of reverse engineering to the observed process.

[13]A parallel argument can be made on the usefulness of constructions that did not work as expected.

Against this short background there are some norms of good interventionist research that can be pointed out. The requirement to keep a detailed field diary that documents, chronologically, the events of the research project, is obvious. Any reverse engineering, going back over the chain of events to discover causal patterns, presupposes that the chronology is documented. The researcher may be tempted, in all the excitement that an interesting project may arouse, to skip documentation work and do it later when things have calmed down. This is to invite disaster. The researcher will stand 'naked' at the end of the observation period with memory, and judgement, clouded by the biasing force of the final links in the chain of events. The field diary will help keep awareness alert of the situational nature of problem solving by recording how facts and possibilities were mobilised there and then. The diary should be bound (no loose leafs)[14] and records kept chronologically like in the journal of traditional bookkeeping with proper references to relevant documents such as interviews, meetings, and protocols. All in order to preserve traceability of the research process.

As has been emphasised above, entry to the host organisation entails a shift in logic and this will affect the role of the researcher in the new environment and, thus, what is appropriate. To a certain extent, the role of the researcher is negotiated prior to entry when conditions are discussed. It is in this situation that expectations of the gatekeeper for the host organisation are formed. Contracting a promise to solve any problem the host might have, or asking for a consultancy fee, are in our opinion no useful foundations for an intervention research project. Obviously, the researcher wants to gain a free hand to pursue whatever interesting prospects that may arise, while the host wants to secure benefits to the organisation. The host organisation may agree to participate in financing the study in recognition of that effort. Our experience yet tells us that trust in the integrity of the researcher, a trust that stretches far beyond the moment that the fieldwork is finished, is the value at stake. Such a value is built through responsible conduct on the side of the researcher, and this is usually rewarded by the host in terms of access to critical information. For ethical reasons, it is recommendable to establish in writing that the personal integrity of individuals and business secrets of the host organisation are not to be infringed upon, and what procedures are required to secure this. The researcher makes it perfectly clear that scientific integrity means that she alone is responsible for the analysis and conclusions that follow. In our experience, there is no problem in agreeing that a representative of the host organisation is supposed to review manuscripts from the project before publication, to secure individual integrity, and the protection of business secrets. In practice this means that the representative is sent the manuscript and given, say, three weeks to respond. Problems of the kind mentioned in the agreement will then be solved, if they emerge. Should the representative fail to respond in time, the author is in a different situation, but should nonetheless strive to deal fairly with complaints. There is little to be gained by agreement advocacy.

Once arrived in the field, the first task for the researcher is to gain an understanding of the situation. This is important for the outcome of the project because the intervention in the host organisation, whatever its form, will be more apt if it is better aligned with the situation. One could look upon the intervention as designing a field experiment, where many known and unknown variables interact. The bundling effects of all these variables may be anathema for a laboratory experimenter, but on the other hand, they add a measure of realism to the object of study. In order to be able to design an intervention that promises to work in practice as well as add to our theoretical knowledge, a good understanding of the situation is essential. What constitutes a good understanding is not only a function of the situation as such but also of the role assumed by the researcher, which can vary. An 'expert' offers systematic knowledge, a 'team member' offers collaborative team work, and a 'comrade' offers sympathy. All these roles determine to some extent what dimensions of the situation the researcher should pay special attention to. There are pros and cons.

The 'expert' is a resource person by virtue of useful knowledge inputs to the problem-solving process. The problem to be aware of here is the bridging from the expert's pure logic of, for instance, accounting theory, to the practical logic of system design with user benefit in view. The home ground of the expert is on the pure side, while the problem to be solved is likely to be formulated in terms of practical reason. If the expert exploits the situation to test her hypotheses on the pure side only, she stands the risk of being labelled insincere and be cast as an outsider.

The 'team member' participates on equal terms with other members of the team and shares responsibility for outcomes. In this role the researcher has to be aware of the need to establish and maintain

[14]In line with this, if a word processor is used, the researcher needs to resist to temptation to edit the earlier written text in any way.

membership through 'membership work' (Munro, 2001), i.e. upholding an identity as competent member and providing contributions to solutions that are aligned with the team mission. Membership carries an implicit commitment to remain an insider throughout the project, so the researcher is well advised to be on the outlook for possible exit points from the contemplated project.

The 'comrade' observes the process as a socially trusted outsider (like an anthropologist). In this case the researcher does not offer solutions but companionship, seeking opportunities to elicit members' reasoning on current events. This obviously is a border case of interventionist research in that intervention is minimal. The difficulties of understanding (properly) the situation as understood by the member have been discussed by Hastrup (1997) in terms of 'living another life'. It is illustrated by the story of how only after demonstrating practical understanding, like understanding how to keep a flock of cows together while driving them to grazing meadows, could she avoid being talked to as a tourist by the farmers she was studying. An outsider with a practical understanding can become a confidant of members. As stated, intervention will be modest, but may still become significant if articulating problems and half-baked ideas to the researcher may help members 'get it right'. Asking the right questions, or just hm-ing at the right moment, may be seen as an intervention.

Regarding the methods of collecting research materials, sometimes interviews in a complex and changing environment can give expressions of the current 'theory-in-use' (Argyris & Schön, 1974; Argyris et al., 1985), which the respondents apply in the examined situation. Such beliefs about the situation may at times be what is looked for, but if a reliable mapping of a system for design or re-design purposes is sought, multiple sources, triangulation, and deep probing to verifiable facts are recommended. As the interventionist researcher conducts her study along the real-time flow of life of the case, observation in the participant mode often dominates the collection of empirical research materials.

All the researcher's roles outlined above require that she engages with empathy in order to elicit genuine information. The resulting description is likely to be 'thick' (Geertz, 1973), because the researcher will get material on the context of the situation as well as the situation itself. Furthermore, the situation will change in response to contextual change as well as due to role-bound action by the researcher or by the members of the host organisation. It is likely that the thick description of the situation that forms the basis for a good understanding has the form of a narrative about how the situation works.[15] The selection of variables to be included in such a narrative making it a good understanding brings us to the matter of relevance and the use of a pragmatic criterion of goodness.

A pragmatic design of an intervention means to integrate facts, possibilities, and values in communication (Nørreklit et al., 2006). Wittgenstein (1953) retreated from his earlier position that the world was constituted by the sum of all facts, and argued in terms of 'life world' and 'language games'. In deliberating upon an intervention, the interventionist researcher and her partners in improvement find themselves in a situation of practical reason. The construction of an intervention in such a situation might proceed as follows: A fact is a fact as recognised by a person. Facts are real in the sense that they are based on a source independent of the actor but constituted in the experience of the actor. As such they reside in 'history'. When we consider the future we use logic to discern possibilities. Some possibilities are fact-like, like the fact that we are all going to die, but most possibilities are constituted by the actor 'seeing' a path (of acts) from the relevant facts to attractive possibilities. This 'seeing' should be understood in a pragmatic sense—based on our experience, we believe it could work. Which possibilities are attractive, and therefore should be selected as the target of the quest, emerge as values are applied to possibilities. Which values are appropriate to apply 'by people like us in a situation like this' is determined through communication. In communication, values of individuals are translated into values justifying collective action (our quest). Arguments for choosing a certain design of the intervention (field experiment) may be persuasive in terms of the values a given individual entertains in the situation (including the sense of duty that may be mobilised) or in terms of exerted power. The collectively constructed action project is based on a good understanding of the situation and on members being able to see the path from current facts to future possibilities that are attractive enough to make them want to initiate action to realise the possibilities. Action now links historic facts to future possibilities. This is summarised in Fig. 1.

A good design of the intervention will build on a thorough understanding of the situation and on the problem of improvement faced by the host organisation. The argument for the researcher's engagement in the intervention is the potential for a theoretical

[15]See Cooren (2000), Chapter 3, for a discussion of a canonical form of a narrative schema.

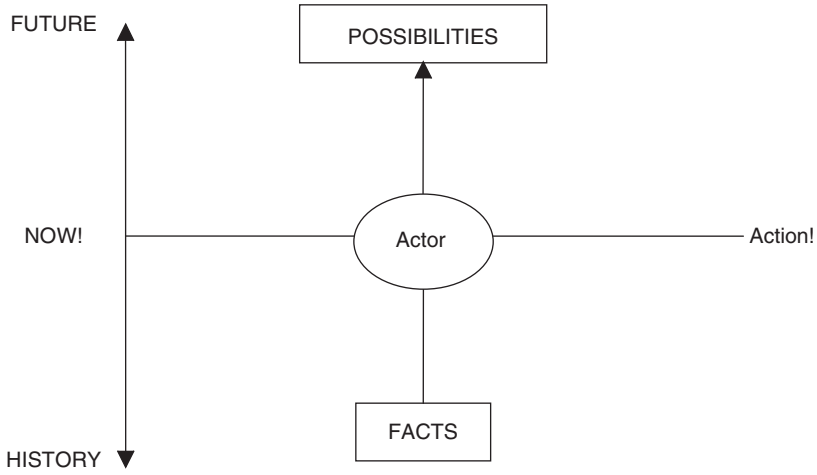


Figure 1. The pragmatic frame of action.

contribution that could come out of a study of the process of improvement initiated by the intervention. The pragmatic requirement that 'it works' thus is twofold. The design of the intervention must be honestly expected to work in practice, as well as have a potential to generate theoretically interesting knowledge. These two expectations provide the researcher with a preliminary frame of reference and attention director as the intervention is launched.

The degree of intervention—those who are affected by the intervention may look upon it as degree of disruption—may vary with the situation as well as with the intentions of the intervention project. We prefer to distinguish two types of intervention: modest and strong. In the case of a modest intervention, the distinguishing character of the intervention is that the intervention team tries to accomplish the initiation of an improvement process by manipulating the context rather than re-engineering work processes or systems. Jönsson & Grönlund (1988), to give an example, managed to initiate improvement processes in advanced production groups by being able to provide them with their own computer capacity, some software, and training in their use, but then only supporting attention to improvement work by frequent visits with the question 'How are you doing?'. This could be called modest intervention.

A stronger intervention, typical of the constructive research approach, occurs when the intention of the team is to change the work processes of the host organisation by design, either by a change in the system that provides information (implying a change in the processing of information and action) or by redesigning the work processes themselves. The Tuomela (2000) study presented below provides an example where the intention was to advance and control customer orientation by designing and implementing a new managerial construction for measuring performance and making different aspects of customer relationships visible.

During the intervention period, the field diary is used to keep track of events and the deliberations of the intervention team in action. The intervention plan will usually include a plan for systematic collection of data deemed of interest for the analysis of processes and outcomes. As this collection is concluded and the intervention has come to an end, the period of analysis starts.[16]

For the researcher the post-intervention analysis will normally consist of two moments: reverse engineering of the change process and re-contextualisation of the findings from the realm of practice to translate them for fitting into a theoretical discourse. Reverse engineering starts from the conception of how the intervention was supposed to work *ex ante* according to the design of the intervention (field experiment). This conception will indicate which variables are critical for accomplishing the intended effects, and how these and other variables are bundled together, possibly in sub-clusters, and the causal links assumed to carry initiation via action towards expected results. Such a 'road map' may take the form of a figure with boxes and arrows much like those accompanying LISREL applications. The reverse engineering, done after the intervention period,

[16]Of course there is some form of analysis going on all the time as researchers, like everybody else, attend to and sort observations continuously.

starts from the other end, when outcomes are known. It traces causality patterns backwards from outcomes to precedents that seem to contribute to the explanation of the outcome, and thus generates a second road map, which can be compared with the *ex ante* road map. The evidence will come from the field diary, documents, interviews, and other data collected during and after the intervention. The point of working backwards from outcomes to precedents is that it helps avoid bias that might stem from the *ex ante* road map. Comparison between the a priori and *ex post facto* road maps will assist the analysis by unbundling some of the complexities contained in the start assumptions. It will also give rise to questioning if some variables should be eliminated (or if they are just latent in this particular case). The result of the comparison is that the researcher posits a new statement on causality generated by reflection on what has been learnt from the differences between *ex ante* and *ex post*. This reflection is still framed in pragmatics and practical reason (Fig. 1).

The final step before writing an academic report is to re-contextualise the findings in order to position them in the appropriate literature. Owing to the richness of the data that a study like this is likely to generate and to the limited size of an article text, the material may judiciously be partitioned into several focused manuscripts. It is noteworthy then that a study designed as a management accounting study is likely to generate results of great interest to the research community of other disciplines too. This provides excellent opportunities for co-authorship with colleagues from other disciplines—opportunities that no management accounting researcher should miss.

In discourse on scientific research, validity and reliability are typically viewed as important criteria of goodness of a study. While in interventionist research reliability in essence is a form of intersubjectivity among competent practitioners, validity relates to whether a statement expresses or corresponds to reality. In interventionist research, such a conception may at first look problematic. After all, the purpose of an intervention normally is to improve on reality so that it will be socially constructed in a new way. At the same time the deliberations on action in a specific setting, i.e. the 'topos'[17] consisting of concepts and arguments applied to that setting (Nørreklit, et al., 2006), should be valid in order to avoid failure. The concept of reality required in an action context differs from that which we usually apply in a spectator view of the world. Since action is 'in the world', we need to look upon reality as a relation between the actor and the world. This relation has to be constructed in discourse. A good understanding of reality, then, means making sense of that which works in action. It is then difficult to separate relevance from validity. Such an understanding of the situation forms the basis for a good design of the intervention (the field experiment).

The test of the validity of the designed constructions—if they happen to be the focus of the interventionist research in question—is hence essentially a holistic, pragmatist test regarding whether the construction can be made to work, or not, in practice. It is holistic in the sense that the construction is a bundle of variables, which either functions as such or not in a holistic sense. However, a rather orthodox notion of validity enters the picture after the empirical phases of the study, i.e. when the researcher starts reflecting on the process she has gone through. The aim of the conceptual unbundling of the construction (the reverse engineering), and the process overall, is to reveal the positive relations (causalities) between the variables at stake. This turn to the application of the etic perspective mobilises the correspondence notion of truth, bringing the interventionist study comparable to any other research endeavour in management accounting.

5. Examples of Interventionist Research in Management Accounting

In seeking examples of good interventionist research the very fact that we are dealing with a pragmatic field, where part of the criterion is that the intervention works, limits our choice. The judgement of goodness requires that we keep to environments we are familiar with. In our case we feel that the limitation is not too restricting since interventionist research has flourished precisely in the Nordic countries. Presumably writers from other research communities would choose other examples.

Accounting, being an academic discipline with a firm anchorage in the age-old practice of registering and reporting transactions in human affairs, has traditionally chosen its topics among the problems of practice. In small countries, like the Scandinavian ones, accounting professors have always been rare and they have often assumed positions of practical authority as a matter of course. Their statements would have an influence on practice. Especially before the modern era of more serious research orientation, their concerns were mostly focused on giving students a good business education and on the involvement in

[17] *Topos* is one of the central notions in Aristotle's rhetoric, for him referring to general instructions saying that a conclusion of a certain form can be derived from premises of a certain form. One *topos* can hence be used to construe several different arguments (see, e.g. Rapp, 2002).

debates, committee work, and standard setting. This gave, by default, education a character of practical relevance. By virtue of their position, professors also participated in the translation of new international ideas into pragmatic local practices. When, to give an illustration, Taylorism came at the beginning of the last century, it carried with it a debate on costing and cost accounting. Academics participated in the committee work on costing terminology and frameworks (charts of accounts) for registering costs. For instance in Sweden, the system and manual of such a standard for manufacturing industry was largely produced by one of the two accounting professors of the country. The standard was widely accepted in the Swedish industry. It was theoretically sound in the sense that it covered a large range of decision situations and that it relied on the user to be able to determine what cost information was needed in a given situation, and it was used in education for decades. In this sense the academic activity was relevant to the practice of management accounting; there was a natural union of theory and practice. This did not go down well in the neighbouring disciplines of the academic world. It was difficult to gain respectability at the university. The professors tended to write their texts in a normative mode even if their insights had been gained in longitudinal studies of system design in several companies.

One example of such pioneering work is the whole *oeuvre* of Vagn Madsen of Denmark. Academic accounting as well as practice was strongly influenced by marginal costing propagated by authors like Schneider and Hansen (cf. Israelsen & Rohde, 2005; Israelsen et al., 1996). A logical consequence of this is that there are good reasons to avoid arbitrary allocations of overhead costs in the accounting systems themselves. Calculations for pricing decisions, for instance, should be geared to the situation at hand, following the well-known 'different costs for different purposes' principle. This inspired management accounting researchers (such as Danish scholars Vagn Madsen and Zakken Worre) to try to design a framework for registering costs without allocations. Madsen (1951) was the first to publish the result of such an effort in his doctoral thesis entitled 'A contribution to the elucidation of efficiency problems in industrial enterprises'.[18] He further developed his framework of variability and objectives accounting in a number of books (only Madsen & Polesie, 1981, available in English).

A particularly interesting aspect of Madsen's research efforts is that they are solidly based on extended participation in problem solving in a number of companies. While they are distinctly normative in presentation (and in great detail), the reader gets almost no information about the practical problems encountered or about problem-solving process. Madsen developed an 'ideal type language' (Israelsen & Rohde, 2005, p. 5). This is explained by the well-founded assumption (*ibid.*, p. 19) that both the author and his colleagues considered it unscholarly to dwell upon the practical difficulties encountered in developing his models. Interestingly, these first systems in Denmark were multi-dimensional (cost registered on type, responsibility centre, and purpose for the use of resources) and were conceptually developed before the IT age. When the applications were transferred to computers, the design of the report generators was the major problem due to limited processor capacity.

An immediate link to interventionist research in the current management accounting research community is the doctoral thesis of Olson (1983), which is a case study of the development and later use of an accounting system (based in Madsen's framework) for the city of Uppsala in Sweden. While Madsen found it unscholarly to give accounts of the process of problem solving in the system design processes he participated in, Olson (1983) is instead very explicit in his accounts of the process of change. This illustrates that by the 1980s interventionist research—Olson called his approach to it action research—had come of age academically, at least in Scandinavia. Part of the explanation for this may be that the Harvard case method in education had provided a kind of legitimacy for doing case studies (albeit with a given educational objective), but also that the business administration disciplines had got used to importing methods from other social science disciplines.[19]

Rolf Solli (1991), another Swede, conducted his Ph.D. study among professional people, who considered it an honour to disregard any concern for budgets and accounts.[20] Managers of a kindergarten, an old age home, or of social services in general, are professionally focused on helping relations. The well being of the client comes first, and it should not be any other way. To set up a study of how such managers would use accounting information in everyday

[18]This thesis was characterised as 'the first example of action research done in relation to business economic management that has been academically accepted in this country' by Johnsen (1983) in a 'Festschrift' to honour Vagn Madsen.

[19]Still one must not forget the powerful mainstream stemming from the cry for scientific method in the Gordon & Howell (1959) report and the ensuing debate initiated by Koontz (1961).

[20]Jönsson (1996) includes a helpful summary of Solli's work.

operations if they were given the information they asked for is a challenge. The theoretical perspective that inspired this study was experiential learning (Kolb, 1984). The contribution was the illustration of how accounting information came to be used in different ways by way of 'accounting talk' (Jönsson & Solli, 1994).

First the municipality, where Solli's case study took place, had to be persuaded to allocate the necessary resources to create good preconditions for a field experiment he had in mind. The argument was designed as a challenge to political leaders to 'walk their talk' (promote the use of financial information in operations), and as an opportunity to see if extra resources to support better control processes can pay off. Resources were granted for the task to see what happens if managers with a professional zeal were given a cost report layout as they wanted it. This required a minimal knowledge of the organisation's cost concepts and some ideas as to what was possible in report design. To accomplish this, six unit managers were chosen to participate in a two-day course out of town. The conceptual structure of the budget and the accounting system were introduced and the possibilities to design rows and columns in the monthly cost report were presented. The final hours of the course were devoted to each participant designing his/her own cost report for the next 12 months. And for the next 12 months the managers received their cost reports in the format they had requested. To see what happened, Solli undertook to interview the six managers each month, soon after they had received their cost report. He asked them 'How are you doing?' to see what they say and how they refer to costs in their response.

Solli's research is an example of modest intervention action research. The intention was to try to bring finances slightly more into the centrestage for a number of professionals by encouraging them to participate in a monthly chat on the (financial) situation.

The different interventions were evaluated in interviews after the year had passed. The participants found the education in cost concepts, on the average, 'useful' (3.8) and 'interesting' (3.5) on a 5-point Likert scale.[21] The reports, according to the participants own design, were seen as 'useful' (3.3) and 'interesting' (3.5) on the average, but the larger the unit the greater the satisfaction (close to 5 on both dimensions for the three largest units). The smallest unit, a part-time kindergarten, saw no use of the reports since the manager felt she knew the finances of the unit by direct observation of the few invoices she had. The interesting signal in the follow-up came in comments to the 'chats'. They were the most appreciated, close to 5 on the Likert scale.

The 'chats' were analysed as to content and it was found that during the first few months comments tended to hover around the borders of the responsibility area ('Isn't toilette paper included in the rent?'), about halfway through the period a frequent issue was blockages to rational management ('If I were to have exemption from the central purchasing agreement, I could buy cheaper/better locally.'), and during the last few months the respondent would bring up 'half-baked' ideas for first reactions from the outsider/researcher, kind of 'what-if' reasoning to articulate possibilities.

It should perhaps be mentioned that for the three units where it was possible to secure comparable data for similar activities, cost performance had improved a great deal during and after the experiment. Some people will claim that this represents cheating: The units performed better just because they were subject to abnormal attention from the researcher. True, but that is precisely what interventionist research is about. It has commonalities with management in general, in which getting people to pay attention to the operations for which they are responsible, is a crucial part of everyday life.

A good example of interventionist research based on the constructive research approach developed in Finland is Tero-Seppo Tuomela's Lic.Sc. thesis (2000), which deals with the practical problem of supporting a customer focus by performance measurement and with the research problem of responding to the exhortations by Hopwood (1983), Kaplan (1983), and others to provide insights into accounting in the real world context.[22] Beside the topic being strategy and the revenue side of the business, the study is interesting since it is a conscious application of the constructive research approach. This means that the problem-solving process, which the researcher engages in, should bear practical relevance and have a theoretical connection, while the intention is that the output of the research effort is the practical functionality of the designed solution concept and that the study produces theoretical contribution. This approach has a more articulated intention to affect practices than the Solli (1991) study. In Tuomela's work, the theoretical connection is given by an account of the 'customer focus' literature from Peter

[21]An evaluation at the time when the course took place showed higher values.

[22]Tuomela's study is carefully analysed in Labro & Tuomela (2003).

Drucker's marketing concept, via the Kohli & Jaworski (1990) market-orientation concept, to a synthesis with the Miles & Snow (1978) typology of strategic orientations. The practical relevance is argued from an interactive control (Simons, 1990) perspective. Different frameworks are reviewed (Tableau de Bord, Performance Pyramid, and Balanced Scorecard) and then the case problem of devising a dynamic balanced scorecard solution for the (non-anonymous) company is introduced.

A note informs us that at the start negotiations with three companies were initiated, but one company was eliminated because of lack of commitment from top management, and between the two remaining organisations, the actual one was selected because its problem situation seemed more acute. The report on the four-year field work first gives an overview of the research process and then on the design process (with illustrative interview quotes) of a new scorecard—called 'Customer Scorecard'—linking customer orientation to the strategy of 'profitable growth' with performance evaluation measures explained and related to each other. Next the implementation process is described with a chronology of what the team discussed and decided upon. In the case of Tuomela's project it so happened that the initial innovative and truly customer focused construction, the Customer Scorecard, was not implemented, since the three top managers of the case firm did not find it precisely corresponding to the needs of the company. Hence an alternative construction was developed, entitled '3 K Scorecard'.[23] This latter scorecard was also implemented in the case firm.

In reporting of the findings of the case study, Tuomela wanted to respond to two questions in particular: what is new in the construction achieved and to what extent it may be considered applicable to other organisations as well. It is demonstrated how the designed first construction—the Customer Scorecard—is consistent with the literature on customer orientation and also links well with the strategic focus of the company. However, the conceptual innovativeness of the truly implemented construction—the 3 K Scorecard—was noted to be only marginal, as it was much closer to the original Balanced Scorecard notion of Kaplan and Norton than the first construction. Despite this surprise element in the course of the project, Tuomela could still derive a theoretical contribution from it. He described his research process in a detailed manner and considered relevant contingency factors in order to grasp the process and the context, and eventually could explain how and why an attempt to bring customer focus into strategic discussions to some extent failed. The study raises an issue of potential incompatibility of customer focus and strategic performance measurement frameworks and refines prior theory in that respect.

According to Tuomela, an issue for further study is how we could evaluate the benefits stemming from strategic performance measurement systems, built as they are, by chains of causal reasoning. A most interesting aspect of his study is that much can be learnt from analysing causes of failure to reach practical implementation in interventionist research. It points to the fact that even if the market test[24] of the construction would not succeed—as was the case with Tuomela's first construction, the Customer Scorecard—there is still a possibility that the study is interesting from the academic point of view. In such a situation, the researcher should obviously ponder, why the problem-solving process did not succeed, and thereby identify the changes of preconditions needed in order to reach a functioning state of affairs (cf. Lukka, 2003; Labro & Tuomela, 2003). We can see the potential value of a proper field diary becoming manifest here as the researcher returns to his notes on the first construction to find clues.

6. Outputs of Interventionist Research

There are a lot of different views, including misunderstandings, regarding what interventionist research will and can produce. This is no wonder as there are many variations of interventionist research, and different schools of interventionist thought stress different issues (see Section 2 above). While some interventionist schools emphasise theory contribution as the primary output, some others strongly stress the practical change aspect of their research up to the point that the potential for theory contribution is more or less ignored. Some schools of interventionist thought position themselves as forming a counterforce to 'normal science' and especially to positivist research agendas (Toulmin, 1996b; Whyte et al., 1991; cf. Kuula, 1999). This fragmented nature of interventionist research has offered the opponents a lot of weapons to undermine its scientific value. The essence of this critique can be captured in the comment that action research (a central form of interventionist research) is 'long on action and short on research' (Heller, 1990). By the opponents of interventionist research, it is often labelled as

[23]The three K's come from the Finnish words 'kehitys' (development), 'kasvu' (growth), and 'kannattavuus' (profitability).

[24]On the various market tests of constructions, see Kasanen et al. (1993) and Labro & Tuomela (2003).

just a cheap attempt to transform consultancy projects to academic studies, resulting in nothing more than sloppy quasi-research (cf. Eden & Huxham, 1996).

Regarding the output of interventionist research, the core thesis of this chapter is to argue that interventionist research has good potential for producing both practically relevant and theoretically interesting contributions. Interventionist researchers seek to produce almost by definition practically useful output in the empirical parts of their projects, but there is no reason whatsoever to close the project there. We argue that seriously, carefully, and thoughtfully conducted interventionist research projects tend to provide a lot of highly useful materials for producing strong theory contribution, too.

We agree with Eden & Huxham (1996) that there is no need to view interventionist research as requiring a compromise between relevance and rigour. We underline that interventionist researchers should take advantage of the distinctive strongholds of their research, which relate to the facts that it necessarily takes place primarily *in vivo*, along the flow of life of the case organisation, in close collaboration with its members in projects, the relevance of which are more or less guaranteed. This close collaboration enables the collection of research materials—primarily by observation, but also by other case research methods—which have qualities that usually cannot be captured by non-interventionist approaches.

Following the natural, chronologically proceeding phases of interventionist research allows us to identify the various forms of potential outputs of such research. The first output—or perhaps this should be called a 'semi-output'—of an interventionist study is produced when the situation of the case organisation is captured conceptually from the viewpoint of the theme of the study, and a thorough understanding of it is gained. This covers, in particular, historical background and current issues as well as aims of the members of the organisation and problems they face. On the basis of examining these, the researcher should be able to make sense of what is going on in the case organisation, and to develop at least tentative links/explanations for the issues at stake, building on the theory frame she uses in, or develops during, the study. While this is often viewed as the acceptable eventual outcome of non-interventionist case research, for an interventionist scholar all this is no more than the starting point for the research project. However, this phase is certainly crucial for the interventionist researcher, too, since without a solid basis the rest of the research project is laid on thin ice. This 'semi-output' of the research is, or at least should be, common to all appropriately conducted interventionist case studies.

The second typical output of an interventionist study is an outline of the ideas for change or a design of a solution concept to the problems faced by the host organisation's participants, both of these typically developed jointly with the members of the organisation. In practice this normally means researcher's participation in a project team in charge of taking care of a change project. These types of outputs make a big difference to non-interventionist research, where the world is merely observed and analysed (Kasanen et al., 1993). For an interventionist researcher, the world is there to be re-conceptualised and redesigned—she participates in bundling together resources at hand in order to construct a new reality. With regard to this type of potential outputs, various modes of interventionist research differ to some extent. In some more problem-solving-oriented interventionist approaches (especially design science and the constructive research approach), designing an explicit solution concept is the core issue, defining the entire research enterprise. In the more process-oriented interventionist approaches (especially certain realisations of action research), the study does not necessarily purposefully focus on explicating any solution concept. However, even then an interventionist study tends to be geared to certain ideas of teasing out change in the studies organisation.

An interventionist study includes the testing of the ideas for change or the designed solution concept by participating in its implementation, typically by teaming up with the members of the host organisation, and hence organisational change (or at least an attempt to accomplish that) is an important output of an interventionist study. Interventionist research is primarily empirically tuned, and therefore it is crucial that the ideas of change or solutions to managerial problems will not be left just at the theoretical level.[25] This output relates to the corner-stone phase of interventionist research, which encompasses researcher's participation in the flow of life of the host organisation. It is important to realise that for an interventionist researcher this phase of research often plays a double-role. Firstly, it relates to the true attempt to gain knowledge of the applicability of the change ideas or designed solution concepts. Secondly, and even more importantly, it offers the interventionist researcher an avenue for gaining knowledge and research material for further analysis as more or

[25]Here comes one of the differences of interventionist research from analytical modelling type of research, see Kasanen et al. (1993).

less 'one of us'.[26] The researcher has to work hard, skilfully, and patiently in order to accomplish such position. But would she manage in achieving that, she will get a particularly useful inside look at the 'true' life of the host organisation from the emic perspective. She gets an opportunity to take a look and participate in the 'theory-in-use' of the host organisation (cf. Argyris & Schön, 1974; Argyris, et al., 1985). In addition, it is not just what the members of the organisation *say* they would think or do, or have said or thought in the past, but it is what they actually *do* in the very life that is just taking place, and to which they have to commit themselves (cf. Eden & Huxham, 1996). This phase of research necessarily requires a certain amount of commitment not only from the members of the organisation but also from the researcher: change projects cannot be credibly participated just by adopting an academic, neutral position. Instead, an interventionist scholar has to 'take sides' when she engages with practice in the practical reasoning mode.

During and particularly after the empirical parts of the project are completed, an interventionist study turns to reflection: what has been learnt? The researcher starts a reflective analysis of the nature, elements, implementation, and effects of the change ideas or solution concepts and, overall, the process she has gone through. This means essentially analytical unbundling of the issues at stake in the study, and requires that the researcher steps back from the committed attitude needed especially in order to produce output described in the previous point above. It is important to note that while outlining the ideas for change or a design of a solution concept to the problems faced by the host organisation's participants and their implementation (described above) are distinctive unique features of interventionist research, the task and outputs related to this point do not differ from those of non-interventionist studies. Therefore the general case/qualitative method literature, dealing with the analysis of the data, is equally valid for interventionist research as it is for the non-interventionist one (e.g. Ahrens & Dent, 1998; Hammersley & Atkinson, 1995; McKinnon, 1988; Silverman, 2000). The major difference is that the empirical materials, which the interventionist researcher now starts to analyse, are at best even more many-sided, thorough, subtle, and relevant—for reasons explained earlier in this chapter—than what can be gained by the non-interventionist approaches. What the researcher is looking for are patterns of action, links between issues (variables), processes, and eventually possibilities for developing (causal) explanations. In sum, the issue is to interpret the research materials the researcher has managed to collect with the help of the theoretical lenses she has chosen to apply in, or is developing during, the research project.

Similarly as in any scholarly study, also interventionist research culminates in drawing conclusions based on the conducted research. Here the central issue is to explicate the theory contribution of the study. Does it illustrate existing theory, or does it refine or test it? Or does it possibly tend to be formative of a new theoretical framework? Kurt Lewin, the first explicator of interventionist research in social studies, strongly emphasised the need of the action researcher to make the theory contribution of the study clear. He also regarded action research primarily as a weapon to test theories (Lewin, 1946/1948). It has later been argued that the biggest potential of action research is in theory building (e.g. Eden & Huxham, 1996). However, in our view there is no difference between interventionist and non-interventionist research regarding the potential for producing theory contribution. Therefore, we consider all the above-mentioned theory contribution opportunities as genuine options for an interventionist researcher, similarly as they are for a non-interventionist researcher (Lukka, 2005; cf. Keating, 1995).

One of the underlying themes of our analysis has been the distinction between the emic and the etic perspectives (Pike, 1954) when conducting interventionist research. The emic perspective dominates the actions of an interventionist researcher in the early phases of the study, forming the cornerstone of the fieldwork in interventionist research. The researcher needs to be viewed as a competent and trustworthy member in the same world where she is doing the fieldwork. This is not only to make her to understand the meanings and actions of the actors in the field, but it also makes her able to communicate and act together with them. Would she fail in gaining this image and position, it will be highly unlikely that she could act as a change agent (or one of them) in the organisation in a convincing manner. However, being successful from the emic perspective is just halfway through in an interventionist study as the researcher also needs to link her findings to a theoretical frame, i.e. to make a theoretical contribution. The successful application of the etic perspective is a 'must' in all types of studies to be academically interesting, and

[26]This analysis can be continued in later studies, of course. Tuomela (2005) is an example of post-constructive work, in which he examines how the implemented solution was actually used. It is based on his earlier study applying the constructive research approach (Tuomela, 2000).

therefore this perspective dominates in the later, reflection-minded phases of interventionist studies, too. However, the application of the etic perspective is also required at the very start of an interventionist study, since no research project seeking theory contribution can be motivated without a thorough consideration of prior theoretical understanding right at the outset. While the role of theory is a debated issue in interventionist research, in our view a balanced use of the emic and etic perspectives is of crucial significance in order to justify the use of this research approach.

7. Other Key Issues of Interventionist Research

In addition to the role of the researcher as an active participant observer in the research process, the various streams of interventionist research (see Section 2 above) bring forth several other common issues of interest. Interventionist research necessarily needs to be longitudinal, since the deep immersion and collaborative style of empirical work, consisting typically of a joint iterative learning process, simply takes time. The common issues of interest also include that interventionist research tends to be problem-solving oriented, aiming to accomplish change in the empirical target of the study. Consequently, interventionist research has a more or less strong normative character. However, the various streams differ regarding whether accomplished problem solving is a sufficient justification for a certain interventionist piece of research. At one extreme lies clinical research, in which the solved problem—curing the patient—is the core issue and legitimates the endeavour. At the other extreme there is the view that the problem-solving-focused part of the study—though it has some inherent value as such—is serving a more general research aim: that of seeking to make a theory contribution.

This brings us to another issue in interventionist research—the role of theory. We can distinguish between three basic attitudes regarding theory in interventionist research: indifference, hostility, and favouring. Clinical research tends to be indifferent when it comes to theoretical contribution since, as noted above, 'curing the patient' is the key issue. For this reason many scholars view clinical research as a form of consultancy rather than research. A relatively indifferent attitude also applies to those action researchers who resist some of the core ideas of Lewin. For them, action research is often primarily 'action in the field', participating in a joint learning process with the actors of the target organisation(s), and the theory contribution of the study is left unclear. For some other interventionist researchers again, theory is a 'red flag', which needs to be attacked. For them, the 'theory-hostile' ones, interventionist research is a critical alternative to 'high science', needing no aim at theorising at all (Toulmin 1996a, 1996b). But there are less anti-scientific views, too, according to which an interventionist researcher is involved with the problem-solving or change processes precisely since she wishes to make a theoretical contribution. This position is shared particularly by the original Lewinian action research, action science, and the constructive research approach. In all of them, the problem-solving-focused part of the study is ideally a field experiment, with the help of which our theoretical knowledge can be pushed further.

The varying notion of theory is worth comment as well. In design science, as well as in Mattessich's (1995) CONAM research programme, the notion of theory developed by interventionist research differs from that typical in social sciences. Here theory is seen as a collection of prescriptive rules or constructions, and new pieces of interventionist research—if successful—add to this collection.[27] In other streams of interventionist research, in which the issue of theory is not ignored or questioned, the notion of theory tends to resemble that typical in social sciences: theory is a tool for making sense of the world with concepts and explanations that have some inherent generality. In these latter studies, in which new constructions may still well be among the outcomes of the research project, these constructions are viewed from the research perspective primarily as weapons to learn something theoretically new about how the world works.

The roles of the researcher and the members of the target organisation(s) in the interventionist research process is another issue, which makes a difference in the various streams of interventionist research. One of the key questions in this regard is how dominating or democratic the researcher should be in the field. The mirroring question to this is, of course, what is the assumed role for the people in the target organisation(s) in the process. Accordingly, should the researchers offer solutions as best she can, for example, based on her theoretical understandings, or rather act more timidly and wait and see how the 'more

[27]Similarly to design science and CONAM, the first suggested notion of the constructive research approach, reported in Kasanen et al. (1991, 1993) focused on the design of new constructions. However, the later developments of this research approach by Lukka (2000, 2003) have considerably revised the aims of this research approach, effectively so that the aim for making theory contribution (understood in the typical manner in social sciences) is staged significantly more up front.

immediate' members of the field proceed and what they get done? These questions boil down to the issue of the nature and strength of intervention, which is another distinguishing variable on which we can differentiate the various approaches to interventionist research. The currently dominant forms of action research (see van Beinum & Pålshaugen, 1996) tend to favour an egalitarian idea of action research leading to the aim of limiting the strength of the intervention of the researcher and resisting the more 'theory-' driven notions, such as the action research originally suggested by Lewin (Kuula, 1999).[28] Some other streams of interventionist research, especially action science and the constructive research approach, tend to more faithfully follow the footsteps of Lewin and favour a stronger researcher intervention. In this way, the researcher will be able to effectively locate the empirical work in her overall research design, seeking to make a theory contribution, which is of high importance in these streams of interventionist research.

A related issue is the closure of the project. There are various views on this matter in the different streams of interventionist research. For instance 'egalitarian-minded' action researchers, who stress the role of the members of the target organisation in the research process, tend to think that the problem-solving/change process needs to be continued until all parties involved can agree on its completion. On the other hand, while the co-operative nature of interventionist research always necessitates negotiation on all critical aspects of the research project, those streams of interventionist research, which stress the central role of the researcher, her research design, and intention to achieve theory contribution, tend to be less worried about a definitely 'democratic' closure of the project.

The limit of the researcher's intervention is an issue, which has so far not received much attention in the methodological literature. It should be noticed that just accepting the basic assumptions and intentions of the co-operating organisation, and working jointly on that basis, is but one option—though typical—for an interventionist researcher. At least in principle, the researcher can also put the basic assumptions and intentions of the target organisation under critical scrutiny, and even question them (cf. Flyvbjerg, 2001; Schipper, 2003). The latter option, especially if made in a straightforward manner, can be risky from the viewpoint of securing the longitude of the research process, and hence the researcher needs to carefully consider the time and place for adopting that approach. However, this is a possibility for the interventionist researcher, which can effectively make her a critical social scientist in the field (cf. Lukka & Granlund, 2002). The difference between being 'co-operative' and 'critical' in practice is usually slight and shifting over time, since part of maintaining an identity as a member of the problem-solving team is for the researcher to uphold a principled view over time. Arguments will have to be judged by their relevance in the current situation. Some arguments are good and some are not so good. Researcher's integrity hinges upon taking well-reasoned positions on controversial issues in context.

The researcher also needs to consider the various risks her interventions may cause for those co-operating with her, and to the entire host organisation. Making interventions carelessly may lead to the 'elephant-in-the-glass-store' effect, where the researcher causes a lot of damage to the target organisation. Social processes tend to be complex and it is therefore difficult, if not impossible, to predict all of their outcomes. Hence an interventionist researcher needs to always be considerate, for instance, regarding what, how, when, and to whom she communicates about the issues she has learned during the empirical work. She also needs to keep in mind the possibility that skilful and opportunistic members of the target organisation may seek to set her up to become—even unknowingly—a promoter of private and hidden political agendas. Since an interventionist researcher can, at best, make a difference in the field, it is even more so important for her to realise that whatever she does probably serves somebody's interests in the target organisation—more than those of some others. There is no such thing as an impartial, neutral interventionist researcher, just if the researcher wishes to be effective in the field, as she should.[29]

The emic perspective is regarded as necessary in interpretive case studies, in which the core issue is to develop (at least first) a solid understanding of the meaning system applied by the actors in the field—seeing things from the actors' point of view (Geertz, 1973). In interventionist studies, the ability to successfully adopt the emic perspective is, if possible, even more inevitably needed in order to be able to communicate in equal terms with the people in the field and thereby participate in the organisational change processes. If unsuccessful in this respect, the

[28]The 'participatory action research', suggested by Whyte et al. (1991), gives a good example of the forms of action research, which stress the significance of the active role of the people in the field, together with the researcher.

[29]A very helpful discussion of these issues is Kuula (1999).

researcher runs the risk of being viewed as an alien in the system. Members of the target organisation will then adapt their communication with her, using 'child talk' and refrain from genuine, trusting conversation.[30] As a consequence the co-operation between the researcher and the target organisation may remain superficial, in the worst case to such an extent that the researcher will not realise it. Hence, the interventionist researcher must take the necessity of adopting the emic perspective seriously. If not, there is a high risk that the results of such studies are flawed both from the practical and the theoretical viewpoints.

8. Concluding Comments

In this chapter we have described the interventionist approaches to conducting management accounting research. We have examined the key differences between interventionist and non-interventionist research, distinguished the most notable forms of interventionist research, developed a philosophical anchoring for interventionist research, offered examples of interventionist management accounting research, and discussed the various roles the researcher can play in such research. Finally we have examined the role of theory, outputs, and other key issues in interventionist research.

Our central thesis is that interventionist approaches provide fruitful options for management accounting scholars to conduct research, in which relevance and rigour relate to great potential to produce theory contribution. Interventionist research is typically problem solving oriented and therefore seeks to produce change in the host organisation. However, it is not only about such change: Researcher's intervention in the life of the host organisation—often viewed as a methodological problem in standard texts on case studies focusing on non-interventionist research—is harnessed as an explicit research asset in interventionist research. In our view, the most essential point of interventionist research is to produce theory contribution. Herein, interventionist research follows the advice by the main developer of action research, Kurt Lewin, according to whom the best way to learn about the world is to set it into change.

We argue that the core advantage of interventionist research is its inclination to produce thorough and many-sided research materials for further analysis. This is since an interventionist researcher has to penetrate into the flow of life of the case organisation, and enter the realm of practical reason of managers, in a way that is not typical of the non-interventionist research approaches. Even though gaining a good understanding about the historical background of the host organisation is a necessity, interventionist research cannot be conducted just *ex post facto*—on the contrary, interventionist research tends to be a longitudinal collaboration process with the case organisation(s) *in vivo*. In order to be able to make any meaningful and relevant interventions, the interventionist scholar has to be taken seriously in the same realm, in which the managers act, and according to the rules of the same logic. Hence, during the critical phases of her empirical work, an interventionist researcher has to apply 'practical reason' parallel to the members of the host organisation. This requires a careful and thoughtful adoption and mobilisation of the emic perspective by the researcher. However, any interventionist study culminates in the question, how the research project eventually affects our priors—what was learned from it and what precisely is the theory contribution one can make out of it. Hence, the researcher has to cross back to the realm of academic 'pure reason' and thereby adopt the etic perspective—something which any researcher has to eventually do to make her study academically interesting and justified.

Our reasoning in this chapter is based on a firm belief that in order to improve the ontological basis for management accounting research we need to open up the 'black box' (Latour, 1987) and observe, directly, management accounting information in use, and, on the basis of these observations, develop and test design rules for systems intended to support and improve such use. This means that we recognise that there is a pragmatic side to management accounting research, namely to investigate the use and usefulness of management accounting information in managerial action. Business and management are not conducted in the way the founding fathers of the theory of the firm assumed, not even like it was when contingency theory was forged from close observations of management in action. We need research approaches, which offer opportunities for 'ontological discovery' to open the black boxes of organisations. Interventionist management accounting research represents this kind of research.

Interventionist research, if seriously conducted, is a most demanding task for a scholar. Not only does it require the command of prior literature and analytical skills like any research approach, but it also requires considerable people skills, boldness, and—as

[30]Cf. Argyris' (1982) 'undiscussibility' problem. He claims that people cover up and they cover up that they cover up. This may make some crucial preconditions for a successful change undiscussible.

interventionist research necessarily takes time—a lot of persistence. Given the current tendency to favour and adopt the 'publish or perish' attitude, it is no wonder that interventionist research is, at least so far, relatively rarely encountered in the management accounting academia.[31] We think this is a pity, since—as we have shown in this chapter—there is a lot of potential in interventionist research.

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[31]In discussing preliminary versions of this text we have encountered, mostly from Anglo-Saxon colleagues, scepticism as to the future of this kind of field research based on the argument that the lawyers of the university has prescribed signatures by respondents on so many forms and declarations that both the researcher and her respondents are exhausted before the study can commence—all in the honourable cause of protecting the university from damage suits. We feel that this tendency of legalistic views on research may steer researchers away from fieldwork and towards survey research and experiments with students as subjects. This is a regrettable development that should be debated by the academic community.

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Doing Archival Research in Management Accounting

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Abstract: In this chapter, I discuss archival research in management accounting, where "archival" is narrowly defined and "management accounting" broadly. Given these definitions, I address the literature's excessive focus on one specific research area, i.e., executive compensation, and its use of publicly available data to answer the dominant research question. I argue that the easy access to databases has led to an uncritical use of the data, which begs the question of what we have learned. I conclude that, relative to the size of this field, we know very little about the design of incentive contracts for CEOs and propose two broad directions for future research.

1. Introduction

In this chapter, I discuss empirical research that can be classified as "archival" and can also be classified as "management accounting." As will become clear later, I use a relatively narrow definition of archival research and a relatively broad definition of management accounting. Given these definitions, I address the literature's excessive focus on one specific research area, i.e., executive compensation. More specifically, I analyze the dominant research question in this area and evaluate the literature's use of publicly available archival data to address this question. The basic issue that I address is whether these archival data can provide the researcher with sufficient assurance that the operational constructs relate to the theoretical concepts.

For researchers new to this type of research method, the difficulty arises that there is no handbook available that provides guidelines on how to do archival research, comparable to those books that are available for other types of research methods. For example, there is the seminal work by Dillman (1978) on how to do survey research and numerous books on how to do experimental research (e.g., Handbook of Experimental Economics; Experimental Design). The purpose of this chapter is therefore to discuss issues particularly relevant to this type of research.

The issue that is most relevant is the one of variable measurement. Variable measurement is always a crucial aspect in empirical research, whatever the type of data used. However, it is of special importance to archival data, since these data are not gathered for the purpose of academic research. Researchers cannot therefore impose academic requirements on the data-gathering process *ex ante* and have to take extra care *ex post* when using the data.

The remainder of this chapter is structured as follows. First, I define archival research and archival data and provide examples of archival studies in accounting. Second, I discuss some general advantages and disadvantages of archival data and describe the main topics that are addressed in managerial accounting. Third, I evaluate the use of publicly available archival data in executive compensation research in detail. Fourth, I elaborate on alternative research questions that open up opportunities for future research. Finally, I conclude with a summary.

2. Archival Research and Archival Data

2.1. Definitions

As a disclaimer, I state up front that the content of this chapter does not do justice to its title. Archival research in management accounting is so broad that it could probably fill a whole handbook. Obviously, this is not my intention in any way. Before being able to discuss archival research, it is therefore necessary to add some structure by providing a clear definition of what constitutes, for the purpose of this chapter, an archival study. I define an archival study as the following:

> *an empirical study that uses archival data as the primary source of data applying quantitative methods to analyze these data.*

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Clearly this definition is narrow, as it excludes probably all "archival" studies in the field of History. For example, in an accounting context, my definition excludes papers such as Quattrone (2004). This exclusion is not meant to indicate that such studies are not important. It merely facilitates the focus on those studies that, I believe, I was asked to focus on. That is, it is a pragmatic decision.

Given the above definition of an archival *study*, the next step is to provide a definition of archival *data*. I define archival data as:

> *data for which the original purpose for gathering it was not academic research.*

This definition is more straightforward and consequently less controversial than that of archival research. However, given the focus on quantitative methods, the data of specific interest here are quantitative data or, at least, data that can easily be quantified. In sum, this chapter discusses quantitative empirical studies that base their analysis on data originally gathered for purposes other than academic research.

Basically, two types of archival data can be distinguished: (i) public data and (ii) proprietary data. Public data can best be described as data accessible to anyone for any reason. Proprietary data, on the other hand, can be described as confidential data to which access can only be granted by the proprietor (owner) of the data. To make things more concrete, I provide specific examples for each of the two types of archival data in the following sections.

2.2. Examples of Publicly Available Archival Data

2.2.1. Compensation Data

Data on executive compensation are readily available in a number of countries, most prominently the US and the UK. The detail with which this data is available ranges from data on the "total compensation" of all board members (e.g., until recently The Netherlands) to data on every single compensation component for an individual CEO (e.g., US). The availability of this data has created a large stream of literature on executive compensation. For example, Lambert & Larcker (1987) use data from Forbes compensation surveys to examine the determinants of the use of accounting and market measures of performance in executive compensation contracts. Since the seminal paper by Lambert & Larcker (1987), numerous papers have been published using this type of data, where the ExecuComp database has gradually "replaced" the Forbes data.

2.2.2. Bonus Plan Data

In addition to the publicly available compensation data, US listed firms need to file so-called proxy statements. These proxy statements contain information about the compensation plan of the CEO, although the amount of detail varies between firms. Ittner et al. (1997) use these proxy statements to gather data on the specific incentive weights on financial versus non-financial performance measures in annual bonus plans of CEOs. Similarly, Wallace (1997) uses the proxy statements to select firms that have adopted residual-income-based compensation plans.

2.2.3. Financial Statement Data

There are numerous databases containing financial information on firms, both listed and non-listed. The database most often used in accounting research is COMPUSTAT, which contains information on US listed firms. Other databases available are, for example, Worldscope (international, listed firms) and Amadeus (European, non-listed firms). In management accounting, there are few studies that use these databases as the main data source. One example is Anderson et al. (2003), who use the COMPUSTAT files to examine the extent to which SG&A costs are "sticky." Most management accounting papers that use these type of databases combine them with other types of archival data (see, e.g., Ittner et al., 1997; Lambert & Larcker 1987).

2.2.4. Industry-Specific Data

All of the above examples relate to information that is available across industries. However, there are also public disclosures that are industry specific. For example, Banker & Johnston (1993) use traffic and financial data from the Department of Transportation (US) to examine cost drivers in the airline industry. An example in the health-care industry is Eldenburg & Soderstrom (1996). They use data from the Washington State Department of Health to examine to what extent hospitals shift costs among payors as a result of (regulatory) incentives.

2.3. Examples of Proprietary Data

2.3.1. Third-Party Surveys

Institutions such as consulting firms, academic institutions, government agencies, and professional organizations often survey a selection of firms on a specific topic. These survey data are "owned" by these institutions, and thus proprietary, and can only be used by researcher with the (written) consent of the respective institution. Numerous examples exist

within management accounting that use these types of data, two of which are Bushman et al. (1995) and Geiger & Ittner (1996). Bushman et al. (1995) use compensation survey data from Hewitt Associates on the use of "firm-level" versus "unit-level" performance measures in compensation contracts of business-unit managers. They use this data to examine to what extent interdependencies affect the incentive use of these types of performance measures. Geiger & Ittner (1996), on the other hand, use survey data from the US General Accounting Office on cost accounting practices in units of the federal government to examine the determinants of these practices.

2.3.2. Firm Internal Data

Finally, the most detailed archival data on firms' (management) accounting practices are data provided by the firms themselves. Examples of management accounting studies that use firm proprietary data are Banker et al. (2000) and Ittner et al. (2003). Banker et al. (2000) use financial and non-financial data from a hotel chain to examine the performance impact of a new incentive plan. Similarly, Ittner et al. (2003) use performance evaluation and financial data from a financial service provider to study superiors' subjective weighting of performance measures.

2.4. General Advantages and Disadvantages of Archival Data

Each type of data has its own advantages and disadvantages. In general, the following advantages are associated with the use of archival data:

1. Data may already be available to examine your research questions (or suggest new/better ones). The advantage here is basically that the researcher does not have to go through all the trouble of, for example, designing surveys/experiments and finding respondents/subjects. This frees up time to think about the topic of interest.
2. Third-party surveys are often longer and more comprehensive than academic surveys. More elaborate surveys allow for more research questions to be answered and more controls in the empirical analysis.
3. Potentially better response rates/larger samples. A larger sample size avoids the statistical problems often associated with small samples such as low power and biased estimators.
4. Perceived as "hard" data. Archival data, whatever the type, are often considered to be hard data in the sense that they are less troubled by issues of perception. However, it is difficult to argue that, for example, academic surveys have "perception issues," while third-party surveys lack such issues. Therefore, this claimed advantage is a perception in and of itself.
5. Time-series and/or panel data may be available. Data over multiple years allow for a more dynamic analysis of the problem, which often better reflects the actual dynamics of management accounting practices (see, e.g., Bol & Moers, 2006).

In addition to the above advantages, the following disadvantages are typically associated with the use of archival data:

1. Little public disclosure of management accounting practices. Given that management accounting is concerned with mechanisms internal to the firm, public disclosure of these mechanisms is often limited. However, more and more firms and specific sectors are increasing their disclosure of management accounting practices, which opens up opportunities (more on this later in the chapter).
2. Disclosure is not random. Given the above point that public disclosure of management accounting practices is not the standard, those firms that do disclose cannot be interpreted as a random draw from the population. The disadvantage here is that care needs to be taken in addressing this self-selection problem.
3. Most data at the corporate level. Firms that do disclose often disclose aggregated data at the corporate level, which reduces the number of management accounting questions that we can tackle with these data.
4. Getting access to proprietary data is a time-consuming activity. Given that access to proprietary data needs to be provided by the owner of these data, a lot of effort needs to be put in to convincing the owner why this is at least not costly to the owner (more on this later in the chapter).

The mere fact that archival data have advantages as well as disadvantages indicates that researchers need to make a trade-off when choosing a certain topic. That is, addressing a certain management accounting topic using archival data implicitly assumes that this data is at least as good in its ability to address that topic as any other type of data.

2.5. Main Topics Addressed Using Archival Data

To provide an overview of the management accounting topics that are addressed using archival data, I scanned the following journals over the time period 1995–present (if available): (1) *Accounting, Organizations and Society*, (2) *Contemporary Accounting Research*, (3) *Journal of Accounting and Economics*, (4) *Journal of Accounting Research*, (5)

Journal of Management Accounting Research, (6) *Management Accounting Research*, (7) *Review of Accounting Studies*, and (8) *The Accounting Review*. As "management accounting topic" I include any topic that focuses on tools used and information measured and reported to assist managers in fulfilling the goals of the organization. Within this broad definition of management accounting research the review of the literature indicates that there are basically two streams of research:

1. Decision-influencing: Focuses on the use of tools and information for decision-influencing purposes, such as the design of CEO compensation contracts and the design of performance measurement and compensation systems for lower-level managers and employees.
2. Decision-facilitating: Focuses on the use of tools and information for decision-facilitating purposes within a firm and includes studies on leading and lagging indicators and cost drivers.

The review further indicates that archival research in management accounting is dominated by the use of publicly available data and most studies are in the area of executive compensation (decision influencing). In the remainder of this chapter, I therefore restrict the attention to research using publicly available archival data. First, this type of data dominates the "archival literature" and therefore requires close examination. Second, it reduces the overlap with other chapters in this handbook that (partly) deal with some of the other types of archival data (e.g., on proprietary archival data see Anderson & Widener 2006). Given this, admittedly *ad hoc*, restriction, I try to (implicitly) answer the following questions:

1. What is the dominant research question in this area?
2. Why are publicly available archival data, in general, "good" data to answer this research question, or are they?
3. How has the literature empirically addressed the research question using publicly available archival data?
4. What are opportunities for future research using (publicly available) archival data?

3. What is the Dominant Research Question?

As noted above, the dominant research area using publicly available archival data is, by far, the area of executive compensation. Within this area, the dominant research question is:

> *how much weight is put on performance measures in CEO incentive contracts and what explains cross-sectional differences in these weights?*

Typically, these studies start of with a simple principal-agent model with two performance measures, where the optimal contract has the following form (cf. Core et al., 2003b):

$$\frac{1}{U'(C)} = C = \alpha + \beta^p p + \beta^y y \tag{1}$$

where

$$\beta^p = \frac{\partial E[p]/\partial a - \frac{\text{cov}(p,y)}{\text{var}(y)}\partial E[y]/\partial a}{k\ \text{var}(p)} \tag{2}$$

$$\beta^y = \frac{\partial E[y]/\partial a - \frac{\text{cov}(p,y)}{\text{var}(p)}\partial E[p]/\partial a}{k\ \text{var}(y)} \tag{3}$$

and $k > 0$ is a constant. That is, the optimal contract provides a fixed wage (α) and incentives β^p and β^y on performance measure p and y, respectively. Given this setting, the model predicts that the relative incentive weight β^p/β^y is a positive function of the relative (adjusted) sensitivity of performance measure y to managerial actions (a) and a negative function of the relative noise (inverse of precision) in this measure (Banker & Datar 1989). In terms of the predictive validity framework (Runkel & McGrath 1972), this implies the following conceptual model (Fig. 1).

This conceptual model obviously applies to employees other than the CEO, so a natural question is why CEOs have been the dominant focus? There might be a host of reasons for this domination, but I believe that the following two are *ex ante* the most plausible. First, incentives are without a doubt a big issue at the CEO level and examining the above conceptual model in this setting assures that the analysis is performed in a setting where incentives actually matter. There is less "assurance" once we go down the hierarchy. This does not imply that incentives do



Figure 1. Conceptual model.

not matter at lower levels in the organization, but rather that the researcher should in that case provide evidence that incentives matter in the setting under study.

The second reason for the focus on CEOs is the public availability of compensation data at the CEO level, especially the US. There has been a huge increase in executive compensation papers ever since the ExecuComp database became available. Although there might be a positive correlation between the availability of this database and the increased importance of incentives at the CEO level, it cannot be ignored that the data availability *per se* has contributed to the dominance of executive compensation research. This latter reason opens up a debate on whether publicly available data, and in particular large-scale databases, can be used to address the research question of interest. I address this issue in the next section.

4. How is the Research Question Typically Addressed?

The choice for using publicly available archival data to examine the above-mentioned conceptual model implicitly assumes that these data are at least as able to address this model as any other type of data. The underlying question that is important in the discussion is to what extent operational constructs relate to the conceptual constructs, as reflected by Fig. 2.

Recall that Link 1 relates to eqs. (1), (2), and (3) above. To empirically test this link, it is necessary to answer a number of questions, the following of which I address:

1. How do we define and measure CEO compensation, i.e., C? (Link 3);
2. How do we measure the incentive weights, i.e., β^i? (Link 3);
3. How do we measure sensitivity and noise, i.e., $\partial E[\cdot]/\partial a$ and $\mathrm{Var}(\cdot)$? (Link 2).

4.1. How Do We Define Compensation?

There has been a huge debate in the accounting and economics literature about what to use as measure of CEO compensation. Two of the first studies in accounting that linked CEO compensation to firm performance used different measures of compensation and these differences in measurement between papers have persisted over the last decades. For example, whereas Murphy (1985) used a measure of total compensation, which included salary, bonus, and the value of stock options, Lambert & Larcker (1987) only focused on cash compensation, i.e., salary plus bonus. The basic issue is the following. The principal-agent model is based on utility theory, which identifies that an agent cares about the utility of the stream of consumption (Baker, 1987). The most suitable proxy for this utility, in the context under consideration, is managerial wealth. This includes not only salary, bonus, LTIP payouts, and stock (options) granted, but also the change in the value of stock (options) already held by the CEO. Antle & Smith (1985) and more recently Core et al. (2003b) have used such a broad measure of total compensation.[1] Even though such a measure is still not an accurate measure of managerial wealth (see, e.g., Core et al. 2003b, pp. 962–963), let alone utility, it is more consistent with the theoretical model than cash compensation. The basic argument therefore is that little can be said about CEO incentives if one does not take all compensation components into account.

If a researcher decides to focus on managerial wealth, then the next question is how to exactly measure this wealth. Valuing salary, bonus, and other cash pay is not a big issue, but it becomes tricky as soon as we move to stock options and restricted stock. In (almost) any undergraduate finance course, students are taught how to value stock options using the Black–Scholes model, so how difficult can it be? One of the difficulties is gathering all the necessary information to calculate the Black–Scholes value, but Core & Guay (2002) provide an alternative method that overcomes this problem. The real difficulty arises because the Black–Scholes model assumes risk neutrality, while the traditional assumption of the principal-agent model is that the agent is risk averse. Lambert et al. (1991), Hall & Murphy (2002), and others argue that the value of equity compensation for an undiversified executive depends on the executive's risk aversion. Hall & Murphy (2002) demonstrate that option value estimates based on the Black–Scholes (1973) method represent the company's cost but not the value to an undiversified risk averse executive and that executives discount the value increases in equity holdings. Core & Guay (2003), however, argue that no such discounting takes place (1) if the equity grant is used to "return" to the contracted level of incentives or (2) if the firm provides equity as a substitute for cash and the executive can rebalance his portfolio.

The above discussion indicates that even within the principal-agent framework with risk aversion, it is difficult to state whether or not discounting should take place. It gets even more complicated if we move beyond the strict principal-agent setting. The little

[1]The reader is referred to these papers for more details.

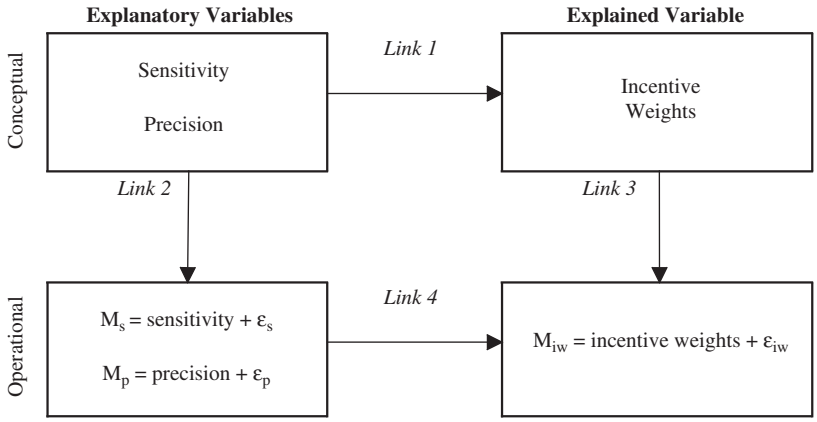


Figure 2. Predictive validity framework

empirical evidence available on how executives value stock options and restricted stock shows that on average executives do not discount equity grants. On the contrary, for example, Lambert & Larcker (2001) and Hodge et al. (2005) show that employees on average *overstate* the value of stock options and restricted stock. This either suggests that employees are on average risk seeking instead of risk averse or that employees "simply" do not know how to value their equity compensation. Both explanations are inconsistent with the basic principal-agent setting, but the latter one is most problematic, since this indicates that employees may not understand the underlying incentives (Core et al., 2003a; Lambert & Larcker 2001).

In sum, the previous discussion indicates that it is not at all clear how we (researchers) should value CEO equity holdings and it is thus difficult to examine CEO incentives without making specific assumptions. This issue becomes even more complicated once we are interested in measuring incentive weights.

4.2. How Do We Measure Incentive Weights?

The most common way to measure the incentive weights in executive compensation research is to regress "compensation" on "performance." That is, the weights are determined implicitly by examining *ex post* realizations of both compensation and performance. The regression specification that is typically used empirically estimates percentage changes in compensation on percentage changes in performance. There are at least four reasons why the implicit method is problematic (for more details see Moers, 2006). First, given the use of publicly available data, the performance measures examined are, almost always, market performance (e.g., stock returns) and accounting performance (e.g., return on equity). As such, the implicit method ignores the possibility that incentive contracts are written on the basis of performance measures other than price and earnings. One could argue that as long as price and/or earnings capture these other measures, it does not cause any problems. This, however, ignores the very theory one is trying to test in the first place, i.e., explaining the cross-sectional variation in incentive weights placed on performance measures *actually* used in incentive contracts. Further, the mere fact that, for example, price captures the other measures does not imply that the signal-to-noise ratio of price and the signal-to-noise ratio of the other measures are identical. As described above, it is the signal-to-noise ratio of these other measures that matters, not that of price and/or earnings.[2]

Now let us assume, consistent with the assumptions underlying the empirical studies in this area, that we live in a world with linear incentive contracts based on two performance measures. Further assume that there is no measurement error, i.e., basically ignore point 1 above, and that we can *ex ante* distinguish homogenous subgroups of managers in terms of their incentive contracts. Then, we can write the

[2]To illustrate this point, just think of Holmstrom's (1979) informativeness principle and the concept of a sufficient statistic. Assume that measure z is unobservable (to the researcher) and characterized by $z = fa + \theta_z$, where a is managerial action, f is the sensitivity of performance to the action, and θ_z is noise. Further assume that the observable performance measure p "captures" z and is simply z plus noise, i.e., $p = z + \theta_p = fa + \theta_z + \theta_p$. The signal-to-noise ratio of p lower than that of z, and it can therefore not explain the incentive weight for z; p will simply not be used for incentive purposes because z is a sufficient statistic for z and p.

incentive contract for manager i in subgroup j at time t as

$$C_{ijt} = \alpha_{jt} + \beta^p_{jt} p_{ijt} + \beta^y_{jt} y_{ijt} \quad (4)$$

To illustrate that percentage changes in compensation on percentage changes in performance does not capture the measurement of incentive weights, I first rewrite eq. (4) in terms of percentage changes in compensation, i.e.,

$$\frac{C_{ijt} - C_{ij,t-1}}{C_{ij,t-1}} = \frac{\alpha_{jt} - \alpha_{j,t-1}}{C_{ij,t-1}} + \frac{\beta^p_{jt} p_{ijt} - \beta^p_{j,t-1} p_{ij,t-1}}{C_{ij,t-1}} + \frac{\beta^y_{jt} y_{ijt} - \beta^y_{j,t-1} y_{ij,t-1}}{C_{ij,t-1}} \quad (5)$$

Now assume, once again consistent with previous research, that we have stationary incentive weights (over at least two consecutive years of data). This simplifies eq. (5) to

$$\frac{C_{ijt} - C_{ij,t-1}}{C_{ij,t-1}} = \frac{\alpha_{jt} - \alpha_{j,t-1}}{C_{ij,t-1}} + \beta^p_j \frac{p_{ijt} - p_{ij,t-1}}{C_{ij,t-1}} + \beta^y_j \frac{y_{ijt} - y_{ij,t-1}}{C_{ij,t-1}} \quad (6)$$

Note that, even though the changes in fixed wages are the same for all managers in subgroup j, eq. (6) shows that the ''intercept'' is manager specific because these changes are scaled by each individual manager's past compensation.[3]

In contrast to eq. (6), the empirical specification of percentage changes in compensation on percentage changes in performance is characterized by

$$\frac{C_{ijt} - C_{ij,t-1}}{C_{ij,t-1}} = \hat{\alpha}_j + \hat{\beta}^p_j \frac{p_{ijt} - p_{ij,t-1}}{p_{ij,t-1}} + \hat{\beta}^y_j \frac{y_{ijt} - y_{ij,t-1}}{y_{ij,t-1}} + \varepsilon_{ijt} \quad (7)$$

Equation (7) does not capture the incentive contract characterized by eq. (6) because of the following inequalities:

$$\hat{\alpha}_j \neq \frac{\alpha_{jt} - \alpha_{j,t-1}}{C_{ij,t-1}} \quad (8)$$

$$\hat{\beta}^p_j \neq \beta^p_j \quad (9)$$

$$\hat{\beta}^y_j \neq \beta^y_j \quad (10)$$

These inequalities simply follow from comparing eq. (6) to eq. (7), which shows that they can only be equal if $C_{ij,t-1} = p_{ij,t-1} = y_{ij,t-1} = 1$. But this cannot hold! In addition, the estimated coefficients per subgroup will contain variance even though the incentive weights are constant for all managers in each subgroup (see Appendix).

The specification described by eq. (7) is not completely invalid. If one assumes a log utility function, then the change in compensation from t–1 to t equals

$$\log C_{jt} - \log C_{j,t-1} = \alpha_{jt} - \alpha_{j,t-1} + \beta^p_j (p_{jt} - p_{j,t-1}) + \beta^y_j (y_{jt} - y_{j,t-1}) \quad (11)$$

where the dependent variable is similar to percentage changes in compensation, but less skewed. So, let us assume that the agent indeed has a log utility function, so that an empirical specification like eq. (11) is consistent with the theoretical model; can we then use this model to deduct the incentive weights? To answer this question, I use data from Höppe et al. (2006). They use details from the bonus contracts described in the proxy statements to classify firms on the basis of, for example, the performance information used, the level of discretion applied, and the incentive weights attached to performance measures. From this dataset, I select a homogeneous subgroup and, more specifically, a subgroup for which the annual bonus is fully based on accounting earnings and there are no discretionary bonuses. Even though this subgroup is homogeneous with respect to the bonus contract, it might be heterogeneous with respect to other incentive contract components. I therefore restrict the measure of actual compensation to actual bonuses and run eq. (11) with two performance measures, i.e., return on equity and stock returns. The exact empirical specification that I use is the following (for more details see Moers, 2006):

$$\log\left(\frac{\text{Bonus}_t + 1}{\text{Bonus}_{t-1} + 1}\right) = a + b \cdot \Delta\text{ROE}_t + c \cdot \text{RET}_t + \text{Year Dummies} + \varepsilon_t \quad (12)$$

where coefficient b is expected to be significantly positive and c not significantly different from zero. The results, presented in Table 1, show that the coefficients for ΔROE and RET are both positive and statistically significant. However, stock returns is not used as a performance measures for bonus purposes, i.e., the incentive weight on stock returns in the annual bonus contract is zero. Although there might be a plausible explanation for why stock returns are significant in the empirical analysis, the mere fact that this occurs illustrates that eq. (12) is incapable of

[3]Note that there are cross-sectional performance differences because each manager is exposed to different random shocks, even though the distributions of these shocks are assumed to be identical, i.e., they are exposed to the same level of noise.

Table 1. The sensitivity of bonus compensation to accounting performance and market performance for a subgroup of CEOs for which the explicit bonus contract is solely written on the basis of accounting performance.

Independent variable	Δlog(Bonus)
Intercept	0.30***
ΔROE	3.19***
RET	0.94***
Adjusted R^2	0.13***
Sample size	870

***is statistically significant at the 1% level (two-tailed) based on White-adjusted standard errors.

measuring the incentive weights at a sufficient level of accuracy.[4]

Things become even more complicated when we move beyond this simple "bonus-setting." Irrespective of how many conditioning or partitioning variables we use, we are empirically unable to adequately specify homogeneous subgroups of incentive contracts *ex ante*. Here is where the reliance on *ex post* realizations becomes a serious problem. Assume that the performance measures p and y are of the following form:[5]

$$p_{ijt} = f_j a_{ijt} + \theta^p_{ijt} = f_j a_j + \theta^p_{ijt}; \quad \theta^p_{ijt} \sim N(0, \sigma^2_j) \quad (13)$$

$$y_{ijt} = g_j a_{ijt} + \theta^y_{ijt} = g_j a_j + \theta^y_{ijt}; \quad \theta^y_{ijt} \sim N(0, \delta^2_j) \quad (14)$$

Then eq. (11) can be rewritten as the following equation:

$$\log C_{ijt} - \log C_{ij,t-1} = (\alpha_{jt} - \alpha_{j,t-1}) + \beta^p_j(\theta^p_{ijt} - \theta^p_{ij,t-1}) + \beta^y_j(\theta^y_{ijt} - \theta^y_{ij,t-1}) \quad (15)$$

On the basis of the above assumptions, the *cross-sectional* variance of $(\theta^p_{ijt} - \theta^p_{ij,t-1})$ and $(\theta^y_{ijt} - \theta^y_{ij,t-1})$ per subgroup are actually suitable proxies for the noise in performance measure p (σ_j) and y (δ_j), respectively. Thus, the cross-sectional variance of these variables *within* each subgroup (theoretically) affects the incentive weights *across* subgroups (see eqs. (2) and (3)). This implies that if we estimate eq. (15) on a sample that pools heterogeneous subgroups, the estimates $\hat{\beta}^p$ and $\hat{\beta}^y$ become some function of the independent variables, which basically implies that the model is misspecified. Furthermore, in minimizing the least squares, relatively more emphasis is put on larger (absolute) values of the independent variables, which implies that these regressions will, all else equal, lead to estimates $\hat{\beta}^p$ and $\hat{\beta}^y$ that are even lower than the average incentive weights across subgroups.[6] As a result, as soon as we are unable to adequately specify the homogeneous subgroups *ex ante*, the empirical specification becomes misspecified and the regression coefficients do not tell us much about the underlying incentive weights.

In general, the fundamental problem with the implicit method is that it ignores the contracting decision it is trying to examine and only focuses on *ex post* realizations of unknown contracts. It is therefore not at all clear what the results of such empirical analyses tell us about incentives and incentive contracts.

4.3. How Do We Measure Sensitivity and Precision?

The two main theoretical determinants of incentive weights are sensitivity and precision and these variables have also been the main focus of executive compensation research. I will elaborate on two specific proxies that have dominated the literature: (1) Book-to-Market ratio as proxy for (relative) sensitivity of accounting performance measures (say ROE) and (2) time-series variance of ROE as a proxy for noise (inverse of precision).

The main argument underlying the use of Book-to-Market ratio as a proxy for sensitivity of ROE is that this ratio reflects the growth/investment opportunities of the firm. To exploit these opportunities, executives need to make decisions that have future-period consequences. Given the traditional assumption that accounting measures are more backward-looking than forward-looking, these measures become less sensitive to "productive" effort when growth opportunities increase, i.e., Book-to-Market decreases, and the incentive weight for accounting measures should decrease. In my opinion, this line of reasoning makes sense. However, there is another line of reasoning

[4]One plausible explanation is that the subgroup is heterogeneous with respect to its definition of "accounting earnings" (e.g., ROE versus Net Income versus EPS) and that stock returns reflect the difference between the actual accounting measure used and the measure used in the empirical analysis.

[5]Note that the latter part of the characterization follows from the assumptions that effort is driven by incentives, the incentive weights are identical for all managers in subgroup j and the incentive weights are stationary.

[6]Theoretically, larger (absolute) values of the independent variables relate to observations of subgroups with lower incentive weights. This implies that for some distribution of $\beta_j \in [\underline{\beta}, \bar{\beta}]$ and $E[\beta_j]$, more weight is put on the observations $\beta_j \in [\underline{\beta}, E[\beta_j]]$ than on $\beta_j \in [E[\beta_j], \bar{\beta}]$, which implies that $\hat{\beta} < E[\beta_j]$.

that, in my opinion, makes sense. Beaver & Ryan (2000) show that the Book-to-Market ratio can be decomposed into bias and lags, the latter of which is consistent with the above line of reasoning. The bias component, on the other hand, reflects a persistent difference between book value and market value and is in the most part due to (unconditional) accounting conservatism. Accounting conservatism is affected by financial reporting decisions or, in other words, by "reporting" effort. In general, the more biased the accounting performance measures are, due to this reporting effort, the less useful they become for contracting purposes, which should lead to a lower incentive weight.

Both of the above lines of reasoning lead to the prediction that the Book-to-Market ratio is positively associated with the incentive weight for accounting performance measures. However, the main question is whether this is due to the extent to which accounting performance measures *are not* sensitive to productive effort (lag) or due to the extent to which they *are* sensitive to reporting effort (bias).[7] Simply examining the impact of Book-to-Market cannot disentangle these conceptually different explanations and it is therefore questionable to what extent this can tell us something about the impact of "sensitivity" on the incentive weight.

A second issue is the measurement of noise. Typically the firm-specific time-series variance of, for example, ROE is used as a proxy for noise in accounting earnings. The usefulness of this proxy depends on the assumption that the incentive weights are stationary and the manager's effort deterministic. However, as Lambert (1993) indicates, this assumption is not very reasonable in a multi-period world where manager's actions vary over time, i.e., the variability in accounting earnings over time might actually reflect the extent to which a manager can influence performance, which is a desirable property, as opposed to random noise, which is an undesirable property.[8] Sloan (1993) tries to circumvent this problem by teasing out the component in accounting earnings that is orthogonal to the firm-specific component in stock returns, the latter of which is interpreted as a measure of the manager's actions. Even though this method is not without problems (Bushman & Smith 2001; Lambert 1993), it does explicitly recognize that the variance in performance is not necessarily noise, something which has subsequently been ignored (almost) completely. Given this, it might not be that surprising that the empirical results have been inconsistent.

[7]See Natarajan (2004) for a different but related discussion of differences between productive effort and reporting effort and the impact of this on the contracting usefulness of accounting information.

[8]Note that as soon as the agent's actions in eqs. (11) and (12) become stochastic, $\mathrm{Var}(p_{ijt}) \neq \mathrm{Var}(\theta^{p}_{ijt})$ and $\mathrm{Var}(y_{ijt}) \neq \mathrm{Var}(\theta^{y}_{ijt})$.

5. What have We Learned?

On the basis of the above discussion, I believe it is fair to say that large-scale compensation databases are not very suited for answering the question of how much weight is put on performance measures in CEO incentive contracts and explaining cross-sectional differences in these weights. So, why did the literature go down this path? It seems to be related to the well-known example of the drunken man who is looking for his car keys under the lamppost: not because that is where he lost his keys, but merely because the light is better there. Although this is somewhat of an exaggeration, the choice for examining CEOs seems to be primarily driven by the easy access to data, not the relevance of the CEO or the data *per se*. The downside at this point is that, relative to the size of this research area, we actually know very little about the design of incentive contracts for CEOs.

So, how could we address the dominant research question using publicly available data? One way would be to gather data about the actual incentive contract instead of inferring these from actual compensation. Public disclosures in the US and the UK, and increasingly in other countries, allow for direct measurement of at least some of the contract variables. For example, UK financial statements and US proxy statements provide detailed information about the performance measures used for incentive purposes. All this data is publicly available, though not (yet) nicely compiled in a (purchasable) database. Furthermore, the data is not "clean" in the sense that the vague nature of some of these disclosures requires the researcher's judgment. However, if the CEO level is worth focusing on, then this should not be a hindering factor.

6. What Other Research Questions can be Addressed?

6.1. Why Provide Equity Compensation?

In addition to the question of how much weight is put on what measure in CEO incentive contracts, there are obviously other questions that are at least as interesting and relevant. Furthermore, the empirical evidence seems to suggest that there might not be much to explain in incentive weights given the predominance of equity incentives. For example, based on a theoretical model, Core et al. (2003b) derive an

Table 2. Variance ratios and mean ratios for CEO cash pay, total pay, and equity portfolio changes.

Percentile (%)	Variance cash pay/ variance portfolio comp	Variance total pay/ variance portfolio comp	Mean portfolio comp/mean cash pay	Mean portfolio comp/mean total pay
99	0.55	1.92	308.38	64.42
90	0.04	0.27	11.37	3.65
75	0.01	0.08	2.70	1.02
50	0.00	0.02	0.39	0.17
25	0.00	0.00	–1.10	–0.37
10	0.00	0.00	–6.85	–2.19
1	0.00	0.00	–95.02	–20.60

empirical proxy for the incentives provided by ''price'' measures (i.e., stock returns) relative to those provided by ''non-price'' measures (i.e., all measures other than stock returns such as accounting earnings). They show that for approximately 80% of their sample, the incentives provided by annual pay are less than 10% of the incentives provided by equity incentives (see for more details Core et al., 2003b). To illustrate this, I once again use data from Höppe et al. (2006) for 502 CEOs with 4–5 yr of compensation data. Following Core et al. (2003b), I calculate for each CEO the time-series variance in: (1) annual cash pay (salary plus bonus), (2) annual total pay (cash pay plus LTIP payouts, stock options granted, restricted stock granted, etc.), and (3) the annual change in the value of the CEO's equity portfolio. The incentives provided by annual cash pay (annual total pay) relative to the equity portfolio is then measured as the ratio of the time-series variance in annual cash pay (annual total pay) to the time-series variance in the changes in the portfolio value.

Columns 2 and 3 of Table 2 show that the relative incentives provided by cash pay and total pay are only a small fraction of the total incentives for almost all CEOs. More specifically, the results indicate that for 95% (79%) of the CEOs, the incentives provided by cash pay (total pay) is less than 10% of the incentives provided by equity incentives (cf. Core et al., 2003b). Given that the changes in the equity portfolio value are completely driven by stock returns, in terms of the available performance measures, these findings suggest that price measures are the only relevant incentive measures for most CEOs.

If incentive contracts are efficient, then the results further suggest that accounting earnings do not play a (significant) role in incentive contracting for CEOs, or at a minimum, there is no relevant incentive information in earnings that is not also in price. But if contracts are actually efficient, then why do we observe annual bonus contracts and long-term incentive plans based on accounting earnings? Höppe et al. (2006) show that there is a lot of variance in the design of annual bonus contracts for CEOs and it is unclear why firms would go through all that trouble if these contracts have no or very low incentive benefits.

Maybe the benefits come from the underlying pay-off structure of annual total pay as compared to that of the equity portfolio. The major difference in the pay-off structure between annual pay and equity incentives is that annual pay is non-negative, while equity portfolio compensation can take on any value. Before I elaborate on the potential consequences of this difference, I first provide some descriptive statistics of the actual changes in wealth due to annual cash pay (total pay) and due to changes in the equity portfolio for the above-identified CEOs. That is, I calculate for each CEO the average actual wealth changes from cash pay, total pay, and changes in the equity portfolio; I then calculate the ratio of the average change in the equity portfolio to the average annual cash pay (total pay).

Columns 4 and 5 of Table 2 present the outcome of these calculations. The results show that for the majority of the CEOs, i.e., 59% (75%), the average change in wealth due to changes in the equity portfolio is *lower* than the average change in wealth due to annual cash pay (annual total pay). Furthermore, for 44% (47%) of the CEOs, the average change in the equity portfolio is less than 10% of average cash pay (total pay) and for 41% of the CEOs, the average change in the equity portfolio is negative. These results indicate that, even though the ratio of the variances suggests that equity incentives are dominant, the actual wealth effects of these incentives are being dominated by annual pay.[9]

[9]These findings are not necessarily conflicting, unless the ranking of the ratio of *average* annual pay to the *average* change in the equity portfolio is similar to the ranking of the ratio of *expected* annual pay to the *expected* change in the equity portfolio. Note that the ratio of the time-series variances, i.e., the empirical proxy for the relative incentives, does implicitly assume that, for each CEO, the time-series average is a suitable proxy for the expected value.

The fact that the change in the equity portfolio value can be negative, and thus can decrease wealth, is why it can provide strong incentive effects. That is, all else equal, a CEO incurs a loss in wealth when the stock price drops and he therefore has the incentive to avoid "poor performance." However, the possibility of a loss in wealth also indicates that equity incentives have a penalty component. Prospect theory predicts that people attach a greater (subjective) disutility to changes in wealth perceived as losses than to changes in wealth perceived as foregone gains (Kahneman & Tversky, 1979; Tversky & Kahneman, 1992). The pay-off structure of annual pay is one of "foregone gains," while the pay-off structure of the equity portfolio is a combination of "foregone gains" and "losses." If prospect theory holds, then this has at least two important implications.

First, if we want to induce the CEO to take a certain action, then it is less expensive for the firm to use annual pay than it is to use equity incentives. More specifically, if the expected change in equity portfolio value due to the action is the same as the expected annual pay due to the action, then a loss averse CEO will prefer annual pay over equity incentives.[10] Consequently, less expected annual pay is needed to make the CEO indifferent between annual pay and equity incentives and still provide the same incentive effects. This raises an important question. That is, if stock price is really the dominant performance measure in CEO incentives, then why would a firm not base annual pay on stock price performance instead of requiring the CEO to hold an equity portfolio?

A second implication of prospect theory for equity incentives relates to risk taking behavior. Cumulative prospect theory predicts the following types of risk taking behavior (Tversky & Kahneman, 1992):

1. risk aversion for gains of moderate and high probability;
2. risk seeking for losses of moderate and high probability;
3. risk seeking for gains of low probability, provided the outcomes are not extreme;
4. risk aversion for losses of low probability, provided the outcomes are not extreme.

Furthermore, if prospects are mixed, i.e., there are likely gains and potential losses, then this leads to extreme risk-averse behavior (Thaler et al., 1997). Given that equity incentives can lead to any change in wealth, the effects of equity incentives on risk-taking behavior depend on the prospects and the probabilities associated with these prospects. For example, a CEO with a certain equity portfolio is expected to engage in risk-seeking behavior when the stock market is declining, because in this setting there is a moderate to high probability that the firm's stock price will decrease and that he will incur a loss in wealth. However, the same CEO with the same equity portfolio is expected to engage in risk-averse behavior when the stock market is doing well, because in this case there is a moderate to high probability that the firm's stock price will increase and that he will incur a gain in wealth. As a result, it cannot be concluded that, in general, equity incentives lead to either risk-averse or risk-seeking behavior. The application of prospect theory to equity incentives therefore provides some interesting opportunities for future research that can be addressed using publicly available data.

6.2. What Role Does Accounting Information Play?

In light of the (increased) use of equity incentives, a question that is of special importance to managerial accounting is what role accounting information plays in incentives. Except for the focus on signal-to-noise ratios, most studies in the executive compensation area ignore the question of what makes accounting information relevant or irrelevant for incentive contracting.[11] This is in contrast to a lot of the analytical papers, which explicitly focus on the contracting role of accounting earnings (e.g., Dutta & Reichelstein, 2005; Dutta & Zhang, 2002). Gjesdal (1981) shows that the ranking of information systems for valuation purposes is different from the ranking of information systems for contracting purposes. This result has been used to argue that, even though price efficiently aggregates information for valuation purposes, it inefficiently aggregates information for contracting purposes (e.g., Bushman & Smith 2001; Feltham & Xie 1994; Paul 1992), which creates an opportunity for accounting information to play a role in incentive contracting. So, if stock price is currently the only performance measure that matters for *incentive* purposes, then what has changed? Alternatively, is the analytical literature simply flawed in its arguments and its focus on the contracting role of *accounting* information?

I personally find this hard to believe, even with all the available empirical evidence. As stated above,

[10]Note that this holds when the variance associated with equity incentives equals the variance associated with annual pay, i.e., this is not a risk aversion effect!

[11]One notable exception is the paper by Sloan (1993), who examines the role of accounting information in shielding managers from market-wide movements.

why are annual bonus contracts written on the basis of accounting earnings, or why are annual bonus contracts used at all, if they do not matter for incentives? Is it merely the issue of firms saying X, while doing Y (see, e.g., Core, 2002)? If so, then what explains this type of behavior? If not, then this opens up a number of research questions. For example, what role does accounting information play; what are the properties of accounting information that make this type of information different and/or unique from an incentive perspective; how significant are the incentives provided by accounting information or how do they affect behavior; how are annual bonus contracts and other contract components, like equity incentives, linked; do different contract components address different incentive problems (e.g., incentives for choosing positive Net Present Value (NPV) projects versus incentives for choosing a certain risk profile)?

I believe that these questions can be answered to some extent using publicly available data, though not necessarily with the currently available (purchasable) databases. Researchers need to go "back" to the actual contracts used for CEOs, study the details of these contracts, and characterize them (see, e.g., Gillan et al., 2005; Höppe et al., 2006; Rusticus, 2006; Schwab & Thomas, 2004). This is obviously more time consuming than spinning the tapes, but if the above (or related) research questions are worth addressing, and I believe they are, then data need to be gathered that fit these questions instead of using data that are easily accessible.

6.3. Look Beyond Executive Compensation

The observation that the data should fit the research question does not imply that we cannot start with the data that are available. Archival research is, relative to for example survey research and experimental research, much more of an interactive process. That is, archival research using publicly available data is restricted by what is available and this affects the specific research questions that we can ask.

Alternatively, the available data can create interesting research questions.[12] This obviously requires knowledge of what data is publicly available to the research community. Given that there is no complete list of publicly available archival data that are relevant to accounting researchers and I am also unable to come up with such a list, researchers need to actively search for data.

Identifying what is available can be done in multiple ways. First, you can scan practitioner-oriented journals and newspapers for new data, either published or referenced in these periodicals. For example, practitioner-oriented journals in the area of IT in The Netherlands often provide detailed information about firms' IT decisions such as the timing of adoption of ERP systems. Second, you can read academic non-accounting journals and talk to non-accounting researchers in your school. A lot of non-accounting researchers use publicly available data and some might use data that we are not aware of (*ex ante*), but that could be relevant for accounting research. Given the very nature of the discipline of non-accounting researcher, the accounting questions will remain unanswered unless we interact with these researchers and exploit the available data. Third, you can simply browse the Internet for data or do keyword searches in databases such as Lexis/Nexis. You can visit the website of government agencies, consulting firms, and research institutes for (recent) surveys that might be of interest to (managerial) accounting. For example, Moers et al. (2005) use data from the National Survey of Small Business Finances to examine the role of accounting information in manager-owned small businesses.[13] Finally, you can find out about new disclosures for public firms or about disclosures for specific industries such as the health sector and governmental institutions. Government bodies all over the world are increasing the disclosure about their operations. For example, the Federal Trade Commission in the US annually publishes a "performance and accountability report" that provides detailed information about their management control practices (see http://www.ftc.gov/par). More specifically, it provides information about (1) the strategic goals and objectives, (2) for each objective, multiple quantitative performance measures, (3) for each performance measure, the performance target and actual performance, and (4) audited financial statements. All this information is publicly available and might be able to address a number of research questions.

In sum, there is sufficient archival data publicly available that can address numerous research questions of relevance to managerial accounting. The

[12]Note that I am merely suggesting a data-driven research question, not an a-theoretical approach to empirical research. Given the research question, theory should still drive the empirical analysis.

[13]This survey is funded by the Board of Governors of the Federal Reserve System and conducted in cooperation with the US Small Business Administration (see http://www.federalreserve.gov/Pubs/oss/oss3/nssbftoc.htm).

basic issue is to actively search and look beyond the data that are easily accessible.

6.4. Look Beyond Publicly Available Archival Data

I restricted the discussion to publicly available archival data, but as discussed at the beginning of this chapter, there is more to archival data than simply what is publicly available. Proprietary archival data, and especially firm proprietary data, provide another opportunity for researchers to advance our knowledge of management accounting issues. The major difficulty associated with gathering proprietary data is that access should be granted to the proprietor. Regarding firm proprietary data, this often involves convincing the firm that your study benefits them in some way. This implies that you should have a well-designed research plan that addresses both the issues that you are interested in and issues that benefit the firm.[14] A problem here is that you do not know what data is actually available until you have access, which illustrates the rather interactive nature of doing archival research. Your original research plan should address broad research questions that can be made more specific only after interacting with the firm and getting more information about what is actually available.

Getting access to proprietary data is less difficult than sometimes assumed. Nothing is lost by asking a firm for access to their (historical) data, so why not simply ask? Just be sure that you have a research plan that (also) answers the question: What do we get in return?

7. Summary

In this chapter, I discuss archival research in management accounting and especially research using publicly available archival data. The analysis shows that the easy access to publicly available databases has driven the choice for the research question asked. Although a data-driven research question is not atypical for archival research and also not problematic *per se*, the dominant research question that has been asked in this area cannot be adequately answered using the publicly available databases. I speculate that the easy access to the databases has led not only to the use of this data, but especially to its uncritical use. This then justifies the question of whether we have learned anything. I conclude that, relative to the large number of studies in this area, we know very little about the design of incentive contracts for CEOs and the explanation of cross-sectional differences.

I basically propose two broad directions for future research. First, to examine the design of incentive contracts for CEOs, data need to be gathered that fit this question and this data is not the "standard" database. Researcher needs to gather actual contract data instead of focusing on *ex post* realizations of these contracts. Second, researchers need to broaden their horizon and look beyond the dominant research question and even look beyond the area of executive compensation. The world is full of publicly available archival data that have yet been explored.

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Appendix

Variance in the Estimator

To show that the estimated coefficients exhibit variance, first assume that each individual component on the RHS of eq. (7) does actually capture each individual component on the RHS of eq. (6). Then, for example,

$$\hat{\beta}_j^p \frac{p_{ijt} - p_{ij,t-1}}{p_{ij,t-1}} = \beta_j^p \frac{p_{ijt} - p_{ij,t-1}}{C_{ij,t-1}} \quad \forall\, i,j,t \tag{A1}$$

which implies

$$\hat{\beta}_j^p = \beta_j^p \frac{p_{ij,t-1}}{C_{ij,t-1}} \quad \forall\, i,j,t \tag{A2}$$

But eq. (A2) cannot hold for all i, j, and t since the LHS is a cross-sectional constant for each j, while the RHS is not.[15] This implies that estimating eq. (7) by subgroup leads to variance in the estimated coefficient even though there is no variance in the true incentive weights.

[14]For example, you as a researcher might be interested in explaining why some firms choose one type of incentive system, while other firms choose another. However, the firm itself is generally not interested in this question. The only thing they want to know is whether or not the system is effective, which is related to a study of the effects.

[15]Note that there is one exception where the right-hand-side is a constant, i.e., if "all" managers in "all" subgroups have the same incentive contract "all" the time and the incentive parameters are $\alpha = 0$, $\beta^p = 1$, and $\beta^y = 0$. I believe it is fair to say that this is not realistic

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Experimental Research in Managerial Accounting

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Abstract: We discuss the importance of conducting experimental research in managerial accounting and provide a framework for understanding and assessing the contributions of research in this area. We then use this framework to organize, integrate, and evaluate the existing experimental managerial accounting research. Based on our review and synthesis of the literature, we suggest avenues for future experimental research in managerial accounting.

1. Managerial Accounting and the Role of Experiments

We have three objectives in this paper. Our first objective is to describe the role of experimental research in managerial accounting and provide a framework with which to understand and assess research in this area. Our second objective is to review, synthesize, and evaluate extant experimental research in managerial accounting.[1] Our final objective is to identify and discuss several directions for future experimental research in managerial accounting.

A fundamental purpose of managerial accounting is to enhance firm value by ensuring the effective and efficient use of scarce resources.[2] Thus, managerial accounting systems should provide information that improves employees' abilities to make organizationally desirable decisions, thereby enabling employees to achieve the organization's goals and objectives (Caplan, 1988; Horngren et al., 2003).[3] Additionally, managerial accounting systems should provide information that helps align the interests of employees with owners by directing employee effort and attention to activities that benefit the organization (Atkinson et al., 1997b; Lambert, 2001). Viewed in this light, the information produced by a managerial accounting system serves two important roles in an organization: (1) to provide some of the necessary information for planning and decision-making, and (2) to motivate individuals (Zimmerman, 2003, p. 4). Respectively, these two roles for managerial accounting information have been referred to as the *decision-facilitating* role and the *decision-influencing* role (Demski & Feltham, 1976).

[1]In this regard, our goal is to summarize and organize, rather than exhaustively review prior experimental research in managerial accounting. Readers interested in more detail regarding the results of specific studies should consult excellent summaries of this literature contained in Arnold & Sutton (1997), Bamber (1993), Birnberg & Shields (1989), Kren & Liao (1988), Luft & Shields (2003), Shields (1988, 1997), Young (1988), Young & Lewis (1995), and Waller (1995).

[2]There are other purposes of managerial accounting. For example, rather than being used in a functionalist sense to support the achievement of owners' objectives, an interpretive perspective of managerial accounting might suggest that managerial accounting practices serve a signaling role by helping individuals and organizations appear rational and efficient, thereby allowing the firm or individuals within the firm to acquire resources, power, and society's support (see, e.g., Carruthers, 1995; Covaleski & Dirsmith, 1988; Covaleski et al., 1996; Scott, 1987). Further, there are numerous

(*footnote continued*)
organizations for which profit (value) maximization is not necessarily the goal (e.g., charitable organizations, cooperatives, and not-for-profit entities). Moreover, organizations have numerous stakeholders, including customers, employees, lenders, suppliers, owners, and the community in which it is located. Invariably, organizations serve the diverse interests of their various stakeholders, albeit to varying degrees.

[3]Organizations *per se* do not have goals and objectives. Rather, the individuals who compose an organization or have an interest in the organization's operations have goals and objectives. Following tradition in economics, we ascribe a profit (value) maximization goal to firms and organizations.

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It is important to study empirically how both roles of managerial accounting information affect the behavior of individuals who compose organizations. First, organizations repeatedly make judgments and decisions regarding the amount and type of information supplied to employees and, in turn, employees make judgments and decisions based on this information (Demski, 1972; Feltham & Demski, 1970). Further, despite the perfect rationality assumption governing agency models and most models of economic behavior (Baiman, 1990), ample evidence indicates that the judgments and decisions of both producers and users of information frequently are not of the highest quality (Bonner, 1999, 2001). Thus, research in managerial accounting is necessary to help evaluate the quality of the judgments and decisions made within an organization, examine the determinants of decision quality, and report on the efficacy of factors posited to improve judgment and decision performance. Such research provides useful insights into the benefits and costs of managerial accounting practices that are intended to support decision-making within an organization.

Second, an organization's managerial accounting system is used to motivate employees (Baiman, 1982; Young & Lewis, 1995; Zimmerman, 2003). Research in managerial accounting can help determine the extent to which managerial accounting practices actually motivate individuals within an organization and help mitigate the divergence of interests between employees and owners (i.e., mitigate agency problems of moral hazard and adverse selection). Additionally, despite the self-interest assumption governing agency models and most models of economic behavior (Baiman, 1990), evidence indicates that individuals respond to ethical and moral principles in addition to economic incentives (e.g., Camerer, 1997; Evans et al., 2001). In this regard, research in managerial accounting also can help determine the extent to which social motives, individual values, and firms' informal information systems interact with more formal governance procedures in helping to ensure that employees undertake actions in the best interest of the firm.

It frequently is difficult, however, to use archival or field data to assess the effects of an organization's managerial accounting system, either in isolation or in conjunction with other variables, on the behavior of its members. Archival-empirical and field research in managerial accounting often are fraught with methodological and econometric problems (see, e.g., Ittner & Larcker, 2001). First, archival data may be unavailable or difficult to obtain. Second, the independent variables under investigation may be contaminated because their effects cannot be disentangled from other effects, including self-selection biases and sample-selection biases. Finally, the dependent variables and independent variables typically are measured imprecisely and, thus, can contain both random noise and systematic bias (measurement error). Collectively, these weaknesses can jeopardize the internal validity, construct validity, and statistical conclusion validity of archival or field studies.[4]

Controlled laboratory experiments help overcome these limitations and allow researchers to answer questions that otherwise might go unanswered.[5] Experimentation involves the active and purposeful manipulation and measurement of variables, thereby enabling the researcher to create a research setting and generate data. By manipulating the independent variables and using the principle of randomization, experiments also allow the investigator to control the research setting and isolate the effects of variables that are confounded in the natural environment. Finally, experiments involve control over measurement. This should lead to a high degree of specificity in the operational definition of variables and precise and objective variable measures.

Properly designed experiments are thus useful mechanisms for studying cause–effect relations under pure and uncontaminated conditions (Kerlinger & Lee, 2000). They control for threats to valid inference and allow researchers to draw strong causal inferences regarding the relations between independent and dependent variables of interest (Campbell & Stanley, 1963; Cook & Campbell, 1979; Kerlinger & Lee, 2000). Their virtue lies not only in being able to report on the precise inter-relations of variables but

[4]These weaknesses can also jeopardize the external validity of archival or field studies. For example, there could be an interaction between self-selection and treatment and, thus, the documented cause–effect relations may not generalize to situations in which self-selection is absent.

[5]An *experiment* is a scientific investigation in which [independent] variables are manipulated and their effects on other [dependent] variables are observed (see Campbell & Stanley, 1963; Kerlinger & Lee, 2000). An experiment can be thought of as a deliberate trial used to test causal propositions, where the investigator has control over the independent variables (Cook & Campbell, 1979). Control is achieved by manipulating treatment conditions and, in the case of extraneous independent variables, by random assignment to those conditions.

also in their ability to report on the concomitant processes underlying those relations.[6]

Experiments are also useful complements to analytic work. While analytic models of behavior provide an excellent framework for evaluating both the value of and demand for managerial accounting procedures, they frequently are criticized for their unrealistic assumptions, highly stylized environment, and complex solutions (Baiman, 1982, 1990). Experimental methods allow for a rigorous test of a theory's predictions, behavioral validity, and assumptions (Simon, 1982, 1987; Smith, 1994). Given the inherent flexibility in the experimental approach, researchers can push the model's limits, test for boundary conditions, test competing theories, document anomalies, and offer evidence regarding why actual behavior deviates from that predicted by an economic model (Kachelmeier, 1996; Moser, 1998; Waller, 1994, 1995).

Such research is valuable because it not only reports on the model's predictive ability (Friedman, 1953) but also supplements the insights of the psychological or economic model and may serve as the basis for revising theory so that it better predicts human behavior in organizations (Friedman & Sunder, 1994). In this regard, experiments are useful vehicles for testing theory, refining theory, and, ultimately, building theoretical systems (Kerlinger & Lee, 2000). Thus, over time, there is a symbiotic relationship between theory and evidence; theory and data interact in developing a complete picture of human behavior (Davis & Holt, 1993; Roth, 1995a).

In sum, organizations are a collection of individuals and, as such, organizational welfare is inextricably linked to the judgments, decisions, and actions of its members. Further, an organization's managerial accounting system plays a key role in motivating employees and improving their judgments and decisions. Consequently, it is vital to understand both the decision-facilitating and decision-influencing effects of managerial accounting information, and experiments are a particularly useful vehicle for studying whether and how managerial accounting practices affect the behavior of individuals within an organization.

The remainder of this paper is organized into four sections. In Section 2, we describe the decision-influencing role of managerial accounting information, review and synthesize the experimental research in this area, and discuss how future research might extend our knowledge regarding the use of managerial accounting information for motivational purposes. In Section 3, we describe the decision-facilitating role of managerial accounting information, review and synthesize the experimental research in this area, and discuss some avenues for future research investigating the use of managerial accounting information for belief revision purposes. In Section 4, we describe how the decision-influencing and decision-facilitating uses of managerial accounting information often are not independent, and suggest research avenues that explore issues connected with using managerial accounting information for both motivational and decision-making purposes. In Section 5, we briefly summarize our main points and offer concluding comments.

2. Decision-Influencing Role of Managerial Accounting Information

The decision-influencing role of managerial accounting information refers to the use of information for motivating employees (Demski & Feltham, 1976). This role for managerial accounting information can be viewed as the use of information to reduce *ex post* (post-decision) uncertainty discussed in Tiessen & Waterhouse (1983), the performance-evaluation use of managerial accounting information discussed in Baiman (1982), and includes the scorekeeping use of information discussed in Simon et al. (1954). The use of managerial accounting information for decision-influencing purposes is intended to influence employee behaviors via the effects that monitoring, measuring, evaluating, and rewarding actions and performance have on motivation.[7] For example, to motivate employees to control costs, firms might link compensation to performance by providing financial incentives that encourage managers to achieve an actual cost that is less than a budgeted or standard cost.

[6]External validity often is thought to be the Achilles heel of experimentation. That is, questions invariably arise as to the representativeness or generalizability of an experiment's results. Such concerns are not unfounded as experiments may not capture all relevant aspects of the population or setting that could interact with the experimental treatment in affecting the direction or magnitude of the results. In this regard, Cook & Campbell (1979, pp. 74–80) present approaches for enhancing an experiment's external validity. Further, Kerlinger & Lee (2000, p. 581) note that "conceding the lack of representativeness (external validity) the well-done laboratory experiment still has the fundamental pre-requisite of any research: internal validity."

[7]Risk-sharing considerations also are important here as motivation likely is affected by the financial (outcome) risk faced by the individual. More generally, given uncertainty in the relation between employees' actions and their consequences (outcomes and rewards), there is a tradeoff between the provision of incentives and the provision of insurance (risk-sharing).

Additionally, firms might use cost allocations to motivate mutual monitoring, co-operation, or the efficient use of a resource (Zimmerman, 1979, 2003).

More generally, the use of managerial accounting information for decision-influencing purposes is intended to help solve organizational control problems and therefore ensure that employees exhibit organizationally desirable behaviors (Merchant, 1985; Sunder, 1997). Control problems exist within organizations because owners presumably wish to maximize firm value, whereas employees are posited to maximize their own utility, which typically has been portrayed in theoretical research as consisting of two arguments: wealth and effort (leisure). Employees therefore are assumed to have different goals from owners, resulting in a divergence of interest between self-interested and co-operative behavior that leads to an agency problem (Baiman, 1982; Jensen & Meckling, 1976; Ross, 1973). When properly structured incentives are absent, an agency problem will lead to a loss in efficiency and a reduction in firm value (agency costs).

There are two general classes of agency problems: hidden action (moral hazard) and hidden information (adverse selection). A moral hazard problem arises when owners cannot observe the actions (e.g., effort levels) of work-averse employees and must therefore evaluate performance and base compensation contracts on imperfect surrogates of behavior (Arrow, 1985; Baiman, 1982). An adverse selection problem arises when employees have private information regarding, for example, their skill level or a state of nature that is of value to the firm, yet they use this information to increase their welfare at the expense of the firm's welfare (Arrow, 1985; Baiman, 1982). Both moral hazard and adverse selection problems are characterized by information asymmetry between employees and owners.

The use of managerial accounting information for decision-influencing purposes is intended to overcome these information-based problems within organizations and therefore reduce agency costs. Thus, a primary function of managerial accounting information is to mitigate the inherent conflict of interest between employees and owners and motivate employees to maximize firm value (Indjejikian, 1999). As discussed next, much experimental research has examined whether managerial accounting practices help solve control problems and encourage employees to act in the organization's interests.

2.1. Summary of Prior Research

The previous discussion related to the decision-influencing use of managerial accounting information raises two inter-related questions. First, do individuals act opportunistically (i.e., behave in a self-interested manner)? That is, do agency problems actually exist? Second, to what extent do managerial accounting practices help mitigate agency problems related to moral hazard and adverse selection?

With regard to the first question, there is evidence that individuals act opportunistically and behave in a self-regarding manner, thereby suggesting that firms may suffer a loss in efficiency because of agency problems. For example, Berg et al. (1992) document that individuals shirk when effort levels are unobservable and individuals are offered a flat-wage contract. Additionally, the results of Baiman & Lewis (1989) and Berg et al. (1990) indicate that individuals will misrepresent their private information for rather small increases in personal wealth (e.g., $0.25; also see Harrell & Harrison, 1994). Collectively, these results suggest that individual values and social norms such as honesty or an ingrained work-ethic are unlikely to completely mitigate self-interested behavior.[8] Accordingly, we turn our attention to the second question, and review experimental research that examines whether managerial accounting practices and procedures help mitigate adverse selection and moral hazard problems.[9]

2.1.1. Hidden Information (Adverse Selection)

Several experimental studies in managerial accounting have examined settings in which employees have private information regarding firm operations, a state of nature, or their own productivity (skill level) that, if honestly revealed or shared, would increase firm value. In a broad sense, this research can be put into two separate streams. Both streams primarily are concerned with the use of standards and budgets to extract private information from employees. Below, we briefly summarize the prior research in each stream.

The first stream of research examines employees' motivation to exploit their informational advantage by creating budgetary slack. Budgetary slack represents a discrepancy between what the employee actually expects to occur and what actually is revealed

[8]See Luft (1997) for additional empirical evidence that is consistent with individuals behaving in a self-interested (opportunistic) manner.

[9]Later in this section, we revisit the issue of whether individuals have preferences for nonpecuniary factors such as honesty, fairness, and equity. Understanding the extent to which social motives and values interact with formal managerial accounting practices in solving agency problems is an important avenue for future research.

(or where the budget is set).[10] Employees are motivated to create budgetary slack to improve their performance evaluations and compensation, shirk, consume perquisites, or hedge against uncertainty in the environment (Baiman & Demski, 1980; Cyert & March, 1963; Merchant, 1998; Williamson, 1969). Theoretically, the creation of slack is posited to reduce firm value because it can lead to inefficient resource allocation and the use of compensation schemes and budgets that are less than optimally motivating. Incentives and opportunities to create budgetary slack exist in the organization, though, when firms use budget-based contracts and employees participate in the budgeting process(Baiman and Evans, 1983; Demski & Feltham, 1978; Jensen, 2003).

Prior experimental research has shown that several factors affect individuals' propensity to create budgetary slack, and therefore exploit their informational advantage to bias budgets in their favor. For example, the degree of information asymmetry is related to slack, with higher levels of information asymmetry leading to higher slack (Waller, 1988; Young, 1985).[11] Research in this area also indicates that risk preferences affect the amount of slack, with risk-averse individuals creating the most slack (Young, 1985). Additionally, research has explored the creation of slack under group incentives, reporting that the type of competitive feedback can affect group slack levels (Young et al., 1993). Finally, research indicates that slack is affected by whether budgets are unilaterally or participatively set by the employee, imposed by the superior, or negotiated and, once set, whether the budget can be renegotiated (Fisher et al., 2000; Rankin et al., 2003; Young, 1985).

The majority of the research in the first stream, though, examines whether standards and budgets can be used to motivate the truthful revelation of private information or, more specifically, examines the efficacy of "truth-inducing" budget-based pay schemes in reducing budgetary slack (e.g., Groves, 1973; Groves & Loeb, 1979; Weitzman, 1976). Research in this area indicates that "truth-inducing" pay schemes generally are effective in reducing budgetary slack and misrepresentations of private information (e.g., Chow et al., 1988, 1991, 1994, 1995; Waller, 1988; Waller & Bishop, 1990). There are, though, several factors that have been found to moderate the effectiveness of truth-inducing pay schemes, including risk preferences (Waller, 1988), the degree of information asymmetry (Chow et al., 1988), the imposition of a ratchet (Chow et al., 1991), and a probabilistic management audit (Chow et al., 1995).

The second stream of research examining issues related to adverse selection investigates how well various budget-based incentive contracts serve as screening mechanisms and, thus, their ability to attract the most able (highest skilled) employees (e.g., Rothschild & Stiglitz, 1976). Budget-based compensation contracts can help reveal private information to the firm because they allow individuals to self-select contracts based on their relative skill or ability. Thus, employees can signal their productivity (or effort) level via the compensation contract they select (Spence, 1973, 1974). This process helps avoid an inefficient pooling equilibrium, and both employees and organizations benefit because the most able employees receive higher wages while organizations reap increases in production efficiency.

In managerial accounting, the seminal work in this area was done by Chow (1983). Chow (1983) found that compensation contracts containing an explicit link between pay and performance (budget-based contracts) were more likely to attract higher skilled employees than contracts without such a link (lower skilled subjects chose fixed pay contracts). Chow's (1983) findings have been confirmed by numerous other studies in managerial accounting; there appears to be a strong correlation between contract selection and skill levels (e.g., Baiman & Lewis, 1989; Berg et al., 1990), whereby individuals with higher skill levels are more likely to choose compensation contracts with higher performance incentives (e.g., Dillard & Fisher, 1990; Shields & Waller, 1988; Waller & Chow, 1985). Additionally, research has shown that factors such as risk preferences, a controllability filter, and state

[10]More generally, *slack* typically is defined as the provision of resources beyond the minimum required (or expected to be required) to complete a task (Antle & Eppen, 1985; Cyert & March, 1963). Further, while we focus on employees' motivation to create slack, organizations also may be motivated to create slack. Slack can be beneficial to the organization by reducing manager tension, increasing organizational resiliency to change, and by making available some resources that can be used for innovation (Merchant, 1998, p. 219; also see Merchant & Manzoni, 1989). Cyert & March (1963) also suggest that organizational slack can protect the firm against uncertainty in the environment (e.g., holding excess safety stock in inventory to ensure that stockouts do not arise). Thus, it is important to remember *slack* is a multifaceted construct that embodies both negative and positive connotations.

[11]However, this positive relationship may only exist in environments that already have high levels of information asymmetry between employees and managers. In environments with low levels of information asymmetry, research finds either a negative or no relationship between information asymmetry and budgetary slack (Hannan et al., 2004; Stevens, 2002).

uncertainty can interact with an individual's skill level in determining the choice of compensation contracts (Shields et al., 1989; Waller & Chow, 1985). Finally, research in this area indicates that the contract selection process not only reveals something about the skill levels of employees but also reveals something about the concomitant effort component as well (Waller & Chow, 1985).

In summary, certain managerial accounting procedures and practices, such as the use of budgets and standards in conjunction with compensation contracts based on these budgets and standards, have been found to be useful in either explicitly or implicitly extracting private information from employees. Thus, certain managerial accounting practices appear to be quite useful in reducing the level of information asymmetry between owners and employees. Research also informs us, though, that there are many factors (e.g., risk preferences, ratchet effect) that interact with these practices in determining the extent to which they foster the truthful revelation of private information.

2.1.2. Hidden Action (Moral Hazard)

Several experimental studies in managerial accounting also have examined the use of managerial accounting practices and procedures in motivating effort, performance and, more generally, desired actions from employees. Much of this research has been directed toward understanding the efficacy of budgets and standards against which employees are evaluated and compensated in solving moral hazard problems. Such research is important given that the use of budgets and standards for performance evaluation and compensation comprises a major aspect of most organizations' managerial control systems (Hopwood, 1976). Other research in this area has focused on the implications various incentive contracts have on firm profit in situations of interest to managerial accountants (e.g., transfer pricing). Below, we briefly summarize the prior research in this area.

One extensively studied topic, although not so much by managerial accounting researchers, is the effect assigned goals have on performance. A consistent finding from the goal-setting literature is that specific and challenging goals lead to higher performance than easy goals or no goals (see, e.g., Locke & Latham, 1990; Locke et al., 1981). In the accounting literature, similar findings have been reported by Chow (1983), Hirst & Yetton (1999), and Rockness (1977). These findings have implications for the practice of managerial accounting because firms employ budgets and standards that contain explicit production, revenue, and cost goals. Thus, the goals contained in accounting budgets and standards may not only serve to evaluate and reward performance, but also may have motivational properties *per se*. That is, independent of their effect on compensation, research consistently documents that goals serve to direct individual attention and actions to increase effort toward successful task completion. Such findings are particularly noteworthy since neo-classical economic theory predicts that, absent a link between goals and some extrinsic reward, the mere presence of a goal and the associated difficulty of the goal will not affect performance because there are no wealth or effort effects (i.e., goals have no intrinsic value *per se*).

Independent of their goal-setting effects and their ability to attract employees with higher skill levels, a number of studies in managerial accounting have examined how alternative incentive-based compensation contracts affect individual effort and performance relative to fixed pay contracts. For example, several studies report that budget-based compensation contracts yield higher levels of individual performance than fixed pay contracts (e.g., Bailey et al., 1998; Chow, 1983; Tuttle & Burton, 1999; Waller & Chow, 1985), suggesting that, above and beyond the goals contained in budgets and standards, further improvements in performance can be obtained by linking compensation to performance. Additionally, experimental research in managerial accounting indicates that piece-rate schemes also have positive effects on effort and performance (e.g., Bailey et al., 1998; Chow, 1983; Sprinkle, 2000).[12] Despite such findings, a recent and comprehensive review of the effects of financial incentives on performance reveals that performance-based monetary incentives are not always helpful in solving moral hazard problems, with only 50 percent of the experiments reviewed indicating positive effects of financial incentives on performance (Bonner et al., 2000; see also Camerer & Hogarth, 1999). Factors such as task complexity and the type of incentive scheme have been shown to interact with financial incentives in determining task performance (Bonner & Sprinkle, 2002; Bonner et al., 2000; Scott & Tiessen, 1999).

Experimental research in managerial accounting also has documented that the manner in which pay is linked to performance has implications for inducing organizationally desirable actions. For example,

[12]Further, Farrell et al. (2005) suggest that piece-rate schemes can even increase performance in environments where the incentives of employees are aligned with those of the firm by making the actions that increase firm value more transparent to employees.

Luft (1994) shows that individuals prefer otherwise economically equivalent incentives framed in bonus terms rather than penalty terms, suggesting that further efficiencies in contracting can be achieved by considering the language employed in compensation contracts. Additionally, in multi-person settings research indicates that exploiting common uncertainty in the environment via the use of relative performance evaluation can enhance performance over compensation schemes based solely on individual performance (Chow & Haddad, 1991; Frederickson, 1992).[13] Finally, in transfer pricing settings experimental research demonstrates that both the nature of the compensation scheme and the mechanism employed can influence the transfer price and quantity selected, and therefore influence the likelihood that individuals will make decisions that maximize firm profit (see, e.g., Chalos & Haka, 1990; DeJong et al., 1989; Ghosh, 1994, 2000; Greenberg et al., 1994; Luft & Libby, 1997).[14]

In summary, managerial accounting practices and procedures, such as the use of budgets and standards as well as linking rewards to performance, have been found to be helpful in solving problems of moral hazard. Additionally, research in this area suggests that the manner in which pay is linked to performance (i.e., the type of incentive scheme) can affect effort levels and resulting task performance (see, e.g., Bonner et al., 2000). Finally, similar to research examining adverse selection issues, research examining moral hazard issues reports that individual, task, and environmental variables frequently interact with performance-evaluation and compensation schemes in determining effort and performance levels (e.g., Bonner & Sprinkle, 2002; Bonner et al., 2000).[15]

[13]Sayre et al. (1998), however, document some negative consequences on the investment decisions made by individuals working under a tournament incentive scheme (which is an extreme form of relative performance evaluation) when the cohort size is greater than two.

[14]Under certain transfer pricing mechanisms (e.g., Hirshleifer, 1956; Ronen & McKinney, 1970), this research relates more to the adverse selection problem than the moral hazard problem. That is, in contrast to negotiation, these mechanisms operate by attempting to obtain the truthful revelation of supply and demand information from divisions so that corporate headquarters can set the optimal transfer price and quantity. We include the transfer pricing studies in the moral hazard section, though, because much of this research uses a negotiated setting where the concern is to get bargaining parties to make decisions that are in the best interest of the firm.

[15]Such variables include skill, task complexity, and assigned goals. For example, assigned goals, on average, have additive positive effects on effort and performance over monetary incentives. This suggests that organizations should employ performance targets (goals) in conjunction with monetary incentives to motivate employees. However, Bonner & Sprinkle (2002) find evidence of an interaction between the difficulty of the goal and the type of incentive scheme. Specifically, compared to piece-rate schemes, performance typically is better under budget-based schemes when goals are moderate, but not when goals are difficult. This evidence has implications regarding whether assigned goals and incentives should be kept as separate motivating mechanisms or whether incentives should be linked to goal attainment.

2.2. Directions for Future Research

There are numerous possible avenues for further inquiry regarding studying the decision-influencing role of managerial accounting practices and procedures in controlled laboratory settings. We concentrate our attention on two broad areas: (1) social motives and values, and (2) performance-evaluation and reward systems.

2.2.1. Social Motives and Values

Most prior experimental research in managerial accounting examines whether and how *formal* accounting controls help overcome moral hazard and adverse selection problems. Collectively, these studies show that commonly used managerial accounting practices help align the interests of employees and owners. However, these studies tend to ignore that managerial accounting information is only one piece of the puzzle, and that organizations may use informal information systems and rely upon socially mediated rewards and individual values to also mitigate contracting frictions (see, e.g., Noreen, 1988).

More generally, it is important to examine social motives and values because individuals make decisions in a broad social context that serves to frame behavior and outcomes. One's actions frequently and unavoidably shape, and are shaped by, the actions of others. Further, while individuals' objective functions almost surely include preferences for personal wealth accumulation, they also often include preferences for the welfare of others and/or conformance with norms of social and moral conduct (see, e.g., Baron, 2000; Thaler, 1992). In turn, preferences for non-pecuniary and other-regarding factors could exacerbate or mitigate the need for certain managerial accounting practices, thereby altering the managerial accounting information that is collected and used to motivate individuals.

For example, research in economics, organizational behavior, and psychology suggests that individuals value concepts of fairness and equity.[16] Collectively, this research suggests that individuals frequently are willing to sacrifice personal wealth to achieve outcomes that they perceive to be fair or equitable. Research in managerial accounting has tended to ignore such preferences (Luft, 1997).[17] One possible reason for this is that agency models generally assume that the manner in which gains to trade are apportioned is not valuable for contracting.[18] In most agency models the principal (owner) is designated as the residual claimant: agents receive their market wage (in expectation), and the principal receives any surplus from the agency relationship. Preferences for fairness and equity could, though, alter the nature of contracting within the firm.

Specifically, distributional (allocative) concerns might increase transaction (contracting) costs. For instance, a common property of performance-based compensation contracts is that employee compensation and owner compensation are correlated; since pay is linked to performance, when employees earn more (less) owners also earn more (less).[19] Depending on the sharing parameter, individuals receiving performance-based incentives might experience competing motivations. When the employee's share of rents is low, the employee's desire to maximize personal wealth conflicts with the desire to achieve equity and reduce the difference between his/her payoff and the owner's payoff. It is unclear how such a conflict will be resolved, and personal wealth considerations may be displaced by fairness and equity considerations, possibly suggesting that alternative allocative arrangements or alternative contract forms or means of motivation need to be employed. More generally, there are numerous instances where equity and fairness considerations might have implications for organizational design and the nature of managerial accounting practices.[20] Thus, it becomes important to understand whether (and how) the relative distribution of rewards, in addition to the absolute distribution of rewards, affects the ability of budgets, standards, and performance-based contracts to motivate individuals to reveal private information or exert high levels of effort.

Concerns for equity naturally lead to issues of reciprocity, or the desire to reward kind acts and punish hostile acts. Research in economics and psychology has demonstrated both forms of reciprocity. Negative reciprocity has been observed in ultimatum bargaining games (Camerer & Thaler, 1995; Roth, 1995b) and public goods games (Fehr & Gächter, 2000a), while positive reciprocity has been observed in trust or gift-exchange games (e.g., Berg et al., 1995; Fehr et al., 1993, 1997). Such reciprocal motivations can have implications for managerial accounting.

Akerlof (1982, 1984), for example, models a situation where employees and owners engage in mutual gift exchange. The owner gives employees a wage that exceeds the market-clearing wage and, in kind, employees give owners higher than "normal" levels of effort. Fehr et al. (1993, 1997) and Hannan (2005) report results consistent with this prediction: as the fixed wages (rents) offered by experimental employers increase, the effort levels of experimental employees increase. Effort levels are significantly higher than enforceable levels (those dictated by pure monetary self-interest) even though all parties know *ex ante* that experimental employers cannot *ex post* reward such behavior. Hannan (2005) also documents that it can be rational for organizations to rely on norms of reciprocity since, on average, higher wages lead to higher surplus and higher firm (residual) profit. Finally, Fehr et al. (1997) report that, if allowed to do so, experimental employers also will reciprocate by *ex post* rewarding employees who exert high levels of effort and punishing workers who shirk (even though both acts are costly to employers). Anticipating this [reciprocal] behavior from employers, employees provide even higher levels of effort. Collectively, these results demonstrate that reciprocity can serve as effort elicitation and contract enforcement mechanisms.

[16]See, e.g., Adams (1965), Blount (1995), Bolton & Ockenfels (2000), Kagel et al. (1996), Kahneman et al. (1986), Loewenstein et al. (1989), Milgrom & Roberts (1992), Rabin (1993), and Vecchio (1984).

[17]A notable exception is Evans et al. (1994) who find that owners of a resource are willing to sacrifice personal wealth in order to prevent being "cheated." Additionally, Luft & Libby (1997) and Greenberg & Greenberg (1997) have found that managers are concerned about how equitably profits are distributed among divisions in transfer pricing contexts (also see Moser et al. (1995) who examine how preferences for equity and fairness affect taxpayer compliance decisions).

[18]To the extent agency models do address these resource allocation issues, they are used to extract additional rents from agents (see, e.g., Arya et al., 1996; Balakrishnan, 1995).

[19]For example, owner and employee pay often is positively correlated under profit-sharing plans, gain-sharing plans, and piece-rate plans.

[20]See, in particular, Luft (1997) for an in-depth discussion regarding how fairness and ethical concerns might affect managerial accounting practices and procedures.

The previous discussion raises a question regarding how explicit incentive contracts, which frequently are used to mitigate agency problems, affect reciprocal motivation. On the one hand, experimental research demonstrates that incentive contracts can enhance employees' willingness to engage in reciprocal co-operation (Coletti et al., 2005; Lazzarini et al., 2004). Incentive contracts can be designed to induce an employee to take actions that benefit others in the organization. However, those benefiting from the employee's induced acts may attribute the behavior of the employee not to the control system *per se* but to the inherent kindness of the employee. In turn, this increases reciprocity (Coletti et al., 2005).

On the other hand, research suggests that incentive contracts can actually reduce (crowd-out) employees' willingness to engage in reciprocal co-operation (Fehr & Gächter, 2001; Tenbrunsel & Messick, 1999). Employers using incentive contracts tend to rely on the "stick" (explicit penalties for non-compliance) rather than the "carrot" (generous wage offers) as a means for motivating employees, possibly creating an "atmosphere of threat and distrust" (Fehr & Gächter, 1998, 2000b). Employees react negatively to this action—their effort levels decrease significantly, as does aggregate surplus.[21] Experimental research in managerial accounting can help reconcile these competing perspectives by providing important insights regarding whether or more precisely when explicit contracts based on managerial accounting information foster or destroy reciprocity and co-operation.

Concepts such as reciprocity also relate to suggestions made by Simon (1991) that individuals are motivated to work hard because they identify with an organization's goals, take pride in their work, and exhibit loyalty to the organization (see also Hirshleifer, 1977; Waller, 1994). Such notions may help explain why the goal-setting literature finds that specific and challenging goals, in and of themselves, motivate individuals to achieve higher levels of performance (Locke & Latham, 1990). Moreover, as part of the employment relation, individuals may simply obey authority, thus accepting (internalizing) the duties and responsibilities commensurate with their position and, thus, make decisions that are in the best interest of the organization.

Numerous other social motives and values also may affect the efficacy of managerial accounting procedures and contracting within the firm. For example, Arrow (1974, p. 23) suggests that there is an element of trust in every transaction and that trust is an "important lubricant of a social system."[22] Reputational considerations also could lead to a reduction in the deadweight loss associated with the inherent nature of second-best contracts (Fama, 1980). As Baiman (1990, p. 356) notes, reputation may serve "as a substitute for or complement to formal governance structures" and has "a number of potentially interesting managerial accounting implications."[23]

[21]Fehr & Gächter (2001) also report that, while the overall surplus was lower when incentive contracts were in place, firm profit was actually higher because the provisions in the incentive contract (a penalty paid by the employee to the firm if the employee was caught shirking) allowed the firm to retain a larger share of the smaller available surplus. That said, the positive distributive effects from the employer's standpoint were not ubiquitous, and in numerous instances the trust contract yielded higher firm profit than the incentive contract. Moreover, future research is needed to examine whether this finding is parameter-specific or, more generally, whether it replicates under alternative production functions, incentive contracts, and tasks. As reported in Fehr & Gächter (2000b, p. 177), such results may not generalize to settings where employers actually are allowed to choose between explicit and implicit contracts (firm profit is higher under the implicit contract). Finally, Fehr & Gächter (2001) discuss that their experiment framed the explicit incentives as a *penalty* and that, if framed as a *reward*, explicit incentives may not destroy, but actually enhance voluntary cooperation. These observations underscore the importance of examining how attributes (or types) of incentive schemes affect cooperation.

[22]There is an extensive literature on trust and its meaning. Some authors treat trust in a calculative fashion and view it as a subset of risk. Gambetta (1988, p. 217), for example, refers to trust as "a particular level of the subjective probability with which an agent assesses that another agent or group of agents will perform a particular action. When we say we trust someone or that someone is trustworthy, we implicitly mean that the probability that he will perform an action that is beneficial or at least not detrimental to us is high enough for us to consider engaging in cooperation with him." Presumably, the foundation for trust and the subjective probability likely are numerous: they could relate to the economic incentives in place, social norms such as reliance on reciprocity, values, history, culture, institutions, and so on. Other researchers (e.g., Williamson, 1993) view trust as being far less calculative and much more personal. For detailed discussions of trust, its meaning, and its effects on economic transactions see Coleman (1990), Gambetta (1988), Kramer and Tyler (1996), and Williamson (1993).

[23]The construct *reputation* likely encompasses both pecuniary and nonpecuniary elements. In repeated transactions, individuals may wish to develop a reputation for "doing the right thing" because the economic gains to doing so exceed, for example, the costs associated with reneging (possible loss of future profitable transactions) and writing and enforcing detailed contracts. There also can be a purely social aspect

Moreover, it is possible that trust and reputation systematically alter the managerial accounting information that is collected and used for performance evaluation and motivation. Additional social motives and values that seem important in managerial accounting settings include, but certainly are not limited to altruism, authority, dignity, honesty, competitiveness, loyalty, retribution, culture, and work norms.[24]

In real-world transactions, it is likely that numerous social motives and values operate in tandem with economic self-interest to govern decisions and actions. This not only makes it difficult to sort out the various factors that impinge on motivation but also makes it difficult to determine whether behavior is driven by pecuniary (e.g., anticipation of some future gain) or non-pecuniary (pure other-regarding) factors. In this regard, experimental methods can be particularly valuable because they can isolate (examine) certain motives and control for other motives and extraneous factors. Additionally, experimental methods allow researchers to cull-out non-economic motivations from economic motivations.[25] From a managerial accounting perspective, our comparative advantage is not so much in examining whether social motives and values affect behavior. Rather, our role is to examine whether such motives and values affect the design of managerial accounting practices and use of managerial accounting information.

In summary, many rewards and penalties take social forms, and individuals often exhibit preferences for ethical behavior (Arrow, 1985). Collective action problems are ubiquitous, and social norms drive behavior as much as explicit contractual agreements (Ostrom, 1998). It is important to study such social motives and values in managerial accounting because these factors may help explain why certain procedures are observed in practice and also may suggest changes in the design of managerial accounting procedures. Such research could help explain differences between the contracts observed in the real-world and those studied in theory (and in numerous experiments), why employment contracts are incomplete, and why employees often are motivated to exert effort even when their actions do not seemingly contribute toward their (immediate) economic self-interest. Moreover, such research would help paint a more complete picture of when, why, and how managerial accounting information is helpful in solving control problems. Additionally, such research would aid theory development and be useful in filling the repeated calls for research that integrates both economic and psychological factors (see, e.g., Kachelmeier, 1996; Merchant et al., 2003; Moser, 1998; Waller, 1994, 1995).

2.2.2. Performance-Evaluation and Reward Systems

Few would deny that managerial accounting is an integral and expansive component of an organization's performance-evaluation and reward system. Given the broad set of organizational control problems such systems are intended to resolve, experimental research in managerial accounting has been rather narrowly focused. Specifically, prior experimental research in managerial accounting typically has examined: (1) single, one-dimensional tasks, (2) single-person tasks, (3) a single type of incentive scheme (usually budget- or standard-based), and (4) single-sided control problems. Below, we discuss the importance of conducting research that moves beyond these boundaries.

First, extant experimental research in managerial accounting typically employs a single, one-dimensional task, yet employees usually perform several different tasks as part of their jobs or a single task with several dimensions of performance (Baker, 1992; Feltham & Xie, 1994; Hemmer, 1996; Holmström & Milgrom, 1991). For instance, production employees frequently are responsible for both the quantity and quality of output. In such settings, organizations need to both motivate high levels of effort from employees *and* direct employees' effort toward their various responsibilities. Consequently, the performance-evaluation and reward system serves both a motivational role and an informational role (see, e.g., Merchant, 1998).

It frequently is very difficult, however, to measure all relevant dimensions of performance with equal precision because the performance on certain tasks or facets thereof are likely to be more difficult to capture or verify. This renders the set of performance measures incomplete or hard to contract on, thereby complicating the design of performance-evaluation and reward systems (Kreps, 1997). *Ceteris paribus*, as the difficulty of measuring any particular facet of

(*footnote continued*)
of reputation as individuals may care deeply about how others interpret their actions irrespective of whether these interpretations affect future economic transactions. In either situation, reputation may serve a role in ensuring that agreements and contracts are honored.

[24]For discussions regarding these, and other, factors see Abbink et al. (2000), Arrow (1974), Baron (2000), Elster (1989), Evans et al. (2001), MacCrimmon & Messick (1976), Rutledge & Karim (1999), and Williamson (1985, 1996).

[25]See, e.g., Nikias et al. (2004) and Williamson (2005).

performance increases, economic theory informs us that the desirability of providing financial incentives decreases, so much so that some have posited that a flat-wage contract may be optimal in multi-dimensional task situations (Holmström & Milgrom, 1991). This analytic result, though, hinges on two assumptions: (1) individuals derive utility from work activities, and (2) individuals receiving incentive contracts focus excessively on the rewarded dimension of performance (incentives lead to a severe misallocation of effort among tasks).[26]

Experimental evidence in managerial accounting suggests that individuals do indeed derive utility from work activities (e.g., Sprinkle, 2000). Additionally, archival-empirical evidence from firms suggests that there can be dysfunctional responses to compensation schemes and that employees often will allocate a disproportionate amount of their effort to the dimensions of their job that are most objectively measured (see, e.g., Prendergast, 1999). It is unclear, though, how this tradeoff actually is resolved and whether an optimal contract in a multi-task setting is a fixed wage contract, a performance-based contract, or some combination thereof. Experimental research in managerial accounting could assess this tradeoff and the extent to which extrinsic incentives lead to an inefficient allocation of effort among an employee's various responsibilities.

Such research could improve our understanding of whether commonly used compensation schemes have unintended consequences such as causing employees to fundamentally change the activities they perform or to reallocate their efforts in ways that harm the organization. In turn, this has implications for job design and how decision rights should be partitioned in an organization. This also has clear implications for the design of responsibility accounting systems and whether, for example, organizations should seek to change employees' opportunity costs by limiting the tasks and activities assigned to them. Such research also could facilitate the design and development of performance measures and how precise they need to be to motivate the desired levels and allocations of effort (see, e.g., Banker & Datar, 1989).

At a more fundamental level, the multi-dimensional task contracting problem frequently reduces to motivating employees to innovate and take risks (Holmström, 1989). Managers can be exposed to both compensation risk and human capital risk when the various dimensions of performance are not equally sensitive to their effort (Milgrom & Roberts, 1992). Even when the dimensions of performance are equally sensitive to effort, managers frequently must select from a menu of projects that vary greatly in both risk and expected return. For example, managers frequently engage in capital budgeting decisions in which they evaluate and select among investments that differ in the timing, magnitude, and riskiness of cash flows. In these situations, the accounting performance measurement and reward system not only needs to motivate high levels of effort from employees, but also needs to encourage the appropriate level of risk taking (i.e., encourage employees to maximize expected performance).

When examining the multi-dimensional task contracting problem, recent experimental research in managerial accounting highlights the importance of decomposing employee performance into its effort and risk-taking components. Specifically, Sprinkle et al. (2005) illustrated that increasing the difficulty of the budget level embedded within budget-based incentive contracts can have opposing effects on employee effort and risk taking. Thus, examining the relationship between budget level difficulty and a measure that co-mingles the effort and risk-taking choice of the employee would prove difficult.[27] Future research could continue to investigate the effects of incentive systems on employee effort and risk taking independently. This research could examine which incentive schemes, or combinations and dimensions thereof, induce managers to take appropriate levels of risk (i.e., select projects that maximize expected value) while concurrently motivating high levels of effort.

In this vein, experimental research in managerial accounting also might consider examining dependent variables and outcome measures other than budget slack and performance quantity. For example, researchers could explore how managerial accounting practices (1) affect employees' propensity to help coworkers; (2) lead employees to voluntarily enhance their knowledge, skills, and abilities; (3) affect conscientious work habits; (4) promote adherence to rules and regulations; (5) enhance loyalty to the organization; and (6) affect employees' propensity to

[26]Further, it is assumed that when pay is not contingent on performance, employees will allocate their efforts according to the organization's wishes.

[27]For example, prior studies' use of measures that co-mingle the effort and risk-taking choice of the employee may contribute to the mixed results of the prior literature examining the relationship between budget level difficulty and employee performance (Locke & Latham, 1990; Merchant & Manzoni, 1989).

change, innovate, and learn.[28] While such outcome measures may not have immediate effects on performance, they may signal future levels of profitability and ultimately are critical to a firm's long-run success and viability (Fisher, 1995; Kaplan & Norton, 1996). Moreover, it is vital to understand the dynamic (multi-period) effects that managerial accounting practices have on motivation as well as the rate and type of learning (see, e.g., Indjejikian, 1999; Shields, 1997). This is particularly important given the repeated nature of most managerial decision problems.

Second, future experimental research in managerial accounting should pay greater attention to incentive issues in workgroups and teams. Team-based structures increasingly are used in organizations, yet few experimental studies in managerial accounting have examined performance-evaluation and compensation issues in group settings (Atkinson et al., 1997a).[29] Compared to a single-person setting, there are additional issues to consider in a team-based (group) setting. For example, organizing production in teams can result in benefits due to improved coordination of information, skills and effort, mutual monitoring, and improved risk-sharing; there are, though, additional control problems to consider, including free-riding, collusion, and a loss of information regarding individual performance (Alchian & Demsetz, 1972; Arya et al. 1997; Balakrishnan et al., 1998; Itoh, 1991; Ramakrishnan & Thakor, 1991). The actual manner in which these theoretical benefits and costs associated with team-based production translate into realized performance is unclear, and experimental research examining these issues across different production settings, group incentive schemes, and communication and monitoring arrangements would be valuable (Fisher, 1994; Nalbantian & Schotter, 1997).

For example, the use of group incentive schemes, which reward individuals on the basis of group outcomes, has grown rapidly over the last 50 years (Blinder, 1990). This raises a question regarding whether organizations should employ group piece-rate contracts (based on, e.g., revenue or profit) or budget-based contracts. While piece-rate schemes reward all positive levels of group output, they theoretically lead to high levels of free-riding. Moreover, given the sharing mechanism and the "public good" nature of group output, free-riding frequently is a dominant strategy. Budget-based contracts, on the other hand, only reward output after some target is achieved; such contracts are characterized by multiple Nash equilibria, some of which include positive levels of individual production and group output (e.g., Holmström, 1982).[30]

Experimental research in managerial accounting (Fisher et al., 2003) finds that, as suggested by theory, group budget-based contracts outperform group piece-rate contracts. Budget-based contracts lead to higher group effort (less free-riding), higher group performance (Pareto-superior outcomes), and less decay in long-run performance. Such research speaks not only to how group compensation schemes might be crafted to enhance productivity but also to the important role that managerial accounting, specifically the use of a budget and the budget level, plays in such schemes. This research could readily be extended to examine how other important issues in managerial accounting affect the efficacy of budget-based contracts, including the partitioning of group decision rights and the information flow among group members.

Third, experimental research in managerial accounting tends to focus rather heavily on budget-based compensation schemes. As previously discussed, there are numerous unresolved issues regarding the

[28]In this regard, management accounting researchers might borrow from organizational behavior researchers who have examined work behaviors that are beyond the prescribed roles of a job and traditional measures of job performance. Such behaviors have been labeled organizational citizenship behavior (e.g., Organ, 1988), prosocial organizational behavior (Brief & Motowidlo, 1986), extra-role behavior (Van Dyne & Cummings, 1990), and organizational spontaneity (George & Brief, 1992).

[29]Notable exceptions are Drake et al. (1999), Rankin (2004), Rankin & Sayre (2000), Rowe (2004), Scott & Tiessen (1999), Towry (2003), and Young et al. (1993).

[30]Under budget-based contracts, only group output that meets or exceeds the target is rewarded. If group output is below the target, workers receive a relatively low [penalty] wage. This type of forcing contract can yield multiple Nash equilibria. Simply put, the discontinuity that exists under budget-based contracts can change the marginal benefit to working. For example, assume that other members of a group are working and that the marginal worker, by exerting effort, is able to ensure that the group target will be met and that pay will be high. If the marginal worker does not exert effort, however, the group target will not be met and pay will be low. Given the discontinuity in pay, the incremental benefit from working can strictly exceed the incremental cost, and working is therefore sustainable as a Nash equilibrium (mutual best reply). Such motivations do not theoretically exist under group piece-rate schemes because these schemes typically are continuous and linear—the marginal benefit of an extra "unit" of effort is constant, thereby giving rise to the classic public good problem where free-riding is a dominant strategy.

efficacy of such schemes.[31] That said, there are numerous ways of linking pay to performance and rewards can vary as to their type, timing, and magnitude (see, e.g., Bonner & Sprinkle, 2002; Bonner et al., 2000).

For example, tournaments (e.g., promotions) frequently are observed in practice (Baker et al., 1988; Bull et al., 1987; Prendergast, 1999), yet few experimental studies have examined the efficacy of tournament-based compensation schemes vis-à-vis other compensation schemes. Additionally, research that does examine tournament pay schemes typically only considers how they affect the firm's moral hazard problem, often reporting that tournaments lead to lower (average) levels of individual effort and performance than alternative pay schemes (Bonner et al., 2000). It is possible, though, that tournaments work quite well when the firm's adverse selection problem is considered and that, compared to other compensation schemes, tournaments attract the highest skilled (most productive) individuals and are best able to sort individuals on the basis of their ability (Prendergast, 1999). This underscores the importance of considering the impact alternative performance-evaluation and reward systems might have on *both* moral hazard and adverse selection problems. This also underscores the importance of considering whether rewards will be based on absolute or relative performance and, if the latter, whether the basis for comparison is some known standard or the (a priori unknown) performance of others.

Finally, in studying principal-agent relationships extant experimental research in managerial accounting tends to focus on only one side of the control problem. Research tends to examine issues relating to employee moral hazard and neglect those relating to employer moral hazard. As Demski (1997, p. 579) articulates "two-sided (or double moral hazard) concerns, in which important control considerations arise on both sides of a relationship, are commonplace."[32] This raises a question regarding whether and how managerial accounting information and practices play a role in helping employees protect themselves against the opportunistic actions of owners.

For example, many organizations frequently augment objective performance evaluation with subjective performance evaluation. Theoretically, such evaluations can increase employee and employer welfare by incorporating non-contractible (unverifiable) information about employees' actions in performance evaluations (see, e.g., Baiman & Rajan, 1995; Baker et al., 1994). However, subjective performance evaluation can be prone to numerous evaluator biases, and owners may renege on the implicitly agreed upon manner in which subjective measures will be used in the evaluation process (Prendergast, 1999). This raises a question, largely unexplored in managerial accounting, regarding the relative roles of objective and subjective measures in evaluating performance and, more generally, employer moral hazard.[33] Indeed, managerial accounting practices may be non-trivially shaped by employees' concerns over owners' opportunistic use of non-contractible information.

In summary, a number of issues connected with the use of managerial accounting information for performance-evaluation and reward purposes merit further inquiry. We suggest that experimental research begin to examine some of the complexities that exist in real-world organizations regarding work tasks, organizational structure, compensation schemes, and two-sided opportunistic behavior. Additionally, research might examine the motivational effects related to the mere act of collecting evaluation data (as well as the type of data collected). The experimental approach is particularly amenable for examining the questions raised since it allows for a systematic analysis of *ceteris paribus* changes in the discrete aspects of tasks, the organization's environment, and performance-evaluation and reward systems. By isolating the effects of these changes, researchers can best assess whether the features identified in theory materialize in the actual actions of individuals.

3. Decision-Facilitating Role of Managerial Accounting Information

The decision-facilitating role of managerial accounting information refers to the provision of information to reduce pre-decision uncertainty (Demski & Feltham, 1976). This role for managerial accounting information can be viewed as the use of information to reduce *ex ante* uncertainty discussed in Tiessen & Waterhouse (1983), the belief revision use of

[31] In addition to the aforementioned issues, it also is unclear whether budget targets should be exogenously set or, as frequently occurs in gainsharing plans, generated endogenously by the historical output of workers. More generally, the presence of a budget target leads to questions regarding how budget levels, and their concomitant difficulty, are determined.

[32] See, e.g., Cooper & Ross (1985) and Demski & Sappington (1991, 1993).

[33] Fisher et al. (2005) is at least one exception. This study found that firm output and employees' compensation are greater when the employer does not have discretion over total employee compensation, but does have discretion over the allocation of total compensation.

managerial accounting information discussed in Baiman (1982), and is analogous to the problem-solving use discussed in Simon et al. (1954). The use of managerial accounting information for decision-facilitating purposes is intended to improve employees' knowledge, thereby enhancing their ability to make organizationally desirable judgments and decisions and better-informed action choices. For example, firms supply managers with product cost data to help ensure appropriate pricing and product-emphasis decisions. Firms also provide managers with standard cost variances so that they can determine the sources of deviations from planned performance and take corrective action.

In its decision-facilitating role, then, managerial accounting information serves as an important input for numerous economic judgments and decisions. Such judgments and decisions subsume both the past (performance evaluation) and the future (e.g., planning). They concern the acquisition, use, and disposition of both inputs and outputs to achieve organizational goals. They also involve a retrospective examination of prior choices and decisions and, as such, involve evaluating, appraising, and assessing performance, with the ultimate goal of improving future performance.[34]

3.1. Summary of Prior Research

Consistent with the aforementioned objectives, prior experimental research reporting on the decision-facilitating role for managerial accounting information has focused on the general issue of determining what information should be supplied to a particular decision maker in a particular decision context. Such a focus is consistent with the general purposes of judgment and decision-making research in accounting and cognitive psychology, which are to (1) examine how and how well individuals (or groups) perform judgment and decision tasks, and (2) examine the determinants of judgment and decision-making performance, with the aim of identifying factors that may enable individuals to make better judgments and decisions (Bonner, 1999, 2001; Hogarth, 1991). Below, we briefly survey the findings of prior experimental research in these two areas.

3.1.1. Quality of Judgment and Decision-Making in Managerial Accounting

Despite the perfect rationality assumption governing most models of economic behavior, much prior experimental research in managerial accounting indicates that individuals' decisions are less than optimal. Two streams of research report on the quality of judgment and decision-making in managerial accounting settings.

First, experimental research in managerial accounting has examined how well individuals make information system choice decisions. This research views the managerial accountant as an "information evaluator" and a producer or supplier of information for decision-making (Demski, 1972; Feltham, 1972). In general, this body of research shows that individuals' choices deviate from normative models and that individuals do not, in general, choose economically optimal information systems (see, e.g., Hilton & Swieringa, 1981, 1982; Krishnan et al., 2002; Ko & Mock, 1988; Schepanski & Uecker, 1983; Uecker 1978, 1980, 1982; Waller, 1995). The second stream of research focuses on the use of managerial accounting information for judgments and decisions. Again, this research tends to indicate that decision makers do not, in a Bayesian or decision-theoretic sense, make optimal decisions.[35] For example, research has shown that individual judgments often are affected by normatively irrelevant outcomes (e.g., Brown & Solomon, 1987, 1993; Fisher & Selling, 1993; Frederickson et al., 1999; Lipe, 1993).

Collectively, the experimental research in managerial accounting is largely consistent with other experimental research in accounting and auditing, which documents that individual judgments and decisions are not always of the highest quality (Bonner, 1999, 2001). Individuals do not appear to be good intuitive statisticians and suboptimal decisions frequently can be traced to the use of simplifying heuristics, judgment biases, and systematic errors (Shields, 1988; Waller, 1995). Consequently, it is important to understand the determinants of decision quality and how managerial accounting practices might improve judgment and decision performance. We turn our attention to these issues next.

[34] Demski (1997) stresses that the performance evaluation of an activity (e.g., department or product) is qualitatively different from managerial performance evaluation. Specifically, he notes (p. 537), "activity evaluation is a question of whether the organization's interests are best served by the activity, while managerial evaluation is a question of whether the manager's inputs, broadly interpreted, have been in the organization's interests." Thus, managerial performance evaluation not only is conducted to determine whether a manager should be "kept or dropped" but also is, due to contracting frictions, conducted to ensure organizationally desirable behaviors. This can change the data collected and reported or threatened to be collected and reported.

[35] Although in some instances (e.g., some variance investigation decisions) research reports that individuals make remarkably good judgments and decisions (see, e.g., Brown, 1981, 1983; Lewis et al., 1983; Shields, 1988).

3.1.2. Factors Influencing Judgment and Decision Performance in Managerial Accounting

Numerous studies examine how well decision makers use managerial accounting information. Further, numerous individual, task, and environmental variables have been found to affect judgment and decision-making performance in managerial accounting settings. For a comprehensive mapping of relations between the dependent and independent variables studied in this area, the interested reader should consult Luft & Shields (2003). Other useful reviews of this literature can be found in Ko & Mock (1988), Shields (1988), and Waller (1995). Below, we briefly discuss prior research that has examined whether variations in managerial accounting practices and procedures affect judgment and decision quality.

Experimental research indicates that managerial accounting practices and procedures can have a significant effect on the quality of individuals' judgments and decisions. For example, receiving budget and variance feedback appears to enhance learning and improve decision performance (e.g., Ghosh, 1997; Mock, 1973). Additionally, feedback frequency has been found to affect managerial decision performance, with more frequent feedback often improving decision quality, but sometimes biasing judgments (see, e.g., Frederickson et al., 1999; Mock, 1969). The amount of information provided to decision makers also influences judgments, with studies reporting an inverted-U relation between the amount of information and judgment accuracy (see, e.g., Iselin, 1988; Shields, 1980, 1983). Finally, recent research shows that other basic properties of managerial accounting information can affect judgment performance, such as the manner in which it is organized, whether it contains financial or non-financial measures of performance, and whether a performance measure is common or unique to an organizational subunit (e.g., Lipe & Salterio, 2000, 2002; Schiff & Hoffman, 1996).[36]

Experimental research in managerial accounting also has extensively studied how various product costing systems affect decision performance. Much of this research examines how absorption costing systems, compared to variable costing systems, affect pricing decisions. This research tends to indicate that individuals prefer absorption cost systems to variable cost systems in making pricing decisions, although such systems generally lead to larger price biases and distortions (e.g., Ashton, 1976; Barnes & Webb, 1986; Hilton et al., 1988; Turner & Hilton, 1989). Recent research in this area, though, suggests that these biases are mitigated in a competitive market setting (Waller et al., 1999). Experimental research has focused on other attributes of an organization's product cost system such as its accuracy, reporting that more accurate product cost information frequently leads to more accurate judgments and more profitable decisions. However, such benefits have been shown to depend on the market structure, the behavior of competitors, the type of feedback, and individual knowledge structures (Briers et al., 1999; Callahan & Gabriel, 1998; Dearman & Shields, 2001; Gupta & King, 1997).

Finally, the use of managerial accounting information for decision-influencing purposes might affect an individual's propensity to use managerial accounting information for decision-facilitating purposes, thereby playing a key role in determining the judgment and decision performance of individuals within an organization. For example, the structure of the compensation contract (performance-contingent or fixed wage) could affect how and how well a manager uses product cost information in making pricing decisions. Such research speaks to the interdependent nature of the decision-influencing and decision-facilitating roles of managerial accounting information and, thus, their interactive effects. Given the organization of this paper, we defer our discussion of these issues to Section 4.

In summary, managerial accounting information and practices have been found to have significant effects on the judgment and decision performance of individuals. Both the provision of information for decision-facilitating purposes and the characteristics of that information have been found to improve individuals' knowledge and ability to make better judgments and decisions. Prior research also has documented, though, that the efficacy of managerial accounting information and practices in improving judgment and decision performance can be moderated by a number of individual, task, and environmental factors (see, e.g., Luft & Shields, 2003).

3.2. Directions for Future Research

Compared to experimental research examining the decision-influencing role of managerial accounting information, fewer studies in the last decade have focused particularly on the decision-facilitating role of managerial accounting information. To spur work in the area, Waller (1995) suggested that researchers adopt a "behavioral-economics" approach, whereby

[36] In addition to affecting the quality of judgments, Kadous et al. (2005) found that the mere presence of managerial accounting information can enhance the persuasiveness of an argument or proposal.

concepts from economics and psychology are integrated and the validity of the assumptions underlying neo-classical economic theory (e.g., perfect rationality) is empirically tested. We agree with Waller (1995), and also suggest numerous additional avenues for further inquiry regarding studying the decision-facilitating role of managerial accounting information in controlled laboratory settings. We focus our attention on two areas: (1) performance evaluation, and (2) multi-person, multi-period, and expertise issues.

3.2.1. Performance Evaluation

Organizations routinely evaluate the performance of individuals, activities, and subunits. While such evaluations clearly have a decision-influencing purpose, they also serve to facilitate numerous economic judgments and decisions. For example, evaluations of performance frequently are used to allocate resources within the organization, decide on corrective actions, set future performance goals, develop or refine strategies, and identify training and development needs. Moreover, accurate performance evaluation is of critical importance in organizations, and both financial and non-financial data from the firm's managerial accounting system serve as a key input in forming these evaluations (Foster & Young, 1997; Ittner & Larcker, 2001).

Within managerial accounting, analytic (agency) research typically focuses on the *ex ante* choice or development of performance measures to motivate employees rather than the *ex post* use of those measures by evaluators (e.g., Feltham & Xie, 1994; Hemmer, 1996). Much of this research is guided by the informativeness principle (Holmström, 1979), which posits that performance measures are valuable if they [statistically] reduce the error with which an employee's actions are estimated. A maintained assumption is that performance measures are either mechanistically used in the evaluation process or that evaluators are perfectly rational and optimally use performance measures. This need not be the case, though, as performance evaluation frequently is subjective and can be prone to much bias and random error (Bommer et al., 1995). Thus, performance measurement and performance evaluation may be a two-stage process (i.e., not perfectly correlated).

This issue is particularly important given the trend toward organizations implementing new and expanded performance measurement systems in an attempt to overcome perceived limitations associated with traditional accounting-based performance measures. Among these trends are the use of economic-value-added methods and measures as well as the use of non-financial performance measures and the balanced scorecard. Such methods and measures are posited to improve managerial and firm performance evaluation as well as decision-making within the firm by providing decision makers with a better set of financial metrics as well as forward-looking non-financial metrics (Ittner & Larcker, 1998).

Despite these claims and increased usage by firms, archival-empirical evidence indicates limited and mixed support regarding the efficacy of these new performance measurement procedures and measures in explaining stock returns and stock prices (Ittner & Larcker, 1998, 2001). Additionally, archival-empirical evidence is limited and mixed regarding the ability of such methods and measures to improve decision-making and operating performance (Ittner & Larcker, 1998, 2001). This raises questions about how and how well individuals use these new measures in decision-making and in evaluating the performance of managers and divisions.

With an expanded set of financial and non-financial performance measures, it is important to understand how evaluators weight and integrate the various performance measures to form an overall evaluation of performance, particularly given the use of subjective performance evaluation rather than a formulaic or objective approach (see, e.g., Ittner & Larcker, 1998, pp. 227–228). In such situations, evaluators must combine performance measures defined in different dimensions (e.g., money, time, customer satisfaction ratings) to form an overall assessment of performance. It is unclear how this process actually works and what factors influence the weights placed on various financial and non-financial measures. Research in managerial accounting and psychology shows that the performance-evaluation process is complex and that numerous economic, psychological, and social attributes influence performance appraisals (Ilgen et al., 1993; Krishnan et al., 2005). Additional experimental research in managerial accounting could continue to use this process approach and provide evidence regarding the manner in which new performance measures affect the acquisition, encoding, storage, and processing strategies of evaluators.

There also are issues related to information overload and bounded rationality. The number of performance measures may be inversely related to an evaluator's ability to form accurate assessments of performance (see, e.g., Shields, 1983; Schick et al., 1990). The optimal amount of performance data that should be supplied to evaluators is unclear, and may be related to the combinations and types of financial and non-financial measures employed. Additionally,

larger numbers of performance measures raise concerns regarding a dilution effect (e.g., Nisbett et al., 1981), or whether cues of lesser diagnosticity dilute cues of higher diagnosticity. Such an effect may be the unfortunate by-product of individuals allocating their attention and efforts to, and thus attempting to integrate, a multi-faceted set of performance measures.

Finally, Ittner & Larcker (1998, p. 215) report that certain economic value methods and measures may simply be too complex for individuals to understand, thereby limiting their usefulness as decision-making and performance-evaluation tools. Additional complexities also might arise when economic value measures are used for more than one purpose in an organization (e.g., capital budgeting, goal setting), as the use of information for multiple purposes can affect how information is stored, retrieved, and subsequently processed (see, e.g., Williams et al., 1986). This raises questions regarding whether the use of economic value measures as well as non-financial performance measures for multiple purposes in the organization results in less accurate performance evaluation.

In summary, given that firms are relying more heavily on both financial and non-financial performance measures, it seems vital to understand how and how well individuals use these performance measures in evaluating individual and division performance and, more generally, in making organizationally desirable decisions. While recent experimental research in managerial accounting addresses some of these issues (e.g., Lipe & Salterio, 2000, 2002; Luft & Shields, 2001), more research is needed. Such research would provide valuable insights regarding the appropriate design of performance measurement and evaluation systems and the role that managerial accounting information plays in these systems. Further, as discussed in Bonner (1999) and Libby & Luft (1993) experiments are particularly valuable for sorting out the determinants of decision performance (e.g., amount and type of information) and measuring the processes through which they affect performance (e.g., information search and integration). In turn, understanding these determinants and processes is critical for improving judgment and decision performance (Bonner, 1999).

3.2.2. *Multi-Person, Multi-Period, and Expertise Issues*

Notwithstanding the recent innovations in performance measurement and other areas of managerial accounting practice, several fundamental aspects of the firm's decision environment merit further inquiry. For example, research in managerial accounting has not fully explored the multi-person and multi-period nature characterizing many managerial accounting settings. As discussed below, several interesting issues regarding the decision-facilitating use of managerial accounting information in these settings warrant exploration.

Regarding the multi-person aspect of many decision problems, firms clearly need to address the organizational structure question. That is, firms must decide how to best organize employees for purposes of production (e.g., should production be team-based or individual-based). As previously discussed, the decision-influencing use of managerial accounting information may help guide this organizational design choice. Conditioned on using workgroups and teams, there are a number of judgment and decision-making issues that also need to be addressed.

For example, group settings frequently are characterized by conflict among members, which can arise from differences in individual beliefs regarding how scarce resources are to be allocated among group members, differences in opinions and judgments, or differences in beliefs regarding the appropriate course of action (Brehmer, 1986; Hocker & Wilmot, 1995). In an attempt to resolve these interpersonal conflicts, organizations and groups oftentimes employ both formal and informal negotiations (Bazerman et al., 2000; Lewicki et al., 1999; Walton & McKersie, 1965). Managerial accounting information might facilitate the negotiation process, enabling group members to better co-ordinate, achieve judgment consensus, and ultimately reach agreement on the issue at hand (see, e.g., Craft, 1981). For example, organizations might provide information about the abilities and resources of the negotiating parties (e.g., payoffs). It is unclear, however, whether such (or other) information facilitates or hinders the negotiation process (see, e.g., Elias, 1990; Haka et al., 2000; Kachelmeier & Towry, 2002; Luft & Libby, 1997).[37]

[37]For example, Kachelmeier & Towry (2002) report, in a negotiated transfer price setting, that the disclosure of relative profit information can increase fairness-based frictions and change negotiation outcomes (possibly impede negotiation agreement). Research in experimental economics also shows that bargaining outcomes can be affected by the amount of information available to each party, even when this information does not change the theoretical Nash solution. For example, in binary lottery games, Roth & Malouf (1979) and Roth & Murnighan (1982) find that the provision of relative payoff information tends to lead to outcomes resulting in a more equitable (equal) split of the monetary payoffs. Here, relative payoff information may actually facilitate negotiation agreement by reducing the

Additional issues relate to how information should be distributed among group members to maximize group decision-making effectiveness. For instance, if a group is responsible for making a pricing decision, should all members be provided with the same information set, or should some members of the group receive cost (supply) data while other members receive demand data? Research in psychology examining these information sharing and pooling issues is inconclusive about the manner in which information should be distributed (see, e.g., Cruz et al., 1997; Winquist & Larson, 1998). More generally, research consistently shows that group decision-making processes differ from individual decision-making processes (Castellan, 1993; Hare et al., 1994). Thus, it is important for researchers in managerial accounting to examine the information needs of groups and, consequently, the information likely to result in the highest quality group judgments and decisions in the most efficient (timely) manner. To date, though, few studies have examined how variations in managerial accounting practices affect group or negotiated decision processes and outcomes and more research in this area is needed (see, e.g., Luft et al., 1998).

Managerial decisions also are multi-period in nature, and an objective of managerial accounting systems is to promote learning. In particular, Atkinson et al. (1997b, p. 4) note, "Management accounting information is one of the primary means by which operators/workers, middle managers, and executives receive feedback on their performance, enabling them to learn from the past and improve for the future." Yet, we know very little about the managerial accounting practices most likely to facilitate individual and organizational (multi-person) learning (Shields, 1997). Oftentimes, studies do not employ multiple decision periods and, in the instances where they do, researchers rarely report on the learning dynamics. However, experimental research could provide useful insights regarding how certain properties of managerial accounting information (e.g., accuracy, level of aggregation, financial vs. non-financial, qualitative vs. quantitative, internal vs. external, formal vs. informal, timeliness) combine with individual, task, and environmental characteristics to affect the process and rate of learning. Additionally, such research could report on how these properties affect continuous improvement as well as the propensity to innovate (re-engineer).

More generally, there is a need for research in managerial accounting that employs the "expertise" paradigm (Libby, 1995; Libby & Luft, 1993). This paradigm has been heavily used in audit judgment settings to explore the relations among ability, experience, knowledge, environmental factors, and judgment performance across a wide variety of audit tasks and settings. Given the expanded role managerial accountants (and managerial accounting information) play in organizations, this framework seems particularly useful for studying judgment and decision-making issues in managerial accounting (Birnberg & Hieman-Hoffman, 1993). For example, the Institute of Management Accountants (1999) noted that managerial accountants are now becoming more actively involved in firm decision-making, frequently serving as internal consultants and business analysts, performing long-term strategic planning, process improvement, and financial and economic analysis. These tasks, as well as numerous other tasks performed by managerial accountants, are economically important to the firm, computationally and cognitively demanding, and unstructured.

In general, though, we know little about how knowledge, ability, and experience affect how and how well managerial accountants perform their various duties.[38] We also know little about how knowledge, ability, and experience affect how and how well managers and others within the firm use management accounting information.[39] Research directed toward filling these voids could provide insights on some substantive practical issues in managerial accounting regarding how, for example, the role of skill, experience, training, education, and environmental and task attributes relate to the development of expertise in managerial accounting and/or the efficacy with which management accounting information is used. To achieve these insights researchers need to systematically investigate, in a variety of decision settings, how managerial accountants' and others' experience, knowledge, and abilities combine with the firm's environment and internal information system to determine judgment performance.

(*footnote continued*)
multiplicity of equilibria, directing bargainers' attention to outcomes that are symmetric and focal. One difference between most transfer pricing settings and binary lottery games is the presence of an outside option (the disagreement outcome in binary lottery games is \$0), although it is unclear whether this alone affects the value of providing relative payoff information.

[38]For some recent work on this issue see Hunton et al. (2000) and Stone et al. (2000).

[39]For some recent work in this area, see Dearman & Shields (2001), Kadous & Sedor (2004), and Vera-Muñoz (1998).

In summary, there are a number of salient institutional features connected with the provision of managerial accounting information for decision-facilitating purposes that have been somewhat neglected, but merit further research. We suggest that experimental research in managerial accounting further explore the multi-person, multi-period, and expertise issues prevalent in numerous decision settings. Such issues are difficult to address in natural settings because the determinants of decision performance are likely to be confounded. Additionally, the dependent variable, individual or small-group decisions, and important independent variables, such as knowledge, are likely difficult to obtain or measure reliably. In this regard, the experimentalist has a clear comparative advantage by being able to isolate the key cause and effect relations.

Future research also might examine the effect that recent trends and innovations in information technology have on judgment and decision-making (see, e.g., Mauldin & Ruchala, 1999). For example, the use of sophisticated information technology can affect the manner in which cost data are classified (direct vs. indirect), the frequency and timing of feedback, and the verifiability (credibility) of information. Thus, information technology can alter the amount, type, and quality of information available to decision makers and has the potential to significantly influence judgment and decision performance.

4. Interdependence of Decision-Influencing and Decision-Facilitating Roles of Managerial Accounting Information

The decision-influencing and decision-facilitating roles of managerial accounting information are not necessarily disjoint. A single information system, managerial accounting practice, or piece of information can be used for both decision-influencing purposes and decision-facilitating purposes. Consider, for example, a manager who makes a production quantity decision in each of several periods and has diffuse priors about product demand. In this setting, realized profit information has a belief revision use and a contracting use. First, the realized profit signal allows the manager to update beliefs regarding the expected profit of future output decisions (i.e., learn about demand). Second, the realized profit signal is useful for incentive-contracting purposes because it provides information about the manager's output (action) choice. Notice, though, that the manager's propensity to use the realized profit information to achieve high performance on the task is likely to be affected by the manner in which the realized profit information is used for contracting purposes.

Analogously, standard costs are used to facilitate several decisions within the firm such as pricing and bidding, production, resource allocation, and causal diagnosis (e.g., variance investigation). Standard costs also are employed as benchmarks for performance evaluation, and firms frequently attempt to motivate employees to control costs by linking rewards to standard attainment. Thus, variance information from a firm's standard costing system may be decision-facilitating with regard to a manager's variance investigation decision, but decision-influencing with regard to the employee responsible for meeting the standard.

These examples illustrate the interdependent nature of the decision-influencing and decision-facilitating uses of managerial accounting information. Data may relate to both uses simultaneously and, as illustrated above, information that is decision-influencing for one party may be decision-facilitating for another party. More generally, questions regarding decision-making and motivation frequently are not orthogonal. Despite such interdependencies, prior experimental research tends to examine the decision-influencing and decision-facilitating uses of managerial accounting information separately (Waller, 1995). Only a few studies provide evidence regarding the interaction of managerial accounting's decision-influencing and decision-facilitating effects.

Perhaps the first study of this ilk was Magee & Dickhaut (1978) who found that individuals' use of cost variance information in their investigation decisions differed depending on the compensation plan. Other research in this area tends to be much more recent. For example, Sprinkle (2000) found that compared to flat-wage contracts, performance-based contracts are more likely to promote the most effective use of feedback information and enhance the rate of learning (improvements in performance). In a similar vein, research demonstrates that providing employees a modest financial incentive or making them more accountable for their decisions increased information cue usage, thereby mitigating information overload and increasing task performance (Libby et al., 2004; Tuttle & Burton, 1999). Finally, Drake et al. (1999) found that the benefit of providing detailed activity-based costing information was inextricably linked to the firm's incentive compensation system. Compared to a volume-based costing system, activity-based costing information led to increased profits when experimental participants worked under a group incentive (profit-sharing). When experimental participants worked under a tournament-based incentive, the opposite occurred—primarily because participants used the activity-based costing information to improve

their own performance rather than co-ordinate and improve group (firm) performance (see also Ravenscroft & Haka, 1996).

Further, research suggests that expanding employee decision-making can have opposing effects on the efficacy of incentive systems. On the one hand, Williamson (2005) found that expanding employee decision-making can enhance the ability of incentive systems based on a non-contractible performance measure to motivate the most effective use of employees' private information. On the other hand, Bloomfield & Luft (2005) found that assigning employees the responsibility for making cost management decisions impeded their ability to effectively use market feedback information when making pricing decisions with biased product cost information.

Collectively, this research provides valuable insights regarding the complementary nature of managerial accounting practices, and suggests that compensation contracts must be appropriately structured to ensure that the information provided for decision-facilitating purposes is fully utilized to enhance firm value. Research in this area could examine whether certain social motives, values, or the mere act of evaluating performance have similar complementary effects. Additional research in this area also might explore a prediction of agency theory that it is not always economically optimal to provide individuals with private decision-facilitating information because they may use it to shirk (see, e.g., Baiman & Sivaramakrishnan, 1991).

Researchers might also further explore the simultaneous use of a particular managerial accounting procedure for decision-influencing and decision-facilitating purposes. For instance, budgets are one of the most widely used tools for planning (e.g., allocating resources) and controlling (e.g., evaluating performance) operations, and organizations frequently use the same budget for both purposes (Horngren et al., 2003; Umapathy, 1987). This use of budgets for both decision-influencing and decision-facilitating purposes can create tension in the budget desired by an employee. Specifically, the use of budgets for performance-evaluation purposes provides employees with an incentive to create budgetary slack. Thus, if a manager in charge of production is evaluated based on a comparison of actual production to budgeted production, the manager has an incentive to understate production capability during budget negotiations. In contrast, when budgets also are used to allocate resources at the planning stage, employees have an incentive to eliminate slack. Managers who propose budgets with excessive slack may appear inefficient and therefore may receive fewer resources needed for production than other managers who submit budgets with less slack. Thus, planning and control incentives can have opposite implications for employees.[40]

Recent experimental research in managerial accounting examines whether the use of an individual's budget proposal to determine the allocation of scarce resources mitigates individuals' tendencies to include slack in the budget to achieve a better *ex post* performance evaluation (Fisher et al., 2002). This research finds that the use of budgets for planning and control purposes can endogenously provide countervailing incentives that reduce (eliminate) employees' misrepresentations of their private information and lead to correspondingly higher budgets with less slack, and higher performance. Such research is important because it provides insights regarding why companies rarely use ''truth-inducing'' compensation schemes (e.g., Weitzman, 1976) and instead evaluate managers' actual performance relative to a budget (Umapathy, 1987). Additionally, these findings demonstrate that the efficacy of managerial accounting practices such as budgeting is perhaps best understood when the two roles of managerial accounting information are considered concurrently. So, rather than being an opportunity for inserting slack, participative budgeting may indeed lead to the truthful revelation of private information, improved information sharing, and higher performance. Capital rationing inefficiencies arising from concerns related to slack creation possibly are mitigated when a single budget forms the basis for resource allocation and performance evaluation.

Finally, it is important to recognize that there oftentimes are tradeoffs between using managerial accounting systems for decision-making and motivation. Invariably, a managerial accounting system cannot be designed to perform both uses as well as a system that need only perform one use (Baiman, 1982). This suggests the need for researchers to adopt a more holistic view regarding studying, for example, the effect of alternative costing systems on individual or group behavior. Moreover, comparing the efficacy of variable costing systems and absorption costing

[40]In certain situations, planning and control incentives appear to reinforce each other. For example, a manager of a cost center may pad the budget in an attempt to garner more resources. Further, by padding the budget, it likely will be easier for the manager to ensure that actual expenditures do not exceed budgeted expenditures. However, by padding the budget, it also is possible that the manager will appear to be inefficient and, as a result, receive fewer resources.

systems in facilitating pricing decisions may only shed light on one piece of the puzzle. To better understand the value of a particular costing system, it also is important to understand its ability to solve motivational problems within the firm.

For example, compared to variable costing systems, absorption (full) costing systems incorporate an opportunity cost of capacity and also better-highlight the costs associated with capacity resources. Thus, absorption costing systems may facilitate cost management decisions and the allocation of scarce resources within the firm (Zimmerman, 2003).[41] On the other hand, absorption costing systems may engender a loss of control because they create incentives for managers to produce for inventory.

Similar tradeoffs exist under activity-based costing systems. Specifically, compared to single-pool systems, multiple-pool (e.g., activity-based) costing systems are posited to provide more accurate cost data and improve decision-making and cost management. However, multiple-pool costing systems may engender a significant loss of control and ability to monitor behavior since managers have considerable discretion in choosing cost drivers. Such a loss of control can occur because managers exercise greater influence over the number of pools formed and what drivers are used, thereby enabling them to manipulate their performance measures.[42]

In summary, managerial accounting information and procedures are used for both decision-influencing purposes and decision-facilitating purposes. Further, the two roles for managerial accounting information frequently are not independent. In some instances, the two roles complement each other in the sense that the use of information for one purpose (e.g., contracting) enhances the use of information for another purpose (e.g., decision-making). In other instances, there are tradeoffs and managerial accounting procedures that might promote better decision-making but sacrifice some control (or vice-versa). In either situation, though, it is important for researchers to recognize the potential for these interactive effects because the ultimate value of any particular managerial accounting practice depends on the array of benefits and costs vis-à-vis other procedures. Again, the experimentalist has a comparative advantage in isolating the conditions under which these benefits and costs materialize and in pinpointing the underlying cause–effect relations.

5. Conclusions

In this paper, we discuss the importance of using experimental methods in managerial accounting research. We also provide a framework for understanding and assessing the contributions of experimental research in managerial accounting. We then use this framework to organize and evaluate the existing experimental managerial accounting research. Finally, based on our survey and synthesis of the literature, we identify and discuss a number of important unanswered managerial accounting questions that may best be answered using experimental methods.

At a fundamental level, managerial accounting information serves two critical roles in an organization: decision-influencing and decision-facilitating. In its decision-influencing role, managerial accounting information is used to mitigate organizational control problems associated with moral hazard and adverse selection. In its decision-facilitating role, managerial accounting information is used to resolve *ex ante* uncertainty and improve judgment and decision performance within an organization.

Consequently, managerial accounting practices are employed to motivate employees to exert effort and undertake actions that maximize firm value. Such procedures center around monitoring and evaluating employee actions and performance as well as rewarding employees for generating more profits. Managerial accounting practices also are employed to increase employees' knowledge and, thus, their ability to make organizationally desirable judgments and decisions. Such procedures center around supplying employees with the best information for a particular decision.

Prior experimental research is quite informative regarding the extent to which managerial accounting information and practices both elicit desired actions from employees and improve judgment and decision performance. For example, prior research informs us that budgets and standards are useful in extracting private information from employees and in motivating increased levels of effort and performance. Prior research also informs us that variations in managerial accounting measurement and reporting methods (e.g., type of product costing system, frequency of

[41]Variable costing systems, though, may provide more relevant information for other economic decisions such as those related to a short-term special order or outsourcing. There is an ongoing debate regarding whether fixed-cost allocations, as under absorption costing, facilitate planning and pricing decisions (see, e.g., Balakrishnan & Sivaramakrishnan, 2001).

[42]This is only a partial list of the tradeoffs. For example, Zimmerman (2003) discusses the importance of minimizing "confusion costs" that can arise from using one costing system for internal reporting and another cost system for external reporting.

feedback) can have significant effects on the quality of economic judgments and decisions. Additionally, research consistently documents that there are a number of individual, task, and environmental factors that interact with managerial accounting practices in determining their benefits for motivational and decision-making purposes.

There are, though, a number of unanswered questions in managerial accounting, providing significant opportunities for future research. In particular, there are a number of unresolved issues regarding the most effective and efficient manner in which to motivate, evaluate, and reward both individuals and workgroups (teams). Other fruitful avenues for future research relate to understanding how socially mediated rewards and ethical concerns combine with formal managerial accounting procedures to resolve control problems within an organization. On the decision-facilitating side, it is important for research to examine whether and how recent trends and innovations in performance measurement actually affect the manner in which performance is evaluated and assessed. Additionally, much research is needed regarding how the multi-person, multi-period, and expertise issues that underlie many managerial decisions affect the provision and use of information for belief revision purposes. Finally, managerial accounting procedures and information frequently are used for both decision-influencing purposes and decision-facilitating purposes. In many instances the two uses of managerial accounting information are not independent, and we suggest several possibilities for investigating their interactive effects.

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Doing Management Accounting Survey Research

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Abstract: This chapter addresses the quality of survey research in management accounting. Specifically, we use a framework containing the five key elements of a well-designed survey to assess the quality of all mail surveys in management accounting published in eight accounting journals over a 20-year period (1982–2001). Our analysis shows that survey research in management accounting has improved over time. However, more attention to improving the ways in which the survey method is deployed is essential if credibility of the data is desired.

1. Introduction

Surveys are the most heavily criticized research method employed by management accounting researchers with the central concern being the reliability of the data obtained (Young, 1996). This criticism is noteworthy, since over the past 20 years, 30% of all published empirical management accounting research has used the mail survey method.[1]

Previous studies on the use of the survey method in management accounting have identified a central weakness—the failure on the part of many studies to adhere to the fundamental principles of survey design and administration (Mangione, 1995). If surveys are constructed and administered appropriately, then they can be a source of large-scale, high-quality data (Diamond, 2000; Dillman, 1978, 1999). The key issue with the survey method, then, centers more on how it is deployed, rather than with the method itself.

The purpose of this chapter is to review the evidence on the quality of survey data in management accounting research with the goal of providing insights to improve the use of the survey method. Specifically, we use a framework containing the five key elements of a well-designed survey to assess the quality of all mail surveys in management accounting published in eight accounting journals over a 20-year period (1982–2001). We address such issues as how sampling is conducted, how surveys are designed and administered, and how specific "norms" within survey research in management accounting have perpetuated. The framework has been used previously by judges to determine the efficacy of surveys offered as evidence in court under *Federal Rule of Evidence 703* (Diamond, 2000). The central point is that whether evidence is acceptable depends not upon the method *per se*, but upon how well the method is used. Throughout the chapter, we provide recommendations to improve the quality and elevate the status of

[1]We determine this by counting all empirical management accounting studies that employ the mail survey method published in *Accounting, Organizations and Society*, *Behavioral Research in Accounting*, *Contemporary Accounting Research*, *Journal of Accounting and Economics, Journal of Accounting Research, Journal of Management Accounting Research*, *Management Accounting Research*, and *The Accounting Review* from 1982 to 2001, and then divide this number by the total number of empirical management accounting studies in said journals during the same period. We define *management accounting research* consistent with Foster and Young (1997) as "the process of using rigorous methods to explain and predict (1) how changes to an existing management accounting system will affect management actions, motivation, and organizational functioning, and (2) how internal and external organizational forces will affect management accounting system design and change" (p. 64). We define *empirical* studies consistent with Birnberg et al. (1990) as studies that rely on data, including archival studies, surveys, field studies, and lab experiments, but excluding analytical studies and computer simulations (p. 33). Finally, we focus on *mail* surveys, which we hereafter refer to as *surveys* for ease of exposition.

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survey evidence in addressing management accounting questions.

In management accounting research, surveys are most commonly employed for theory testing, but some are used for descriptive purposes. While the survey method often evokes controversy (Young, 1996; Zimmerman, 2001a), even critics of the method recognize the power that collective opinions have on the behavior and functioning of individuals, organizations, and society. For example, despite criticism about the quality of their instruments, business school surveys of students and recruiters by the business press (e.g., *Business Week*, *US News and World Report*, *The Financial Times*, *The Wall Street Journal*) have had an enormous impact on the behavior of business school administrators, staff, faculty, students, and other constituents (Zimmerman, 2001b). Further, census takers, political opinion makers, and television raters all use survey data. In short, surveys form a central role in shaping everyday opinions.

Why then are surveys so controversial? Mangione (1995: pp. 2–3) sums it up as follows:

> The world is filled with examples of poor quality mail surveys. Mail surveys are seductive in their apparent simplicity—type up some questions, reproduce them, address them to respondents, wait for returns to come in, and then analyze the answers. Any survey process, however, contains many important steps that need to be considered carefully and carried out in a particular sequence. Not knowing what these steps are leaves you vulnerable to producing a poor quality product. There are many reasons that people get pushed into doing poor quality work. Certainly time pressure is one reason, but perhaps the biggest cause is ignorance—not knowing the negative consequences of a decision.

There is no doubt that "data collected from [poor quality] surveys suffer from well-known problems such as response and surveyor biases" (Zimmerman, 2001a: p. 420, brackets added). However, researchers can employ several techniques to curtail these problems. For example, some researchers attempt to improve survey construction by developing the "right" questions and their wording for a given purpose. Others try to increase response rates by determining when follow-up letters should be sent, how to entice respondents to fill out a questionnaire, and how to obtain representative samples from a target population. Using our framework, we discuss these and other ways to improve the quality of survey data in Section 4.

2. The Framework

While several frameworks are available for analyzing survey research—such as the Dillman (1978, 1999) or Cook & Campbell (1979) frameworks—the legal framework (Diamond, 2000; Federal Rules of Evidence, 1971) that we adopt in this chapter has the following features. First, calls for using judicial standards for guiding survey research have been made for similar purposes as ours in other literatures, such as marketing (Morgan, 1990; Smith et al., 1983). Second, and more importantly, the legal framework provides a stringent standard for survey research, that is, whether the survey evidence is admissible in court. Quoting Morgan (1990), "the adversarial nature of a trial exposes the survey researcher to a very hostile environment, making anonymous journal reviewers seem very supportive in comparison" (p. 68).

Thus, consistent with Diamond's (2000) framework, we use five general categories: (1) purpose and design of the survey, (2) population definition and sampling, (3) survey questions and other research method issues, (4) accuracy of data entry, and (5) disclosure and reporting. We have adopted the general categories and many of the sub-categories within this framework, but we do deviate when specific elements refer only to legal or procedural matters.

First, the *purpose* of a survey determines the use of survey data and drives decisions regarding survey *design*. A well-designed survey should be conducted with a specific research objective in mind to avoid the inappropriate selection of samples of respondents and the use of misguided or irrelevant questions. In the main section of this chapter, we analyze issues of *research design* and *level of analysis* in this category. Second, *population definition* and *sample selection* determine whether valid inferences can be drawn from the characteristics of the sample and whom the inferences can be drawn about. The extent to which this can be done with confidence also depends on the sample size and the response rate. Thus, in this category, we analyze issues related to *survey population*, *response rate*, and *sample size*. Third, *survey questions* and other *research method issues* focus on design (internal) validity, that is, the extent to which a survey study provides evidence regarding the theories being tested. In this category, we describe *pre-test procedures*, *follow-up procedures*, *non-response bias*, and *types of dependent measures*. Fourth, *accuracy of data entry* involves determining the procedures for data entry, checks for completeness, checks for reliability and accuracy, and rules for resolving inconsistencies. We do not discuss *accuracy of data entry* in this

chapter because the framework merely provides procedural guidelines related to careful data handling, coding, and documentation, which we consider a baseline requirement for any type of research. Finally, *disclosure and reporting* focuses on describing what research procedures were used and how data were collected and presented. In this category, we describe survey data disclosure practices in management accounting.

Using this framework and its categories and sub-categories, we analyze survey research in management accounting over the past 20 years. We describe the dataset in the next section followed by analyses across the major categories of the framework.

3. The Dataset

One hundred and thirty studies using the survey method were published in *Accounting, Organizations and Society* (AOS), *Behavioral Research in Accounting* (BRIA), *Contemporary Accounting Research* (CAR), *Journal of Accounting and Economics* 7(JAE), *Journal of Accounting Research* (JAR), *Journal of Management Accounting Research* (JMAR), *Management Accounting Research* (MAR), and *The Accounting Review* (TAR) during the period 1982–2001.[2]

Table 1 shows the number of empirical management accounting studies by journal during the period 1982–2001, as well as by the two decades comprising this 20-year period. It also shows the number and proportion of survey studies by journal and by period. As a percentage of the total number of empirical management accounting studies published in each journal, *AOS* has the highest proportion of survey studies followed by *JMAR* and *BRIA*. *JAE* and *TAR* have the lowest proportion.

Splitting the 20-year period into two decades shows an increase in the use of surveys over the past 10 years. The number of surveys in our sample is 44 in the first 10-year period (1982–1991) and 86 in the 1992–2001 period, indicating an almost 100% increase. The increase, however, is due to the entry of three new journals (*BRIA*, *JMAR*, and *MAR*) since 1989. Two of these journals focus exclusively on management accounting research (*JMAR* and *MAR*). Excluding these three journals shows that the number of management accounting articles that use the survey method is approximately the same across both decades (37 vs. 39). As Table 1 shows, the number and proportion of survey-based articles in management accounting in *AOS* increased during this period, and decreased in *CAR*, *JAE*, *JAR*, and *TAR*. The last management accounting article that used the survey method in *CAR* was in 1988; 1990 in *JAR*; 1993 in *TAR*; and 1997 in *JAE*.

Exhibit 1 lists the articles chronologically by journal and records the characteristics for each study discussed previously: (1) survey population, (2) response rate and sample size, (3) pre-test procedures, (4) follow-up procedures, (5) non-response bias analysis, and (6) types of dependent measures. We use these data, as well as other untabulated data in Exhibit 1, in our analysis of the issues bearing on the quality of survey research in management accounting.

4. Applying the Framework to the Data

4.1. Purpose and Design of the Survey

The legal framework requires that any survey should include a statement describing the purpose of the survey (Diamond, 2000). Survey research can be used for two main purposes: description and explanation (Groves, 1989; Pinsonneault & Kraemer, 1993; Sudman & Blair, 1999). Descriptive studies are designed to discover characteristics of a given population, not to test theory. The purpose of survey research used for explanation is to test theory that states the expected causal relationships among a set of variables (Pinsonneault & Kraemer, 1993; Sapsford, 1999).

Both types of survey research have been conducted in management accounting, but theory testing is by far the dominant form (116 [89%] of the 130 articles in our sample). The few descriptive surveys typically tabulate (trends and variations in) management accounting practices across organizations (e.g., Chenhall

[2]We exclude four types of survey-type studies: (1) third-party surveys (e.g., Ittner & Larcker, 1995, 1997); (2) surveys as part of, or in combination with, the case method (e.g., Berry et al., 1991), lab experiments (e.g., Brownell, 1982a), or interview-protocols (e.g., Chenhall, 1997); (3) surveys administered (during) on-site (interviews) (e.g., Brownell, 1982b) or in class settings (with students) (e.g., Hirst, 1983); and (4) surveys administered face-to-face (e.g., McGowan & Klammer, 1997) or by phone (e.g., Swenson, 1995). We exclude these studies because they do not use the mail survey methods that we discuss, and thus are not comparable. Further, they are few in number compared to mail surveys. These variants of the survey method, however, should undergo the same scrutiny as "traditional" mail surveys. For example, there is no reason why researchers using third-party surveys should be allowed to neglect methodological issues simply because the survey was done by somebody else, even though the researchers typically have no control over the design and administration of the surveys.

Table 1. Percentage of survey studies among all empirical management accounting studies in eight accounting journals in the period 1982–2001 (with a breakdown in the two decades comprising the 20-year period).

Journal	Number of Empirical Management Accounting Studies			Number of Survey Studies in Management Accounting			Percent Survey Studies of all Empirical Management Accounting Studies		
	1982–2001	1982–1991	1992–2001	1982–2001	1982–1991	1992–2001	1982–2001	1982–1991	1992–2001
AOS	138	64	74	60	24	36	43.5%	37.5%	48.7%
BRIA	22	0	22	8	0	8	36.4%	N/A	36.4%
CAR	13	6	7	3	3	0	23.1%	50.0%	0
JAE	33	8	25	2	1	1	6.1%	12.5%	4.0%
JAR	28	18	10	5	5	0	17.9%	27.8%	0
JMAR	55	12	43	21	4	17	37.5%	33.3%	39.5%
MAR	100	9	91	25	3	22	25.0%	33.3%	24.2%
TAR	50	21	29	6	4	2	12.0%	19.0%	6.9%
Total	439	138	301	130	44	86	29.6%	31.9%	28.6%

Exhibit 1. Two decades of survey studies in management accounting.

	Survey Population	Response Rate	Pre-Test of Instrument	Follow-Up Procedures	Non-Response Analysis	Type of Dependent Measures
Panel A. *Accounting, Organizations and Society (AOS) [1982–2001].*						
Aranya et al. (1982)	2,626 chartered accountants across firms in Canada	1,206/2,626 = 47%	No	No	No	Self-rating of job satisfaction
Seiler & Bartlett (1982)	154 operating executives across 18 manufacturing firms in the US	97/154 = 63%	No	Yes	No	Self-rating of attitudes towards budgets
Brownell (1983a)	48 middle-level cost-center managers in one large manufacturing company	Not reported	No	No	No	Self-rating of performance and job satisfaction
Govindarajan (1984a)	70 business unit managers across 8 *Fortune 500* multi-divisional firms in the US	58/70 = 83%	Yes	No	No	Self-rating of performance evaluation style
Govindarajan (1984b)	100 corporate controllers across top 100 of the *Fortune 500* companies	50/100 = 50%	No	No	No	Self-rating of the corporate controller's formal authority over the division controller
Merchant (1984)	201 managers across 19 firms in the electronics industry	170/201 = 85%	No	Yes	No	Self-rating of organizational performance and budget-related behaviors
Rockness & Shields (1984)	113 first-line R&D supervisors or work group heads across 10 organizations in the US (8 private for-profit, 1 government, and 1 private not-for-profit)	76/113 = 67%	No	No	No (not possible)	Self-report of perceived importance of input and output controls
Merchant (1985a)	62 profit center managers in one large firm	59/62 = 95%	No	Yes	No	Self-rating of performance
Govindarajan & Gupta (1985)	70 business unit managers across 8 *Fortune 500* multi-divisional firms in the US	58/70 = 83%	No	No, but mentioned	No	Self-rating of performance
Merchant (1985b)	201 managers across 19 firms in the electronics industry	170/201 = 85%	No	Yes	No	Self-rating of slack propensity
Schweikart (1986)	164 managers in one large multinational organization	152/164 = 93%	No	No	No	Self-reports on information use and business environment
Giroux et al. (1986)	204 city managers across six cities	120/204 = 59%	No	No	No	Self-rating of influence

Exhibit 1. (*Continued*)

Simons (1987)	261 CEOs across Canadian manufacturing firms in 38 industries	171/261 = 66%	Yes	No	No	Self-reports on control system attributes
Chenhall & Brownell (1988)	36 middle managers within one large manufacturing firm	33/36 = 92%	No	No	No	Self-rating of performance
Birnberg & Snodgrass (1988)	1,051 managers and workers across 22 large manufacturing firms in the US and Japan	Not reported or unknown by researchers	Yes	No	No	Self-rating of controls
Mia (1988)	115 middle- and lower-level managers across various functional areas within one company in Australia	83/115 = 72%	No	No	No	Superior's ratings of performance
Dunk (1989)	30 production managers across industries in Britain	26/30 = 87%	No	No	No	Self-rating of performance
Imoisili (1989)	188 cost center managers across three manufacturing firms	102/188 = 54%	Yes	No	No	Self-rating of performance
Dunk (1990)	30 production managers across industries in Britain	26/30 = 87%	No	No	No	Self-rating of performance
Merchant (1990)	62 profit center managers within one manufacturing firm	54/62 = 87%	No	Yes	No	Self-rating of control system variables
Hirst & Lowy (1990)	58 senior managers within one property development firm	44/58 = 76%	No	No	No	Self-rating of budget goal attainment
Abernethy & Stoelwinder (1991)	203 sub-unit managers within four large Australian hospitals	192/203 = 95%	No	No	No	Self-rating of performance
Daniel & Reitsperger (1991)	459 manufacturing managers across 26 Japanese consumer electronics firms	Not reported	No	No	No	Self-rating of control system variables
Brownell & Dunk (1991)	118 managers in 61 firms across industries in Australia	79/118 = 67%	No	No	No	Self-rating of performance
Jaworski & Young (1992)	479 marketing executives across firms	379/479 = 79%	Yes	Yes	No	Self-rating of dysfunctional behavior
Dunk (1992)	30 production managers across industries in Britain	26/30 = 87%	No	No	No	Self-rating of departmental performance

Harrison (1992)	279 retail managers across firms in Singapore and Australia	211/279 = 76%	No	No	No	Self-rating of job related tension and satisfaction
Harrison (1993)	279 retail managers across firms in Singapore and Australia	211/279 = 76%	No	No	No	Self-rating of job-related tension and satisfaction
Dunk (1993a)	118 manufacturing managers across firms in Australia	79/118 = 66%	No	No	No	Self-rating of performance
Gul & Chia (1994)	100 managers across telecommunication firms in Singapore	48/100 = 48%	No	No	No	Self-rating of performance
Ross (1994)	308 managers across 18 Australian organizations	215/308 = 70%	No	No	No	Self-rating of job-related tension
Abernethy & Stoelwinder (1995)	100 physician and nurse sub-unit managers in one large hospital in Australia	91/100 = 91%	Yes	No	No	Self-rating of sub-unit performance, role conflict, and job satisfaction
Lau et al. (1995)	240 functional heads of manufacturing firms across 80 firms in Singapore	112/240 = 47%	No	Yes	Yes	Self-rating of performance
O'Connor (1995)	282 Singaporean managers across 62 manufacturing firms in Singapore	125/282 = 44%	No	Yes	No	Self-rating of power distance and other behavioral variables
Magner et al. (1995)	56 diverse manager-participants from all over the world in a 10-week executive program for international managers	53/56 = 95%	No	No	No	Self-rating of attitude towards supervisor and organization
Firth (1996)	1,254 CFOs across Chinese firms involved in joint ventures with foreign firms	361/1,254 = 29%	No	No	Yes	Self-rating of changes to management accounting systems
Chow et al. (1996)	61 US profit center managers and 37 Japanese division managers in one large US and one large Japanese manufacturing firm	58/61 US; 29/37 Japan (87/98 = 89%)	No	No	No	Self-ratings of control tightness and dysfunctional effects
Fisher (1996)	143 managers across nine different industry groups in Tasmania	98/143 = 69%	No	No	No	Self-ratings of scope and timeliness of information
Chong (1996)	78 senior managers of manufacturing companies across firms in Western Australia	42/78 = 54%	No	No	Yes	Self-rating of performance

Exhibit 1. (*Continued*)

Gosselin (1997)	415 SBUs across manufacturing firms in Canada	161/415 = 39%	Yes	Yes	Yes	Self-rating of adoption of activity management and ABC
Abernethy & Brownell (1997)	150 senior research officers in one large R&D division of an Australian company	127/150 = 85%	No	No	No	Self-rating of performance
Perera et al. (1997)	200 managers across manufacturing firms in Sydney, Australia	105/200 = 53%	No	No	No	Self-rating of performance
Shields & Shields (1998)	75 manager-participants in an EMBA program	60/75 = 80%	No	No	No	None
Chenhall & Langfield-Smith (1998b)	140 senior financial executives across manufacturing firms in Australia	78/140 = 56%	Yes	Yes	Yes	Self-rating of performance
Nouri & Parker (1998)	203 managers in one large multinational company	135/203 = 67%	No	No	No	Self-rating of performance
Kalagnanam & Lindsay (1999)	1,580 plant managers across Canadian firms	197/1,580 = 13%	No	Yes	Yes	Self-rating of types of control
Vandenbosch (1999)	612 (not clear who the respondents are) across 18 companies (3 in the US and 15 in Canada)	344/612 = 56%	Yes	No	Yes	Self-rating of the usefulness of executive support systems
Scott & Tiessen (1999)	583 persons in managerial positions or in positions with significant responsibility across12 for-profit and 15 not-for-profit organizations across industries	248/583 = 43%	Yes	No	No	Self-rating of team performance measures
Chow et al. (1999b)	391 Taiwanese managers across six Japanese, Taiwanese, and US-owned firms	159/391 = 41%	No	No	No	Self-ratings of types of control
Chow et al. (1999a)	102 middle-level managers across Taiwanese and Australian companies	Not reported	No	No	No	Self-rating of cultural factors involving face-to-face interactions with superiors
Guilding (1999)	217 chief accountants across 230 large New Zealand companies	112/217 = 52%	No	Yes	Yes	Self-rating of competitor-focused accounting methods

Malmi (1999)	1,240 employees in various industries across companies in Finland; four surveys in total	490/1,240 = 40%	No	No	Yes	Descriptive statistics only
Davila (2000)	73 project managers across 11 companies	56/73 = 77%	Yes	No	No	Self-rating of performance
Otley & Pollanen (2000)	176 Senior administrators across 35 universities in Canada	127/176 = 72%	No	Yes	No	Self-rating of performance and satisfaction
Vagneur & Peiperl (2000)	82 managers across 28 British-based business units of 210 international companies	66/82 = 80%	No	No	No	Objective and self-rated measures of performance
Van der Stede (2000)	341 business unit general managers across 37 Belgian companies	153/341 = 45%	Yes	Yes	Yes	Objective and self-rated measures of performance
Stone et al. (2000)	5,932 management accountants across three industries	2,941/5,932 = 50%	No	No	Yes	Test for degree of management accounting knowledge
Hunton et al. (2000)	5,932 management accountants across three industries	2,941/5,932 = 50%	No	No	Yes	Test for degree of management accounting knowledge
Moores & Yuen (2001)	338 CEOs across 600 companies in clothing and footwear in Australia	49/338 = 15%	No	No	Yes	Self-reports of organizational effectiveness
Williams & Seaman (2001)	206 personnel directors or CEOs across 206 firms in Australia	93/206 = 45%	No	Yes	Yes	Self-reports of change in management accounting and control systems
Panel B. *Behavioral Research in Accounting (BRIA) [1989–2001].*						
Macintosh & Williams (1992)	278 managers across 22 public sector firms	201/278 = 72%	No	No	No	Self-rating of performance
Chenhall & Morris (1993)	85 manufacturing managers across firms	Not reported	Yes	No	No	Self-rating of performance
Collins et al. (1995)	344 non-supervisory employees in one religious charitable organization	172/344 = 50%	Yes	No	Yes	Self-rating of organizational commitment
Nouri & Parker (1996)	23 planning committee members and 180 managers in one large multinational firm	135/203 = 67%	No	No	No	Self-rating of slack propensity

Exhibit 1. (*Continued*)

Choo & Tan (1997)	156 managers across 10 firms in the US	110/156 = 71%	No	No	No	Self-rating of job-related tension, job satisfaction, and performance
Comerford & Abernethy (1999)	100 physician and nurse managers in one large public teaching hospital in Australia	88/100 = 88%	No	No	No	Self-rating of goal conflict
Chalos & Poon (2000)	190 project managers across 55 project teams in a large multinational firm in the US	177/190 = 93%	No	No	No	Self-rating of performance
Clinton & Hunton (2001)	1,710 accounting personnel across 386 public companies in diverse industries	386/1710 = 23%	No	No	No	Self-reported financial measures (percent change in net income, stock price, and ROI) and self-rating of performance
Panel C. *Contemporary Accounting Research (CAR) [1984–2001].*						
Covaleski et al. (1987)	Corporate managers randomly selected from the Midwest chapter of the Financial Executives Institute (FEI) electronics industry listings; And, independent auditors with electronics auditing experience selected by partners in Big-8 CPA firms (non-random)	Managers: 60/496 = 12% Auditors: 84/150 = 84% Total: 144/646 = 22%	Yes	No	Yes	Perceptions of the impact of financial accounting information on managerial decision making
Rockness & Shields (1988)	113 first-line R&D supervisors or work group heads across 10 organizations in the US (8 private for-profit, 1 government, and 1 private not-for-profit)	76/113 = 67%	No	No	No (not possible)	Self-reports of the perceived importance of expenditure budget controls
Simons (1988)	108 senior managers across Canadian manufacturing firms in 19 industries	86/108 = 80%	No	No	No	Self-reports of control system attributes and firm performance

Panel D. *Journal of Accounting and Economics (JAE) [1982–2001].*						
Foster & Gupta (1990)	(Type of respondent not reported) Across 38 facilities of a US manufacturing firm	37/38 = 97%	No	No	No	Cost driver data
Keating (1997)	175 division managers across 175 firms with three or more domestic divisions	78/175 = 45%	No	No	Yes	Self-report of which of three types of performance metrics are used to evaluate division managers
Panel E. *Journal of Accounting Research (JAR) [1982–2001].*						
Brownell (1983b)	224 middle-level managers, but not reported from which population	122/224 = 55%	No	No	No	Self-rating of motivation
Brownell (1985)	60 R&D professionals and 60 marketing professionals in one large multinational electronics and computer firm	61/120 = 51% (21 R&D and 40 marketing respondents)	No	No	No	Self-rating of performance
Brownell (1986)	90 line managers in one large manufacturing firm in Australia	76/90 = 84%	No	No	No	Self-rating of performance and job-related tension
Evans & Patton (1987)	650 city CFOs across 650 US cities	444/650 = 68%	Not reported	Not reported	Yes	N/A (Surveys were used to gather independent information)
Brownell & Merchant (1990)	201 production managers across 19 electronic firms	146/201 = 73%	No	No	No	Self-rating of departmental performance
Panel F. *Journal of Management Accounting Research (JMAR) [1989–2001].*						
Duncan & Moores (1989)	210 CEOs in New Zealand firms across industries	145/210 = 69%	No	No	No	Financial measures
Aranya (1990)	223 franchise managers in one large retail drug company	100/223 = 44.8%	Yes	No	No, but mentioned	Financial measures
Borkowski (1990)	452 controllers across manufacturing firms (*Fortune 500*, *Business Week 1000*)	236/452 = 47%	Yes	Yes	Yes	Self-report of transfer pricing method
Klammer et al. (1991)	500 CFOs across large industrial companies	100/500 = 20%	No	Yes	Yes	N/A
Daniel & Reitsperger (1992)	16,724 US and Japanese production managers across manufacturers in the US and Japan	1,468/16,724 = 9%	No	No	No	Self-reports of goal and feedback information

Exhibit 1. (*Continued*)

Kaplan & Mackey (1992)	120 Canadian production managers across industries	47/120 = 9%	No	No	No	Self-reports of purposes of cost information
Pierce & Tsay (1992)	400 controllers of *Fortune 500* firms in two surveys across industries	95/200 = 48% 73/200 = 37%	No	No	No	Self-reports of post completion audit practices
Weisenfeld & Killough (1992)	88 plant managers across two companies in furniture manufacturing	Not reported	No	No	No	Self-rating of performance
Shields & Young (1993)	487 controllers across firms in the *S&P 500*	98/487 = 20%	No	No	No	Self-rating of firm-wide performance
Young & Selto (1993)	507 production workers within one large manufacturing firm	387/507 = 76%	Yes	No	No	Quantitative measures of performance
Foster & Gupta (1994)	220 marketing managers and controllers across industries in Australia, Canada, UK, and US	50/220 = 23%	No	No	No	Descriptions of practice
Shields & Young (1994)	285 R&D professionals across 4 firms in the chemicals industry	160/285 = 56%	No	No	No	Self-reports of cost consciousness
Shields (1995)	143 accounting managers, controllers, CFOs, and VPs of Finance across 143 firms	Not reported	No	No	No	Self-reports of ABC success
Foster & Sjoblom (1996)	2,000 quality managers and engineers across 2,000 ASQC-members in the electronics industry	232/2,000 = 14%	No	No	No	Self-reports of quality variables
Libby & Waterhouse (1996)	70 controllers across manufacturing firms in Canada	24/70 = 34%	No	No	Yes	Self-reports of the number of changes to the management accounting system
Sangster (1996)	4,238 UK-based members of CIMA across UK firms	1,063/4,238 = 25%	Yes	No	No	Self-ratings of expert systems knowledge
Foster & Swenson (1997)	750 (not clear who the respondents are) across 750 potential ABCM sites	166/750 = 22%	Yes	No	No	Self-reports of ABCM success
Krumweide (1998)	778 manufacturing managers of the cost management group of the Institute of Management Accountants	238/778 = 31%	Yes	Yes	Yes	Self-reports of stage of ABC development

Sim & Killough (1998)	1,500 directors of manufacturing across firms in the US	83/1,500 = 6%	No	Yes	No	Self-ratings of customer and quality performance
Widener & Selto (1999)	600 CFOs across US Compustat firms	83/600 = 14%	Yes	Yes	Yes	Assessment of total outsourced hours
Hoque & James (2000)	188 financial controllers across Australian manufacturing firms	66/188 = 35%	No	Yes	Yes	Self-rating of performance
Panel G. *Management Accounting Research (MAR) [1990–2001].*						
Ezzamel (1990)	186 financial directors across UK companies (*The Times 1000*)	81/186 = 44%	No	No	Yes	Self-reported budget characteristics
Peel et al. (1991)	443 company officials across UK companies (*The Times 1000*)	180/443 = 41%	Yes	Yes	No	Self-reported impact of employee sharing schemes and description of employee communication and participation procedures
Scarbrough et al. (1991)	492 controllers across companies in various manufacturing industries	198/492 = 40%	No	No	No	Description of product costing and inventory valuation; cost analysis and planning; and control and performance evaluation practices
Bright et al. (1992)	5,463 managers across manufacturing firms listed on Kompass and approximately 40 other manufacturers known to the researchers	667/5,463 = 12%	No	No	No	Self-reported cost accounting system revisions; use made of costing techniques and practices; barriers to, and benefits expected from, new costing techniques and practices
Munday (1992)	82 managers across component suppliers to UK firms	27/82 = 33%	No	No	No	Self-reported provision of supplier cost data to buyers and perception of feedback as a consequence of cost data provision
Grinyer & Daing (1993)	300 finance directors across largest UK companies (*The Times 1000*)	88/300 = 29%	No	No	No	Self-reported choice between two projects

Exhibit 1. (*Continued*)

Tani et al. (1994)	703 chief accounting officers across manufacturing firms listed on the Tokyo Stock Exchange	180/703 = 26%	No	No	No	Descriptions of target cost management practices
Ross (1995)	308 responsibility center managers across 18 Australian companies in diverse industries	215/308 = 70%	No	No	No	Self-rated job-related tension
Innes & Mitchell (1995)	1,000 finance and accounting directors, managers, or staff across largest UK companies (*The Times 1000*)	251/1,000 = 25%	No	Yes	Yes	Descriptions of activity-based costing practices
Daniel et al. (1995)	Multiple levels of manufacturing managers (20 surveys per company) across manufacturers in the US (about 700 firms) and Japan (about 200 firms)—no precise target sample numbers reported	789 from 64 US firms (789/14,000 = 6%) and 698 from 50 Japanese firms (698/4,000 = 18%); Total 1,487/18,000 = 8%	Yes	Yes (not systematic)	Yes	Self-rated importance to the manager's promotion of achieving quality goals
Tani (1995)	703 chief accounting officers across manufacturing firms listed on the Tokyo Stock Exchange	180/703 = 26%	No	No	No	Various target costing system design and process variables
Joseph et al. (1996)	1,000 members of the Chartered Institute of Management Accountants across UK industrial and commercial firms	308/1,000 = 31%	Yes	Yes	Yes	Self-rated assessments of the interaction between external reporting, internal accounting, and decision making
Mouritsen (1996)	"About" 800 chief management accountants across the 800 largest Danish firms	370/800 = 46%	No	No	No	Descriptions of various aspects of the accounting department's work
Bjornenak (1997)	132 Norwegian companies (without mention of target respondents) across the large(st) Norwegian manufacturing companies	75/132 = 57%	No (not mentioned)	No (not mentioned)	Yes	Descriptions of activity-based costing adopters

Busby & Pitts (1997)	100 Finance Directors across all firms in the *FT-SE 100* index	44/100 = 44%	No	No	No	Descriptions of capital budgeting decisions
Carr et al. (1997)	200 CEOs (with an option to delegate the survey to another manager) across100 ISO accredited and 100 non-ISO accredited New Zealand manufacturing companies	107/200 = 54%	No	Yes	No	Self-rated implementation of quality management practices
Chenhall & Langfield-Smith (1998a)	140 Australian companies (without mention of target respondents) across manufacturing companies from the *Business Review Weekly* list of Australia's largest firms	78/140 = 56%	Yes	Yes	Yes	Descriptions of the adoption of various management accounting practices
Lau & Tan (1998)	320 middle-level managers (160 from Australia and 120 from Singapore) across 20 financial institutions in Australia and 30 financial institutions in Singapore	Australia: 104/160 = 65%; Singapore: 85/160 = 53%; Total: 189/320 = 59%	No	No	Yes	Self-rating of performance
Abdel-Kader & Dugdale (1998)	466 finance directors across large UK manufacturing firms from the *FAME* database	99/466 = 21%	Yes	Yes	Yes	Descriptions of the investments in various advanced manufacturing practices
Coad (1999)	480 non-CEO members of the Chartered Institute of Management Accountants across UK industrial and commercial firms	190/480 = 40%	Yes	No	No	Self-rated management accountants' goal orientations
Guilding et al. (2000)	1,292 senior accounting officials across large companies in New Zealand (217), UK (155), and the US (920)	About 300/1,292 = 23%	No	Yes	Yes	Descriptions and comparisons of strategic management accounting practices in three countries
Innes et al. (2000)	775 finance or accounting directors, managers, or staff across largest UK companies (*The Times 1000*)	177/775 = 23%	No	Yes	Yes	Descriptions of activity-based costing practices and comparisons with Innes & Mitchell (1995)

Exhibit 1. (*Continued*)

Van der Stede (2001)	341 business unit general managers across 37 Belgian companies	153/341 = 45%	Yes	Yes	Yes	Self-rated budgetary control tightness
Luther & Longden (2001)	1,811 management accountants, broadly defined, across South Africa (1,230) and UK (581) companies	216/1,811 = 12%	Yes	No	No	Descriptions of management accounting practices and drivers of management accounting change
Laitinen (2001)	859 managing directors across small Finnish manufacturing and service firms with reported R&D expenditures	93/859 = 11%	No	No	Yes	Self-reports of management accounting change
Panel H. *The Accounting Review (TAR) [1982–2001].*						
Brownell & McInnes (1986)	224 manufacturing managers across three firms in the electronics and steel industries	140/224 = 63%	No	No	No	Self-rating of performance
Chenhall & Morris (1986)	68 middle- and upper-level managers across 36 manufacturing firms in Australia	Not reported	No	No	No	Self-rating of information usefulness
Collins et al. (1987)	3,404 planning executives and 1,325 managers across industry associations	1,021/3,404 = 30%; 318/1,325 = 24%	No	No	No	Self-reports of budget attitudes
Frucot & Shearon (1991)	83 managers across industries in Mexico City	83/83 = 100%	No	No	No	Self-rating of performance
Kren (1992)	154 profit center managers across 63 *Fortune 500* firms	80/154 = 52%	No	Yes	No	Self-rating of performance
Dunk (1993b)	118 manufacturing managers across firms in Australia	79/118 = 66%	No, but instruments were tested on a different sample after hypothesis testing	No	No	Self-rating of budget slack

& Langfield-Smith, 1998a). Survey research used for explanation examines relationships among management accounting (and other) variables guided by theoretical expectations about how and why these variables should be related.

The purpose of a study and its associated research questions affect important survey design decisions, such as the choice of a cross-sectional or longitudinal design and the determination of the level of analysis. Longitudinal designs require either repeated surveys over time or one-time surveys that ask respondents about measurements over time. Longitudinal designs provide greater confidence for causal inferences than cross-sectional designs because they more easily establish temporal priority (Pinsonneault & Kraemer, 1993). Most survey articles in management accounting are cross-sectional (127 [98%] of 130 articles in our sample), yet most articles aim to test theories that specify causal relationships among variables. Longitudinal designs are not as frequently observed because repeated surveys are difficult and costly to conduct, are subject to increasing nonresponse over time, and result in incomplete longitudinal data. Because of these reasons, longitudinal studies often do not pay off in light of short-term research agendas or incentives. Longitudinal surveys that involve one-time surveys that ask respondents about measurements over time, on the other hand, are subject to various kinds of recall biases. In sum, due to the limitations of cross-sectional designs, if the purpose of the survey is to test theory, then the researcher should have strong theory in order to make causal inferences. If there is no theory, or the theory predicts a bi-directional effect, then a cross-sectional survey study is likely to be inadequate for the purpose of establishing causal relationships, although there are statistical techniques to potentially address this issue (e.g., two-stage least squares).

Decisions about the level of analysis are also critical, particularly for studies in management accounting that often relate to phenomena at the industry, organization, organizational unit (e.g., strategic business unit, division, and department), or individual levels (Kwok & Sharp, 1998; Luft & Shields, 2003). When a survey employs a level of analysis beyond the individual, the researcher must consider whether to survey multiple respondents within each level (e.g., within an organization). As in many other fields, however, most studies that focus on organization-level phenomena use very few respondents in each organization with the modal number being one (Pinsonneault & Kraemer, 1993). Using one respondent weakens the validity of the study because a single individual often cannot reasonably reflect the beliefs of an entire organization (Young, 1996). Even though 50 articles (38%) in our sample obtain organization-level measures from multiple respondents per organization, multi-respondent corroboration of measures is rarely done (only two articles in our sample). In many cases, however, corroboration is impossible because the researcher has promised anonymity to respondents.

4.2. Population Definition and Sampling

A *population* is the entire set of elements about which the survey researcher wishes to make generalizations (Diamond, 2000). The judicial standards for survey research indicate that the population should include all relevant respondents and exclude inappropriate, unknowledgeable, or unconcerned respondents (Federal Rules of Evidence, 1971). The population usually consists of people (hence, the common use of the word *respondents*), but populations may also consist of other elements, such as organizations (e.g., publicly traded firms). A *representative sample* is a subset of the population that closely resembles the population on key characteristics. If the sample is representative of the population, then what is true for the sample is also true for the population within a calculable margin of error (Sapsford, 1999). Population definition and sample selection are critical because they determine whether valid inferences can be drawn from the characteristics of the sample. The extent to which valid inferences can be drawn from the sample also depends on the sample size and response rate.

4.2.1. Survey Population

Based on the research purpose and objectives, researchers identify the survey population to ensure it adequately covers the target population. The *target population* is the collection of all respondents that the researcher would like to study (e.g., profit center managers). The *survey population* is the collection of respondents available to the researcher that is actually sampled (e.g., a consumer electronics industry association membership list of plant managers in the UK). The legal framework emphasizes the consistency of the target and survey populations (Diamond, 2000). If the survey population includes subjects not in the target population (e.g., cost center managers), or omits subjects in the target population (e.g., profit center managers in charge of divisions other than

manufacturing plants or in industries other than consumer electronics), then the study will yield biased results (Henry, 1990). Although the target population in this example is "profit center managers," the actual survey has been confined to its own survey population of "plant managers in the consumer electronics industry in the U.K," and hence, the survey's findings may not be generalizable to non-plant managers in other industries in other localities.[3]

The second column of Exhibit 1 reports the survey populations in our sample of management accounting articles. Using our entire sample, the mean number of subjects in the survey population is 848 with a standard deviation of 2,385. The range is wide, with a minimum (bottom decile) of 30 (51) and a maximum (top decile) of 18,000 (5,541). But the data from seven articles can be viewed as outliers.[4] To provide a more representative statistic, we omit these seven articles and calculate an adjusted mean. The adjusted mean number of subjects in the survey population is 373 with a standard deviation of 437, and adjusted maximum (top decile) of 2,626 (1,452). Due to the skewed distribution, we also calculated the median. Using our entire sample, the median number of subjects in the survey population is 217 (204 after eliminating the seven outliers).

The vast majority of the articles in our sample (125 articles, or 96%) do not report a target population. As such, the target population *is* the survey population. In addition, because many articles also do not have a sampling frame the target population is also the sample.

4.2.2. Sample Selection

Sample selection (sampling) directly affects the generalizability of survey findings. Perhaps the greatest strength of the survey method lies in its ability to collect data from a representative subset of a population (Birnberg et al., 1990). However, the extent to which this benefit is obtained depends on the quality of the sampling procedures.

The central element of a sampling plan is whether to employ probability or non-probability sampling. *Probability* samples are selected such that every element of the survey population (sampling frame) has a known nonzero chance of being included in the sample. Probability samples (with high response rates—see below) increase the representativeness of survey results, thus allowing inferences to be made from the sample to the survey population within a calculable margin of error (Diamond, 2000; Sapsford, 1999). In *non-probability* samples, some survey population members are more likely to be selected in the sample than others.

In the legal framework, evidence from surveys that use non-probability samples (*convenience samples*) can be admitted into evidence if the method used to select respondents is justifiable; special caution has been taken to reduce the likelihood of biased samples; and quantitative inferences from such samples are viewed only as indicative (Diamond, 2000; Morgan, 1990). For example, consumer surveys using results from nonprobability samples are often admitted as evidence in court based on the argument that non-probability sampling is widely used in marketing research and that "results from these studies are used by major American companies in making decisions of considerable consequences" (Diamond, 2000, pp. 238–239). But the legal framework also suggests that even if probability sampling of the target population is impractical, the researcher should still try to apply probability sampling to some aspects of sample selection in order to reduce the likelihood of biased samples (Diamond, 2000). For example, even though it may be challenging to obtain a random sample of mall locations in a mall intercept survey, the researcher still can randomly sample time segments since the characteristics of persons visiting a shopping center vary by day of the week and time of day (Diamond, 2000).

In management accounting, survey researchers often do not have the luxury of obtaining a sampling frame (i.e., a complete list of survey population elements that match the intended target population) and developing a probability-sampling plan. Most articles in our sample actually do not discuss or report a sampling plan and most surveys appear to have been mailed out to the entire survey population, which may not adequately represent the intended target population to which the hypothesis-testing results are generalized. However, some articles do provide detailed sampling plans. For example, Perera et al. (1997) used *Riddell's Business*

[3]The *target population* is sometimes also called *general population*, *inferential population*, or *universe*. Regardless of the term, this level of population is defined conceptually. Similarly, the *survey population* is sometimes called *working population*, *frame population*, or *sampling frame*. At this level, the population is no longer conceptually defined; instead it is operationalized as the list of eligible, identifiable, and contactable subjects in the target population, thus the list to which the sampling scheme is applied.

[4]These studies are: Collins et al. (1987); Bright et al. (1992); Daniel & Reitsperger (1992); Daniel et al. (1995); Sangster (1996); Stone et al. (2000); and Hunton et al. (2000).

Who's Who Australia 1994 to randomly select 200 managers of manufacturing firms or divisions. Brownell & Dunk (1991) used a published directory of manufacturing managers in Australia (*Kompass Australia*) as their sampling frame and developed a probability-sampling plan to draw a random sample.[5] Widener & Selto (1999) randomly selected their sample of 600 firms from *Compustat*. Despite these examples, however, such sampling procedures are not the dominant practice in management accounting research.

Non-probability sampling can be a useful and efficient sampling method under certain circumstances, and in some situations, it is the only available alternative. However, a non-probability sample is not merely a group of respondents readily available to take part in a study. Rather, it should be selected such that it maximizes the likelihood that the resulting sample exhibits the variation in the independent variable(s) necessary to examine the hypotheses with sufficient power. For example, to study the impact of corporate diversification on management control system design, the researcher might purposefully select a well-chosen sample of unrelated diversifiers (at one end of the spectrum) and single-business firms (at the other end). The idea is that if the hypotheses do not hold with a carefully chosen sample of "extreme" cases, then it is unlikely to hold in a random sample. Thus, careful non-probability sampling involves more than just selecting those subjects to which the researcher has easy access, although the latter practice is most commonly observed (Young, 1996). In our sample, 92 articles (71%) use some sort of a *convenience* sample. And while the use of convenience samples is sometimes justifiable, reearchers relying on them forfeit any sampling advantages that surveys have over other research methods (Birnberg et al., 1990), causing their inferences to be indicative at best of the target population to which they wish to generalize the findings.

In conclusion, the lack of explicit sampling procedures in management accounting survey studies makes it difficult to make valid statistical inferences to the target populations about which they wish to speak. Sending surveys to conveniently selected survey populations, rather than survey populations (or random samples thereof) that match intended target populations, limits our ability to accumulate generalizable results across studies and over time. Realistically, however, given that management accounting researchers often perform their studies with a given group of respondents to which they have convenient access, the field would benefit from attempts to define or discuss the population of which the sample is potentially representative.

4.2.3. Sample Size

Standard treatment of sampling in most textbooks recommends determining sample size by deciding how much precision is required (the confidence interval), which requires an estimate of both the sample variance (s) and an estimate of the expected response rate.[6] This approach, while correct, often is not pragmatic when designing studies in management accounting, for the following reasons (Fowler, 1984).

First, the vast majority of survey studies in management accounting are theory-testing studies (89% of the articles in Exhibit 1); not studies concerned with measuring the "mean" of a variable within a sample and generalizing it to a population, as in a poll. Second, surveys in management accounting invariably try to obtain from respondents as much information as possible related to the multiple variables (including control variables) of interest to the theory (relationships) being tested (within the confines of acceptable survey length). Thus, management accounting surveys are usually designed to make estimates about *relationships* among *multiple* variables, making it unlikely to be able to specify a desired level of precision in more than just the most general of ways.

Moreover, investing in sample size often does not pay off (beyond the acceptable sample size needed to perform the desired statistical tests with sufficient

[5]Although most management accounting studies in our sample do not explicitly discuss their sampling frames, they nonetheless might have used one. For example, Foster & Sjoblom (1996) mention that they sampled 2,000 ASQC members in the electronics industry, and thus, it seems that they used the directory of ASQC members as a sampling frame to generate their sample. However, they do not discuss how their sample is representative of the survey and target population.

[6]From basic sampling theory, we know with 95 (99)% certainty that the actual value of a population parameter falls within the range of the sample estimate plus or minus 1.96 (2.58) times the size of the sampling error. The sampling error is the square root of the sample variance of the estimate (s) divided by the sample size (n): $\sqrt{s/n}$. Sample variances and expected response rates can be obtained from using pilot study results or from taking the sample in two stages and using the variance and response rate observed in the first stage to determine how many additional responses are needed in the second stage. The expected response rate could also be estimated from reviewing previous studies of similar populations (in the same or related fields).

power).[7] Studies have shown consistently that *non-sampling error* (i.e., error caused by non-response and measurement problems not associated with the sampling process) is the major contributor to the total survey error (Assael & Keon, 1982). Thus, rather than investing in sample size, resources would probably be allocated more wisely to improvements in other areas of survey design, such as in attempts to increase response rates.[8]

In conclusion, sample size *per se* is not as critical for the quality of survey data as it is often believed to be (assuming, of course, that sample size is adequate for the statistical tests used to analyze the data).[9] Instead, the focus should be on *non-response bias* (see below), which depends on both sample size (making it important in this respect) and response rate (Colombo, 2000). Consistent with this, the legal framework prescribes that sample size must be "intuitively justifiable," meaning that survey researchers should be able to justify sample size primarily with non-statistical arguments (Morgan, 1990: p. 63). That said, however, minimum samples of 200–300 respondents seem to be able to achieve a certain degree of face validity in court (Morgan, 1990).

The third column in Exhibit 1 shows the sample sizes of the 130 management accounting articles in our sample. Exhibit 1 shows that 30 articles (23%) had sample sizes greater than 200, which is the lower bound to the legal reliable minimum of 200–300. The mean sample size in Exhibit 1 is 239 with a standard deviation of 432. But the range is wide. The largest (top decile) sample size is 2,941 (1,235) and the smallest (bottom decile) sample size is 24 (35). The median sample size is 125. However, of the 51 articles in Exhibit 1 with sample sizes greater than 150, 31 have a response rate of less than 50%, making response bias a potentially bigger threat than sample size *per se*.

4.3. Survey Questions and Other Methodological Issues

The foregoing analysis dealt with *population* (or *external*) *validity*—the extent to which the survey study provides an accurate representation of the population it is supposed to represent (Sapsford, 1999)—and the error encountered when the sample is not a good representation of the population (*sampling error*). External validity is the most important concern for descriptive surveys aimed at providing accurate estimates of population parameters. Surveys designed for theory-testing, however, not only need to provide predictions about relationships to samples other than the focal test sample (external validity), but also need to determine that the variation in the dependent variable is related to variation in the independent variables (internal validity) (Campbell & Stanley, 1963; Cook & Campbell, 1979). Because the vast majority of surveys in management accounting have a theory-testing focus (116 [89%] of the 130 articles in our sample), this section focuses on *design* (or *internal*) *validity* and its associated error (*non-sampling error*). Non-sampling error is no less important than sampling error. In fact, non-sampling error has been shown to be the most severe contributor to total survey error (Assael & Keon, 1982; Groves, 1989).

Non-sampling error consists of two components. The first, *non-response error*, occurs when some *target* respondents do not reply, causing responses to be an unreliable representation of the selected sample. The second component, *response error*, occurs when some *actual* respondents respond inaccurately (Assael & Keon, 1982: p. 114). Both components establish whether the inferences drawn from the study speak of the arguments they are supposed to test.

Response error includes, but is not limited to, validity of measurement (also referred to as *construct validity*). When poorly designed questions are included in the survey, they threaten the internal validity by systematically distorting responses or by inflating random error if respondents make guesses because they do not understand the question (Diamond, 2000). Therefore, researchers should pay particular attention to the questions they use, how they are worded, how their response format is designed, and how they are ordered and presented in the survey.

A detailed discussion of measurement and survey design issues is beyond the scope of this chapter.[10]

[7] Technically, because of the square root in the sampling error formula, $\sqrt{s/n}$, reducing sampling error by half means that the sample size has to be quadrupled.

[8] A sample of 120 respondents describes a population of 12,000 or 12,000,000 with virtually the same accuracy, *assuming that all other aspects of the sampling design were the same* (Fowler, 1984; Mangione, 1995). But, a sample of 120 obtained as a 10% response in a randomly selected initial sample of 1,200 is more likely to be biased, and thus, less likely to accurately describe the population than a sample of 120 obtained as an 80% response in a randomly selected initial sample of 150.

[9] Actually, smaller samples are biased *against* finding any statistically significant differences, that is, they are likely to rule out relatively small differences that might really exist in the population as a chance product of sampling. In other words, small samples are more likely to detect the larger differences only, that is, differences that are likely to be substantively significant (Sapsford, 1999).

[10] A recent paper in accounting deals with the measurement issues exclusively (Kwok & Sharp, 1998), and there are

In this section, we focus on pre-testing (to curtail response error), follow-up procedures (to reduce non-response error), and non-response bias analysis (to assess any remaining non-response error in the sample). We also describe issues in management accounting research associated with the choice (as opposed to just measurement) of dependent measures.

4.3.1. Pre-Tests

The legal standard suggests that survey questions should always be pre-tested to assess whether they can "… be correctly understood by respondents and easily answered by them" (Morgan, 1990: p. 64). Courts recognize that pre-tests can improve the quality of a survey by increasing clarity and avoiding misunderstandings of survey questions (Diamond, 2000). Pre-testing is especially important in mail surveys because there are no interviewers to report problems in the questions and the survey instrument to the researcher. The purpose of the pre-test is to test both the questions and the questionnaire (Dillman, 1978, 1999). Dillman recommends submitting the questionnaires to the scrutiny of three groups of people: colleagues, prospective respondents, and users of the data.

First, individuals with an understanding of the design and topic of the study should be engaged in pre-tests primarily to assess the construct validity of the questions and how they will (fail to) accomplish the study objectives. Second, a number of prospective respondents should be engaged to fill out the questionnaires either in the researcher's presence or on their own, followed by an extensive debriefing to identify and rectify problems with the questions and the questionnaire. Finally, users of the data should be engaged to obtain feedback from people with substantive knowledge of the survey topic.[11] Pre-testing with the latter two groups also has another benefit: it increases the likelihood that the survey uses terminology that reflects the respondents' frame of reference, and thus, decreases the likelihood that the respondents will be offended by, and perhaps decline to respond because of, outdated or unsuitable language (Young, 1996). Only 30 articles (23%) in our sample indicated that they pre-tested their survey instruments (Exhibit 1).[12]

4.3.2. Response Rates

The legal framework provides some thresholds for acceptable response rates:

> Response rates between 75% and 90% usually yield reliable results, but the researcher should conduct some check on the representativeness of the sample. Potential bias should receive greater scrutiny when the response rate drops below 75%. If the response rate drops below 50%, the survey should be regarded with significant caution as a basis for precise quantitative statements about the population from which the sample was drawn (Diamond, 2000: p. 239).

Exhibit 1 shows that eight articles in our sample did not report a response rate.[13] Omitting these eight

(*footnote continued*)
many excellent sources on survey design, the most notable of which is Dillman (1978, 1999). Dillman's (1978) *Total Design Method* (TDM) basically consists of three parts: writing questions, survey construction, and survey implementation. Each part consists of a number of precise steps. *Writing questions* deals with the kind of information being sought, deciding the question structure, and common wording problems. (Schuman & Presser, 1981, provide another comprehensive source on writing question and survey measurement issues.) *Survey construction* deals with designing the survey booklet, ordering the questions, formulating the pages, and pre-testing. *Survey implementation* deals with writing and printing the cover letter, preparing the envelope, adding postage, identification of the questionnaires, preparing return envelopes, assembling the mail-out package, selecting the mail-out date, and conducting follow-ups. Apart from the details, the essence of TDM is that it shapes each aspect of the survey process in a way that should encourage good response. Jaworski & Young (1992) is an example of a study in our sample that followed and attributed good responses rates to the implementation of selected TDM-procedures.

[11]Users of the data are, for example, *corporate controllers* in a study that surveys *business unit managers* to assess management control practices in diversified firms (e.g., Van der Stede, 2000, 2001).

[12]One could argue that 23% of the papers in our sample using pre-tests is not a good indicator of survey quality unless it also considers whether the studies use a "new" or an "old" instrument. We note, however, that researchers should *always* pre-test their survey instrument, even if some measures in their survey instrument have been previously used and validated. Realistically, studies rarely use prior survey instruments in their entirety as it is unlikely that a prior survey fits the particular context of the new study, and thus, not adapting the survey would be poor practice, as would be not pre-testing an adapted, even if not entirely new, survey. As such, even if the survey instrument has been previously used, the terminology (or the ordering of questions, etc.) may have to be modified to reflect the respondents' frame of reference, and this is especially true for organizational research due to the different organizational settings.

[13]These studies are Brownell (1983a), Chenhall & Morris (1986), Birnberg & Snodgrass (1988), Daniel & Reitsperger (1991), Weisenfield & Killough (1992), Chenhall & Morris (1993), Shields (1995), and Chow et al. (1999a).

articles, the average response rate is 55%. The highest (top decile) response rate is 100 (92%) and the lowest (bottom decile) response rate is 8 (15%). These statistics do not stand favorably against the legal standard as described above.

The average response rate in management accounting (55%), however, is almost identical to that reported in a study of 141 organizational behavior studies published in the *Academy of Management Journal*, *Human Relations*, *Journal of Applied Psychology*, *Organizational Behavior and Human Decision Processes*, and *Journal of International Business Studies* in the years 1975, 1985, and 1995 (Baruch, 1999). The average response rate was 56%, but most notable was the decline through the years (48% in 1995) and lower response rates in studies involving top management and organizational representatives (36%). A study in operations management over the 1989–2000 period revealed a similar pattern where the average response rate in surveys of managers bottomed out in the mid-1990s at about 32% without improvement since then (Frohlich, 2002). Finally, in a study of 94 survey studies between 1980 and 1990 in the management information systems field, 71% either did not report the response rate or had a rate below 51% (Pinsonneault & Kraemer, 1993). Various reasons for declining response rates in social science research have been cited, such as increased time and job pressure on respondents and rise in unsolicited mail (including surveys from consultants) (Colombo, 2000; Frohlich, 2002; Groves et al., 2002; Sudman & Blair, 1999).

The observation that only eight articles in management accounting in Exhibit 1 (6%) do not report response rates compares favorably with academic journal articles in other fields, such as sociology and political science, where 56% and 77% of the articles that use surveys, respectively, make no mention of response rates (Smith, 2002). In organizational behavior studies, the incidence of not reporting response rates also seems more prevalent than in management accounting (Baruch, 1999).

In Exhibit 1, the average response rate of the 44 (86) articles published in the 1982–1991 (1992–2001) period is 67 (48%). In conclusion, the response patterns observed in management accounting seem qualitatively similar, and certainly no worse, than those observed in other areas of organizational research. Although the decline in response rates in management accounting research, like the decline in response rates in other areas of organizational research, is a drawback for researchers, it appears inevitable due to the changing economic and social environment. Therefore, instead of being discouraged, researchers should be aware of this problem and try to use follow-up procedures to increase response rates and pay more attention to non-response bias analysis.

4.3.3. Follow-up and Other Procedures to Enhance Response Rates

If high response rates are not achieved in the first round of returned surveys, then follow-up procedures should be employed (Diamond, 2000). Studies have shown that follow-ups effectively improve response rates and help bring the more resistant respondents into the study, sooner (Dillman, 1978, 1999; Moore & Tarnai, 2002). The response pattern in Van der Stede (2000, 2001) was as follows: 31% of the replies were received immediately, 38% after the first follow-up 2 weeks after the initial mail-out, and 31% after the second follow-up with replacement 4 weeks after the initial mail-out. A similar pattern was observed in Hansen & Van der Stede (2004): 25% of the replies were received immediately, 34% after the first follow-up, and 41% after the second follow-up with replacement. Thus, in the absence of follow-up procedures, about 70%, or more, of the potential replies would not have been obtained. However, each wave of follow-ups potentially brings in different respondents based on the studied variables (Moore & Tarnai, 2002), which calls for the need to perform non-response bias analyses (see below). Only 32 articles (25%) in Exhibit 1 use any type of follow-up.

Another, often effective, way to increase response rates is to seek survey "endorsement," such as from a corporate officer, industry association, or some other authority (Pinsonneault & Kraemer, 1993). Twenty-five articles (19%) in our sample administered a survey with corporate endorsement (e.g., Govindarajan, 1984a; Malmi, 1999; Merchant, 1990). These articles generally report higher response rates, typically upwards of 60%.[14] Even though this practice appears to lead to higher response rates, it also potentially introduces sampling bias due to, for example, the possibility that the contact person channels the surveys to employees with favorable views only (Baruch, 1999; Young, 1996).

[14]The purpose of using an organizational contact in these studies was to try and achieve high(er) response rates compared to mailing the survey directly to the target respondents. However, some studies in our sample used an organizational contact in order to obtain multiple responses within one organization. And some studies simply used an organizational contact because their mailing lists did not provide a direct contact for the intended target respondents.

But there are other (creative) possibilities to increase survey response rates.[15] One is to pre-notify respondents (e.g., by phone) and ask about the most convenient time to receive the survey. This approach might work as the most commonly cited reasons for non-cooperation are inconvenience and time constraints. This approach is also likely to lead to more involvement and commitment by the respondent almost from the beginning of the project (Baldauf et al., 1999). Another method is the greater use of mixed modes of response, such as by allowing respondents to select whether they will complete the survey via mail, e-mail, or online (Pinsonneault & Kraemer, 1993; Sudman & Blair, 1999). Yet another possibility is to be creative in providing (higher) compensation to respondents, both monetary (e.g., money, prizes, and gifts) and non-monetary (e.g., promise of feedback about the study) (Diamond, 2000; Sudman & Blair, 1999). Although empirical evidence is mixed regarding the effectiveness of such inducements to cooperate, the idea is that carefully implemented surveys *won't hurt*. In Exhibit 1, only one study (Jaworski & Young, 1992) did provide some direct compensation to respondents.[16]

Although high response rates undeniably reflect the rigor of a study in the eyes of editors, reviewers, and readers, response rates are, however, an incomplete, surrogate measure of non-response error. Response rates reveal the relative number of respondents, but ignore the differences between respondents and the total sample (Assael & Keon, 1982), that is, *non-response bias*, to which we now turn.

4.3.4. Non-Response Bias

The effect of survey non-response on the generalizability of the results, however, depends not only on the *response rate*, but also, and primarily, on the extent to which the respondents are systematically different from the non-respondents (*non-response bias*) (Groves, 1989; Moore & Tarnai, 2002). Therefore, as a general rule, courts require evidence on the potential impact of non-response on the survey results (Diamond, 2000).

Even when response rates are low, the results are still generalizable if there is low non-response bias. However, response rates and non-response bias are unlikely to be independent because a survey with a low response rate (less than 20%, say) is more likely to include respondents that are essentially self-selected, and thus, more likely to generate results that look nothing at all like the surveyed population to which the theory relates (Fowler, 1984; Mangione, 1995). Because 86 articles (66%) in Exhibit 1 lie within the 20–80% bracket of response rates,[17] assessing potential non-response bias is important because there is a possibility that the target respondents have self-selected to respond based on some correlated omitted variable(s), thus posing a threat to the theoretical generalizability of the survey results.

Non-response is contingent on many characteristics of the respondent (e.g., gender, age, education, and socio-economic status), as well as characteristics of the survey itself (e.g., topic, open- vs. close-ended, and length) (Groves, 1989). A detailed discussion of the many potential sources of non-response bias is outside the scope of this chapter. Besides, most survey-methodology studies are concerned with non-response bias in (general population) surveys of *individuals*. More pertinent to management (accounting), however, are non-response issues encountered in *organizational* surveys (i.e., surveys of firms, business units, divisions, plants, and teams).

Surveys with low response rates can produce biased samples, particularly if key organizational characteristics affect the patterns of survey response. Tomaksovic-Devey et al. (1994) discuss non-response in *organizational* surveys as a function of the authority, capacity, and motivation to respond. In brief, *authority* is related to the respondent's position in the organization; *capacity* has to do with the respondent's access to information or knowledge about what is being asked; and *motivation* deals with the respondent's propensity to reveal information about the organization. For example, for a survey about management accounting practices, unit managers may have the capacity (knowledge) but not the authority to respond, while corporate managers may have the authority but not the capacity. And, the motivation to respond may depend on whether the survey asks sensitive or otherwise non-disclosed information. In other words, authority, capacity, and

[15] See Frohlich (2002) for a more detailed discussion of various survey response enhancing techniques.

[16] The response rate in this study was 79%, compared to 55% for the whole sample. However, one observation does not allow to make valid inferences about the effectiveness of providing compensation to respondents.

[17] The 20–80% bracket is arbitrary as there are no agreed-upon standards for a minimum acceptable response rate (Fowler, 1984). Similarly, there is no agreed-upon response rate at which the threat of non-response bias can be ruled out, although when response rates exceed 80% the threat of non-response bias is generally believed to be minimal (Groves, 1989; Moore & Tarnai, 2002).

motivation to respond are affected by organizational characteristics (e.g., ownership, size, diversification, and decentralization), survey characteristics (e.g., the type of information asked) and, of course, individual respondent characteristics (e.g., time burden, attitude towards research).

While it is unreasonable to expect that all these potential sources of non-response bias can be avoided when response rates are less than 80%, say, discussing how the respondents and non-respondents differ in their authority, capacity, and motivation to respond would enhance the quality of management accounting survey research. Studies that start with a sampling frame (such as by using industry association membership databases to select the sample)[18] usually have some information about the non-responding organizations that could be usefully employed to assess the extent of bias in the sample. For example, sales or employment can proxy for size, number of division managers listed per company can proxy for decentralization, and number of different industry codes or product lines can proxy for diversification.

The most common type of non-response analysis in management accounting (26 articles, or 72% of the 36 articles that report any type of non-response bias analysis in Exhibit 1) is a comparison of *early* vs. *late respondents*.[19] The idea behind this approach is that late respondents are more likely to resemble non-respondents than do early respondents (Moore & Tarnai, 2002), which is supported by research of the patterns of return in general population surveys that shows that early returns are almost always biased (Fowler, 1984: p. 49). However, all studies in management accounting that resort to this type of non-response bias analysis find that their samples are *not* biased. This discrepancy might be due to the different nature of *individual* and *organizational* surveys, the latter being the most common in management accounting. In other words, if the factors that influence the authority, capacity, and motivation to respond to organizational surveys do affect the *decision* to respond, but not the *timing* (early vs. late), then it is unlikely that early vs. late response comparisons will detect bias to the same extent as in general population surveys of individuals. Moreover, comparing early and late responses requires that at least one follow-up has been administered so that immediate replies without follow-up can be compared with late replies, that is, those received after the first (if one only) or second (or third) follow-up. As discussed, only 32 articles (25%) in Exhibit 1 did any type of follow-up.

Researchers can use follow-ups or monetary incentives to increase response rates and reduce non-response bias. However, these efforts are costly. Oftentimes, it is less costly to adjust estimates from the respondents. For example, data can be weighted or imputed to conform to known population distributions (see Groves et al., 2002, for a detailed discussion of various statistical procedures to reduce the effects of non-response bias). No articles in our sample have employed such procedures, either because they do not assess non-response bias (94 articles or 72%); assess non-response bias and claim to find no evidence of bias (27 articles or 21%); assess non-response bias, find bias, but dismiss it (9 articles or 7%). Dismissal is warranted only if the non-response bias is not associated with the dependent variable. However, as discussed above, given that the authority, capacity, and motivation to respond is likely to be affected by organizational size, structure, and formalization, market competition, and profitability, "it is difficult to imagine a substantively interesting organizational analysis that is not potentially compromised" (Tomaksovic-Devey et al., 1994).[20]

But survey non-response is not the only concern. As a matter of fact, efforts to reduce *survey* non-response may increase *item* non-response, thus giving researchers a false sense that they are reducing total survey error when, in fact, they are not (Mason et al., 2002). Item non-response occurs when the returned surveys contain missing values, thus, reducing sample size and potentially introducing bias. None of the articles in our sample discuss *item* non-response.

Any missing value on any independent variable in a multivariate analysis will result in a lost observation for the whole analysis. Thus, if different observations have (many) missing values across different independent variables, then the total number of observations in a multivariate analysis will be (much) less

[18]Only nine studies (7%) in our sample used industry association membership databases as their sampling frames.

[19]In addition to comparing early vs. late respondents, 9 out of the 26 studies also used other methods to analyze non-response bias. For example, Krumwiede (1998) used a "nonresponse" sheet and compared the respondents with known characteristics of the CMG membership, which was used as the sampling frame.

[20]To assess non-response bias, researchers could also attempt to obtain small amounts of information from non-respondents on key (demographic) characteristics as a supplement to the original data collection effort (Mangione, 1995), but it is rarely done in management accounting (see Guilding et al., 2000, for an exception).

than the total number of observations in the sample, thus potentially biasing the *results* even if there was no evidence of non-response bias in the *sample*.[21] Thus, rather than reporting non-response analyses about the sample in the methods section (which precedes the results section), non-response analyses should be reported *after* the presentation of results based on the observations that were actually included in the analyses. As such, non-response bias would actually be informative of whether the *results* are biased, rather than just the *sample*. Of the articles that discuss non-response bias in Exhibit 1 (36 articles, or 28%), all report *sample* bias in the methods section and none discuss *item* non-response (thus, potential bias of the *results*) subsequent to reporting the results.

4.3.5. Dependent Measures

One observation about survey research in management accounting is the extensive reliance on unverified self-reports of dependent measures. Although subjective measures tap into the respondent's beliefs regarding the topic of interest to the researcher, exclusive reliance on such measures might result in measurement error due to subjective biases (Birnberg et al., 1990). Of the 116 articles that collect data on a dependent measure in Exhibit 1, 98 (84%) used self-ratings of performance (46 articles) or self-ratings of a behavioral construct (e.g., job satisfaction or job-related tension) (52 articles). Only nine articles collected objective measures of performance (Aranya, 1990; Clinton & Hunton, 2001; Duncan & Moores, 1989; Foster & Gupta, 1990; Simons, 1988; Vagneur & Peiperl, 2000; Van der Stede, 2000; Widener & Selto, 1999; Young & Selto, 1993), three of which obtained both subjective and objective performance measures (Clinton & Hunton, 2001; Vagneur & Peiperl, 2000; Van der Stede, 2000).

A meta-analysis of studies containing both objective and subjective ratings of employee performance showed a mean correlation of 0.39 between the two measures. This relatively low correlation indicates that objective and subjective performance measures perhaps cannot, and should not, be used interchangeably (Bommer et al., 1995). But, criticizing subjective measures of performance on the basis of their weak correlations with objective measures fails to recognize that both types of measures are not necessarily *conceptually* congruent. For example, in management accounting, (aggregate) objective measures of (organizational) performance are often measures of output, whereas respondents' evaluations of performance are more likely to reflect evaluations of input (such as effort put into the execution of organizational strategies or action plans). Simply increasing input does not necessarily, or immediately, translate into improved overall organizational performance (Parks, 1984).

There are also statistical reasons why subjective and objective measures may not agree or correlate strongly. The use of aggregated objective measures to examine disaggregated subjective measures assumes that objective measures of performance are uniform across the organization, when in reality there might be considerable variation in performance across organizational sub-units. And, respondents probably do not experience organization-wide average performance; rather they experience performance in their own unit or work situation (Parks, 1984).

Finally, the fact that objective measures do not always strongly correlate with subjective measures does not by definition invalidate the subjective measures, as it does not eliminate the possibility that the problem lies with the objective measures. Objective measures, such as profits or returns, are often those that are the easiest to collect, which does not automatically make them the "best" indicators of performance. As such, some argue that subjective measures of performance provide a "better" type of information because subjective beliefs *are* reality, at least in the eyes of the respondent (Link & Oldendick, 2000). Hence, subjective measures of performance are based on those aspects of performance that are most salient to the respondent, and thus, are most likely to shape their behaviors and guide their actions.

In sum, subjective measures of performance should not be viewed as poor indicators of performance by virtue of being subjective or perceptual. Both objective and subjective measures of performance contain error, but both measures also have their strengths, and thus, their choice should be guided by the research objectives and setting. The level of analysis is pivotal in this regard. Using subjective measures of performance might be more appropriate when the research is conducted at the individual or work-unit level. (At this level, it is also less likely that public performance data are available.) Of the 46 articles in our sample that use subjective measures of performance, 25 (54%) use them to assess individual or local performance. Of theses 25 articles, only 3 attempted to corroborate them with ratings made by other people (e.g., superiors or peers), which is no surprise as it

[21] Imputation of missing values is one of the most common methods to address item non-response (Mason et al., 2002).

is difficult to obtain and analyze such corroborating ratings (Cheung, 1999).

In contrast, subjective measures of performance are likely to be less reliable as measures of higher-level performance (e.g., firm, department, or sub-unit), especially when they are obtained from only one respondent who is either far removed form it (e.g., at lower organizational levels) or is more likely to conceptually assess the higher-level performance by means of disaggregated local or self-performance. Of the 46 articles in our sample that use subjective measures of performance, 21 (46%) use them to assess higher-level performance.

4.4. Disclosure and Reporting

Diamond (2000) points out that "the completeness of the survey report is one indicator of the trustworthiness of the survey" (p. 264). Among other things, a study should describe in detail the purpose of the survey, the level of analysis, the definition of the target population and the sample, the sample design, the type of respondents, the response rate, the exact wording of the questions used, and measure validity and reliability. While this is an accepted practice for surveys used in court, details of the actual survey data collection process are usually sparse in academic publications (in accounting), in part, because of limitations on the length of journal articles.

Nevertheless, survey (or other private) data disclosure practices (in accounting) are worth noting. For example, Hartmann & Moers (1999) contacted the authors of three articles to request data, but to no avail, although all stated that their data were available upon request. Although their sample was small (only three requests), it does raise questions about the actual data availability policy. While it is the norm among survey researchers to guarantee confidentiality to respondents in an effort to increase response rates and to encourage truthful reports, such confidentiality promises do not imply that the survey data, after proper removal of any information that might identify the respondents, cannot be made available to reviewers or readers who wish to review the raw data.

Another issue relating to disclosure has to do with how much of the original survey was actually used in the reported study. In some articles, the reported results of one study are part of a larger survey. Full disclosure pertaining to whether a particular survey is part of a larger project should be the norm. This is important because, at the very least, it helps the reader understand the context in which the results came about.

5. Change Over Time

In order to assess whether there have been any improvements in the use of the survey method in the field of management accounting research over time, we compare the survey articles in the first and second 10-year period in our sample (1982–1991 vs. 1992–2001) in Table 2. Table 2 indicates: (1) a decrease in the average response rate from 67% to 48% ($t = 4.32$, $p < 0.01$); (2) an increase in the average sample size from 184 to 261 ($t = -1.24$, not significant); (3) a larger proportion of articles using pre-tested instruments (18% vs. 26%, $\chi^2 = 6.53$, $p < 0.05$); (4) a larger proportion of articles using follow-up procedures (18% vs. 28%, $\chi^2 = 8.00$, $p < 0.01$); and, (5) a larger proportion of articles conducting non-response bias analysis (11% vs. 36%, $\chi^2 = 18.78$, $p < 0.01$). Except for sample size, all the temporal differences are statistically significant.

The decrease in response rates is consistent with the trend in the other disciplines of social science research (see Section 4.3.2). The increase in sample size and the greater use of pre-testing, follow-up procedures, and non-response bias analysis suggest that the quality of survey research in management accounting has improved over time. Although there is still room for improvement (because, e.g., still relatively small proportions of the articles do pre-tests, follow-ups, and non-response analysis), the trend is positive and we are hoping that management accounting researchers will continue to improve the rigor of their use of the survey research method in the future.

Table 2 also lists the changes of these various survey characteristics by journal, but for most journals except *AOS*, the number of articles in each decade is too small to derive any valid inferences.[22] For *AOS*, however, the trend over time is similar to the one described above, thus showing similar improvements in the application of the survey method.

6. Conclusion

The quality of survey data in management accounting is as weak as the weakest link in the survey data collection process. Hence, no feature of the survey data collection process should be so poor that it would undermine the researcher's ability to use the data for the purpose at hand (Fowler, 1984).

[22]Although it is difficult to interpret differences in the various survey method characteristics by journal in Table 2, they might indicate differences in editor views of what is acceptable (Baruch, 1999).

Table 2. Comparison of response rate, sample size, pre-tests, follow-ups, and non-response analysis over time (1982–1991 vs. 1992–2001) and by journal.

Journal	Average Response Rate[a]			Average Sample Size[a]			Number and Percent of Studies Using Pre-Tests		
	1982–2001	1982–1991	1992–2001	1982–2001	1982–1991	1992–2001	1982–2001	1982–1991	1992–2001
AOS	66%	76%	61%	174	144	316	12 (12/60 = 20.0%)	4 (4/24 = 16.7%)	8 (8/36 = 22.2%)
BRIA	66%	N/A	66%	181	N/A	181	2 (2/8 = 25.0%)	N/A	2 (2/8 = 25.0%)
CAR	56%	56%	N/A	102	102	N/A	1 (1/3 = 33.3%)	1 (1/3 = 33.3%)	N/A
JAE	71%	97%	45%	55	37	78	0	0	0
JAR	66%	66%	N/A	170	170	N/A	0	0	N/A
JMAR	38%	47%	33%	266	145	297	7 (7/21 = 33.3%)	2 (2/4 = 50.0%)	5 (5/17 = 29.4%)
MAR	35%	41%	34%	238	153	250	8 (8/25 = 32.0%)	1 (1/3 = 33.3%)	7 (7/22 = 31.8%)
TAR	62%	64%	59%	344	521	80	0	0	0
Total	55%	67%	48%	239	184	261	30 (30/130 = 23.1%)	8 (8/44 = 18.2%)	22 (22/86 = 25.6%)

Journal	Number and Percent of Studies Using Follow-Ups			Number and Percent of Studies Using Non-Response Analysis		
	1982–2001	1982–1991	1992–2001	1982–2001	1982–1991	1992–2001
AOS	15 (15/60 = 25.0%)	5 (5/24 = 20.8%)	10 (10/36 = 27.8%)	14 (14/60 = 23.3%)	0	14 (14/36 = 38.9%)
BRIA	0	N/A	0	1 (1/8 = 12.5%)	N/A	1 (1/8 = 12.5%)
CAR	0	0	N/A	1 (1/3 = 33.3%)	1 (1/3 = 33.3%)	N/A
JAE	0	0	0	1 (1/2 = 50.0%)	0	1 (1/2 = 50.0%)
JAR	0	0	N/A	1 (1/5 = 20.0%)	1 (1/5 = 20.0%)	N/A
JMAR	6 (6/21 = 28.7%)	2 (2/4 = 50.0%)	4 (4/17 = 23.5%)	6 (6/21 = 28.6%)	2 (2/4 = 50.0%)	4 (4/17 = 23.5%)
MAR	10 (10/25 = 40.0%)	1 (1/3 = 33.3%)	9 (9/22 = 40.9%)	12 (12/25 = 48.0%)	1 (1/3 = 33.3%)	11 (11/22 = 50.0%)
TAR	1 (1/6 = 16.7%)	0	1 (1/2 = 50.0%)	0	0	0
Total	32 (32/130 = 24.6%)	8 (8/44 = 18.2%)	24 (24/86 = 27.9%)	36 (36/130 = 27.7%)	5 (5/44 = 11.4%)	31 (31/86 = 36.1%)

[a]The average response rates and sample sizes were calculated after eliminating the eight studies that did not report a response rate or sample size: Brownell (1983a); Chenhall & Morris (1986); Birnberg & Snodgrass (1988); Daniel & Reitsperger (1991); Weisenfield & Killough (1992); Chenhall & Morris (1993); Shields (1995); and Chow et al. (1999a).

In presenting several issues of survey research in management accounting, researchers are in effect saying (adapted from Sapsford, 1999: p. 91):

> OK, I know I haven't got a random sample, so I have trouble delineating exactly which population my results hold for. Also, I haven't got a very good response rate, further complicating the generalizability of my results. And, some of my measures weren't very good either, introducing error. However, my findings have support from the literature and look useful. It's up to you, dear reader, to decide how much reliance you will place on my results. Perhaps you'll think the results are important and will be able to replicate them without the sampling difficulties that I have had and have reported.

Conducting high-quality survey research requires a set of conditions that are not all within the researcher's control. It requires a population that has good access; that uses a common language; that is willing to discuss a wide range of subjects with strangers; and that trusts pledges of confidentiality (Groves, 1989). Such conditions appear increasingly difficult to find, not only in management accounting, but also in other areas of organizational research.

In management accounting, as in many other fields, we tend to just duplicate the survey procedures employed in other articles because it is convenient, it provides justification for what we did (or failed to do), and it usually helps to "make the case" (e.g., for low response rates) with editors and reviewers. Unfortunately, it precludes innovation and improvements in the application of the survey method in management accounting research. There are extensive, often normative, literatures with empirical evidence in a variety of fields on all key aspects of the survey method (which we often could not discuss in detail in this chapter), such as about novel ways to improve survey response (other than doing follow-ups), analyze non-response bias (other than comparing early and late responses), or check measurement reliability (other than reporting Cronbach alphas). If future studies could begin to use some of these methods, we are confident that the quality of management accounting survey evidence produced, and hence, the collective knowledge created from it, would improve.

In conclusion, we believe that survey research in management accounting would benefit if we started devoting more effort to studying the fundamental principles of the method and apply them accordingly. In this spirit, we hope that our chapter will be viewed as food-for-thought to conduct survey research more consciously to overcome its weaknesses in innovative and creative ways. After all, the legal framework suggests that a well-designed and well-executed survey can be admitted as evidence in court (Diamond, 2000; Morgan, 1990). We hope this drives home the idea that that the key issue with the survey method lies more in how it is used rather than with the method *per se*.

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