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23 April 2008

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MPRA Paper No. 9583, posted 16 Jul 2008 00:46 UTC

## On the Interplay between Strategy and Management Control Systems

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**April 8<sup>th</sup> 2008**

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### **Abstract**

*There is considerable academic interest for the interplay between strategy and management control systems (MCS). Strategic performance measurement systems (SPMS), such as Simons' levers of control and Kaplan and Norton's balanced scorecard were introduced in the normative literature as vehicles for developing and implementing strategy. But there are also numerable case studies and surveys that investigate empirical evidence of the interplay between management control and strategy derived from management practices. This paper is a review of the extant literature aimed at identifying developments and gaps within this specific area of accounting research. To this end literature from six fields of research has been searched in a structured manner using exhaustive search algorithms. Studies are analysed using Mohr's (1982) approaches to explanation and frameworks of Langfield-Smith (1997) and Keating (1995). The review by Langfield-Smith (1997) indicated that literature in this specific area of scholarly inquiry is characterized by a diversity of research designs and ambiguity in operationalization of - among other variables - strategy. Analysis of survey & case based research performed during the last decade reveals that operationalization of strategy is more than often based on one of the established strategy frameworks and is currently not as diverse as reported in Langfield-Smith (1997). Several scholars indicate that knowledge in this area is still rather limited, however comparison among studies provides insights that have not been made explicit.*

Key words: Management Control, Management Control Systems, Strategy

### Acknowledgements:

We gratefully acknowledge helpful comments on earlier versions of this paper from Ed Vosselman.

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## 1. Introduction

There is and has been considerable academic interest for the interplay between management control systems (MCS) and strategy (e.g. Dent, 1990, Langfield-Smith, 1997, Ittner & Larcker, 2001, Chenhall, 2003). Exemplary are the strategic performance measurement systems (SPMS), such as Simons' levers of control (1995), Kaplan and Norton's balanced scorecard (1992, 1996, and 2001) and activity based management systems (Kaplan and Cooper, 1998) introduced in the nineties in the normative literature - also labeled consulting research (Lukka and Granlund, 2002) - as vehicles for developing and implementing strategy. But there are also numerable case studies and surveys that provide empirical evidence of the interplay between management control and strategy.

In 1997, Langfield-Smith wrote a seminal paper<sup>1</sup> on the interplay between strategy and management control systems (MCS) reviewing a period of over more than 20 years of research. This critical review covered a selection of empirical – survey and case - studies<sup>2</sup> published prior to 1995. Based on her review, Langfield-Smith argued that the inconsistent way in which control, effectiveness and strategy were operationalized and measured in the studies under investigation resulted in fragmented and sometimes conflicting research evidence.

Other reviews have appeared since then. Chenhall (2003) for example explores management control system design related to strategy, focusing on contingency based survey research only. Ittner and Larcker, (2001) likewise review parts of this research area through a focus on the examination of measurement of strategy in empirical studies. These scholars argue in a similar vein that strategy measured as a continuum between firms ignores the multidimensional nature of strategic choices (Ittner & Larcker, 2001: p363). Measures of strategy derived from publicly disclosed information are noted to often provide only noisy proxies. Furthermore, they conclude that when studies focus on lower level operational strategy, higher level strategic choices made by firms are often ignored.

Comparison between survey and case studies led Langfield-Smith (1997) to conclude that case studies address the interplay between strategy and MCS “*in much greater depth and often in a dynamic way*” (Langfield-Smith, 1997: p228). Directions and recommendations for future research resulting from her review were twofold, i.e. to aim for the development of consistent classifications for contingent variables and to aim for the use of established classifications of strategy. Langfield-Smith (1997) identified the typologies of Miles and Snow (1978), Porter (1980, 1985), Miller and Friesen (1982) as being used in the studies she reviewed. Different scholars since then identified several issues pertaining

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<sup>1</sup> Analysis within the Business Source Premier database indicates 55 citations minimally (recorded citations cover only a part of the exact number of citations because of non-textual storage and typing errors, the number stated thus represents a minimum).

<sup>2</sup> Langfield-Smiths' (1997) review covered 14 studies

to the use of strategy archetypes. Ittner & Larcker (2001: p363) noted for example that the use of these typologies in which strategy is represented “[a]s a simple continuum misses the multidimensional nature of strategic choices”. Chenhall (2003: p152) suggested that there is a need to develop theories for specific archetypes of strategy. He noted that the linkage between typologies of strategy and MCS is problematic, while these typologies may have lost relevance for contemporary settings. As Langfield-Smith (1997), Chenhall (2003: p152) proposed usage of validated measures of strategy. To address this specific issue, Chenhall suggested the consideration of studies by Dess and Davis (1984), Kotha et al. (1995), Miller and Friesen (1986), Miller and Roth (1994) and Shortell and Zajac (1990). On a more practical level Chenhall noted that managers, when confronted with these typologies would not easily be able to relate to them.

To determine how this specific area of the accounting field has developed since Langfield-Smiths’ review paper, we examine the state of this area by performing a structured and focused search and subsequently perform an analysis of the relevant literature. This review is in part motivated by the notion presented in Chapman (2005: p6) suggesting that “[t]he traditional understanding of the relationship between MCS and strategy is at best limited in scope.” This review however shows that our traditional understanding is not as limited in scope as suggested. Examination of the different studies and their linkages shows that there is a firm understanding of the themes that have been studied. It shows that several gaps in research start to be addressed in the extant literature. This review furthermore shows that the common body of literature that has emerged provides a firm grounding for further exploration of the field.

Using Langfield-Smiths’ model as a starting point we analyze research on the relationships between strategy and MCS published in the last decade. Prior to the study performed by Langfield-Smith, Lukka and Kasanen (1995) investigated the differences between explanatory and descriptive models in accounting research and found that statistical explanatory models had a dominant position in the field. However, they also found that the number of descriptive models used was increasing. By analyzing the reviewed literature we examine if this trend has possibly resulted in a shift of methodological domination. Furthermore, the role of survey and case based studies in confirming and elaborating on scholarly knowledge is investigated.

The remainder of this paper is structured as follows. In the next section we explain the selection procedure used for obtaining the relevant literature. The third section provides descriptions of the frameworks used to analyze the studies collected in the search. In section four the various studies are presented. In the fifth section we analyze these studies using the different frameworks and we present the conclusions based on the review. Recommendations for future research are given in section six.

## **2. Methodology**

In order to obtain a relatively complete census of the existing body of knowledge pertaining to this specific research area, eighty-nine journals from the fields of finance and accounting, general management science, management science and information systems, marketing, organization and strategy were searched (see appendix 1 for the complete journal list). The choice to also include journals from other fields of research was driven by the idea that the interplay between MCS and strategy could also be an area receiving interest in other fields of scholarly inquiry. As such, accounting research could possibly benefit from findings in other fields, adding to current knowledge. The Business Source Premier database was chosen as the primary source for the journals, while it provides indirect access to online repositories as Berkeley Electronic Press, Blackwell Synergy, EconPapers, Emerald, IEEE Computer Society, JSTOR, SAGE journals online, ScienceDirect and SwetsWise.

Subsequent searches were performed using the EBSCOhost interface. The search was thus aimed at providing a representative list of studies that would enable identification of the developments of the field. The choice to only include these journals was made to enforce a quality threshold and limit the number of potentially interesting studies to a manageable size.

### *2.1 Exhaustive Search Algorithms*

In order to obtain the relevant literature for the actual review exhaustive search algorithms were used. The problem that the set of developed algorithms aims to solve is the large amount of manual work involved in searching scientific literature. The set of algorithms was designed for searching literature that describes a relationship between two phenomena. Phenomena can be described with several synonyms or closely related aspects thereof. It is thus possible that two studies provide a description of the same relation in completely different wording. When this kind of ambiguity exists, logically so it is a necessity to use multiple keywords, as otherwise the results of the search for relevant literature is incomplete. The drawback of the attempt at a comprehensive coverage is that the number of search instructions involved in the process of obtaining relevant studies rapidly increases. The algorithms allow for automatic retrieval of document information through a search engine, such as the EBSCOhost interface. The first algorithm creates clusters of queries based on pre-entered sets of journals and keywords. A second algorithm is used to extract the data from the files received from the server and stores it in a local database. The data in the local database can be sorted by any element, which can be helpful to organize the literature. The third algorithm that is used allowed us to map the data in a dimensional model. The resulting model consists of tables containing links to the data of the retrieved papers. For an explanation of the problem the body of existing literature is presented as a dimensional model shown in figure 1.

[INSERT FIGURE 1 HERE DIMENSIONAL MODEL]

The figure shows three dimensions; a set of journals and two sets of keywords. The set of journals consist of a predefined list considered to be suitable for the study. Both sets of keywords describe a phenomenon at one end of the relation. Each possible combination of an element from each set brings forth one search instruction. The total number of search instructions is the product of number of elements in the sets. Figure 2 shows the keywords used in the exhaustive search.

[INSERT TABLE 1 HERE KEYWORDS]

Using this method is the first step in acquiring the relevant literature on the relation between strategy and MCS. In our review we specifically focus on this relation, the review presented here is conducted against this particular background. To obtain the necessary focus we then selected the relevant studies from the resulting list. The search led to a result of 89 papers (see appendix 2 for the complete list of papers resulting from the search); however only the studies that effectively relate to the subject at hand are analyzed in this paper. The screening of papers that show a clear relation to the subject of MCS and strategy resulted in 30 studies identified as suitable for the review. The next step is classification of the retrieved studies. From these 30 studies, 16 were identified as survey based and 14 were identified as case based studies.

### 3. Frameworks for analysis

To enable a thorough analysis, frameworks focusing on different elements of these studies are employed. The classification and subsequent analysis of studies is in essence based on the framework developed by Mohr (1982) where the focus is on the approach taken to explanation. A further analysis of these studies is enabled by the frameworks developed by Langfield-Smith (1997) where the focus is on measurement and method within survey-based studies and Keating (1995), where the focus is on the aims of case studies pertaining to discovery, refinement – specifically illustration and specification - or refutation of theory. Furthermore, conclusions drawn in partial reviews of this specific strand of literature by scholars as Ittner & Larcker (2001) - focusing primarily on measurement of strategy related to MCS - and Chenhall (2003) - focusing on strategy as a contingency variable - are taken into account. Although other types of classifications of studies have been developed, for example Chenhall (2005a) who describes a process and content approach to classify studies pertaining to strategy and MCS, we do not adhere to this classification. This review is deliberately aimed at the approach taken to explanation. The motivation for choosing the approach to explanation as the primary framework for classification lies in the emphasis that is put on the use of causation in developing hypotheses and subsequently theory. Causality and its direction has become a returning theme in studies focused on MCS and strategy (e.g. Langfield-Smith, 1997, Ittner and Larcker, 2001, Chenhall, 2003) and studies of accounting in general (e.g. Luft and Shields, 2003).

#### 3.1 Approaches to explanation

The extant literature reviewed in this study clearly shows that there is a dichotomy visible in approaches to explanation and theorizing when performing research. The dichotomy that emerges stems from the theoretical structure underpinning research and the adopted research approach. The theoretical structure in this case is concerned with the formulation of the argument put forward in each of the studies. Scholars either aspire to produce process theory or aspire to produce variance theory. Mohr (1982) provides a clear description of the difference between the two approaches; *"In variance theory the precursor is a necessary and sufficient condition for the outcome"* (1982: p 37) while *"[i]n process theory, the precursor is a necessary condition for the outcome"* (1982: p 45). ). Table 2 provides an overview of the characteristics of the two approaches.

[INSERT TABLE 2 HERE CHARACTERISTICS OF VARIANCE AND PROCESS APPROACH]

These characteristics allow for easy conceptualization in terms of necessary and sufficient conditions as modes of explanation. The dichotomy as illustrated previously has also implicitly surfaced in prior research within the field of accounting. The following citation illustrates the distinction made by Lukka and Kasanen (1995: p75) between studies: *"With regard to empirical research in accounting today, we may distinguish two quite clearly emerging principal alternatives. On the one hand there are statistical researchers who represent the international mainstream and typically either test hypotheses deduced from certain theories, or develop new hypotheses on the basis of relationships discovered through the analysis of data. On the other hand, there are case researchers working in the field with a very limited number of research objects, who typically stress the importance of interpretation and deep understanding..."* This dichotomy is however only based on applied methodology when performing research. There is no strict, neither a perfect match between the use of a methodology and a study using either a process or a variance approach. Studies that fit within the category that use a process approach are in some cases using multiple methods to perform research. Within the variance approach we see the

same occurring. The study by Malina and Selto (2004) for example is reported as being a case study; however, the approach taken to explanation shows it as a variance study. Similarly, Bhimani & Langfield-Smith (2007) use a variance approach to determine the nature of strategy development, strategy implementation and the role of financial and non-financial information herein.

### 3.1.1 Variance studies

In variance research, the base of explanation is causality, while the precursor in variance research is said to always cause a certain predetermined outcome (deterministic). Variance studies address “*what*” questions using explanatory models. They aim to establish causal relations, using statistical analyses of quantitative data collected primarily through survey based studies. The variance studies identified within the selection of thirty papers are characterized by a structural and functional approach to the relationship between strategy and MCS. These studies are rather deterministic in nature, implying usage of implicit assumptions. More concisely, “*the typical approach is to assume a causal relation running from strategy or organizational design to the design of managerial accounting and control systems*” (Ittner & Larcker, 2001: p367). A certain strategic orientation *will* thus lead to a predefined set of management controls and subsequent performance effects (e.g. Ittner and Larcker, 1997, Chenhall and Langfield-Smith, 1998, Lillis, 2000). Causation is thus literally the driving force in the sense that causes are assumed to produce outcomes in a regular manner. Chenhall (2003: p150) draws a similar conclusion specifically for contingency research: “[*c*]ontingency-based research predicts that certain types of MCS will be more suited to particular strategies” and finds that most contingency studies indeed link MCS to typologies of strategy. Langfield-Smith (1997: p210) also noted that implementation of strategy was (implicitly) addressed in contingency research. This line of research within the management accounting field mainly focuses on organizational performance improvement after altering the strategic orientation of an organization. The approach to the relation between strategy and MCS is deterministic in the sense that the adoption of a certain strategy leads to predetermined hypothesized outcomes. The aim of variance studies is to develop theory that posits an invariant relationship between causes and effects when contingent conditions exist. This line of research focuses on strategy, MCS and subsequent performance effects. Scholars in this stream attempt to explain variation in the outcome variables by associating those outcomes with predictor variables (e.g. Ittner and Larcker, 1997, Abernethy and Brownell, 1999). Research methods in use are primarily of a quantitative nature. In accounting research this primarily involves the use of statistical methods, although there are studies within this category that use a multi-method approach. These studies more or less suggest that the adoption of a strategic orientation in each separate case *will* have effects on MCS and subsequently on performance. In these cases strategy is often conceptualized using different typologies. Scholars actively engaged in this specific area suggest also that the direction of causality assumed - as previously mentioned, i.e. strategy determines MCS - may actually be opposite: “*with accounting system design promoting or inhibiting the adoption of certain strategies*” (Ittner & Larcker, 2001: p367). Langfield-Smith (1997) came to a similar conclusion based on the case studies she reviewed, showing how MCS and strategy were interdependent in the sense that MCS enabled development and implementation of strategy. The hereto related determination of causality - i.e. to examine whether objectives, strategies and organizational design are determined simultaneously or otherwise - has been suggested by Ittner & Larcker (2001) as an avenue for further research. These scholars suggested the examination of causality through simultaneous equation models. Chenhall (2003) concluded for contingency based research into MCS using surveys that causality was either unidirectional (MCS determines outcomes) or bi-directional (MCS determines outcomes which in turn determine MCS). The possibility of bi-directional causality led Chenhall (2003) to suggest that

relationships concerned with MCS and strategy are cyclical. More specifically, results of cross sectional survey based studies can be considered as representations of states of equilibriums, relevant for only one stage in the cycle. Marginson (2002) similarly suggested that the nature of the relation between MCS and strategy is likely to be cyclical.

### *3.1.2 Process studies*

The other strand identified adopts a process approach to research. According to Van de Ven and Huber (1990: p 213) *“process studies are fundamental to gaining an appreciation of dynamic organizational life and to developing and testing theories of organizational adaptation, change, innovation and redesign.”* Within this strand studies aspire to develop and test theories of processes of strategy adoption and implementation related to the adoption and implementation of MCS. Scholars within this stream seek to explain *“how”* and *“why”* strategic change emerges and unfolds and how outcomes develop over time; see for example Marginson (2002) and Tuomela (2005). In process research, the base for explanation is a probabilistic outcome, which may occur through a recipe of ‘causes’. There is not *one* ‘cause’ and a cause is insufficient to be responsible for an outcome, but is merely necessary for it to occur. Process studies thus differ significantly in the assumptions made pertaining to the relationship between antecedents and outcomes. In contrast to variance studies, process studies attempt to explain the story that connects predictors and outcomes. Sequentiality plays a pivotal role within process theory, while its aim is to explain how a sequence of events leads to a certain outcome. Different issues - e.g. strategic management accounting (SMA), impact of MCS on the empowerment of employees and their possible attempts to thwart change - receive attention when this approach is applied. Process studies in the main are aimed at deriving theory from observation (theory discovery); in some cases these studies are also geared at testing hypotheses derived from theory (theory refutation or theory illustration). In other cases when a process approach is taken, theory is used to guide observation in order to further specify said theory (theory specification). These different approaches are sometimes used in combination, resulting in the use of both qualitative and quantitative approaches in process research (Langley, 1999).

### *3.2 Examining studies according to methodology*

The aspirations of process studies, i.e. answering how and why questions against a temporal background, are more easily aligned with aims of case studies as being those of explanation or exploration (Keating, 1995, Yin, 2003). Although there is no - as mentioned earlier - perfect match between the use of a methodology and either a process or a variance approach, studies need to be assessed based on their merit. More than often, a process approach is associated with the case study methodology. Case studies are used to accomplish various aims. Case studies can provide description (Kidder, 1981), test theory (Pinfield, 1986), and generate theory (Gersick, 1988, Keating, 1995). Otley and Berry (1994) also recognize that case studies can fulfill several roles, but they emphasize the central role of case studies as being that of exploration. Several different typologies and taxonomies of case studies are available that explain the aim of using this research methodology and enable classification. Well-known are descriptions of why and how to employ case studies by Keating (1995), Eisenhardt (1989), Ryan et al. (2002) and Yin (2003). The framework developed by Keating (1995) uses the stages of theory development as criterion for classifying case studies. The framework is specifically geared at capturing *“[t]he diversity of research scope covered in management accounting case studies”*, and *“provides a straightforward framework for “taking stock” of those aspects of theoretical contribution that researchers have or have not addressed in their research.”* (Keating, 1995: p66). To examine case studies on their merit - i.e. theory discovery, refinement or refutation - the



choice to employ the framework of Keating (1995) is thus quite straightforward, while in the main case studies within this specific area are easily aligned with studies using a process approach. To enable examination of survey based studies - in the main using a variance approach to explanation - the logical step is to use the framework as developed in Langfield-Smith (1997).

## **4. On the interplay between Strategy and MCS**

### *4.1 Central themes in research*

This section provides a comprehensive review of the thirty studies resulting from the search. The studies are organized around returning themes, and classified based on the approach taken to explanation. The returning themes in research focus specifically on (1) the relations between strategy, MCS/MAS and performance, and (2) the use of MCS/MAS. The focus for survey based research is on the same items identified in Langfield-Smith (1997). However, the level of abstraction taken in studies is also examined; i.e. is strategy examined on the level of the organization, the business unit level or the operational level, in order to examine whether or not studies take strategy development and implementation at different levels into account. Furthermore the theories scholars draw upon to formulate and test hypotheses are made visible. The case studies are assessed based on Keating (1995) as previously stated.

### *4.2 Variance studies pertaining to Strategy, MCS/MAS and Performance*

In essence the studies by Ittner and Larcker (1997), Chenhall and Langfield-Smith (1998), Laitinen (2001), Baines and Langfield-Smith (2003), Malina and Selto (2004) and Auzair and Langfield-Smith (2005), share the same theme i.e. strategic orientation, control practices and their combined impact on performance. Ittner and Larcker (1997) study the relation between strategic orientation pertaining to quality and strategic control practices - derived from the quality management literature - and their combined impact on performance. They call attention to different approaches towards strategic control practices between organizations from different countries. Country comparisons reveal that American and German organizations following a quality-oriented strategy place more emphasis on strategic control practices. Japanese organizations however use strategic control practices regardless of their strategic orientation. Analysis of quality strategy, strategic control practices and performance does not provide an unambiguous relation between these factors. Performance effects of strategic control practices vary by industry. Findings indicate that the effect of strategic control practices might depend on the environment. Chenhall and Langfield-Smith (1998) in a similar vein examine the relation between combinations of management accounting practices, management techniques and organizational performance. Organizations in the sample are classified according to “*strategic priorities*” using Porter’s (1980) typology of strategy. Their hypothesis is geared at testing whether strategic priorities with corresponding combinations of management accounting practices and management techniques lead to - relative - superior performance. Based on cluster analysis they conclude that aligning management accounting practices and management techniques with subsequent strategic priority have a positive influence on organizational performance. This finding is in line with the Ittner and Larcker (1997) study, who found that under fixed strategic orientation some management controls lead to improved performance, whereas other (formal) management controls may actually lead to decreased performance. Both studies indicate that strategies should be combined with corresponding management controls in order to improve performance.

Laitinen (2001) describes the influence of organizational and strategy factors on management accounting system (MAS) change within small technology companies in Finland. The author constructs

a typology of motivation patterns of MAS change for organizations. The identified types of motivation patterns are (1) change-oriented, (2) stable and conservative, (3) performance-contented and (4) discontent resourceless organizations. Based on Simon's (1957) behavioral theory of rational choice a model is constructed to calculate probability of survival, given a motivation pattern. The model is employed to generate tests used to draw conclusions concerning probability to survive and to compare the motivation patterns. The tests show that in a complex environment investments in innovation projects do not substantially improve the chance of survival. Laitinen thus concludes that MASs used to identify possibilities of innovation may be ineffective in complex environments. With regard to the strategic planning period the author concludes that in environments with high uncertainty, the strategic planning period should be relatively short, as numerical tests with a random environment shows that the strategic planning period has a limited optimum level. Different types of motivation patterns are expected to lead to different behavior. Change-oriented organizations are expected to have large changes in MASs while stable and conservative organizations are expected to only report small changes in MASs. Discontent resourceless companies are expected to report an average level of changes in MASs.

With an exploratory study Lillis (2002) aims to clarify two relations pertaining to strategy and performance measurement systems (PMS). Firstly, the impact of strategy on the formulation of PMS is explored and secondly, the ways in which performance dimensions are managed facilitating the implementation of strategy. Using across case patterns in data organizations are classified according to strategy and performance measures, labeled "*strategic priorities*". The classifications of strategy are cost strategy, quality strategy, customer services strategy and combinations of the aforementioned. Classifications of performance measures are cost measures, quality measures, customer service measures and subsequent combinations. For each strategic priority it is determined how many organizations have problems with implementation and what facilitators are used to manage these problems. Twelve organizations from all strategic priorities manage problems during implementation by "*reducing emphasis on variances*" (Lillis, 2002: p 507). The "quality strategy/cost (efficiency) measures" combination is the largest group of strategic priorities encountering problems during implementation of strategy. This group mainly manages their problems by "technical integration", meaning restatement of efficiency measures to also integrate quality measures. The largest group of organizations that does have implementation problems, but has no facilitative mechanism to manage them is the strategic priority "responsiveness strategy/efficiency measures". Further analysis reveals that performance measures are not always linked to strategic orientation. The author concludes that issues emerging from "responsiveness strategy/efficiency measures" strategic priorities are the most problematic as they are common and there appear to be no facilitators to manage this.

From a slightly different perspective Baines and Langfield-Smith (2003) focus on the interplay between strategy and MCS by studying the impact of environmental change in the form of intensified competition on management accounting practices. Intensified competition is expected to lead to more organizations focusing on a differentiation strategy. The theoretical assumption is that when markets become crowded organizations have to distinguish themselves from others by providing customer-oriented aspects in order to sell. The anticipation is that a change in strategic focus influences management accounting practices. Cost and efficiency-based performance measures are expected to lose importance over non-financial information when changing towards a differentiation strategy. Organizational design and manufacturing technologies are expected to change. The shift towards a differentiation strategy is expected to increase organizational performance. Analyzing data provides support for the hypotheses. A positive relation between a more competitive environment and an increased emphasize on differentiation strategy is identified. There was no support for the hypotheses

that a more competitive environment results in greater use of team-based structures or increased use of advanced manufacturing technology. The hypothesis that an increased emphasis on a differentiation strategy leads to changes in organizational design is supported for all dimensions. The hypothesized positive impact of increased use of advanced manufacturing technology on organizational change is not supported. For the increased use of advanced management accounting practices and greater use of team-based structures no significant positive impacts were found. Increased use of advanced management accounting practices and greater use of team-based structures are identified as reasons for greater reliance on non-financial management accounting information. The results support the hypothesis that a greater emphasis on non-financial management accounting information results in improved performance. The authors conclude that the strongest link exists between the change in strategy and change in management accounting practices.

Malina and Selto (2004) describe a case study using qualitative and quantitative approaches at a large U.S. equipment manufacturer, focusing on efforts of the organization to model drivers for performance of its distribution system. To this end a framework of performance measurement attributes, based on prior research is created. Eight desirable attributes of performance measures are identified; *“diverse and complementary, objective and accurate, informative, more beneficial than costly, causally related, strategic communication devices, incentives for improvement, and supportive of improved decisions”* (Malina and Selto, 2004: p465). The study is structured around four research questions, addressing the role of measure attributes and their relations to management control and strategy. Empirical data for qualitative analysis is collected through interviews, company documents and performance data. Company documents serve as data for quantitative analysis. Results of the study indicate that adoption of performance measures depends on the organizations strategic orientation, as it influences the importance of individual attributes. The study reveals that the organizations adopting a conservative strategy only abandon a performance measure that fits the strategy when it has an abundant amount of negative attributes. The same result is found for performance measures pertaining to the entrepreneurial strategy. The authors explain this contradiction with other findings in prior research on the basis of three arguments: (1) this study investigates individual measures instead of performance measurement models, (2) strategy does not lend itself to be classified using a simple dichotomy of conservative and entrepreneurial strategies and (3) related strategic entities are studied. A company can logically adopt aspects of different strategies leading to a mix - instead of a predefined set - of performance measures. Concerning the relative values of the attributes the authors conclude that attributes associated with design are more influential than attributes associated with use. Analysis of trade-offs between attributes in the case study reveals that the two most influential attributes are *“objectivity and accuracy of measures”* and *“the cost versus benefit balance of measurement”*. The authors conclude that these attributes are consistent with the organizations’ strategy, as attributes as well as strategy signify a conservative approach.

Auzair and Langfield-Smith (2005) study the impact of service process type, business strategy and life cycle stage on MCSs. The authors scope their efforts by investigating service organizations. Dimensions of MCSs under investigation are action versus result control, formal versus informal control, tight versus loose control, restricted versus flexible control and impersonal versus interpersonal control. Mass versus professional depicts the dimension of service process type. Dimensions of strategy are depicted by a low or high emphasis on a cost leadership strategy and a low or high emphasis on a differentiation strategy. The dimension of life cycle stage is envisioned by growth stage versus mature stage. A high emphasis on a cost leadership strategy and a mature stage is hypothesized to individually lead to forms of bureaucratic management control. High emphasis on a differentiation strategy and a professional service process type are expected to lead to forms of non-bureaucratic

management control. The hypotheses are based on the assumption that a certain strategy is always linked to management controls with a fixed set of characteristics. The argument is furthermore grounded in the notion that not all companies apply management controls according to implemented strategy. However, organizations that do match management controls to strategy have the highest performance (Chenhall and Langfield-Smith, 1998). The results provide support for three conclusions: (1) with regard to the service process type results indicate that mass service organizations apply more bureaucratic management controls than professional service organizations, (2) cost leaders apply more bureaucratic management controls than differentiators, and (3) for the life cycle stage the results indicate that organizations in the mature stage of their life cycle apply more bureaucratic management controls than organizations in the growth stage of their life cycle. It is interesting to note that the authors do not further examine the data collected on organizations that scored higher or lower than the median for both strategies. These organizations represent a group that does not make a distinct strategic choice, which might thus provide valuable information.

Central theme of Chenhall (2005b) is the influence of integrative strategic performance measurement systems (SPMS) on strategic competitiveness of organizations. Chenhall identifies three dimensions of SPMS to determine the level of integrativeness: strategic and operational linkages, customer orientation and supplier orientation. Strategic and operational linkages show the extent to which operations in the organization link to goals and strategies. The expectation is that a higher level of integrativeness of the SPMS directly leads to more competitive outcomes for organizations with a low cost strategy as well as for organizations with a differentiation strategy. Secondly, a higher level of integrativeness of the strategic performance measurement system is hypothesized to improve organizational learning and strategic alignment of manufacturing. These factors are anticipated to have a positive impact on competitive strategic outcomes as well. Analysis provides support for parts of the hypothesized relations. Integrativeness of SPMS is significantly correlated with the competitive outcome for both strategic orientations. Customer orientation has significant positive correlation with organizational learning, while supplier orientation has significant positive correlation with strategic alignment of manufacturing. Organisational learning has only significant positive correlation with the strategic outcome dimension delivery while strategic alignment of manufacturing has significant positive correlation with the strategic outcome dimensions delivery, flexibility and low cost price.

Li, Li, Liu and Wang (2005) study the impact of environmental change and internal organizational factors on the choice of MCS. A conceptual model based on Hayes and Wheelwright (1984), Hitt et al. (1996), Li (2000) and Simons (1994) indicating relations between environment, MCS and manufacturing decisions is constructed. A dynamic environment is expected to lead to top management's choice for strategic control, instead of financial controls, as strategic controls provide for better adaptation to market changes. Furthermore, they hypothesize that when strategic change is driven by internal factors, financial controls are preferred as these are perceived to induce less risks than strategic controls. The expectation is to find positive relations between financial controls and manufacturing process decisions and between strategic controls and product development, as these factors are emphasized in these particular control systems. The authors find support for their hypotheses.

#### *4.3 Process studies pertaining to strategy, MCS and performance*

Kloot and Martin (2000) report on a field study in the public sector of Victoria, Australia. The focus is on how local government organizations develop and implement performance management systems. Based on work by Fitzgerald et al.(1991), Ballantine et al. (1998) and Kaplan and Norton (1996) the authors construct a framework with performance management processes, divided into primary and

secondary objectives and the questions that an organization needs to address in order to achieve these objectives. This framework is used to classify and analyze empirical evidence that was collected by interviewing 80 people from seven councils of local governments. Respondents' reports indicated a strong emphasis on cost efficiency. The authors argue that this is a result of the Victorian State Government's pressure to achieve efficiency through competitive tendering. The Victorian Office of Local Government (OLG) requires councils to monitor 21 financial performance indicators, which the respondents experience as a burden. Local governments emphasized customer satisfaction, by allowing significant community input, resulting in outcomes that better meet the needs of the community. Analysis of the data shows that performance measurements from all categories of the framework constructed by the authors are present in the local governments, but they are not well balanced. Overall the emphasis was on the primary objectives, financial and community dimensions, while secondary objectives, internal processes and innovation and learning, were evidently much less measured and used in decision making. The authors argue that hence the linkage between financial and community dimensions and strategy was stronger than the linkage between internal processes and innovation and learning and strategy. Some of the indicators that the OLG requires turn out to be dysfunctional, as they do not provide usable information. Resources used for these measures should be used for a better balance between measures, by better monitoring and using secondary objectives, in order to improve long-term quality.

Hudson, Smart and Bourne (2001) focus on the alignment of performance measurement systems (PMS) with strategy within small- and medium-sized enterprises (SMEs). They present a typology of characteristics of performance measurement development processes. It defines well designed performance measures and appropriate dimensions of performance used to evaluate normative models for developing strategic PMS. The typology is based on Globerson (1985), Maskell (1989), Dixon et al. (1990), Lynch and Cross (1991) and Neely et al. (1996). Critical characteristics of well designed performance measures are *"derived from strategy, clearly defined with an explicit purpose, relevant and easy to maintain, simple to understand and use, provide fast and accurate feedback, link operations to strategic goals and stimulate continuous improvement"* (Hudson, Smart and Bourne 2001: p 1101). Performance measurements used in the literature are identified and classified according to the performance dimensions quality, time, flexibility, finance, customer satisfaction and human resources. The authors determined for ten theoretical models which of these performance measures are actually covered. The Cambridge performance measurement process (Neely et al., 1996, 1997, Bourne and Wilcox, 1998, Bourne et al., 1998) was identified as the only theoretical model covering all of the identified performance measurements. For the empirical phase of the study the authors collect and analyze data obtained from eight SMEs using thematic coding, resulting in an overview of PM development processes, performance measure characteristics and measurements used in practice. Based on the findings the authors suggest that there are substantial barriers to developing performance measures in SMEs. Comparison with the critical characteristics of performance measures found in the literature reveals that there were large differences between what scholars identify as important and what is applied in practice. The second part of the empirical phase of this study involves the investigation of the appropriateness of the constructed typologies in SME context. The SME applied the Cambridge performance measurement process and the authors observed developments for six months. The authors argue based on their observations that the current normative models may not be appropriate for SMEs. The focus on long range planning is however deemed valuable. Developments of PMS are discontinued while the participants of the SME felt that the organization did not need a top-level performance measurement system, but needed focus on the basics. The conclusion is drawn that

PMS development was too resource intensive and time consuming for this organization to complete the process.

Parker (2001) performed a case study of planning and control at a head office of an Australian church using the grounded theory methodology of Ferreira and Merchant (1992). The study is aimed at adding to the relatively small amount of literature concerning strategic management processes at not-for-profit organizations. The framework of planning and control constructed is used as the basis for discussion. The author describes the framework as solely based on field observations and free from prior commitment to existing theories. Empirical data is collected from different sources, subsequent coding and analysis of data is performed as suggested by Glaser and Strauss (1967), Strauss (1987) and Strauss and Corbin (1990). Parker identifies four key factors that strongly influence the planning within the organization. These are community culture, resources pressure, consultative bureaucracy and compliance oriented accounting information. Analysis reveals that these factors result in a reactive, short-term oriented and a resource focused approach of managing and planning. Short-term planning is a consequence of slow decision making while the organization makes extensive use of committees' consultations. The lack of attention for long-range planning resulted in a strategic vacuum. The author argues that this can be perceived as a weakness when compared to commercial organizations expected to having clear strategies and effective MCS. Parker suggests that ad-hoc problem solving in the case of this organization can however also be interpreted as a dynamic and flexible approach towards environmental uncertainty.

Marginson (2002) examines the impact of management control systems (MCS) on the process of developing and implementing strategy. Based on Simons (1990, 1991, 1994) he develops the hypothesis that strategic outcomes are influenced by MCS via managers their strategic activities. In order to investigate how this relation between MCS and strategy works in practice, a case study is performed at Telco plc, an organization in the British telecommunication industry. This company was chosen for its leading position and its high emphasis on creativity and innovation by middle-level managers. Top-management of Telco tries to control this specific behavior. Control is employed in order to prevent unwanted situations, but the aim is to do so without hampering possible valuable developments. At the moment of the study the organization had shifted its strategic orientation from cost leadership to a differentiation strategy. The author clusters the different sorts of MCS according to three criteria. The first group consists of MCSs that are used to proscribe the organization's strategic purpose, also known as belief and boundary systems (Simons, 1995). The second group consists of administrative controls that are used to establish role expectations and evaluations. The third group consists of MCSs aimed at monitoring organizational performance. The classifications are used to structure the remainder of the study. The author collected empirical data by interviewing managers of Telco during the development and implementation of their MCS, called the "change program". The answers of respondents concerning the first group of MCSs indicated that the change program had an impact on which ideas and projects would be executed. For the administrative controls in the second group of MCSs, the evidence from the case study indicated a relation between the use of the MCSs and the location of grass-roots activities (Simons, 1999). The liberal use of administrative controls led to initiatives from low level employees aimed at creating ideas to achieve strategic goals. The MCSs aimed at monitoring organizational performance seemed to create tension and trade-offs between the different performance measurements. Based on findings in the three groups of MCSs discerned, the author states propositions for further research, aimed at describing the role of the MCSs in developing strategy.

Perera, McKinnon and Harrison (2003) examine diffusion of transfer pricing as an innovation in a government trading enterprise (GTE) during a major environmental change. The authors pay attention

to the interplay between transfer pricing as an accounting technique and the strategy of the enterprise. The study is based on the question raised by Boyns et al. (1999) whether transfer pricing is a result or determinant of strategy. Rogers' (1995) diffusion of innovations framework is used to examine how innovations diffuse at the aggregate level in the organization under investigation. During the case study the organization moved from a monopolistic position into a competitive market, as it loses its governmental protection. During this period the organization introduces transfer pricing, abandons it and then reintroduces it. The environmental change made it necessary for the organization to shift its emphasis on technical excellence of services to commercialization. Analysis of the data reveals that transfer pricing was initially introduced as instrument to change the organizations' strategy. Once necessary changes were made, transfer pricing was abandoned. However, the authors argue that the reintroduction that followed can be seen as a result of the changed strategy in a later stadium.

Collier (2005) describes the investigation of linkages between systems based control and social controls by means of a longitudinal field study in a multinational packaging equipment supplier, TNA. The author uses the Ferreira and Otley (2005) and Simons (1995) frameworks for examining management control. Empirical data was mainly collected through meetings between the scholar and the owner of the organization over a ten year period, whilst additional data was retrieved by interviewing employees, customers and suppliers. The owner, Taylor, is characterized as an entrepreneur. The company's success is the result of Taylor's "Robag" invention. The product provides TNA with a differentiation advantage resulting in prosperous growth. In order to keep this advantage, over 10% of the annual sales are spent on research, development and patents. Taylor's dominance in the organization is visible in the applied control systems. Even though sales grew to \$ 6 million per year after a decade, Taylor refused to employ an internal accountant. Debtors and creditors were recorded using a computer, but there was no system for reporting inventory. The only reason to calculate sales figures was for statutory reporting and taxation purposes. Because the company expanded fast, after two decades annual sales were \$ 60 million, Taylor felt the need for accurate recordings of cash flows. During the nineties he developed an Excel spread-sheet model to record both financial and non-financial information. This model functioned as main tool for organizational decision-making. Taylor eventually had to employ an internal accountant as recording information was taking up too much of his time. Annual sales were then \$ 30 million. The spread-sheet model was still in use, but its focus shifted from the use for internal processes to use for environmental changes. In terms of social control Taylor played a central role as well. After office hours Taylor routinely spent his evenings with employees, suppliers and customers: "*[a]lmost every waking hour of Taylor's life was devoted to TNA*" (Collier 2005: p 331). Taylor says his reason for investing so much of his time in networking and building social control is that people are better in predicting the market than financial systems are. In his discussion the author argues that Taylor's way of controlling the company has one mayor weakness; it is completely dependent on one individual. The author concludes that the case study provides an example of a notion of control mix (Abernethy and Chua, 1996) where Taylor's own developed spreadsheet model and social controls had a much greater influence than traditional accounting. Concerning the methodology the author concludes that the framework by Ferreira and Otley (2005) is less helpful than the framework by Simons (1995), as it lacks the recognition of belief systems and boundary systems, which are evidently very important in the organization under investigation. The author argues that both frameworks pay too little attention to socio-ideological (Ditillo, 2004) forms of control.

Tuomela (2005) performed a case study in a Finnish organization on the introduction of a strategic performance measurement system (SPMS), based on Kaplan and Norton (1992, 1993, 1996) their balanced scorecard (BSC) concept. The focus of this action research is on the interplay of the different

controls, as described in the theoretical framework by Simons (1995). The author examines how MCS can be used diagnostically and interactively as investigated in previous research (Abernethy and Brownell, 1999). Furthermore, the aim is to examine how this impacts belief and boundary control. Tuomela suggests that SPMS are connected to all four levers of strategic control based on a study by Kasurinen (1998). The case study is performed at FinABB, an organization with a differentiation strategy and initially a strong emphasis on financial information. The author collected his data through observation during his participation in the development of the SPMS and from archival documents, informal discussions and interviews. The developed SPMS was used both in a diagnostic and an interactive way. The interactive use of performance measures took place during meetings set up to discuss “*strategic metrics, assumed cause-and-effect relationships and strategic uncertainties underlying these*” (Tuomela 2005: p 307). The author supports his suggestion that SPMS are connected to all four levers of strategic control by arguing that this SPMS visualizes customer relationships and core competencies, accentuating respect for individuals and customers (representing the beliefs system) and this SPMS particularly addresses key customers and accepted suppliers, providing sense of certain boundaries (representing the boundary system). Tuomela finds that ex-ante cause-and-effect verification for activities and goals does not hold as the validity of cause-and-effect relationships is uncertain and must be tested by using and discussing the measures. Bhimani and Langfield-Smith (2007) identify two different approaches towards the characteristics of strategy development and implementation. In general, management accounting researchers view strategy development and implementation as structured and formal processes based on both financial and non-financial information whereas strategic management researchers take the view that these processes have a high variety in form and nature. In order to determine which view is used within organizations the authors performed a multi-method process study. The results indicate that the respondents perceive the form of strategy development and implementation similar to management accounting researchers, namely as structured and formal. Regarding the role of financial and non-financial information during the processes of developing and implementing strategy the result indicate that only financial information is perceived important during implementing strategy, but when it comes to strategy development both financial and non-financial information are considered to be important.

#### *4.4 Variance studies pertaining to uses of MAS/MCS*

The variance studies contained in this part mainly focus on the ways in which MAS/MCS are used, and factors that are of influence on that use. These studies have different themes as capital budgeting (Carr and Tomkins, 1998), interactive use of MAS/MCS (Abernethy and Brownell, 1999, Hansen and Van der Stede, 2004, Naranjo-Gil and Hartmann, 2006, 2007), strategic management accounting (Guilding et al, 2000) and interactive design of MAS/MCS (De Haas and Algera, 2002).

Carr and Tomkins (1998) conducted field research focusing their attention on strategic decision-making styles in order to distinguish different financial approaches towards strategic investment decisions (SIDs) among different cultures. Examination of capital budgeting techniques used on SIDs reveals that all U.S. organizations use discounted cash flow (DCF) techniques, whereas only half of the U.K organizations in the sample practices DCF techniques. In Germany and Japan the percentage of organizations using DCF techniques are even lower. Fifty percent of the U.S. organizations identify DCF as the most important measure in SIDs, for the the U.K. and Germany this percentage was distinctly lower. None of the Japanese organizations pointed DCF out as the most important measure in SIDs. However, organizations from the U.K, Germany and Japan placed much more emphasis on payback periods than U.S. organizations. Also average targeted payback periods varied among countries, indicating short-termism within U.K. and U.S. organizations. When it comes to emphasizing



financial calculus the authors find the same division within the samples. More specifically, German and Japanese organizations place relatively low emphasis on financial calculus compared to U.K. and U.S. organizations. The authors compared these findings to the performances and competitiveness of the organizations and concluded that on the long-term Japan and Germany outperform the U.K. and the U.S. These scholars do however note that these findings may be limited to the particular industry. The authors identified three different stages of integrating financial approaches to SIDs. From least advanced capital budgeting to most advanced capital budgeting these are; traditional, best practice capital budgeting and an integrated strategic/ financial approach. The authors conclude that in order to keep up with their competitors the organizations in this industry ultimately needs to adopt the integrated strategic/ financial approach.

Abernethy and Brownell (1999) study the moderating role of style of budget use on the relation between strategic change and performance. The interactive role of accounting practices during strategic organizational changes is explored. Based on the recognition of accounting as a vehicle for interaction and learning (Burchell et al., 1980) the researchers hypothesize a reduction of disruptive performance effects caused by organizational changes if budgeting is used interactively. The theoretical assumption is that when people interact by discussing budgets, they create a shared vision which in turn can improve performance. Survey data is obtained from 63 Australian hospitals. In order to support the hypotheses, analysis should show that organizations with a greater emphasis on interactive use of budgets perform better. The construct of strategic change is operationalized using the definitions of strategy introduced by Miles and Snow (1978). Styles of budget use are classified according to Simons (1990) budget system use classification. Multiple dimensions of all three constructs are measured. The analysis reveals that the style of budget use is a moderating factor of the relation between strategic change and performance. This leads to the conclusion that *“the relation between strategic change and performance is more positive when the style of budget use is interactive compared to when it is diagnostic”*.

Guiding, Cravens and Tayles (2000) report on usage of strategic management accounting (SMA) practices within organizations in the U.S., the U.K. and New Zealand. Twelve SMA practices are identified in the literature. To investigate to what extent these practices are used, a survey is employed to enable comparison across countries, and assess understanding and perceived usefulness of SMA among respondents. Analysis of strategic costing and pricing practices revealed that on average only strategic pricing is employed. Comparison of the usage and perceived merit of strategic costing and pricing practices shows a high level of similarity. When comparing the usage and perceived merit of practices with regard to countries, the organizations in the U.K. score relatively low on both usage and perceived merit of attribute costing and value chain costing. Organizations in New Zealand score high on both usage and perceived merit of quality costing and value chain costing. The authors conclude that the potential of SMA should not be dismissed as the perceived merit scores are significantly higher than the usage rate scores. Analysis of the set of data from organizations of similar size revealed that similar organizations in New Zealand make greater use of three SMA practices than their U.S. and U.K. counterparts. The final conclusion is that the term “strategic management accounting” is hardly ever used within the organizations and appreciation among respondents is limited.

De Haas and Algera (2002) perform an action-research based case study on the effect of strategic dialogue on goal coherence between and within groups participating in management control (MCS) design. The strategic dialogue is an intervening goal setting process during the design of MCSs aimed at promoting the level of goal coherence among employees at all levels of the organization. During the case study, goal-interdependent groups participate in a strategic dialogue. During the strategic dialogue, the participants discussed the importance of seven goal related subjects. Analysis of the results showed

an increase in goal coherence, both between and within groups that participated in strategic dialogue. The authors thus concluded that strategic dialogue has a positive impact on goal coherence within and between groups.

Hansen and Van der Stede (2004) study the different roles and forms of budgeting in organizations. The idea to investigate the reasons to budget stems from the notion that most organizations use budgeting to control processes, but the reasons for doing so differ. Prior research has determined operational planning, performance evaluation, communication of goals and strategy formation as reasons for budgeting within organizations. The authors investigate multiple reasons to budget, whereas prior research always isolated a single reason to budget. The survey contains similar scales as the surveys used in Chenhall and Langfield-Smith (1998), Abernethy and Brownell (1999) and Baines and Langfield-Smith (2003). For investigating the reasons to budget antecedents of these reasons - organizational strategy and structure - are measured as well as the budgeting characteristics target difficulty and budget emphasis. Based on an analysis of the four reasons to budget the authors conclude that the reasons to budget are "*sufficiently distinct to warrant analysis by themselves*". The study is extended with an analysis of the relationships between all the reasons to budget, antecedents and budgeting characteristics. The analysis shows the links between antecedents, budget characteristics and reasons to budget. Every reason to budget has its own unique set of antecedents and budget characteristics. Based on this evidence the authors conclude that the "distinct" reasons-to-budget... are associated with different underlying drivers".

Naranjo-Gil and Hartmann (2006, 2007) performed two studies with the first focusing on the influence of the top management team (TMT) professionalism on use of MAS and strategic orientation. The second study is focused on the influence of TMT composition and the characteristics of the management accounting system (MAS) on organizations' ability to realize strategic change. These studies are based on the same data set. The first (2006) study investigates the role of management accounting systems (MAS) in strategy implementation and the effect of professionalism of TMT on this role. The role of MASs is determined using the assessments of general use of the MASs as perceived by the TMT members. The professionalism of TMT members is measured with the years of experience and education on health care, management and business administration issues. The authors hypothesize direct relations between professionalism of TMT and strategy implementation and indirect relations via the different uses of MAS information. Data analysis reveals that higher levels of professionalism of TMTs are positively related to flexibility strategy implementations. However, the hypothesized direct negative relation between professionalism of TMTs and cost strategy implementation and the negative relation between professionalism of TMTs and coercive use of MAS are not significant. The relations between coercive use of MAS and cost strategy implementations as well as the indirect relation between professionalism of TMTs and flexibility strategy implementation via enabling use of MAS are supported by the analysis. The authors conclude that as TMTs have more professional orientation they make more interactive use of MAS.

The central theme of Naranjo-Gil and Hartmann (2007) is the influence of the top management team (TMT) composition and the characteristics of the management accounting system (MAS) on organizations' ability to realize strategic change. The authors investigate how TMT heterogeneity positively influences strategic change. They hypothesize that the influence consists of a direct impact and an indirect impact through the design and interactive use of the MAS. The authors base this expectation on the findings of prior research indicating that the background and competences of managers have an impact on the ability to realize strategic change within the organization. Evidence of a relation between interactive use of MAS and strategic change is found in Abernethy and Brownell (1999). Strategic change is measured using the instrument by Abernethy and Brownell (1999) based on

the typology of Miles and Snow (1978). TMT heterogeneity is measured by coefficients of variation of obtained scores on age, tenure, experience, and education of managers. The instrument for measuring the interactive use of MAS is also taken from Abernethy and Brownell (1999). For testing the hypotheses the authors perform a partial least square analysis, the same method as used by Chenhall (2005). Analysis reveals that all four constructs, TMT heterogeneity, extent of strategic change, Interactive use of MAS and broad-scope MAS significantly positively correlate, except TMT heterogeneity and broad-scope MAS. The authors suggest that “This result could be explained by the fact that this is a design dimension of MAS, which cannot directly be influenced by TMTs, or which cannot be adapted to the individual characteristics of TMT members” (Naranjo-Gil and Hartmann, 2007: p750). The authors present the perceived usefulness of broad-scope MAS as a characteristic of the MAS and not as a characteristic of the team members. The study supports the hypotheses that TMT heterogeneity has a direct positive impact on strategic change. The hypothesis that states that TMT heterogeneity has a positive indirect impact on strategic change is supported as a positive relation is identified between TMT heterogeneity and interactive use of MAS and between interactive use of MAS and strategic change.

Davila and Foster (2007) examine management control systems in early-stage start-up companies using a multi-method approach. In essence this study deals with two hypotheses: (1) an increase in MCS intensity facilitates future company growth, and (2) managers anticipate future growth and increase MCS intensity to enable them to manage that growth. The findings from analysis of the data show that company growth and MCS are interrelated. MCS are needed to provide the management infrastructure that supports growth beyond the informal stage; simultaneously, these systems are needed only if growth exists.

#### *4.5 Process studies pertaining to uses of MAS/MCS*

Karlsson and Åhlström (1997) present an exploratory longitudinal case study of an electro mechanical manufacturing firm striving to gain a competitive advantage by aligning their product development to changes in the marketplace. Realization of this strategy is attempted through building capabilities to quickly and efficiently develop new products. The authors focus on how the process of changing product development strategy takes place. The framework in use as starting-point for the study was developed by Wheelwright and Clark (1992). Based on the data acquired during the study the authors provide several lessons learned concerning the strategy development process. The first lesson is that by making the product development manager responsible for the progress of the process between the seminars, problems that occurred during meetings, such as the lack of viability, are actively managed and solutions are sought outside of the meetings. The second lesson learned is that reacting to changes in the marketplace should be a responsibility of all functions. A shared understanding of how to achieve strategic goals was created with the functional maps, but a lack of attention for recent developments, resulting in less sales, has led to a schism between the participants on how much resources could be spend. The third lesson is that three factors required attention throughout the process: time, money and goal achievement. Pushing time and money targets on the expense of goal achievement can lead to shortsightedness and missing strategic goals. The fourth lesson learned is that a bottom-up approach of strategic planning is more realistic than starting from the wishes of managers. The fifth lesson learned is that product development must be seen as an issue for the whole firm, as project-planning decisions have an impact on all functions. Concerning the action research based nature of this study the authors conclude that keeping the roles of scholars and management strictly separated improves the process of changing the product development strategy. A second conclusion that the authors draw based on the intervention is that keeping the conceptual framework intact is important.

The final conclusion they draw is that the focus must be on concrete plans instead of abstract strategies. This can improve the developments as participants better relate to concrete realities than to abstract concepts.

Slagmulder (1997) performed multiple case studies with the main theme being how MCSs are designed and used to align strategic investment decisions (SID) with a firm's strategy. The acquired data gives implications that organizational structure, competition and strategy changes cause strategic misalignment and alter the set of feasible investments, which require adaptation of the MCSs and SIDs. Slagmulder identifies three steps in the process of realigning MCSs and SIDs to strategy; determine the source of the misalignment, alter the MCS for SID to correct the problem of strategic misalignment and increase efficiency of the MCS. Based on the findings the author concludes that achieving strategic alignment is the main reason for designing and redesigning MCSs for SIDs. As the environmental conditions continuously change the MCSs have to change accordingly to prevent or resolve strategic misalignment. Dixon (1998), investigates the role of strategic management accounting (SMA) within a British packaging firm. The firm is characterized by an active policy of analyzing market information and a hierarchical management structure. Its main competitive advantage was a newly accredited industry standard. In order to keep this advantage and create growth the organization focuses on a differentiation strategy. The organization uses a management information system (MIS) to record financial data and track developments. The strategic planning process is structured and formal, involving all managers. Performance is monitored using financial and non-financial indicators. The financial indicators are compared to historical data and competitor data on a regular basis. The non-financial performance measures are (1) Quality Assurance Supplier and Purchasing information, (2) Sales and Marketing information, and (3) Capital and Asset Management Performance. Concerning the mix of financial and non-financial information management argues that an over-emphasis on strategic objectives leads to losing sight of other important performance indicators. The management of the organization perceived that there were gaps in external information concerning competitors' costs, cost structures, volume and product profitability. Management felt however, that they were capable of reducing these gaps through their own MIS. The organizations' accountant used information from the MIS to calculate the strategic position of the organization as a basis for business strategy, showing the managers of the firm possibilities of SMA. The opportunities for the accountant to exploit his role and the level of subjectivity of the information lead management to decide not to use SMA in its pursuit for sustainable competitive advantage. Nilsson (2000) examines how styles of management create value. The creation of value is realized by designing appropriate systems for strategic planning - also known as parenting styles (Goold et al., 1994) - and management control system (MCS). The aim of the study was to identify and analyze relations between parenting styles and MCS. Furthermore, the intent was to provide in-depth knowledge on the coordination of control systems between corporate and business-unit level. The empirical evidence was collected through case studies at four organizations. Two of the companies apply a parenting style of financial control and two of the organizations apply a strategic planning parenting style. Based on the gathered data, the author concludes that the companies applying a financial control parenting style have unified controls for corporate and business-unit level that are adapted to the situation they are used in. However, he also argues that for the design of effective control the degree of diversification and the differences in strategy must not be too large. The companies applying a strategic control parenting style have the greatest need for a clear philosophy of control. With regard to value creation the four case studies provide a clear opportunity for comparison, as all four organizations have the same primary goal, namely to increase total shareholder return. The two organizations that apply a financial control parenting style have superior shareholder return, shareholder equity and capital employed compared to the two organizations that apply a strategic-

planning parenting style. The author ascribes this to the fact that the organizations applying financial control parenting style create control systems that support the development of each business unit, improving their effectiveness. Both organizations applying a strategic-planning parenting style struggled with strategic mistakes and depressed prices. The author states that synergies between parental styles and MCS are not the only factors influencing company results while he assigns mayor importance to the ability of corporate management to design and use appropriate management control systems.

Saravanamuthu and Tinker (2003) performed a case study investigating decision-making styles and the circumstances under which decisions are made by managers. Based on their findings the authors theorize that workers' leverage of dissent influences labor strategies used by managers. When the leverage of dissent is high, the sub unit management has to employ accommodative decision making behavior. Disregarding the workers demands could otherwise lead to disruption of the production process. At the other end of the continuum the leverage of dissent is low, workers could easily be replaced. However, this will also result in accommodative decision making behavior by the sub unit manager, as resistance of workers could easily lead to the top managements' decision to close the complete sub unit. A medium leverage of dissent will result in an impasse where managers will use a technocratic decision-making style. The authors direction for future research are to analyze "frequency of occurrence of accommodative and technocratic behaviors based on a contextualized survey instrument" (Saravanamuthu and Tinker, 2003: p 57), in order to add credibility to their findings.

Roslender and Hart (2003) investigate the impact of strategic management accounting (SMA) practices in 10 international companies from different industries. The aim of this exploratory study is to create a typology of relationships between management accounting and marketing management functions. The authors found a range of practices performed on the interface of management accounting and marketing management. Analysis of these practices reveals three relationships between the functions of management accounting and marketing management; traditional relationships, transitional relationships and synergistic relationships. The traditional relationship consists of the most simple practices involving management accounting as well as marketing management. The interfunctional cooperation is limited to financial management by using budgetary controls, which marketing managers embrace for their activities. A transitional relationship consists, in addition to budgetary controls, of management accounting techniques that are beneficial to both functions. The authors give as examples activity-based costing, customer profitability analysis and direct product profitability. The synergistic relationship between the functions requires practitioners to abandon traditional practices allowing for inter functional coordination of practices. The authors refer to this merger of functions as strategic marketing management accounting. Based on experiences gathered during this field research the authors take a stand against Lord's (1996) statement that SMA is a figment of the academic imagination. Even though many interviewees are not familiar with the term SMA, most of them were positive about the potential of cooperation between the management accounting and marketing management functions. Furthermore, the respondents engaged in synergistic relationships were enthusiastic about value-based management, an advanced SMA technique.

## 5. Analysis and conclusions

This section presents the analysis of the studies summarized in the previous section. From the review as presented here, it is easy to infer that research into the interplay between MCS and strategy has led to a common body of knowledge.

### 5.1 Studies pertaining to strategy MAS/MCS and performance

In variance studies, there is greater consistency in research designs and use of measures. More than often scholars draw on findings of previous research; this specifically applies to studies adopting a variance approach. Table 3 contains elements of the survey studies reviewed, providing the basis for several of the conclusions drawn.

[INSERT TABLE 3 HERE RESEARCH DESIGN OF SURVEY STUDIES]

Examination of the studies pertaining to strategy, MCS and performance, allows for several conclusions. Variance studies mainly focus on sets of relations between strategy, MCS and subsequently performance. The primary tenet of these studies is that an alignment of controls with a certain strategy can increase organizational performance. Additionally, certain combinations of strategy and controls provide for a better performance than others. Contingency variables predominantly derive from existing theory found in the literature. For variance studies in the main, it is fairly easy to deduct that these employ strategy frameworks based on either Miles and Snow (1987) or Porter (1980). The studies that do not use a strategy framework are Ittner & Larcker (1997) and Carr & Tomkins (1998). which is logical while the study is performed within one industry under the assumption that the environment is stable, and Guilding et al. (2000) who use a confluence of different strategic frameworks.

[INSERT TABLE 4 USED STRATEGY TYPOLOGY IN VARIANCE STUDIES]

Table 4 presents an overview of the studies and the respective strategy typology used. These studies mainly test hypothesized relations with empirical evidence based on statistical data retrieved from samples. In variance studies, mainly questionnaires are used to collect data, however, alternative survey methods as semi-structured interviews (Abernethy and Brownell, 1999, Lillis, 2002) and interception (de Haas & Algera, 2002) are employed. Furthermore, multi-method studies have started to appear, for example field-research combined with questionnaires (Davila and Foster, 2007). As mentioned earlier, the study by Malina and Selto (2004) is reported as being a case study, but the approach taken to explanation shows it as being a variance study. Table 3 shows only the survey studies, and as such the Malina and Selto (2004) study is not mentioned in this table. Ittner and Larcker (2001) found in their assessment of empirical research in managerial accounting that most studies examine corporate or business strategy. In the studies reviewed here, their finding is corroborated, the greater part of these studies focuses on strategy at the corporate level; table 5 shows the examined level of strategy.

[INSERT TABLE 5 HERE LEVEL OF STRATEGY IN VARIANCE STUDIES]

In the identified survey studies researchers predominantly retrieve their data from top managers; CEOs and CFOs are the most important source for data collection. Very few variance studies include middle

managers (Davila and Foster, 2007, de Haas & Algera, 2002) or controllers (Chenhall and Langfield-Smith, 1998) as a source for data gathering. When middle managers serve as the source for data, then this occurs only in combination with data retrieval from top management. This corresponds to the level of strategy that these studies focus on, which is mainly corporate level. De Haas & Algera (2002) and Chenhall (2005) are the only two variance studies identified in which a linkage between operational strategy and strategy on a higher level is made explicit. It is notable that for this purpose Chenhall (2005) retrieves his data from top management, whereas de Haas & Algera (2002) retrieve data from the operational and middle management level.

The analysis by Langfield-Smith (1997) showed a high level of inconsistency pertaining to the operationalization and measurement of control, effectiveness and strategy in the studies she reviewed. Pertaining to operationalization and measurement of strategy, there is less inconsistency noticeable among the different studies. Scholars for the greater part draw on established typologies of strategy, in particular Porter (1980) and Miles & Snow (1978). Operationalization and measurement of strategy in these studies is performed in very similar ways, as in most studies the examined organizations are classified based on the strategic orientation - assessed on Likert scales - using established typologies. Often instruments for measuring variables developed in previous research are used; Baines and Langfield-Smith (2003) use instruments developed by Chenhall and Langfield-Smith (1998), which are in turn based on instruments developed in Govindarajan and Fisher (1990). Similarly Naranjo-Gil and Hartmann (2006, 2007) use instruments from Abernethy and Brownell (1999). The way in which operationalization of strategy is performed is in several of these studies also based on prior work. Abernethy and Brownell (1999) use the approach by Shortell et al. (1990) to operationalize strategy, based on the strategy typology of Miles and Snow (1978). Auzair and Langfield-Smith (2005) use the approach of Chenhall and Langfield-Smith (1998), Laitinen (2001) uses Gosselin's (1997) analysis of prospector strategy (Miles and Snow, 1978) and Chenhall (2005) uses the constructs based on Miller et al. (1992), an elaboration of Porter's (1980) strategy typology. The relations between studies thus show that constructs are more than often based on established typologies and once constructs have been developed, they are often reused in further research, sometimes however after an adaptation.

Process studies show a much greater variety in research aims, design, subjects under investigation and the theoretical frameworks which scholars draw upon. Most of the process studies are case studies, except for the study by Bhimani and Langfield-Smith (2006), where questionnaires are combined with interviews. Studies pertaining to strategy, MCS/MAS and performance are predominantly geared at theory discovery and theory refinement. When it comes to studies aimed at theory refinement, there is an equal distribution of studies aiming at theory illustration and specification. It is notable that no studies are geared at theory refutation. The process studies contained in this review were not designed to test - with the aim to corroborate or falsify - theory. Table 6 presents the theoretical aims of the different studies investigated classified according to Keating (1995).

[INSERT TABLE 6 THEORETICAL CONTRIBUTIONS OF CASE STUDIES]

When it comes to the level of strategy examined within the different process studies there is also great diversity. Almost all process studies examine strategy on the corporate level, table 7 shows the different levels at which strategy is investigated in process studies.

[INSERT TABLE 7 LEVEL OF STRATEGY IN PROCESS STUDIES]

Within process studies, there is also attention for the linkage between the different levels on which strategy is developed and implemented. This is specifically visible in the Nilsson (2000) and Hudson et al. (2001) studies. The theoretical frameworks used and the approaches taken when performing process studies differ greatly. Table 8 presents an overview of the different approaches taken in the different process studies.

[INSERT TABLE 8 APPROACHES IN PROCESS STUDIES]

The adoption of a grounded theory approach in process studies signifies attempts to discover new theory. Process studies for the greater part use existing accounting theory when the aim of the study is theory illustration. Interesting to note is that Kaplan & Norton (1996) their Balanced Score Card (BSC) and Simons' (1995) control framework are indicative of the fact that there is an increasing interest in the workings of interactive control. However, scholars do also draw from theories outside the domain of accounting, e.g. Perera et al. (2003) who use Rogers' (1995) diffusion of innovation (DOI) theory. A further point of interest is that scholars who perform process studies seek novel areas in which to perform research. Illustrative of this are studies by Hudson et al. (2001) who perform their studies in SMEs, Parker (2001) who performs a study in a non-profit organization. Different factors that induce MCS change play a significant role in several of these studies, Collier (2005) for example examines change in MCS in a growing organization, Marginson (2002) examines the alteration of strategy as a result of MCS and Perera et al. (2003) examine an organization undergoing an environmental change resulting in a need to change strategy and MCS.

### *5.2 Studies pertaining to use of MAS/MCS*

The variance and process studies on uses of MAS/MCS show great diversity in focus. However, a central theme that is identifiable in most of these studies is the notion that MAS/MCS can be used interactively. Abernethy and Brownell (1999) as well as De Haas and Algera (2002) show how MCS/MAS use can engender a shared vision within an organization. In some of the studies, the notion also surfaces that MCS/MAS can engender learning and innovation. Several of these studies show different factors influencing how MAS/MCS are used (e.g. Hansen and Van der Stede, 2004) and show inhibitors and enablers of use (e.g. Collier, 2005, Davila and Foster, 2007). Factors that influence use are furthermore related to the aims that an organization wishes to achieve with MAS/MCS. In general, there has been a shift noticeable in the topics that studies address. Abernethy and Brownell (1999) as Chapman (1997) and Shields (1997) found that relatively few studies examine how the role of accounting may change dependent on the strategic setting, what Simons (1994) referred to as "interactive" use of MACS. The potential for MACS to be used actively as a tool for formulating and implementing changes in strategic direction was mostly ignored (Shields, 1997). In a great part of the studies reviewed here, the impact of MCS on strategy receives attention, specifically in studies that suggest that there is a bidirectional causal relation between MCS and strategy and studies that assume a unidirectional causal relation where MCS determine strategy. The shift in research focus can be explained by the emergence of studies by Kaplan and Norton (1992), who initially designed the BSC to develop MCS according to an existing strategy and at a later stage elaborated on the BSC (Kaplan and Norton, 1996) to also include strategy development enabled by the BSC and the studies by Simons (1994, 1995).

Different scholars have addressed issues on development and measurement of constructs within accounting research, in this specific area the focus is mainly on measurement of strategy and MCS/MAS (e.g. Bisbe et al., 2007). However, less attention is paid to establishing what the actual



relationship is between - in this specific case - MCS/MAS and strategy. If we examine the variance and process studies on a more general note, focusing on causality and the direction thereof, an interesting picture emerges. Three different causal relations can be identified based on assumed causal directions in research. The three identified categories are (1) Strategy determines MCS, (2) MCS determine Strategy, and (3) the relation between Strategy and MCS is bidirectional.

[INSERT TABLE 9 HERE DIRECTION OF CAUSALITY IN VARIANCE STUDIES]

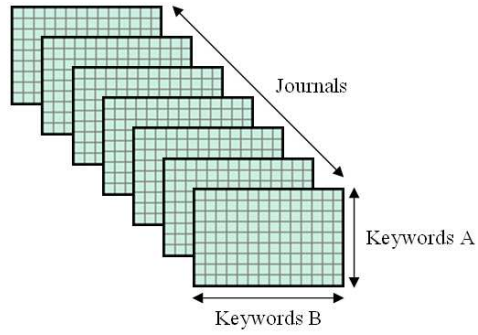
Table 9 shows the differences concerning the assumed causal direction for variance studies pertaining to the relation between MCS and strategy. Problematic with the variance studies, is that these studies do not easily allow for construction of a single variance theory, while in most cases variance studies lead to formulation of separate theoretical statements. Variance studies in this specific research area, because of differences in adopted theoretical frameworks, differences in research designs and differences in the measures and samples, do not combine into one theory.

[INSERT TABLE 10 HERE DIRECTION OF CAUSALITY IN PROCESS STUDIES]

Table 10 shows differences concerning the assumed causal direction in process studies pertaining to the relation between MCS and strategy. If we assume that the relation between MCS and strategy is cyclical as suggested by several scholars (e.g. Chenhall, 2003, Tuomela, 2005) then it is logical to assume that development and implementation of strategy occurs along the lines of a cybernetic feedback cycle. The different studies can then be organized according to the causal relations identified on this cycle and thus present an - at least partial - overview of the current knowledge in the field. When examining the interaction between process and variance studies, it is clear that knowledge acquired through process studies - and more specifically case studies - is not used within variance studies. Although the two approaches to explanation could benefit from interaction, we do not see reuse of findings, there are however some multi-method studies. There are some exceptions, seminal studies performed in the accounting field are used often. Within this specific research area it is obvious that there is no methodological domination, different methodologies are employed to perform research.

### *5.3 Directions for future research*

An intriguing avenue for further exploration of this field is found when examining the directions of causality that underlie the different studies and suggestions done by different scholars in relation to causality. It is easy to infer that there is something to learn here. Different authors in turn have suggested that the relation between strategy, MCS and subsequent outcomes might be cyclical (Ittner & Larcker, 2001, Chenhall, 2003) or that their relation might be interdependent (Langfield-Smith, 1997).



**Figure 1 Dimensional Model**

MCS	Strategy
<b>Keyword Set A</b>	<b>Keyword Set B</b>
Performance measurement system	Strategy implementation
Non-financial information	Strategy development
Managerial accounting	Strategic planning
Management control system	Strategic change
Management accounting	
Financial information	

**Table 1 Keywords**

	<b>Variance Approach</b>	<b>Process Approach</b>
<b>Base of Explanation</b>	Causality	Probabilistic outcome
<b>Role of Time</b>	Static	Dynamic
<b>Definition</b>	The cause is necessary and sufficient for the outcome	Causation consists of necessary conditions in sequence; chance and random events play a role
<b>Assumptions</b>	Outcome will invariably occur when necessary and sufficient conditions are present	Outcomes may not occur (even when conditions are present)
<b>Elements</b>	Variables	Discrete outcomes, discrete states and events
<b>Logical Form</b>	If X, then Y; If more X, then more Y	If not X, then not Y; cannot be extended to "more X" or "more Y"

**Table 2 Characteristics of Variance and Process Approach<sup>3</sup>**

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<sup>3</sup> Freely adapted from Mohr (1982: p38, table 1 in the original)

	Itner and Larcker (1997)	Chenhall and Langfield-Smith (1998)	Laitinen (2001)	Lillis (2002)	Baines and Langfield-Smith (2003)	Auzair and Langfield-Smith (2005)	Chenhall (2005b)	Li, Li, Liu and Wang (2005)	Bhimani and Langfield-Smith (2006)
Method	Questionnaire (data was recorded in 1991)	Questionnaire administered to financial controller, senior management accountant or chief executive	Questionnaire administered to managing directors.	Semi-structured interviews with profit centre managers	Questionnaire administered to general managers	Questionnaire administered to financial controllers	Questionnaire administered to senior managers.	Questionnaire (no further information on respondents)	Questionnaires and interviews administered to senior accounting officers
Sample selected	Sample of 249 organizations in the automotive and computer industries in Canada, Germany, Japan, and the United States	Sample of 140 large manufacturing firms in Australia	Sample of 93 small technical companies in Finland	Sample of 36 manufacturing firms in Victoria, Australia.	Sample of 141 manufacturing organizations in Australia	Sample of 121 service organizations operating in Australia.	Sample of 80 organizations drawn from Australia's largest 200 industrial organizations	Sample of 585 manufacturing companies in China	Sample of 51 large UK firms (4000+ employees)
Control variables	Country specific variations, organization size, presence of labor unions and research and development expenses.	---	---	---	Size (number of employees) stratification	---	Response medium type - Internet (70) versus hard copy (10).	---	Non-response bias tests

Table 3. Research design of survey studies

	Itner and Lareker (1997)	Chenhall and Langfield-Smith (1998)	Laitinen (2001)	Lillis (2002)	Baines and Langfield-Smith (2003)	Auzair and Langfield-Smith (2005)	Chenhall (2005b)	Li, Li, Liu and Wang (2005)	Bhimani and Langfield-Smith (2006)
Operationalization of strategy	The emphasis on quality is measured, no further classification is used.	Product differentiation and cost leadership (or combination) classification from Porter's (1980) strategy typology	Strategy is measured by four dimensions; export intensity, R&D intensity, strategic positioning and customer intensity, based on Gosselin's (1997) analysis of prospector strategy (Miles and Snow, 1978).	Product differentiation (quality or responsiveness) or cost leadership classification from Porter's (1980) strategy typology	Product differentiation or cost leadership classification from Porter's (1980) strategy typology and development of competitive advantage (Porter, 1996).	Cost leadership and differentiation strategies by Chenhall and Langfield-Smith (1998), this is an elaboration of Porter's (1980) typology	Competitive strategic priorities by Miller et al. (1992), this is an elaboration of Porter's (1980) product differentiation and cost leadership taxonomy	Strategy control is operated using three indicators; sharing of competitor information, discussing competitor's strategy and competitive advantage, exchange views on the information about competitors.	Strategy itself is no variable.
Dependent variables	Strategic control practices, performance	Performance	Management accounting change	Strategy implementation	Changes in: strategy, organization design, technology, advanced management accounting practices, management acc. information	Design of management control system	Strategy	Management control system (strategic change) and manufacturing decisions.	---
Independent variable	Strategic emphasis on quality	Combinations of management techniques and management accounting practices, strategy	Organizational characteristics, motivation factors	Technical integration, structure, innovative performance measurement, incentives	Changes in competitive environment	Service process type Business strategy, stage in the organizational life cycle	Competitive strategic priorities	Environmental change.	---

	Itner and Larccker (1997)	Chenhall and Langfield-Smith (1998)	Laitinen (2001)	Lillis (2002)	Baines and Langfield-Smith (2003)	Auzair and Langfield-Smith (2005)	Chenhall (2005b)	Li, Li, Liu and Wang (2005)	Bhimani and Langfield-Smith (2006)
Source of measures	Strategic control practices are measured with 9 constructs from 3 kinds of practices; strategy implementation, internal monitoring and external monitoring. Performance is measured with 4 variables: return on assets, return on sales, sales growth and perceived performance.	Performance is measured by performance relative to competitors over the last three years across 10 dimensions. Management techniques are measured by the emphasis given to six techniques. Management practices are measured by benefits gained from four practices over the last three years.	Motivation factors : For each factor of change, a five-point ordinal scale of importance was applied	Questions focused on: the competitive edge, the nature of the market, price premiums consistency with differentiation, handling of product customization.	All variables were measured on an 11-point scale, to capture decreased change (-5 to -1), no change (0) and increased change (+1 to +5), over the past 3 years. Measures are derived from Chenhall and Langfield-Smith (1998)	Dimensions of MCS: action/results controls, formal/informal controls, tight/loose controls, restricted/flexible controls, impersonal/interpersonal controls; semantic differential 5 point scales. Service process type: mass service, professional service: Semantic differential 7 point scales	Dimensions of strategic performance measurement systems; strategic and operational linkages, customer orientation, supplier orientation	All measures are assessed on seven-point Likert scales. The sources are: environment: five external environment indicators organizational factors: five indicators to define organizational factors, financial control: four items modified from Hitt et al. (1996) and Li (2000). Items for strategic control, product development and manufacturing process are developed by the authors.	The level of structure and the role of information in strategy development and implementation is assessed on 5 point Likert scales

Table 3. Research design of survey studies, continued

	Carr and Tomkins (1998)	Abernethy and Brownell (1999)	Guilding, Cravens and Tayles (2000)	de Haas and Algera (2002)	Hansen and Van der Stede (2004)	Naranjo-Gil and Hartmann (2006, 2007)	Davila and Foster (2007)
Method	Questionnaires administered to chief executive and senior finance executive	Semi-structured interviews with CEOs	Questionnaire administered to senior accounting officers	Interception field research using two-group pre-test/post-test design, based on questionnaires administered to participants	Questionnaire administered to CAM-1 (Consortium for Advanced Manufacturing–International) members and managers responsible for preparing the budget	Questionnaires administered to TMT members.	Field research and questionnaires administered to CEO, CFO and marketing manager.
Sample selected	Sample of 56 organizations from the U.K. and Germany for a prior study, 14 and 13 cases in the U.S. and Japan, respectively, for this study.	Sample of 63 public hospitals in Australia	Sample of 314 large companies from the U.K. (63), the U.S.A. (127) and New Zealand (124).	Group of principals and two groups of agents at SBU of Corus situated in The Netherlands	Sample of 57 organizations (no further information)	Sample of 473 TMT members forming 92 complete TMTs from 103 Spanish public hospitals.	Sample of 78 companies.
Control variables	---	---	Non-response bias investigations were undertaken.	One combination of principal group / agent group functions as control group	Size (number of employees)	Size and governmental dependency	---

Table 3. Research design of survey studies, continued

	Carr and Tomkins (1998)	Abernethy and Brownell (1999)	Guiding, Cravens and Tayles (2000)	de Haas and Algera (2002)	Hansen and Van der Stede (2004)	Naranjo-Gil and Hartmann (2007)	Davila and Foster (2007)
Operationalization of strategy	Strategy itself is no variable in this study	Approach developed by Shortell and Zajac (1990), based on Miles and Snow (1978) strategy typology	Strategy itself is no variable in this study	Strategy itself is no variable in this study	Product differentiation or cost leadership classification from Porter's (1980) strategy typology	Defenders, prospectors, analyzers and reactors. Strategic typology by Miles and Snow (1978)	--
Dependent variables	Cultural differences, control styles, financial techniques used in strategic investment decisions	Performance	SMA usage, Perceived merit of SMA. Familiarity with the term SMA	Goal coherence	Operational planning, performance evaluation, communication of goals, strategy formation	Strategy	Adoption rates of MCSs
Independent variable	Country of origin	Strategic change, style of budget use	Country of origin	Strategic dialogue	Organization structure, organization strategy, operating environment, external environment	Composition of the top management team and characteristics of the management accounting system as mediator	Company age (life stage)



	Carr and Tomkins (1998)	Abernethy and Brownell (1999)	Guilding, Cravens and Tayles (2000)	de Haas and Algera (2002)	Hansen and Van der Stede (2004)	Naranjo-Gil and Hartmann (2007)	Davila and Foster (2007)
Source of measures	Cultural differences are not measured, they are copied from other sources. Relative emphasis on strategic versus financial considerations is measured by percentage weightings placed on each consideration. Financial techniques on any types of investment decisions are measured by whether they are used or not per organization.	Performance is measured using CEOs' self-ratings on a seven-point Likert-type scale. Strategic change is measured by CEOs perceptions of the strategic position of two years ago on a seven-point scale. Style of budget use is measured on a seven-point scale of four items based on Simon's (1990) interactive use of budget use.	12 SMA practices have been itemized in a questionnaire designed to elicit usage rates. The extent of use of practices by organizations is given on a Likert scale from 1 to 7. The extent of perceived helpfulness of practices to organizations is given on a Likert scale from 1 to 7. The extent of familiarity and use of the term within organizations is given on a Likert scale from 1 to 7.	Goal coherence is measured with the level of similarity between respondents' rankings of strategic priorities. Strategic dialogue is not measured, it is either applied or not applied.	All variables were measured on 5 point scales	Top management team heterogeneity; factual questions related to age, tenure, experience, and education. MAS; perceived usefulness of several aspects of the available MAS information on 5-point scale. Strategic change; Subjective rating of strategy on 1 to 5 scale (defender to prospector) now and three years ago conform Abernethy and Brownell (1999).	The date of adoption of eight general categories of systems and the founding dates of the organizations are assessed with the questionnaires.

		Ittner and Larcker (1997)
	↙	Chenhall and Langfield-Smith (1998)
Miles and Snow (1978)	↙	Laitinen (2001)
	↙	Lillis (2002)
	↙	Baines and Langfield-Smith (2003)
	↙	Auzair and Langfield-Smith (2005)
	↙	Chenhall (2005)
		Li, Li, Liu & Wang (2005)
		Davila and Foster (2007)
		Carr and Tomkins (1998)
	↙	Abernethy and Brownell (1999)
		de Haas & Algera (2002)
	↙	Hansen and Van der Stede (2004)
		Guilding, Cravens and Tayles (2000)
Porter (1980)	↙	Naranjo-Gil and Hartmann (2007)

Table 4. Used strategy typology in variance studies

					Ittner and Larcker (1997)
					Chenhall and Langfield-Smith (1998)
					Laitinen (2001)
					Lillis (2002)
					Baines and Langfield-Smith (2003)
					Auzair and Langfield-Smith (2005)
			↙		Chenhall (2005)
					Li, Li, Liu & Wang (2005)
					Davila and Foster (2007)
					Carr and Tomkins (1998)
					Abernethy and Brownell (1999)
			↙	↙	de Haas & Algera (2002)
					Hansen and Van der Stede (2004)
					Guilding, Cravens and Tayles (2000)
					Naranjo-Gil and Hartmann (2007)
Operational strategy linked with high-level strategy					
Business unit strategy linked with corporate strategy					
Operational strategy					
Business unit strategy					
Corporate strategy				↙	

Table 5. Level of strategy in variance studies

			Klout and Martin (2000)	Hudson, Smart and Boume (2001)	Parker (2001)	Marginson (2002)	Perera et al. (2003)	Malina and Selto (2004)	Collier (2005)	Tuomela (2005)	Karlsson and Ahlstrom (1997)	Slagmulder (1997)	Dixon (1998)	Roslender and Hart (2003)	Nilsson (2000)	Saravanamuthu and Tinker (2003)		
Theory discovery	Theory discovery	Theoretical building blocks in form emergent constructs and hypothesized relationships	✓	✓								✓				✓		
		Novelty and theoretical /practical significance of analysis		✓	✓					✓		✓					✓	
		Domain of theoretical applicability and relationship to extending theories	✓	✓	✓						✓		✓		✓			✓
		Summary of knowledge gaps and unresolved theoretical puzzles									✓		✓					
		Specification of research program to develop theoretical issues raised			✓								✓					
Theory refinement	Theory illustration	Evidence to support plausibility of illustrated theory	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
		Respecified constructs and relationships				✓	✓				✓	✓			✓	✓		
		Relative strength, limitations and domains of illustrated and rival theories					✓		✓	✓					✓			
		Recommended next steps to specify or test illustrated theory		✓	✓		✓	✓	✓			✓	✓	✓	✓	✓	✓	
	Theory specification	Clear statement of confirmed, disconfirmed, respecified and new constructs and relationships				✓		✓		✓								
		Operational definitions and constructs				✓		✓								✓		
		Testable propositions				✓		✓										
		Specification of further specification studies to address anomalous evidence or strategies for theory test				✓												
Theory refutation	Theory refutation	Findings of falsification/corroboration and theoretical/practical significance																
		Refinement designed to strengthen theory weakened by negative evidence																
		Counterpoint interpretations of previous case research																
		Specification of further studies																

Table 6. Theoretical contributions of case studies

	Kloot and Martin (2000)	Hudson, Smart and Bourne (2001)	Parker (2001)	Marginson (2002)	Perera, McKinnon and Harrison (2003)	Collier (2005)	Tuomela (2005)	Bhimani and Langfield-Smith (2007)	Karlsson and Ahlstrom (1997)	Slagmulder (1997)	Dixon (1998)	Roslender and Hart (2003)	Nilsson (2000)	Saravanamuthu and Tinker (2003)
Corporate strategy	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Business unit strategy		✓	✓	✓				✓	✓			✓	✓	
Operational strategy	✓	✓		✓	✓	✓		✓	✓					
Business unit strategy linked with corporate strategy		✓	✓	✓								✓	✓	
Operational strategy linked with high-level strategy	✓	✓		✓	✓				✓					

Table 7. Level of strategy in process studies

	Kloot and Martin (2000)	Hudson, Smart and Bourne (2001)	Parker (2001)	Marginson (2002)	Perera, McKinnon and Harrison (2003)	Collier (2005)	Tuomela (2005)	Bhimani and Langfield-Smith (2007)	Karlsson and Ahlstrom (1997)	Slagmulder (1997)	Dixon (1998)	Roslender and Hart (2003)	Nilsson (2000)	Saravanamuthu and Tinker (2003)
Grounded theory approach		✓	✓							✓				✓
Strategy framework Wheelwright and Clark (1992)									✓					
Balanced Score Card Kaplan and Norton (1996)	✓						✓	✓						
Control framework Simons (1995)				✓			✓	✓						
MCS Framework Ferreira and Otley (2005)							✓							
Cambridge PM process (Neely et al., 1996)		✓												
Framework of characteristics affecting innovation diffusion (Roger 1995)					✓									
Strategy / performance model Fitzgerald et al. (1991)	✓													
Parenting styles typology Goold et al. (1994)													✓	
Strategy typology (Porter, 1980)													✓	
Strategy typology (Porter, 1987)													✓	
Concept of SMA (Simmonds, 1981, Bromwich, 1988)											✓	✓		

Table 8. Approaches in process studies

Relation between strategy and MCS is bidirectional	MCS determines strategy	Strategy determines MCS	
✓			Ittner and Larcker (1997)
✓			Chenhall and Langfield-Smith (1998)
		✓	Laitinen (2001)
		✓	Lillis (2002)
		✓	Baines and Langfield-Smith (2003)
		✓	Auzair and Langfield-Smith (2005)
	✓		Chenhall (2005)
	✓		Li, Li, Liu & Wang (2005)
	✓		Davila and Foster (2007)
	✓		Carr and Tomkins (1998)
	✓		Abernethy and Brownell (1999)
		✓	de Haas & Algera (2002)
		✓	Hansen and Van der Stede (2004)
			Guilding, Cravens and Tayles (2000)
	✓		Naranjo-Gil and Hartmann (2007)

Table 9. Direction of causality in variance studies

Relation between strategy and MCS is bi-directional	MCS determines strategy	Strategy determines MCS	
		✓	Kloot and Martin (2000)
		✓	Hudson, Smart and Bourne (2001)
		✓	Parker (2001)
	✓		Marginson (2002)
✓			Perera, McKinnon and Harrison (2003)
	✓		Collier (2005)
✓			Tuomela (2005)
✓			Bhimani and Langfield-Smith (2007)
	✓		Karlsson and Ahlstrom (1997)
		✓	Slagmulder (1997)
	✓		Dixon (1998)
✓			Roslender and Hart (2003)
		✓	Nilsson (2000)
			Saravanamuthu and Tinker (2003)

Table 10. Direction of causality in process studies

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## Appendix 1

Abacus	Bibliographic Records: 09/01/1965 to present
Academy of Management Journal	Bibliographic Records: 04/01/1958 to present
Academy of Management Review, The	Bibliographic Records: 04/01/1976 to present
Accounting and Business Research	Bibliographic Records: 03/01/1982 to present
Accounting Review, The	Bibliographic Records: 03/01/1926 to present
Accounting, Organizations and Society	Bibliographic Records: 03/01/1976 to present
Administrative Science Quarterly	Bibliographic Records: 06/01/1956 to present
Auditing: A Journal of Practice and Theory	Bibliographic Records: 06/01/1981 to present
British Journal of Industrial Relations	Bibliographic Records: 03/01/1966 to present
Business History	Bibliographic Records: 12/01/1958 to present
Communications of the ACM	Bibliographic Records: 01/01/1965 to present
Contemporary Accounting Research	Bibliographic Records: 09/01/1984 to present
Decision Sciences	Bibliographic Records: 01/01/1970 to present
Decision Support Systems	Bibliographic Records: 01/01/1997 to present
European Journal of Information Systems	Bibliographic Records: 03/01/1997 to present
European Journal of Operational Research	Bibliographic Records: 01/01/1977 to present
Financial Management	Bibliographic Records: 03/01/1972 to present
Harvard Business Review	Bibliographic Records: 10/01/1922 to present
Human Relations	Bibliographic Records: 02/01/1965 to present
Human Resource Management	Bibliographic Records: 03/01/1965 to present
Human Resource Management Journal	Bibliographic Records: 09/01/1997 to present
IEEE Transactions on Engineering Management	Bibliographic Records: 02/01/1994 to present
IEEE Transactions on Knowledge and Data Engineering	Bibliographic Records: 08/01/1996 to present
IIE Transactions	Bibliographic Records: 07/01/1996 to present
Industrial and Corporate Change	Bibliographic Records: 04/01/1992 to present
Industrial and Labor Relations Review	Bibliographic Records: 10/01/1947 to present
Industrial Relations	Bibliographic Records: 02/01/1965 to present
Information and Management	Bibliographic Records: 10/01/1996 to present
Information Systems Research	Bibliographic Records: 03/01/1990 to present
Interfaces	Bibliographic Records: 11/01/1970 to present
International Journal of Electronic Commerce	Bibliographic Records: 12/01/2000 to present
International Journal of Industrial Organization	Bibliographic Records: 03/01/1983 to present
International Journal of Operations and Production Management	Bibliographic Records: 01/01/1980 to present
International Journal of Production Research	Bibliographic Records: 11/01/1961 to present
International Journal of Research in Marketing	Bibliographic Records: 03/01/1984 to present
Journal of Accounting and Economics	Bibliographic Records: 03/01/1979 to present
Journal of Accounting Research	Bibliographic Records: 03/01/1963 to present
Journal of Advertising	Bibliographic Records: 03/01/1972 to present
Journal of Applied Psychology	Bibliographic Records: 02/01/1965 to present
Journal of Banking and Finance	Bibliographic Records: 06/01/1977 to present
Journal of Business and Economic Statistics	Bibliographic Records: 01/01/1983 to present
Journal of Business Ethics	Bibliographic Records: 02/01/1982 to present
Journal of Business Venturing	Bibliographic Records: 12/01/1985 to present
Journal of Business, The	Bibliographic Records: 01/01/1965 to 11/30/2006
Journal of Consumer Psychology	Bibliographic Records: 01/01/1992 to present
Journal of Consumer Research	Bibliographic Records: 06/01/1974 to present
Journal of Corporate Finance	Bibliographic Records: 03/01/2002 to present
Journal of Derivatives, The	Bibliographic Records: 06/01/1997 to present
Journal of Empirical Finance	Bibliographic Records: 03/01/2002 to present
Journal of Evolutionary Economics	Bibliographic Records: 01/01/1991 to present
Journal of Finance, The	Bibliographic Records: 08/01/1946 to present

Journal of Financial and Quantitative Analysis	Bibliographic Records: 03/01/1966 to present
Journal of Financial Economics	Bibliographic Records: 05/01/1974 to present
Journal of Financial Intermediation	Bibliographic Records: 10/01/1999 to present
Journal of International Business Studies	Bibliographic Records: 03/01/1970 to present
Journal of International Money and Finance	Bibliographic Records: 07/01/1996 to present
Journal of Management	Bibliographic Records: 09/01/1975 to present
Journal of Management Accounting Research	Bibliographic Records: 09/01/1989 to present
Journal of Management Information Systems	Bibliographic Records: 06/01/1984 to present
Journal of Management Studies	Bibliographic Records: 03/01/1964 to present
Journal of Marketing	Bibliographic Records: 07/01/1936 to present
Journal of Marketing Research	Bibliographic Records: 02/01/1964 to present
Journal of Operations Management	Bibliographic Records: 08/01/1980 to present
Journal of Organizational Behavior	Bibliographic Records: 01/01/1980 to present
Journal of Product Innovation Management, The	Bibliographic Records: 03/01/1984 to present
Journal of Retailing	Bibliographic Records: 03/01/1964 to present
Journal of the Academy of Marketing Science	Bibliographic Records: 03/01/1973 to present
Journal of Vocational Behavior	Not available
Leadership Quarterly	Bibliographic Records: 09/01/1996 to present
Long Range Planning	Bibliographic Records: 09/01/1968 to present
Management Accounting Research	Bibliographic Records: 03/01/1997 to present
Management Science	Bibliographic Records: 10/01/1954 to present
Manufacturing and Service Operations Management	Bibliographic Records: 01/01/1999 to present
Marketing Letters	Bibliographic Records: 12/01/1989 to present
Marketing Science	Bibliographic Records: 01/01/1982 to present
MIS Quarterly	Bibliographic Records: 03/01/1977 to present
MIT Sloan Management Review	Bibliographic Records: 04/01/1960 to present
Operations Research	Bibliographic Records: 05/01/1953 to present
Organization Science	Bibliographic Records: 02/01/1990 to present
Organization Studies	Bibliographic Records: 01/01/1980 to present
Organizational Behavior and Human Decision Processes	Bibliographic Records: 09/01/1966 to present
Personnel Psychology	Bibliographic Records: 03/01/1965 to present
Production and Operations Management	Bibliographic Records: 03/01/2002 to present
Quantitative Marketing and Economics	Not available
Research in Organizational Behavior	Bibliographic Records: 01/01/1979 to present
Research Policy	Bibliographic Records: 08/01/1996 to present
Review of Accounting Studies	Not available
Review of Financial Studies, The	Bibliographic Records: 03/01/1988 to present
Small Business Economics	Bibliographic Records: 02/01/1997 to present
Strategic Management Journal	Bibliographic Records: 01/01/1980 to present
Transportation Research Part B-Methodological	Bibliographic Records: 02/01/1993 to present
Transportation Science	Bibliographic Records: 02/01/1967 to present

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