

Configurations of Control: An Empirical Analysis

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Abstract

In recent years there has been growing interest in how controls operate together as a system of interrelated mechanisms. Despite extensive theoretical development dating back to the seminal paper of Otley (1980), there has been little empirical analysis of the operation of controls as a package, with the majority of quantitative studies in management accounting isolating elements from the wider control structure. To build knowledge in this area this paper develops and tests a theory of control configurations. From a cross-sectional sample of 400 firms, the analysis yields six configurations used by top managers, termed results, action, devolved, simple, inter-personal and hybrid. Some of these patterns are consistent with predictions, while others reveal novel arrangements and unexpected associations, presenting a much more complex picture of control than recognized by conventional approaches and archetypal theories that currently dominant MA research. The paper suggests ways in which this complexity can be further explored and incorporated into control theory.

Keywords: Management control, configuration theory

Introduction

It has long been recognized that management controls operate as systems of interrelated mechanisms (Dent, 1990; Fisher, 1995; Flamholtz et al., 1985; Otley, 1980). Despite this acknowledgement the majority of quantitative studies in management accounting (MA) have examined accounting and other mechanisms in isolation from wider control arrangements (Chenhall, 2003; Speklé, 2001; see also Luft & Shields, 2003). As Abernethy and Brownell (1997, p. 246) concede, this line of research has provided limited insight into the influence of any one control upon another or how controls might combine and integrate as a package:

It is clear that organizations rely on combinations of control mechanisms in any given setting [...] Until empirical work begins to examine this complex question, our understanding of how the full range of management controls operates will remain piecemeal.

One of the reasons for limited progress in this area may be the tendency for MA research to rely on approaches that assume singular and universal associations between contingencies and control mechanisms. Emerging evidence suggests, however, that it may be “important *not* to assume automatically” that causal paths are necessarily represented by direct one-to-one relationships because “different control mechanisms available in the control package may well combine in different ways in a particular context” (Gerdin, 2005, p. 119; Fiss, 2011; Grandori & Furnari, 2008). To advance our knowledge in this area it may therefore be necessary to consider alternate perspectives. One that offers particular appeal is the configuration approach. The approach entails a shift in emphasis from direct *associations* to the analysis of *combinations* of multiple control and contextual attributes. This allows for an examination of how accounting is integrated as part of an internally consistent package of controls as well as the more complex relationships that control arrangements may have with contingent factors.

The aim of this paper is to contribute towards the literature on management control structure variety by developing and testing a theory of control configurations. Drawing from literature on organizational configurations (e.g. Mintzberg, 1979, 1989) and prominent archetypal theories of control structure choice (e.g. Ouchi, 1977, 1979; Speklé, 2001) a set of control combinations expected to be empirically observable are theorized. Findings from contingency research are additionally incorporated to develop propositions concerning the contextual circumstances in which each control arrangement is likely to reside. Expectations are examined using a cross-sectional sample of 400 medium-to-large firms. The analysis presents six configurations used by top managers, termed results, action, devolved, simple, inter-personal, and hybrid. Some of these patterns are consistent with predictions, while others reveal novel arrangements and unexpected associations.

This study has a number of implications for management control theory. First, the study presents an empirical investigation of how accounting and other control mechanisms integrate and combine as a package. Although a few prior studies examine multiple controls in combination (e.g. Chenhall & Langfield-Smith, 1998; Moores & Yuen, 2001), these exclude many components known to be employed by organizations as part of the control package (Malmi & Brown, 2008). By examining a more comprehensive array of control mechanisms this study questions the capacity of existing theories and frameworks of control structure choice to adequately describe and explain contemporary practice. Second, the study demonstrates that accounting based mechanisms have a presence and relative importance in a wide diversity of control configurations. This is in contrast to extant archetypal frameworks (e.g. Ouchi, 1977, 1979; Speklé, 2001) that marginalize the contribution of accounting control efforts – present in results-based control strategies, and absent, or at best incidental, in alternative forms (Caglio & Ditillo, 2008). Third, results indicate that a configuration premised predominately on clan or cultural control is an unlikely occurrence in practice (cf. Ouchi, 1977, 1979). Instead it is found that socio-ideological mechanisms are most prominent in configurations with extensive bureaucratic structures. In situations where cultural control is the theoretically preferred alternative, organizations adopt quite basic control arrangements. This suggests that socio-ideological mechanisms are more likely to exhibit a complimentary relationship with bureaucratic controls, rather than act as substitutes, as is commonly assumed (Alvesson & Kärreman, 2004). Finally, analysis across different combinations reveals considerable complexity in the association between contextual and control attributes. The analysis reveals that very different control arrangements can be aligned to the same contextual feature, while in other cases control mechanisms in different configurations have equivalent emphasis despite variation in context. To summarize, the paper provides a much more complex picture of control than recognized by conventional approaches and archetypal theories that currently dominant MA research.

The remainder of this paper is structured as follows. The next two sections consider the implications of the configuration approach for control systems analysis followed by an outline of the research questions. The section thereafter theorizes on the control combinations and contextual associations expected to be observed empirically. The research design, measurement of variables and statistical methods are then detailed, followed by an analysis and discussion of results. The paper concludes by commenting on the limitations of the study and areas of future research.

The configurational approach

The configurational approach contends that a comprehensive understanding of structural diversity requires organizations to be investigated as multidimensional constellations of interconnected and interacting elements (Meyer, Tsui & Hinings, 1993). The central assumption underpinning this approach is that a strong propensity exists for organizational attributes to cluster systematically,

forming a discrete number of temporally stable arrangements (Gersick, 1991). This tendency arises from both exogenous and endogenous forces. Exogenous forces, such as environmental selection and competition (Hannan & Freeman, 1989), effectively limit the number of viable combinations. But endogenous pressures mean that organizations will themselves attempt to seek out structural arrangements that have an internally consistent logic (Child, 1972). This implies that organizations are not distributed widely across structural and contextual traits, but will tend to co-locate around a finite number of empirically identifiable patterns.

Organizations are expected to maintain internal consistency even at the expense of superior environmental fit. Piecemeal alterations work against developing efficiency in operational routines and may destroy existing complementarities between system components (Miller & Mintzberg, 1984). As components combine in complex and integral ways altering only a “few of the system elements at a time to their optimal values may not come at all close to achieving all the benefits that are available through a fully coordinated move, and may even have negative payoffs” (Milgrom and Roberts, 1995, p. 191). While there may be some latitude to alter structural arrangements in response to oscillating environmental conditions, particularly less connected components situated at the periphery, organizational systems will actively resist change past the point that threatens internal consistency (Tushman & Romanelli, 1985).¹ The import of this contention is that the design and effectiveness of a particular mechanism, such as accounting, will be associated not only to external conditions, but also upon how that mechanism is situated within the broader control package. This is consistent with the position established by Otley (1980). But with much of our attention devoted to discovering associations between external conditions and isolated components of an organization’s anatomy, we may lose sight of the wider structural patterns and logics that are likely to be implicated in the constitution of accounting.

The configurational approach, however, represents more than just a multivariate extension of contingency analysis, offering understandings of control structure diversity that might be difficult to obtain through conventional approaches alone. First, configurational analysis is able to examine how control and contextual attributes *combine*, not just their direct association. For instance, it has been found that both coercive and enabling aspects of MA are associated with cost strategy implementation (Naranjo-Gil & Hartmann, 2006). It is not an obvious conclusion from this result, however, that enabling and coercive modes of control can or even should be combined, nor are we afforded an

¹ It is worth noting that not all components in a configuration need be tightly coupled (Fiss, 2011). Peripheral components loosely connected to the structural core may be more readily adjustable to changes in contextual conditions, and consequently, be amenable to examination using contingency methodology without risk of model misspecification (Chenhall, 2003).

insight into just how these different MA attributes might be effectively arranged.² Second, the approach allows for analysis of possible discontinuities or asymmetries in relationships between context and controls. As noted, contingency logic assumes that control structures evolve in direct, often linear, response to context. For example, application of output, behavior and clan archetypes are expected to vary in direct association with task characteristics. But this would fail to explain the existence of the more complex and intricate arrangements observed in practice where multiple control modes are simultaneously active (Alvesson & Kärreman, 2004). Third, the focus of analysis is not just on variation but also instances of equivalence. This enables identification of particular contexts where organizations may be able to combine quite diverse control structures or employ the same mechanisms in different environments. For these reasons the configuration approach is particularly suited for analyzing complex control combinations.

Research questions

Our empirical understanding of how accounting and other control mechanisms integrate and combine as a package is limited. At the firm level of analysis there are just two main quantitative studies. The first is by Chenhall and Langfield-Smith (1998). In analyzing a variety of management techniques, accounting practices and competitive strategies, they provide support for the idea that internally consistent arrangements enhance firm performance. Results further indicate that techniques and practices hypothesized to be beneficial for firms pursuing differentiation strategies are also important for firms following a low-price strategy, suggesting that the association between strategic priorities and control variables may not be a simple one-to-one relationship. The second is Moores and Yuen (2001) who investigate variation in MA systems across organizational life-cycle stages. Their study shows how reliance on formalized accounting information varies in response to changes in strategy and organizational complexity.

Although these studies are informative, they provide only partial examinations of how accounting and control mechanisms combine. Moores and Yuen (2001) limit their analysis of control structures to the formal information characteristics of accounting. Chenhall and Langfield-Smith (1998) include a wider array of mechanisms, but many aspects of control known to be employed at the firm level, such as administrative and cultural components, are excluded (Malmi & Brown, 2008). This is partly addressed in recent case-based investigations that consider control packages in far more breadth and depth (e.g. Alvesson & Kärreman, 2004; Sandelin, 2008). These are, however, restricted in their capacity to deduce whether these packages are representative of control patterns more widely observable in practice. This leads to the first research question:

² This is in no way to diminish the importance of such studies, but simply to suggest that other approaches might make contributions to understanding control phenomena not easily accessible to investigations premised on conventional assumptions and methodology.

Research Question 1: *What are the common control configurations in practice? What is the role of accounting in these configurations?*

Firms are expected to select internally consistent control combinations best suited to contextual conditions faced. An extensive body of contingency-based research highlights significant factors associated with the design and use of accounting and other controls (Chenhall, 2003). However, contingency (Cartesian) and configurational approaches contain contradictory assumptions regarding contextual alignment (Gerdin & Greve, 2004). Whereas contingency studies typically treat fit as a continuous line across multidimensional space, the configuration approach assumes there are a limited number of discrete control-context combinations. Associations between control and context are not necessarily symmetric or continuous between different configurations, making it difficult to directly translate results from one approach to the other. With this caveat in mind, the following research question is posed:

Research Question 2: *What contexts are associated with each configuration? Are contextual factors systematically associated with control structure variety?*

A final concern relates to equilibrium assumptions. It is expected that organizations will tend to stabilize around the structural form that has the highest performance capacity for a given context. Idiosyncratic shifts in conditions will mean, however, that not all (or possibly few) organizations will be in an “optimal” position, but given switching costs and performance benefits of an internally consistent arrangement, the structural alternative currently in place will represent the most economically viable. Some organizations are likely to have low performance. When the cost of contextual misalignment outweighs the benefit of internal consistency, organizations will make the disruptive shift to a new system state. However, as episodes of stability are generally much longer than reorientations, the number of organizations in transition at any point in time should be small (Miller, 1982; Tushman & Romanelli, 1985). Organizations are therefore expected to be, on average, in equilibrium.³ It is also assumed that empirically derived configurations will represent practically viable alternatives. Infeasible combinations are unlikely to be found – either they never arise or quickly die out (Williamson, 1991).

To explore these questions the following section presents an initial theorization about the control combinations expected to be observed in practice and the contexts in which they are likely to be found.

³ This represents a congruence form of configuration theory (Gerdin & Greve, 2004).

Research propositions

Management control and control configurations

Management control can be defined as a purposive set of processes and mechanisms used by managers to influence the behavior of individuals and groups towards more or less predetermined objectives (Flamholtz et al., 1985; Langfield-Smith, 2007; Speklé, 2001). The array of mechanisms that form part of the control efforts of management is extensive. This poses a distinct challenge for inquiry into control configurations, as there is an inevitable “need to balance parsimony and exhaustiveness of coverage” (Venkatraman, 1989, p. 433). One of the strategies adopted in an attempt to reduce this variety to manageable portions has been to factor analyze a list of control elements and attributes thought to be applicable to a sample of firms (e.g. Chenhall & Langfield-Smith, 1998; Simons, 1987). This method certainly has merit. However, control literature has not advanced to a stage that allows for an easy prioritization of the items that should be included. What may be more constructive is to specify the theoretical categories of control *a priori*, with the selection of constructs intended to provide comprehensive coverage of those categories. In this respect there is a better-developed stream of research delineating the core dimensions of control to draw upon (Alvesson & Kärreman, 2004; Brickley, Smith & Zimmerman, 2004; Daft & Macintosh, 1984; Fisher, 1995; Flamholtz, 1983; Flamholtz et al., 1985; Langfield-Smith, 2007; Malmi & Brown, 2008; Merchant & Van der Stede, 2007; Ouchi, 1977, 1979; Simons, 1995). A synthesis of this literature indicates that management controls fall within the following categories:

- *Strategic planning*: Establishment of long-term goals, expectations, and courses of action (Daft & Macintosh, 1984; Flamholtz, 1983; Langfield-Smith, 2007).
- *Measurement*: Capture and use of quantitative information that represents aspects of individual and group performances (Brickley et al., 2004; Flamholtz, 1983; Malmi & Brown, 2008).⁴
- *Compensation*: Attachment of rewards to outcomes (Brickley et al., 2004; Fisher, 1995; Flamholtz et al., 1985).⁵
- *Structure*: Designation of position, authority structures, and interaction patterns of individuals and groups (Chenhall, 2003; Fisher, 1995; Flamholtz, 1983).

⁴ Flamholtz (1983) includes in his category of measurement “accounting systems” and “information systems”. Accounting is limited to “measures of financial and managerial performance”, while information systems refer to operational and non-financial metrics (Flamholtz, 1983, p. 156). Contemporary usage of the term “accounting” in MA research would seem to be synonymous with “measurement”, although it is recognized that some information systems, such as those used by human resources or in project management systems, may not be considered accounting yet fit the definition of measurement. The focus of the category as applied in this study is the accounting information used by managers for control purposes.

⁵ Rewards that are desirable to an individual may be either extrinsic or intrinsic, although the design of compensation systems as part of the evaluation-reward process is primarily concerned with the provision of tangible, financial rewards (Fisher, 1995; Flamholtz, 1983).

- *Policies and procedures*: Specification and direct monitoring of desirable or undesirable behaviors (Daft & Macintosh, 1984; Fisher, 1995; Malmi & Brown, 2008; Merchant & Van der Stede, 2007).
- *Socio-ideological*: Diffusion of values, norms and beliefs that justify certain actions and discourage others (Alvesson & Kärreman, 2004; Fisher, 1995; Flamholtz, 1983).

<Insert Table 1 about here>

Control constructs included within each category are defined in Table 1.⁶ Although most of these have been subject to empirical investigation, a review of the maps detailed by Luft and Shields (2003) reveals that prior analysis has been almost exclusively concerned with direct associations to context, not on how these controls connect or combine with one another. There are, however, a number of theoretical conceptualizations in control and organizational literature that consider how multiple structural attributes integrate to form internally consistent arrangements. The most extensive are Mintzberg (1979, 1989) and Speklé (2001). These describe a range of hierarchical alternatives considered to represent a significant portion of structural arrangements adopted in practice. Five are consistent with the focus of the present study, providing useful templates from which to construct expectations about how the control mechanisms listed in Table 1 might combine and function in practice.⁷ These five alternatives also bear close resemblance to most other archetypal forms incorporated into accounting research (e.g. Bruns & Waterhouse, 1975; Burns & Stalker, 1961; Ouchi, 1977, 1979). Expectations are summarized in Table 2 and explained in detail below.

<Insert Table 2 about here>

⁶ Control categories are meant to be discrete but are not necessarily unrelated. For instance, measurement and compensation systems would be tightly coupled in control structures premised on cybernetic regulation, while in other configurations they may operate quite independently. Constructs within categories could also be closely associated, such as the use of standardization (specifying how an activity is to be performed) and boundary controls (defining the domain of acceptable activity) in a conventional bureaucracy. In more organic control structures standardization might be expected to have limited application, although boundary systems could feature quite prominently as a means for managers to focus subordinate behaviors without removing the capacity for autonomous action. Boundary systems would be common to both control arrangements, but it is how this mechanism is combined in a package that is important for understanding different control outcomes.

⁷ Not all of the types described by Mintzberg (1979, 1989) and Speklé (2001) are applicable to the present study. In relation to the former, professional bureaucracies and political forms are not usually business firms, while the divisionalized structure sits outside the scope of this study (see method section). From the five hierarchical alternatives illustrated by Speklé (2001), two are not likely to be observed: boundary and arms-length control. Boundary control is likely to be limited to control of specialized departments. Arms-length control is more likely to be characteristic of relationships between corporate management and divisions in some conglomerate firms.

Machine bureaucratic (results and action control)

Control in the machine bureaucracy is embedded in technocratic structures geared towards the production of hierarchical accountability, visibility of action, and predictability of subordinate performances (Hodgson, 2004; Mintzberg, 1979). These outcomes can be achieved through two variations – *results* and *action* control (Ouchi, 1977; Speklé, 2001). In results control, goal-directed behaviors are elicited through codified, predetermined and inflexible targets, monitoring of variances and provision of performance-dependent rewards. In the action-oriented kind, control is predicated upon the codification of rules, routines and responsibilities, with observance of behaviors to ensure compliance. Within either approach strategy formation is a highly formalized and top-down affair - goals and objectives are systematically constructed at the organization's apex and communicated down the chain of command (Mintzberg, 1979). Strategic aims in the results-variant are translated into quantitative measurements with incentive structures used to induce target achievement, while in action control they take the form of detailed instructions and procedures.

For results control, then, accounting is the central mechanism for securing individual performances. Accounting serves to define what is important and valued by the organization through selective emphasis on performance dimensions. This emphasis will tend to be restricted to financial metrics that are perceived as relatively “objective” bases for comparison and unambiguous in their interpretation (Henri, 2006). Operating on an exception basis allows for individual autonomy and delegation of decision rights, providing some flexibility in the way local contingencies are handled, while subordinate conduct remains visible through accounting representations. As a counter to control loss associated with decentralization, targets will be oriented towards the short-term, regularly monitored, and rigidly enforced. Interactive use of measurement systems will be limited – the control mentality that pervades the machine bureaucracy encourages vertical and restricted information flows (Burns & Stalker, 1961; Henri, 2006). The constraining and intensive nature of the accounting apparatus is also likely to diminish the need for an extensive employment of socio-ideological mechanisms. This comes down to the way accounting controls are mobilized as the primary intermediary for individual accountability (Hopwood, 1972). Hierarchical systems of accountability act to internalize efficiency and productivity as dominant organizational norms, providing the ideological grounding for individual action (Roberts, 1991).

Results: *Results control is characterized by formalized strategic planning with minimal participation; high emphasis on diagnostic, tight, financially-oriented measurement systems; short-term, objectively determined, performance-dependent compensation; hierarchical authority, mechanistic communication patterns, moderate decentralization and autonomy; limited use of socio-ideological controls.*

Action control shares the same bureaucratic logic as the results-variant, except with a different set of mechanisms accomplishing efficiency and reliability of behaviors. Control is based upon centralized authority, restricted autonomy, standardization of procedures, well-defined boundaries of conduct and extensive monitoring procedures to circumscribe discretionary activities (Merchant, 1982, 1985a). Accounting may be present to some extent to monitor financial performance and cost efficiencies, but will have minor importance for securing individual accountability. Likewise, incentive systems are not expected to be significant for control efforts; if present rewards will necessarily be subjective and short term in nature. Firms will exhibit a tall hierarchy and vertical, routinized and restricted patterns of communication that serve to reinforce positional authority and existing lines of accountability (Mintzberg, 1979). There is little requirement for sophisticated integrative devices as exceptions can be handled through set decision rules and hierarchical referral (Galbraith, 1973; Scott, 2003), and as accountability is secured through hierarchical compliance, socio-ideological mechanisms are not central for control.

Action: *Action control is characterized by formalized strategic planning with minimal participation; accounting limited to cost control; little use of incentives; tall, centralized hierarchical structure with mechanistic communication; very high emphasis on standardized policies and procedures, boundary setting, and direct monitoring of subordinate activities (limited autonomy and use of pre-action reviews); little use of socio-ideological controls.*

*Devolved control*⁸

Organizations pursuing sophisticated innovation or problem-solving require a markedly different control arrangement from the performance-gear machine bureaucracy. As future states are not subject to reliable prediction control cannot be achieved through standardization of processes or outputs. Instead knowledge of required contributions unfolds as individuals experiment with different courses of action (Mintzberg, 1979). For emerging insights to coalesce into coordinated activity, however, organizational participants must continuously adjust and redefine tasks through mutual interaction. Exchanges tend to arise naturally because task complexity ordinarily extends beyond the capacity of the individual (Speklé, 2001). Hence coordination is predominantly a self-organizing process between autonomous individuals, resulting in a structure that is highly organic and fluid, with

⁸ The label “devolved” is used here because it encapsulates the shift in the locus of authority and self-organizing nature fundamental to discussions of many “new” forms of organizing - lateral, network, flexible, post-bureaucratic and heterarchical being some of the more widely used terms (see e.g. Galbraith, 1993; Heckscher, 1994). However, as Fenton and Pettigrew (2000, p. 6) point out, “many of the new forms are not entirely new but reminiscent of earlier typologies,” such as the organic type of Burns and Stalker (1961) and the adhocracy of Mintzberg (1979).

minimal hierarchy, frequent and ad-hoc communication, and dispersed and shifting networks of authority (Burns & Stalker, 1961).

Available means for managers to influence behaviors in devolved structures are often assumed to be quite limited and largely informal in nature, centered upon active engagements in lateral coordination and the shaping of shared expectations and cognitive premises through socio-ideological practices (Burns & Stalker, 1961; Mintzberg, 1979; Speklé, 2001). This might not, however, be an entirely accurate reflection of contemporary practice, with recent research observing that formalized mechanisms can be interweaved in such a way as to enable information exchange and encourage novel patterns of activity (Davila, Foster & Oyon, 2009). For instance, pre-action reviews provide a means to periodically elicit information from subordinates and clarify expectations (Speklé, 2001), while boundary systems can facilitate more efficient search behaviors by defining strategically-appropriate domains (Simons, 1995). And although strategy is often emergent, formal articulation can serve as a repository for accumulated learning and facilitate coordinated responses to unanticipated opportunities (Dent, 1990; Mintzberg, 1994).

Accounting is often considered inappropriate too because in situations of uncertain causation information is rendered incomplete (Chapman, 1997). But when detached from short-term accountabilities and mobilized interactively the ambiguity of information can stimulate debate and opportunity search (Dent, 1990; Simons, 1995). Performance appraisals also become possible through increased interaction as acceptable standards materialize and individual contributions are revealed (Speklé, 2001). Broad-scope metrics may be implicated in evaluations, although greater subjectivity and considerably longer time frames would be expected relative to results control (Govindarajan & Gupta, 1985).

Devolved: *Devolved control is characterized by highly participative, moderately formalized strategic planning; interactive use of broad-scope measurement systems; long-term, relatively subjective reward structures; a highly decentralized, flat, organic structure with complex integrative mechanisms; high autonomy, minimal standardization, moderate emphasis on boundary systems and pre-action reviews; high emphasis on socio-ideological controls.*

Simple control

The simple control configuration is “characterised, above all, by what it is not – elaborated” (Mintzberg, 1979, p. 306). Instead of hierarchical structuring the basis for control is informal and personalized, achieved through centralized decision-making, direct surveillance and continuous, often ad-hoc instructions of superiors (Astley, 1985). Top management is not, however, confined to

supervisory roles with coordination frequently achieved through active participation in task execution. Guidelines for task accomplishment may alternatively be quite vague, with trust placed in the competence and tacit knowledge of subordinates. Here coordination of work activities is implicitly structured through mutual adjustment (Astley, 1985). This results in a reasonably flat and organic structure, with lateral interactions interspersed by managerial directives. Formalized components are not entirely absent in basic control structures (Sandino, 2007), but are typically peripheral features. Measurement controls will tend to be restricted to the monitoring of a few financial metrics, and incentives, if distributed, are discretionary (Bruns & Waterhouse, 1975; Khandwalla, 1977). Formal socio-ideological practices are largely unnecessary for control, although the often intimate working conditions of interpersonal structures are conducive to developing a shared identity, meaning some reliance may be placed on social control (Mintzberg, 1979).

Simple: *Simple control is characterized by a rudimentary bureaucratic structure with little reliance on strategic planning, measurement or compensation systems; centralized authority, moderately organic communication, low autonomy, relatively minor formalized policies and procedures; possible emphasis on social control.*

Cultural control

Cultural control is based upon a widely shared and deeply ingrained organizational ideology (Mintzberg, 1989; Wilkins & Ouchi, 1983). Ideologies represent integrated systems of values and beliefs that serve to justify certain actions and commitments and discourage others (Alvesson & Kärreman, 2004). This mode of control is often conceptualized as an informal and unconscious process of cultural reproduction through exposure to the unique symbols, stories, rituals, and history of an organization (Harrison & Carroll, 1991; Schein, 2004). However, cultural control may also be the product of formally legitimated and intentionally constructed managerial practices (Alvesson & Kärreman, 2004). Shared norms and values can be shaped and reinforced through selection procedures, socialization processes, and codified belief systems (Chatman, 1991; Gottschalg & Zollo, 2007; Simons, 1995; Snell, 1992). But apart from these mechanisms, control through ideology largely obviates the need for bureaucratic structuring as individual behaviors are guided by reference to collective values and interests. This configuration thus shares aspects of both devolved and simple control, combining the highly organic, fluid and consensual processes of the former with the unelaborated structure characteristic of the latter (Kirsch, Ho & Haney, 2010; Turner & Makhija, 2006). Accounting is unlikely to have much of a presence, nor are explicit compensation structures. Any financial rewards are typically unrelated to specific performances, reflecting rather long-term considerations of collective equity (Wilkins & Ouchi, 1983).

Cultural: *Cultural control is characterized by a high emphasis on socio-ideological controls; minimal application of formalized control instruments apart from selection, socialization and belief systems; very limited use of accounting and incentive systems; highly organic and participative structure.*

Context of configurations

To analyze variation in the operating conditions of control combinations a set of contextual factors is identified from prior literature.⁹ The comprehensive review by Chenhall (2003) guided initial selection. Chenhall highlights several dimensions found to have implications for management control: technology, external environment, structure, strategy, size, and national culture. Two are excluded: structure, because it has been conceptualized as part of the control arrangement, and culture, as the study has been conducted in a single national context. Table 3 defines the main contextual constructs analyzed. Age (Sandino, 2007) and stock exchange listing (Merchant & Van der Stede, 2007) are also included.

<Insert Table 3 about here>

Expectations in relation to each contextual dimension are discussed below and summarized in Table 4. Circle sizes indicate predicted differences between each configuration.

<Insert Table 4 about here>

Technology

As this study analyzes control choices made by firm top management the appropriate technological concern is administrative technology (Waterhouse & Tiessen, 1978). This relates to the informational preconditions determining the validity and reliability of using formalized control mechanisms to influence subordinate behaviors (Snell, 1992). Most empirical research on structural associations with technology has been conducted at the department or project level of analysis, with only a handful of studies examining effects at a firm level (i.e. Govindarajan & Fisher, 1990; Snell, 1992). There is, however, general support that increases in task programmability and goal measurability are associated with higher use of behavioral and output controls respectively. These factors are expected to be the primary determinant between bureaucratic variants - results control applicable if information is available to accurately capture achievement of desired outcomes and action control suitable when

⁹ The term “context” is preferred in place of “contingency” for three reasons. First, it avoids the deterministic connotation that contingency carries (Gerdin & Greve, 2004). Second, the contextual factors are external to what has been defined as the management control structure, but this is not meant to imply an actual separation in reality. Third, it is recognized that an organization is likely to have some degree of influence over its context and all factors are choice variables for the firm at least at one point in time (Fisher, 1995).

tasks can be programmed and performances monitored (Ouchi, 1977; Eisenhardt, 1985). When the availability of administrative information decreases firms will tend to place less reliance on formalized control structures (Chenhall, 2003), hence simple and devolved control structures become more appropriate. Simple control is likely to be associated with a moderate level on both technology scales. The undeveloped administrative structure means that even if desired outcomes are known or tasks observable reliable quantification and standardization of exceptions is problematic. In devolved control structures activities remain largely non-programmable, although quantifiable standards of performance may emerge over time (Speklé, 2001). Finally, cultural control is expected to be the only viable alternative for firms that satisfy neither administrative precondition – an imperfect understanding of transformation processes and an inability to reliably measure outcomes (Ouchi, 1979).

Environment

MA research has tended to examine the environment as a singular construct (i.e. environmental uncertainty), although it is widely recognized that the environment is comprised of multiple dimensions (Chenhall, 2003; Dess & Beard, 1984). Prior analysis has revealed associations between unpredictability and increases in the use of broad-scope information, subjective performance assessment, delegated authority, complex integrative mechanisms and organic interactions (Burns & Stalker, 1961; Chenhall & Morris, 1986; Gordon & Narayanan, 1984; Govindarajan, 1984; Miller & Dröge, 1986). Environmental turbulence, often referred to as dynamism when grouped with unpredictability, increases information processing requirements of the organization (Dess & Beard, 1984; Miller & Friesen, 1983). Complex environments also demand greater information processing capabilities, with associations found to more extensive and participative strategic planning processes (Kukalis, 1989) and decentralized decision-making (Miller, 1979). Hostility has been associated with a greater reliance on cost controls, formalization and decentralization (Baum & Wally, 2003; Khandwalla, 1973), although under extreme hostility organizations will tend to revert to centralized and interpersonal control structures that are able to deliver coordinated responses more rapidly (Khandwalla, 1977).

These findings suggest that the most dynamic and complex conditions will require devolved control structures. Cultural control may also be feasible in highly dynamic environments as control through internalized values permits significant behavioral variability, while collective decision-making processes and a prevailing consensus upon organizational objectives facilitate handling of moderate complexity and hostility (Chatman, 1991; Turner & Makhija, 2006). The centralized and informal coordination of the simple control structure facilitates operation in reasonably dynamic and hostile conditions, although with little information-processing capacity only relatively homogenous environments can be successfully handled (Mintzberg, 1979). For the bureaucratic alternatives,

environments will tend to be simple, predictable, stable and non-hostile (Mintzberg, 1979; Scott, 2003). Results control does, however, allow for better handling of variation and complexity as distributed decision-making increases the collective capacity of the organization to process information (Speklé, 2001), while the centralized structure of action control can accommodate higher levels of hostility (Mintzberg, 1979).

Strategy

Empirical findings indicate that firms pursuing cost leadership type strategies are more likely to adopt “centralised control systems, specialised and formalised work, simple coordination mechanisms [...] cost control and specific operating goals and budgets”, while firms following product differentiation strategies tend to have a “lack of standardized procedures, decentralised and [...] flexible structures and processes, complex co-ordination of overlapping project teams, and attention directing to curb excess innovation” as well as more subjective and long-term performance assessment (Chenhall, 2003, pp. 150-1). Devolved control structures are therefore expected to be associated with the greatest emphasis on differentiation strategies (innovation and customer focus), while the bureaucratic arrangements of results and action control will be aligned to a high emphasis on low-cost (Miller, 1986). Although results control is moderately decentralized, the rigidly defined accountability structure is likely to restrict the potential for novel or risk-seeking behaviors (Langfield-Smith, 2007). Simple control is often adopted by entrepreneurial ventures, which seek novel and flexible responses within market-niches, but are too centralized and undifferentiated to support complex innovation (Miller, 1986; Mintzberg, 1979). A moderate emphasis on differentiation-type strategies is therefore expected, while low-cost is unlikely to be a priority given the small scale and unsophisticated nature of operations typical of these firms (Ward, Bickford & Leong, 1996). Similar reasoning applies to the cultural control configuration, which although more organic and flexible, tend to be restricted to particularly small-scale firms, as discussed below.

Other conditions

Few MA studies have explicitly considered size, age and listing as contextual variables despite evidence indicating that these factors have potentially significant consequences for control. Size has consistently been found to be associated with the adoption of bureaucratic control structures (Astley, 1985; Donaldson, 2001), while age has been shown to have similar effects (Davila, 2005; Mintzberg, 1979). The specific demands on information disclosure imposed by public listing may necessitate investment in planning and measurement systems, while associated governance requirements could entail an emphasis upon action-oriented controls. The bureaucratic control structures are therefore most appropriate for large, mature organizations and that are publicly listed (Chenhall, 2003; Donaldson, 2001), while simple control is likely to be associated with small, young and privately financed firms (Astley, 1985; Bruns & Waterhouse, 1975; Davila, 2005). For the “new organization”

there is often little alternative as “it has not had the time to elaborate its administrative structure” (Mintzberg, 1979, p. 308). Despite its complexity, devolved structures are sketched as temporary and unstable arrangements adopted by young firms prior to bureaucratization (Mintzberg, 1979; Speklé, 2001). Because of this typical condition of youth, firms are more likely to be privately owned. Firm size is also limited – large organizations are too unwieldy to coordinate through organic structuring (Mintzberg, 1979). Finally, cultural control organizations should be small and mature, as the kind of thick social understandings and intense commitment to collective values and interests necessary for ideological control requires organizational members to have close and frequent personal contact and an extended history of shared experiences (Ouchi, 1979; Schein, 2004).

Research method

Sample

Data was obtained from a mail survey conducted in Australia. The population sample was acquired from the Certified Practicing Accountants of Australia (CPAA). A random sample of 1500 firms was selected from their database. Firms were independent companies or strategic business units (SBU).¹⁰ It was required that firms had a minimum size of 100 employees and at least \$20 million dollars revenue. This was to ensure that formal controls were in place, as many of the constructs focused on control use rather than its presence or absence. Through cross-checking requirements against Dun and Bradstreet and Hoovers databases, 107 firms were removed, leaving a useable population of 1,393.

Survey administration was conducted over three months. Targeted respondents were the highest member of the top management team whose details were available in the CPAA database.¹¹ Some were chief executive officers or general managers while others were responsible for functions such as accounting, finance and operations. Telephone calls were initially made to generate interest in the research, ensure that firm characteristics were appropriate for the study, and check that respondents had sufficient knowledge of questionnaire contents. In total, 911 respondents satisfying the criteria agreed to participate. Surveys were sent out within a week of contacting each respondent. Reminder postcards were sent one and a half weeks after initial mailing, and a further telephone call to non-respondents after three weeks (Dillman, 2000). The process generated a response rate of 46.2% with 421 returned surveys.¹²

¹⁰ This definition is consistent with prior management control research at the firm level (e.g. Chenhall, 2005; Chenhall & Langfield-Smith, 1998; Henri, 2006). In all cases firms appeared as separate entities in the CPAA, Dun and Bradstreet and Hoovers databases.

¹¹ Top management team is defined as the top two tiers of an organization’s management structure (e.g. CEO/GM, COO, CFO, and the next highest level of management) (Henri, 2006).

¹² As the mail-out was conducted in stages, to minimize the time between a respondent being contacted and receiving the questionnaire, a non-response bias test could not be performed. Size and industry of respondent firms were however compared to the sample population with no significant differences detected ($p < 0.05$).

The analysis used 400 responses. Responses were removed if they failed to meet the criteria of the study or had significant missing data. Surveys where one or more items appeared to have been missed inadvertently were retained. Missing values were imputed using the expectation-maximization process.¹³ Demographic data for the usable sample is shown in Table 5.

<Insert Table 5 about here>

Variable measurement

Where possible previously validated constructs were used or modified. However, a number of new constructs were purpose developed because prior measures were considered inappropriate or were not available. Extensive pilot testing of the survey instrument was undertaken to enhance content validity. This involved 10 in-depth interviews with senior managers from medium-to-large organizations in manufacturing and service industries. The purpose of the interviews was to refine the selection of constructs, analyze consistency in understanding of survey items between interviewees, and remove any undue complexity or ambiguity in item wording. To further establish content and face validity nine academics in the management control discipline reviewed the survey.

The measurement model guidelines of Rossiter (2002) and Jarvis, MacKenzie and Podsakoff (2003) were applied in the development or modification of constructs. In some cases existing literature indicated the most appropriate measurement model (e.g. Bisbe, Batista-Foguet and Chenhall, 2007). Otherwise the selection of singular, reflective or formative models was based upon the conceptual definition and concreteness of each construct.¹⁴ For example, measurement control is tighter when there is: more specificity and less flexibility of targets, more frequent and timely communication of targets, closer and more frequent monitoring of results, and a more transparent and stringent link between performance and rewards (Merchant, 1985b, 1998). These attributes do not appear to share a common nomological net nor be driven by a higher order latent construct, but are rather defining components of the construct. While prior research has (implicitly) used a reflective measurement model for this construct, a formative model is theoretically more appropriate.¹⁵

¹³ Data was shown to be missing completely at random (MCAR: chi-square=1588.19, DF=1626, $p>0.10$). The expectation-maximization method is applied as it has negligible impact upon mean, covariance and correlation parameters (Hair et al., 2006).

¹⁴ Rossiter (2002) uses the terms concrete (singular), formed (formative) and eliciting (reflective). Single-item constructs are sufficient, and even preferable, when the object of measurement and its attribute are concrete and uniformly conceived by raters. When a concept is more abstract in nature then multiple items are required to capture the construct (Rossiter, 2002). In this case model choice (reflective or formative) depends upon the directionality of indicators.

¹⁵ The selection of formative or reflective models has important implications. If a reflective model is selected when indicators are in fact defining facets of the construct then replacing or removing indicators may alter the conceptual domain and theoretical meaning. This may result in flawed interpretations of empirical tests (Bisbe et al., 2007; Jarvis et al., 2003).

For reflective measurement models, unidimensionality was evaluated through principal components analysis using oblique rotation, with Cronbach alphas calculated to examine internal consistency. Factor analyses returned single factor solutions with satisfactory alphas (between 0.67 and 0.90). Descriptive statistics are reported in Table 6. Survey items, measurement models, factor solutions, alphas and literature sources for items and dimensions of each construct are in Appendix 1. Scales from 1 to 7 were used unless otherwise indicated.

<Insert Table 6 about here>

Multicollinearity was assessed through Pearson bivariate correlations. Only two correlations were above 0.6 and significant: interactive and diagnostic measurement system use, and socialization and belief systems ($r=0.645$ and 0.643 respectively). Considerable attention was given to both sets of items in development and pilot testing phases, and as they are theoretically distinct constructs, they were retained in the analysis. Harman's one-factor test was conducted to assess for common-rater bias. The first factor in an unrotated principal components analysis explained 20.7% of variance, supporting the absence of single-source bias (Podsakoff & Organ, 1986).

Data analysis

Cluster analysis was used to identify combinations of control and contextual variables. This technique is consistent with configuration theory as it attempts to locate homogenous, mutually exclusive groupings within a population set (Chenhall & Chapman, 2006; Gerdin & Greve, 2004). The clustering process involved two stages (Ketchen & Shook, 1996). In the first stage the number of clusters and centroids were determined through a hierarchical agglomerative procedure using Ward's algorithm with squared Euclidean distance. This method is appropriate as it factors in both intra-cluster homogeneity and inter-cluster differentiation (Everitt, Landau & Leese, 2001). However, the approach can be sensitive to outliers and construct scaling (Hair et al., 2006). Constructs were Z-score standardized to minimize the effect of different measurement scales, while tests for the effect of multivariate outliers found minimal differences in cluster solutions.¹⁶

A six cluster partition was selected because it had the closest correspondence to theoretical expectations and was further supported by supplementary analyses. Examination of the dendrogram indicated significant "jumps" for two to seven clusters. The Duda-Hart index, a stopping rule,

¹⁶ A Mahalanobis distance (D^2) test was conducted (Hair et al., 2006). The analysis at $p<0.001$ suggested that six cases could be considered outliers. Visual inspection did not suggest any unusual patterns. Removal of the cases had only minor impact on cluster formation, with three variables or less in three of the six clusters having statistically significant differences ($p<0.05$). These differences did not substantively affect cluster interpretations or statistical testing of propositions. All cases were retained.

supported four, six and seven cluster solutions.¹⁷ These alternate cluster partitions were examined. Partitions of two to five clusters were not as closely aligned to a priori expectations, while the seven cluster solution produced a cluster with significant overlap providing little additional insight. Replication with alternate algorithms demonstrated that the six cluster solution had relative stability.¹⁸

The centroids from the six cluster hierarchical solution were then used in the second clustering stage. Here a non-hierarchical procedure (*K*-means clustering) that allows switching of cluster membership was used (Hair et al., 2006). The results of this analysis are shown in Table 7. Differences in cluster patterns are examined through analysis of variance (ANOVA) and Games-Howell post-hoc multiple comparison procedures (MCP).¹⁹

<Insert Table 7 about here>

Analysis of results

Control configurations

The first cluster in Table 7 corresponds to predictions for results control.²⁰ The pattern of C1 reveals accounting to be the central mechanism for control: diagnostic and tight application of accounting information (>C2,C3,C4,C5), an emphasis on cost control (>C4,C5), narrow measurement diversity (<C2*,C3,C6), and high use of formula-based incentives (>C2,C3,C4,C5) oriented towards short-term performances (<C3). In distinction to devolved control (C3), communication patterns are more mechanistic and hierarchy more pronounced, while in comparison to action control (C2) the use of formalized policies and procedures is significantly lower. Strategic planning is not as formalized as predicted (<C2,C6; =C3,C4), possibly because primary attention is directed towards short-term financial performance than long-term aspirations. Apart from selection, socio-ideological mechanisms have relatively little importance for control efforts (<C2,C3,C6).

The second cluster most closely resembles action control. C2 shows significant emphasis on formalized (>C1,C3*,C4,C5) and centrally-orchestrated strategic planning (<C3,C6), standardized

¹⁷ Other stopping rules were also analyzed for the first ten cluster partitions. Davies-Bouldin and Dunn indexes supported solutions of two, five, six and seven clusters, although the Cubic Clustering Criterion (CCC) did not provide any clear preference.

¹⁸ The clustering process was repeated with alternate hierarchical (within-group) and non-hierarchical (*K*-means) algorithms. The within-group procedure had a correspondence of 89.25% to the cluster membership from Ward's method. In a comparison of clusters no statistically significant differences were detected ($p < 0.05$). Using the non-hierarchical procedure resulted in 78% of cases with equivalent cluster membership. A small number of statistical differences were found in comparison to mean scores reported in Table 7 but these did not affect cluster interpretation.

¹⁹ Chi-square tests with Bonferroni pairwise comparisons were conducted to assess potential differences in industry association across clusters. There were no significant results ($p < 0.05$).

²⁰ Differences between clusters indicated by an asterisk (*) are significant at $p < 0.10$. All other differences in means are significant at $p < 0.05$ or better.

procedures (>C1,C3,C4,C5), boundary systems (>C1,C4,C5), pre-action reviews (>C4,C5), vertically-oriented hierarchy (>C3,C6), formal patterns of communication (<C3,C4,C6), and retention of decision rights and low levels of subordinate autonomy (<C1,C3,C6). As expected little importance is placed upon objective assessment or performance based compensation (<C1,C6; =C3,C4) but there is strong emphasis on cost control (>C4,C5; =C1,C6). Unexpectedly accounting is relatively prominent in this configuration, with broad-scope information (>C1*,C4,C4; =C3) used to engage interactively with subordinate activities (>C5, =C1,C3,C4). Diagnostic use and tightness is, however, lower than results control (<C1). Accounting information may be used in this configuration to supplement the direct observations of top management in evaluating task execution and refining standardized procedures. Also unexpected is the relatively high emphasis upon lateral integrative devices (>C4,C5; =C3) and socio-ideological mechanisms (>C1,C4,C5; =C3).

C3 exhibits a profile consistent to devolved control. Firms have the most organic, decentralized and flattest structure out of all clusters, with relatively low standardization (<C2,C6), significant individual autonomy (>C2,C4,C5), intense use of integrating liaison devices (>C1,C4,C5), and relative importance of socialization procedures, belief systems and social control (>C1,C4,C5). Formal controls also have a presence. Boundary controls and pre-action reviews are utilized to a similar extent as action control (=C2) but combined in an otherwise organic structure they likely have an enabling role. The interactive use of accounting controls (>C4,C5; =C1,C2) and the moderately formalized (>C5; =C1) but highly participative strategic planning process (>C1,C2,C4,C5) is consistent with this enabling logic. Although diagnostic control is not as low as expected for a devolved control structure (<C6,C1; =C2,C4), there is less stringency in the link to individual accountability (<C1,C2,C6). As expected measurement diversity is reasonably high (>C1,C4,C5) and the moderate application of performance-dependent compensation (>C5; =C2,C4) incorporates subjectivity (<C1,C6) and long-term evaluation periods (>C1,C2,C4,C5,C6).

The patterns of C4 and C5 both have reasonable congruence to predictions for simple control. In particular, decentralization and autonomy are significantly lower than other configurations (<C1,C3,C6), apart from action control (C2), as expected. Emphasis on other formalized policies and procedures, lateral integrative devices and socio-ideological mechanisms are considerably lower than most other clusters. There are, however, differences between C4 and C5 indicating that they represent distinct control modes. Edwards (1979) notes that simple control has previously been conceptualized as having two variants – direct and hierarchical. Direct control is closely associated to the interpersonal control structure describe by Bruns and Waterhouse (1975), which appears to fit well the pattern of C5. Here control is achieved through concentrated authority, infrequent but performance-directed communication and limited accountability for a few financial and cost related metrics. The mean values for diagnostic and cost control are higher than other mechanisms within this

configuration (apart from selection) indicating that accounting still has a presence, albeit significantly lower than the other configurations.

In C4 there is a more notable incidence of formalized bureaucratic mechanisms.²¹ This cluster incorporates a higher emphasis than C5 on participative strategic planning, diagnostic and interactive use of accounting, measurement diversity, performance-based incentives, and standardized procedures. This more formalized structure, however, is also coupled with less mechanistic communication patterns and greater emphasis on socialization and social control than C5. Possibly the increased hierarchical structuring provides a more sufficient basis for patterned interchanges between individuals, allowing for slightly stronger ideological control to emerge.

C6 is not representative of any of the postulated configurations. This cluster has the most elaborated arrangement, characterized by an intensive and demanding application of accounting and a significant bureaucratic complex. C6 reveals tightly emphasized accountabilities (>C2*,C3,C4,C5) to a wide array of metrics (>C1,C2,C3,C4,C5) coupled with strong performance-based incentives (>C2,C3,C4,C5), while strategic planning, boundary systems, standardization and pre-action reviews are equal or greater in emphasis than other clusters. Balanced against this is a high level of participation in strategic planning (>C1,C2,C3,C4,C5), delegated decision authority (>C2,C4,C5), discretion in conducting work activities (>C2,C4,C5), moderately organic patterns of interaction (>C2,C5), and use of lateral integrative devices (>C1,C2), indicating quite complex modes of integration and coordination. Reliance on socio-ideological controls is also significant, perceptibly higher than all other clusters. As firms in C6 appear to be comprised of a complex intermeshing of multiple control modes the cluster is labeled “hybrid” control.

Contextual associations

There is some support for the general expectation that outcome measurability and task programmability are related to the use of results and behavior type controls respectively. The hybrid configuration (C6) has the highest values of administrative technology while the least bureaucratic structure, inter-personal control (C5), is associated with the lowest values. Simple control (C4) also has significantly higher values than inter-personal control (C5), providing a possible explanation for the higher level of bureaucratic structuring. Support for specific predictions, however, is mixed. Devolved (C3) and simple (C4) control configurations are found to have lower outcome measurability than results control (C1), as expected. But there are no differences between action (C2), devolved (C3) or simple (C4) control for task programmability, despite significant variation in the emphasis on

²¹ This cluster (C4) retains the name “simple” control because the contextual characteristics are more closely aligned with initial expectations than for C5 – moderate administrative technology, niche focus on innovation and customer focus, small size, unlisted and early-stage.

behavioral-type controls. The cultural control configuration was expected to be present when neither administrative preconditions are met. This situation is associated instead with the inter-personal control structure (C5), which exhibits the lowest emphasis on socio-ideological mechanisms. The highest emphasis on these controls, conversely, occurs in C6 where administrative technology is the most significant. Furthermore, it was expected that administrative technology would be the primary differentiator between bureaucratic control types, but no significant differences between C1 and C2 on either dimension were found.

Instead differences between bureaucratic variants relate to environmental factors, with action control (C2) operating in more turbulent, unpredictable and complex environments than results control (C1). Action control structures were expected to be able to handle moderately hostile environments, although this was hypothesized to be equivalent to devolved control (C3) and less than simple control (C4). Findings ($C2^* > C3^*, C4^*$) are contrary to expectations, however, indicating that action control structures may have a better capacity to cope with intensely competitive and resource constrained environments. Results control was associated with less unpredictable ($< C2, C3, C4^*, C5, C6$), variable and complex ($< C2, C3, C4, C6$) conditions than most other configurations. This was expected as environmental stability is a typical prerequisite for control strategies holding subordinates accountable to predetermined targets. However, hybrid control (C6) firms employ a similar results-based accountability structure in significantly more dynamic conditions, suggesting that this association is not systematic across configurations. Devolved control was expected to be able to operate in the most uncertain and complex environments. Apart from comparisons to C1, statistical differences are found only for unpredictability ($> C1, C4, C6$).

Prior research suggests that firms emphasizing low-cost are associated with more bureaucratic and formalized control structures. Findings show that results (C1) and action control (C2) firms are more focused on low-cost than those employing simple control (C4), while devolved (C3) and action (C2) configurations have higher association to customer focus than inter-personal control (C5). Interestingly, interpersonal-control (C5) is related to a higher importance on low-cost strategy than simple control (C4), despite little emphasis on the control mechanisms typically associated with this strategic perspective. Furthermore, there is no variation in low-cost emphasis across C1, C2, C3, C4 and C6 although those controls typically related with this strategic position – cost focus, tightness, objective performance assessment, centralization, hierarchy and standardization – do vary considerably. As expected, though, the relatively organic control structure of the devolved cluster (C3) is associated with a high emphasis on innovation ($> C1, C2, C4, C5$). Yet an equivalent emphasis on innovation combined with high customer focus ($> C1, C2, C3, C4, C5$) is also found in the more intensive bureaucratic structure of hybrid control (C6). These findings indicate a quite complex relationship between firm strategy and control combinations.

It was expected that firms with more bureaucratic control structures would be significantly greater in size than other configurations. Hybrid control is associated with the largest firms. This is significantly greater than other clusters, except for results control (C1). The mean value for C1 is higher than all other clusters, but differences were only significant in comparison to simple control (C4) and, interestingly, action control (C2) but not devolved (C3). Listing revealed only one moderately significant difference (C6* > C4*). Consistent with predictions, the age of firms in the results cluster was higher than devolved (C3) and simple (C4) configurations. These differences hold also for the hybrid configuration, while action (C2) and inter-personal (C5) clusters contained significantly more mature-stage firms than simple control (C2, C5* > C4*). The differences between C4 and C5 are unusual as the opposite result would be expected – older firms are typically associated with greater bureaucratic structuring.

Discussion

The objective of this study was to develop and test a theory of control configurations. The empirical analysis found that results (C1), devolved (C3) and simple (C4) clusters corresponded closely to expectations, both in terms of observed patterns of accounting and control and alignment to contextual conditions. Other clusters - action (C2), inter-personal (C5) and hybrid (C6) - reveal combinations that were unexpected or inconsistent with initial theorizing.

The pattern exhibited in C2 is in many respects in line with predictions for the action-bureaucratic configuration – an emphasis on hierarchical relations, centralized authority, and the structuring of tasks through an extensive array of formalized rules, routines and operating procedures. But combined with this structure is a strong emphasis on accounting, integrative devices and socio-ideological controls, suggesting a quite different control logic to the conventional action-bureaucratic form proposed by current archetypal theories (Ouchi, 1977, 1979; Speklé, 2001).²² Similarly, the empirical results indicate that many firms simultaneously combine an extensive range of controls. This is particularly evident in the hybrid (C6) configuration that demonstrates a complex interweaving of multiple modes of control. This is in contrast to the common assertion that firms will emphasize a

²² One interpretation of the control logic is that top management is in closer proximity with subordinates, not to monitor or enforce adherence to rules as in the conventional action-bureaucratic structure, but to ensure flexible adjustment. This is because in situations of higher uncertainty valid assessments of subordinate behaviors require a more intimate knowledge of the operational conditions and information deficits faced at the time of action (Chapman, 1998). Accounting is present but unlike the results-variant it is not privileged as a source of control. Combined with lateral integrative devices and an emphasis on ideological cohesion, information conveyed by accounting systems may be “interpreted and understood within the *shared* context of extensive mutual knowledge” (Roberts & Scapens, 1985, p. 451). This is suggestive of a “socializing” style of accountability quite different from the “individualizing” effects characteristic of conventional bureaucratic control (Ahrens, 1996; Roberts, 1991), and is potentially more amenable to requirements for flexibility (see e.g. Mouritsen, 1999).

single control mode (Alvesson & Kärreman, 2004). It is also often espoused that the internalization of shared beliefs and values obviates the need for an extensive bureaucratic apparatus of explicit rules and formalized systems of accountability to govern behavior (Alvesson & Lindkvist, 1993). Yet in C6 traditional bureaucratic structures co-exist with the more indirect and unobtrusive mechanisms oriented towards the normative and ideational spheres of individual conduct. Furthermore, where theory indicated that socio-ideological controls should dominate – instances of imperfect information, small size and mature firms – a very basic bureaucratic structure (C5) is found. Socio-ideological controls instead have the greatest presence when combined with extensive bureaucratic structures, such as hybrid (C6) and action (C2) control. This suggests that socio-ideological mechanisms are more likely to exhibit a complimentary relationship with bureaucratic controls, rather than act as substitutes, as is commonly assumed (Alvesson & Kärreman, 2004).

This study also sought to examine how accounting is situated within wider control structures, and in doing so, to better understand the role of accounting in managerial control efforts. In current control choice frameworks (i.e. Ouchi, 1977, 1979; Speklé, 2001) accounting is conceptualized as a formal and mechanical technology, present in results-based control strategies and absent, or at best incidental, elsewhere. The role of accounting in C1 was consistent with this theorizing - situated within a conventional hierarchical accountability structure as the primary means for enacting control. But accounting was also found to have a presence and relative importance in all configurations, even in quite basic (C4, C5) and organic (C3) structures. C3 provides support for conjectures on the potential for accounting to be combined within lateral and organic structures in situations of innovation and uncertainty (Davila et al., 2009). To effectively function in these circumstances accounting must be relatively detached from short-term accountabilities and activated in an enabling and interactive manner (Hartmann, 2000). This is consistent with devolved control (C3), but other configurations show that more novel combinations are possible. In action control (C2) accounting is activated in a similarly flexible manner, but is combined within a mechanistic structure. This may provide some degree of flexibility to otherwise highly bureaucratic organizations, facilitating integration of activities under dynamic conditions (Walton, 2005). The use of accounting in the hybrid configuration (C6) is also intriguing. As many conditions are similar to C3, a relatively loose application of accounting would be expected. But instead accounting forms part of an intensive and demanding accountability structure. The combinatory potential of accounting would appear to be far greater than currently recognized by existing control theories.

The second research question related to the capacity of contextual factors to explain control structure variety. Some variation in control structures would seem to have a systematic association to context. For example, the tight, diagnostic application of accounting in results control (C1) operates within stable environments, while less stringent and more interactive applications are apparent in the

dynamic conditions associated with C2 and C3. But many associations are not consistent with predictions. In C6 we find an intensive results-based accountability structure operating in dynamic environments. Interactive and cost control between C1, C2 and C3 is invariant as is diagnostic control, performance-based and objectively determined compensation between C2, C3 and C4, and short-term compensation amongst all clusters except C3, despite variations in technological, strategic and environmental conditions that were expected to have systematic associations with these controls. Furthermore, two very different control arrangements are associated with innovation – devolved (C3) and hybrid (C6) – yet the latter is replete with bureaucratic mechanisms that are often assumed to hinder innovative efforts. It is also notable that action control (C2) is associated with turbulent, unpredictable and complex environments, which is in contrast to conventional wisdom that mechanistic-type structures are only “appropriate to an enterprise operating under relatively stable conditions” (Burns & Stalker, 1961, p. 5).²³ This points to significant complexity in the relationship between contextual and control attributes, much of which is not predicted by existing theory.

Parsimonious frameworks, such as Ouchi (1977, 1979) and Speklé (2001), that suggest certain sets of contextual factors are best served by a particular control structure are intuitively appealing. But the complex and messy image of control painted in this study suggests that existing archetypal theories may conceal more than they are able to reveal about contemporary practice. Although the analysis has raised more questions than it provides definitive answers, it does point towards some specific aspects that need to be considered if we are to sufficiently explain control structure variety. First, the analysis indicates that archetypal theories must reconsider the control forms commonly found in practice. It would seem that conventional bureaucratic types no longer dominate the organizational landscape with alternative combinations not only possible but also frequently realized (cf. Mintzberg, 1979; Ouchi, 1977, 1979). This study has provided evidence for a number of novel permutations. Additionally, certain pure-type arrangements might have “limited diversity” – an instance where a logically possible configuration is not found empirically (Fiss, 2007). In this study there was no evidence for the cultural configuration, rather, socio-ideological controls were most prominent when combined with more complex structural arrangements. And even if the cultural control mode is a theoretically more efficient alternative than interpersonal control (C5), the former may not be viable in practice, at least at the firm level.²⁴ Rather than focusing only on pure-type alternatives, future

²³ Flexible bureaucratic structures operating under conditions of uncertainty have been described at an operational level in recent case studies (e.g. Ahrens & Chapman, 2004; see also Walton, 2005). A similar logic might be applicable to firm-level arrangements.

²⁴ Alvesson and Lindkvist (1993) offer a potential explanation for this limited diversity. They argue that early-stage firms are unlikely to exhibit the preconditions of a long and stable membership necessary for clan formation. As these firms mature, they will tend to adopt more bureaucratic structures, even if the control configuration remains relatively basic. The presence of these basic bureaucratic arrangements limit the potential for clan controls to dominate, hence a pure-type clan will be a relatively rare form of control in practice.

theorizing should explicitly consider how different control modes can be combined, not only substituted (see Grandori & Furnari, 2008).

Second, frameworks need to take into account the potential interactions between multiple contingency variables. Considering just one contextual dimension would not seem to be sufficient to explain emphases on different control types. For instance, current theory argues that technology has a direct influence on control design choices, but the results of this study suggest that the relationship is more complex. Prior theory argues that when information is available to feasibly pursue either bureaucratic control approach, results-control will be preferred because “it tends to require less elaborate structuring, [...] is likely to demand less higher level involvement, and is more supportive of adaptation” (Speklé, 2001, p. 429), indicating a trade-off between alternatives. This is supported in the case of C1, but in the hybrid arrangement (C6) output and behavior mechanisms are *combined* not substituted. It was also expected that task programmability would be associated with differences in policies and procedures. While there are significant differences in these controls (autonomy, boundary systems, standardization) between C2, C3 and C4, there is no variation in task programmability. There also does not appear to be any systematic variation between technology and socio-ideological controls (cf. Ouchi, 1977, 1979). The way that technology interacts with other conditions may provide explanations for these findings. There is also the possibility that the relative importance of contextual attributes varies between configurations. Although C1, C3, and C4 have equivalent task programmability as action control (C2), the competing influence of other conditions may alter or minimize its influence.

Third, the explanatory power of control theories are likely to improve if the assumption of singular and universal associations is relaxed. In this study configurations are found to be characterized by differences *and* similarities - very different control arrangements can be aligned to the same contextual feature while in other cases control mechanisms in different configurations have equivalent emphasis despite variation in context. This study has noted a number of contexts where controls might be combined in multiple ways, particularly in relation to strategic priorities (e.g. devolved and hybrid structures for firms pursuing innovation). Finally, to adequately explain the design and use of any one mechanism is likely to require knowledge of not only contextual conditions, but also of the wider control structure in which that mechanism resides. For instance, the accountability structure found in the hybrid configuration (C6) would seem inconsistent with complex and dynamic conditions. Yet it may be able to function effectively *because* of the combination with socio-ideological controls (Davila et al., 2009). Understanding how mechanisms are internally aligned within a control package may also provide explanations for instances of invariance across configurations.

Concluding comments

A primary motivation for this study was the concern that conventional assumptions and existing archetypal theories may not be able to adequately explain combinations of control and contextual attributes. The analysis suggests that although they *do* still have much to say about contemporary practice - many of the configurations found here closely resemble prior archetypal descriptions – they also mask much of its complexity. Instances of multiple control modes simultaneously active, bureaucratic structures operating in dynamic conditions, multiple ways that accounting is able to integrate into control arrangements and the considerable complexities apparent in the relationship between control mechanisms and contextual conditions suggest that extant theoretical illustrations and dominant control assumptions conceal and even misrepresent empirical reality.

A number of paths for future research to explore this complexity emerge from this study. First, the analysis shows that organizations use different combinations of control mechanisms in a particular context. There is, however, an important difference between observing the existence of multiple structural forms in the same context, and demonstrating that they are functionally equivalent. Gresov and Drazin (1997) argue that equifinality exists when more than one structural combination is able to meet the functional demands imposed by contextual circumstances. Firm performance could be used, but a better frame of reference would be assessing the contribution control systems make to fulfilling organizational functions. This is consistent with calls to “refocus attention on *control problems* rather than on *control solutions*” (Caglio & Ditillo, 2008, p891). For instance, in an inter-firm context controls variously contribute to resolving the problems of cooperation, coordination and appropriation. A similar theoretical framework could be developed for intra-firm control, providing a consistent basis upon which to integrate and compare the structural solutions found or proposed in different studies.

Second, the configurations presented offer insight into how control mechanisms combine as an integrated package. What is not clear, however, is the relative importance of mechanisms in each configuration for achieving certain outcomes. Theoretically this concerns the distinction between core and periphery. Core elements in a configuration are those that are tightly coupled and necessary to achieve an outcome while peripheral elements are less connected and have weak associations to the outcome of interest (Fiss, 2011). For instance, it could be expected that the core mechanisms of hybrid and devolved configurations central to achieving high innovation would be quite different. Distinguishing between core and periphery would also provide insight into which elements within a package are potentially substitutable. The core of the devolved configuration may centre upon lateral relations and organic processes with more formal elements being peripheral features. This might help to explain why some studies have found tight formal controls being successfully employed in

innovative firms (e.g. Simons, 1987) when much of the literature has argued instead that control structures must be informal and loose (Langfield-Smith, 2007).

To address these issues a combination of conventional and alternate methodological approaches is likely required. Path analytic techniques may be able to examine the interrelationships between control mechanisms thereby identifying core and peripheral components in different configurational subgroups. Such techniques may also be able to identify relationships between control and contextual variables that hold for one class of configuration but are absent or even reversed in direction for another. Other theoretical concerns might better be addressed through methods less common in MA literature. The utility of cluster analysis for examining how multiple control elements make up a system or package has been previously noted (Chenhall & Langfield-Smith, 1998; Gerdin, 2005). A quite different approach is offered by set-theoretic methods. These use Boolean algebra to assess how different variables combine to achieve an outcome (Fiss, 2007). One unique benefit of this approach is the ability to examine necessary and sufficient causal conditions. For example, imperfect administrative information, maturity and small size may be *necessary* conditions for cultural control, but the results of this study suggest they are not *sufficient* for this form to emerge. This approach may be able to further untangle the effect of multiple contingent variables on control structure variety.

There are a number of limitations to this study. First are the typical caveats to survey research, notably issues of sampling and measurement. While much effort was made to draw upon a representative sample that mirrored size and industry distributions, the database used may contain biases against this. A number of measures used in this study were purpose developed, and some based on formative measurement models. However, all were subject to rigorous pre-testing. Second, the resulting clusters should be considered as providing suggestive, rather than conclusive, evidence of the more prominent control structures in practice. The clusters are not meant to be exhaustive of all possible control configurations, nor are they necessarily ideal or optimal forms, but rather indicative of the central tendencies of common control patterns. Like any study, these results should be subject to scrutiny through empirical replication. Third, despite the breadth of elements considered, analysis at arm's-length is unlikely to reveal the subtle contours and intricacies of control that would be apparent in a micro analysis of an individual firm. Finer-grained investigations are more likely to reveal the generative mechanisms and internal logics that create, sustain and transform structural and behavioral patterns of control. It is hoped, however, that the insights provided here into the complex nature of control configurations will contribute towards developing more comprehensive theories of accounting and control.

Table 1
Definitions of management control constructs

Construct	Definition
<i>Strategic Planning</i>	
Mode	Mode of developing the long-term ends and means of the firm - ad-hoc, adaptive and emergent, to formalized, deterministic and deliberate (Brews & Hunt, 1999; Mintzberg, 1994)
Participation	Involvement of subordinates in strategic planning processes (Ketokivi & Castaner, 2004; Shields & Young, 1993)
<i>Measurement</i>	
Diagnostic	Monitoring activity through deviations from preset standards of performance (Simons, 1995)
Interactive	Regular involvement in subordinate activities by management to encourage debate, creative behaviors and address strategic uncertainties (Bisbe et al, 2007; Simons, 1995)
Tightness	Individual accountability for meeting pre-established performance targets (Merchant, 1985b, 1998; Van der Stede, 2001)
Cost Control	Financial performance measures of cost efficiency and effectiveness (Kober, Ng & Paul, 2007; Simons, 1987)
Measure Diversity	Broad scope and non-financial performance measures (Henri, 2006; Ittner, Larcker & Randall, 2003)
<i>Compensation</i>	
Performance Pay	Performance-contingent rewards and incentives (Fisher, 1995; Shields & Young, 1993)
Subjective / Objective	Method of determining individual compensation - subjective to objective (Fisher, 1995; Govindarajan & Gupta, 1985)
Short / Long Term	Time horizon used for individual compensation - short to long term (Fisher, 1995; Govindarajan & Gupta, 1985)
<i>Structure</i>	
Decentralization	Locus of authority - centralized to decentralized (Abernethy, Bouwens & van Lent, 2004; Gordon & Narayanan, 1984)
Hierarchy	Vertical differentiation of firm structure - flat to tall (Scott & Tiessen, 1999)
Communication	Nature, direction and content of communication patterns - mechanistic to organic (Burns & Stalker, 1961; Chenhall & Morris, 1995)
Integrative Liaison Devices	Horizontal structural arrangements overlaying traditional functional structures (Abernethy & Lillis, 1995; Galbraith, 1973; Scott, 2003)
<i>Policies and Procedures</i>	
Autonomy	Work activities conducted in the absence of direct observation or involvement by management (Bruns & Waterhouse, 1975; Kober et al., 2007)
Boundary Systems	Statements defining acceptable or unacceptable domains of activity (Simons, 1995)
Standardization	Rules and procedures specifying the means of conducting work activities (Daft & Macintosh, 1984)
Pre-action Reviews	Processes of scrutinization and authorization prior to activity performance (Merchant & Van der Stede, 2007; Speklé, 2001)
<i>Socio-Ideological</i>	
Selection	Search, evaluation and recruitment of employees according to a set of criteria, such as value alignment (Chatman, 1991; Gottschalg & Zollo, 2007; Harrison & Carrol, 1991)
Socialization	Processes whereby individuals come to appreciate prevailing norms and beliefs in the firm (Chatman, 1991; Harrison & Carrol, 1991)
Belief Systems	Statements communicating the basic values and premises for action of the firm (Schein, 2004; Simons, 1995)
Social Control	Reliance on shared values, norms and beliefs to direct work activities (Ouchi, 1979; Schein, 2004)

Table 2
Key features of control configurations

Configuration	Control characteristics	Contextual characteristics	Indicative archetypes
Results	<p>Top-down implementation of strategy Predefined performance targets Performance dependent compensation Budget-constrained style evaluations Hierarchical authority structure with some delegation of decision-rights</p>	<p>Large, mature, listed firms Predictable environments with moderate complexity and turbulence Measurable outputs Low-cost strategies</p>	<p><i>Results-oriented machine bureaucracy</i> (Mintzberg, 1979; Speklé, 2001) <i>Output</i> (Ouchi, 1977) <i>Administrative</i> (Bruns & Waterhouse, 1975; Merchant, 1981)</p>
Action	<p>Top-down implementation of strategy Standardized rules and procedures Direct monitoring and supervision of tasks Hierarchical authority structure with centralization of decision-rights Little use of accounting other than cost control</p>	<p>Large, mature, listed firms Predictable environments with moderate complexity and hostility Programmable tasks Low-cost strategies</p>	<p><i>Action-oriented machine bureaucracy</i> (Mintzberg, 1979; Speklé, 2001) <i>Behavioral</i> (Ouchi, 1977) <i>Mechanistic</i> (Burns & Stalker, 1961)</p>
Devolved	<p>Emergent strategy and performance standards Long-term, broad-scope evaluation Flat, highly decentralized structure Fluid, open channels of communication Complex integrative mechanisms Interactive and enabling uses of accounting and formal control instruments</p>	<p>Medium sized, young firms Highly dynamic and complex environments Emphasis on innovation and flexibility</p>	<p><i>Organic</i> (Burns & Stalker, 1961) <i>Adhocracy</i> (Mintzberg, 1979) <i>Exploratory</i> (Speklé, 2001) <i>Lateral</i> (Gerdin, 2005)</p>
Simple	<p>Top-down, informal strategy implementation Direct monitoring and supervision of tasks Centralized authority Little formalization Minimal use of accounting</p>	<p>Small, young, unlisted firms Moderately dynamic environments with potentially high hostility Selective emphasis on innovation and customer focus strategies</p>	<p><i>Simple</i> (Gerdin, 2005; Mintzberg, 1979) <i>Interpersonal</i> (Bruns & Waterhouse, 1975; Merchant, 1981)</p>
Cultural	<p>Internalization of shared norms and values Informal and participative structure Little use of formal controls apart from selection and socialization procedures and belief statements Minimal use of accounting</p>	<p>Small, mature, unlisted firms Non-programmable tasks Outputs difficult to quantify Highly dynamic environments</p>	<p><i>Clan</i> (Ouchi, 1979, 1980) <i>Missionary</i> (Mintzberg, 1989)</p>

Table 3
Definitions of context constructs

Construct	Definition
<i>Technology</i>	
Outcome Measurability	Extent to which outcomes of subordinate activity can be validly and reliably captured in quantitative standards of performance (Eisenhardt, 1985; Ouchi, 1977)
Task Programmability	Extent to which subordinate actions required to achieve an objective are known and visible to top management (Eisenhardt, 1985; Ouchi, 1977)
<i>Environment</i>	
Unpredictability	Inability to anticipate variations among elements of the environment and assess the effect of material changes on the organization (Child, 1972; Dess & Beard, 1984; Miller & Friesen, 1983)
Turbulence	Rate of change and instability in the environment (Dess & Beard, 1984; Mintzberg, 1979)
Complexity	Range and diversity of environmental factors relevant to firm operations (Child, 1972; Dess & Beard, 1984)
Hostility	Degree of threat from competitors for market demand, necessary resources and opportunities for growth (Child, 1972; Khandwalla, 1973; Miller & Friesen, 1983)
<i>Strategy</i>	
Low Cost	Emphasis on cost and efficiency of operations and competition through low price (Chenhall, 2005; Porter, 1980)
Innovation	Emphasis on differentiation through new product development (Ittner et al., 2003; Porter, 1980)
Customer Focus	Emphasis on differentiation through customization and flexible response to customer demands (Chenhall & Langfield-Smith, 1998; Porter, 1980)

Table 4
Summary of context expectations^a

	Results	Action	Devolved	Simple	Cultural
<i>Technology</i>					
Outcome Measurability	●	•	●	●	•
Task Programmability	•	●	•	●	•
<i>Environment</i>					
Unpredictability	•	•	●	●	●
Turbulence	●	•	●	●	●
Complexity	●	●	●	•	●
Hostility	•	●	●	●	●
<i>Strategy</i>					
Low Cost	●	●	•	•	•
Innovation	•	•	●	●	●
Customer Focus	•	•	●	●	●
<i>Other</i>					
Size	●	●	●	•	•
Listed	●	●	●	•	•
Age	●	●	•	•	●

^a ● = Above average emphasis, • = Average emphasis, ◦ = Below average emphasis.

Table 5
Demographic data

Panel A: Industry classification

Agriculture, forestry, fishing	10
Mining	18
Construction	26
Manufacturing	151
Transportation, utilities	31
Wholesale	22
Retail	20
Finance, insurance, real estate	41
Services	78
Other	3
Total sample	400

Panel B: Size of organizations

0-250	184
251-500	116
501-1000	54
1001-2500	32
2500+	14
Total sample	400

Table 6
Descriptive data

	Mean	Std. Dev.	Min.	Max.	Skewness	Kurtosis
<i>Strategic Planning</i>						
Mode (Inf. / Formal)	3.64	1.27	1.00	7.00	0.30	-0.60
Participation	3.41	1.51	1.00	7.00	0.32	-0.89
<i>Measurement</i>						
Diagnostic	5.51	0.83	1.90	7.00	-0.72	0.80
Interactive	4.78	1.03	1.40	7.00	-0.48	0.05
Tightness	4.32	0.98	2.00	6.75	-0.16	-0.59
Cost Focus	5.05	1.10	1.67	7.00	-0.61	-0.07
Measure Diversity	4.26	1.06	0.00	7.00	-0.53	0.63
<i>Compensation</i>						
Performance Pay	4.56	1.42	1.00	7.00	-0.47	-0.38
Subjective / Objective	4.63	1.75	1.00	7.00	-0.52	-0.81
Short / Long Term	2.44	1.34	1.00	7.00	0.80	-0.08
<i>Structure</i>						
Decentralization	2.48	0.80	1.00	5.80	0.45	0.23
Hierarchy (Flat / Tall) ^a	3.87	1.81	1.08	7.00	0.17	0.17
Communication (Mech. / Org.)	4.10	0.96	1.00	6.75	-0.14	-0.26
Integrative Liaison Devices	3.29	1.22	0.00	6.50	-0.14	-0.39
<i>Policies and Procedures</i>						
Autonomy	4.98	1.05	1.50	7.00	-0.68	0.08
Boundary Systems	4.68	1.03	1.50	7.00	-0.35	-0.03
Standardization	4.43	0.95	1.33	6.33	-0.62	-0.08
Pre-Action Reviews	4.37	1.19	1.00	7.00	-0.42	-0.32
<i>Socio-Ideological</i>						
Selection	5.44	1.04	1.50	7.00	-0.92	1.04
Socialization	4.08	1.19	1.00	7.00	-0.27	-0.37
Belief Systems	4.53	1.36	1.00	7.00	-0.32	-0.55
Social Control	4.57	1.03	1.50	7.00	-0.30	-0.28
<i>Technology</i>						
Outcome Measurability	4.85	0.96	2.00	7.00	-.539	-.104
Task Programmability	4.72	1.04	1.33	7.00	-.571	.109
<i>Environment</i>						
Unpredictability	3.61	0.91	1.00	6.00	-.060	-.278
Turbulence	3.72	0.99	1.40	6.40	.129	-.342
Complexity	3.45	1.29	1.00	7.00	.307	-.433
Hostility	4.41	0.83	1.67	7.00	-.036	.325
<i>Strategy</i>						
Low Cost	3.82	1.45	1.00	7.00	.190	-.755
Innovation	4.10	1.10	1.00	7.00	-.062	-.276
Customer Focus	5.63	0.85	2.80	7.00	-.630	.100
Size ^b	5.82	0.91	4.61	8.70	.919	.365
Listed	0.55	0.50	0	1	-.192	-1.973
Age ^c	0.68	0.47	0	1	-.750	-1.445

^a For ease of comparison the hierarchy variable has been transformed using the softmax scaling procedure to a range of 1-7. The softmax procedure is a linear transformation of a variable for values within a specified span of standard deviations. Outlier values are truncated, so the distribution reaches maximum and minimum values asymptotically. This is appropriate for the hierarchy variable, which has a small number of extreme outlier values. A standard deviation response of 3 was chosen, meaning that 99.7% of cases are transformed linearly, preserving the inherent meaning of the variable (Pyle, 1995).

^b Size is the natural log of the number of employees.

^c Age is a dichotomous variable, having a value of 0 if an early-stage firm, and 1 if it is a mature firm (over 20 years old).

Table 7
Results of K-Means clustering^{a,b}

	C1	C2	C3	C4	C5	C6	ANOVA		MCP
	Results	Action	Devolved	Simple	Inter-personal	Hybrid	F-Stat	Sig.	Games-Howell
Controls									
<i>Strategic Planning</i>									
Mode (Inf. / Formal)	3.98	4.74	4.21	3.74	<u>3.27</u>	5.31	31.31	0.000	6>2>1*,3>5*; 6>2>4
Participation	3.01	2.92	3.93	2.82	<u>2.08</u>	4.37	25.76	0.000	3,6>1,2,4>5
<i>Measurement</i>									
Diagnostic	5.80	5.41	5.32	5.28	<u>4.21</u>	6.09	50.61	0.000	6>1>2,3,4>5
Interactive	4.77	4.63	4.97	4.24	<u>3.16</u>	5.65	69.88	0.000	6>1,3>4>5; 6>2>5
Tightness	5.23	4.35	3.70	3.92	<u>3.53</u>	4.68	40.40	0.000	1>6'>2'>3,4*,5
Cost Control	5.25	5.15	4.85	4.65	<u>4.43</u>	5.47	9.08	0.000	1,2*,6>4*,5*; 6>3
Measure Diversity	3.99	4.44	4.49	3.60	<u>2.81</u>	5.12	59.08	0.000	6>2*,3,>1*,4>5
<i>Compensation</i>									
Performance Pay	5.51	3.85	4.40	3.99	<u>2.84</u>	5.38	44.15	0.000	1,6>2,3,4>5
Subjective / Objective	6.01	3.75	3.97	4.19	<u>2.92</u>	5.50	37.77	0.000	1>6>3,4>5; 1>6>2
Short / Long Term	1.87	2.10	3.82	2.37	<u>1.78</u>	2.29	27.66	0.000	3>1,2,4,5,6
<i>Structure</i>									
Decentralization	2.54	<u>2.11</u>	3.04	2.19	<u>2.11</u>	2.54	15.08	0.000	3>1*,6>2,4*,5*
Hierarchy (Flat/Tall)	4.04	4.66	<u>3.06</u>	3.92	4.56	3.67	6.75	0.000	1,2,4,5>3; 2>6
Communication (Mech./Org.)	3.87	<u>3.48</u>	4.85	4.16	3.50	4.21	21.39	0.000	3>4,6>2,5; 3>1
Integrative Liaison Devices	3.08	3.35	3.77	2.48	<u>2.03</u>	4.01	33.09	0.000	6>1,2>4,5; 3>1>4,5
<i>Policies and Procedures</i>									
Autonomy	5.37	<u>4.16</u>	5.38	4.65	4.32	5.29	20.14	0.000	1,3,6>2,4,5
Boundary Systems	4.60	<u>5.16</u>	4.86	3.96	<u>3.65</u>	5.19	29.42	0.000	2,6>1>4,5; 3>4,5
Standardization	4.41	5.19	4.36	3.71	<u>3.27</u>	4.98	53.29	0.000	2,6>1,3>4*>5*
Pre-Action Reviews	4.46	4.72	4.54	3.47	<u>2.92</u>	5.12	42.43	0.000	6>1,3>4,5; 2>4,5
<i>Socio-Ideological</i>									
Selection	5.54	5.69	5.40	4.66	<u>4.47</u>	6.10	32.14	0.000	6>1,2,3>4,5
Socialization	3.63	4.45	4.46	3.24	<u>2.46</u>	5.04	70.65	0.000	6>2,3>1*>4*>5
Belief Systems	4.06	4.98	4.93	3.26	<u>3.10</u>	5.66	72.75	0.000	6>2,3>1>4,5
Social Control	4.14	4.68	4.83	3.89	<u>3.29</u>	5.48	67.32	0.000	6>2,3>1,4>5
Context									
<i>Technology</i>									
Outcome Measurability	5.04	4.74	4.57	4.19	<u>3.07</u>	5.53	64.39	0.000	6>1,2>4>5; 6>1>3*>4*>5
Task Programmability	5.00	4.78	4.80	4.54	<u>3.43</u>	5.50	40.27	0.000	6>1,2,3>5; 6>1>4>5
<i>Environment</i>									
Unpredictability	<u>3.11</u>	3.77	3.96	3.50	3.90	3.58	7.95	0.000	2,3,4*,5,6>1*; 3>4,6
Turbulence	<u>3.09</u>	3.80	3.93	3.74	3.62	3.97	8.38	0.000	2,3,4,6>1
Complexity	<u>2.84</u>	3.68	3.85	3.54	3.29	3.46	5.17	0.000	2,3,4,6>1
Hostility	4.41	4.74	4.34	<u>4.31</u>	4.39	4.35	2.14	0.060	2*>3*,4*
<i>Strategy</i>									
Low Cost	4.05	4.10	3.68	<u>3.29</u>	4.15	3.84	3.10	0.009	1,2,5>4
Innovation	3.85	3.67	4.54	4.05	<u>3.55</u>	4.40	8.87	0.000	3,6>1,2,5; 3>4
Customer Focus	5.42	5.70	5.70	5.39	<u>4.93</u>	6.09	15.32	0.000	6>1,2,3,4,5; 2,3>5
<i>Other</i>									
Size (Employees)	656	358	458	<u>340</u>	440	866	7.02	0.000	6*>2,3*,4,5*; 1>2,4
Listed ^c	0.61	0.58	0.48	<u>0.43</u>	0.50	0.63	10.20	0.070	6*>4*
Age ^c	0.79	0.71	0.58	<u>0.44</u>	0.67	0.79	30.51	0.000	1,6>3,4; 2,5*>4*
Cluster Membership	67	52	73	68	36	104			

^a Pairs indicated by an asterisk (*) or apostrophe (') are significant at p<0.10. All others are significant at p<0.05 or better.

^b Underlined figures denote the lowest value on each variable. Bold numbers denote the highest value on each variable.

^c Dichotomous variables (listed, age) are assessed using chi-square tests and Bonferroni pairwise comparisons.

Appendix 1: Construct Measurement

Survey items	Anchors	Measurement model	Factor loadings	Cronbach alpha	Primary references
Strategic Planning					
<i>Planning Mode (reverse scored)</i>					
1. How would you describe the strategic goals of your SBU?	Specific, detailed, quantified / Broad, general, qualitative	Reflective	0.845	0.874	Brews & Hunt (2004); Covin, Slevin & Heeley (2001); Mintzberg (1994)
2. How would you characterise the strategic plan of your SBU?	Highly detailed, comprehensive outline of strategic actions / Little detail, rough outline of strategic actions		0.900		
3. How closely is the strategic plan followed in your SBU?	Tightly followed, plans implemented as outlined / Loosely followed, acts as a guide only		0.870		
4. How would you describe the process by which strategy develops in your SBU?	Develops through formalised and deliberate processes / Develops through often unintended and emergent processes		0.794		
<i>Planning Participation</i>					
1. To what extent are subordinates involved in the strategic planning processes of the SBU?	Very low extent / Very high extent	Single item	n/a	n/a	
Measurement					
<i>Diagnostic Use</i>					
To what extent does the top management team use budgets (performance measurement systems) for the following		Formative	n/a	n/a	Henri (2006); Widener (2007); Simons (1995)
1. Identify critical performance variables (i.e. factors that indicate achievement of current strategy)	Very low extent / Very high extent				
2. Set targets for critical performance variables					
3. Monitor progress towards critical performance targets					
4. Provide information to correct deviations from preset performance targets					
5. Review key areas of performance					
<i>Interactive Use</i>					
To what extent does the top management team use budgets (performance measurement systems) for the following		Formative	n/a	n/a	Bisbe et al. (2007); Henri (2006); Widener (2007); Simons (1995)
1. Provide a recurring and frequent agenda for top management activities	Very low extent / Very high extent				
2. Provide a recurring and frequent agenda for subordinate activities					
3. Enable continual challenge and debate of underlying data, assumptions and action plans with subordinates and peers					
4. Focus attention on strategic uncertainties (i.e. factors that may invalidate current strategy or provide opportunities for new strategic initiatives)					

- Encourage and facilitate dialogue and information sharing with subordinates

Tightness

		Formative	n/a	n/a	Merchant (1985b); Van der Stede (2001); Simons (1987)
	The following questions relate to pre-established targets set for subordinates of the top management team (e.g. senior managers that report directly to a member of the top management team). These targets or goals may be financial (e.g. budget targets) or related to other performance dimensions.				
1.	How flexible are subordinate performance targets once they have been set? (R)				Very inflexible / Very flexible
2.	How frequently are subordinates consulted about performance target achievement? (R)				Very frequently (daily) / Monthly / Very infrequently (quarterly or longer)
3.	To what extent are written explanations for variances from target performance levels required from subordinates?				Very low extent / Very high extent
4.	To what extent are subordinate evaluations predominantly based on achievement of performance targets?				

Cost Control

		Reflective		0.719	
1.	Cost control systems monitor virtually all tasks in the SBU		0.794		Simons (1987); Kober et al. (2007); Widener (2004)
2.	SBU operations are controlled by analysing and reporting to top management variances between actual costs and standard or expected costs		0.860		
3.	To what extent are cost centres used in your SBU?		0.747		Not used at all / Used occasionally / Used to a great extent

Measure Diversity

	To what extent are measures related to the following dimensions used to evaluate subordinate performance?	Formative	n/a	n/a	Ittner et al. (2003); Scott & Tiessen (1999); Henri (2006)
1.	Customer (e.g. market share, satisfaction, retention)				N/A / Very low extent / Very high extent
2.	Employee (e.g. employee satisfaction, turnover, workforce capabilities and development)				
3.	Operational Process (e.g. productivity, safety, cycle time)				
4.	Innovation (e.g. R&D, new product/service success, development cycle time)				
5.	Quality (e.g. product/service quality, defects, awards)				
6.	Social Responsibility (e.g. environmental compliance, community impact, public image)				
7.	Other Dimension (please elaborate)				

Compensation

Performance Based Compensation

	Please indicate the extent to which...	Reflective		0.734	Chalos &
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1.	The financial rewards of subordinates increase as actual performance increasingly exceeds targets	Very low extent / Very high extent		0.834		O'Connor (2004); Shields & Young (1993)
2.	Subordinates whose performance relative to targets is among the top 25% are given larger financial rewards than those given to managers among the bottom 25%			0.800		
3.	Compensation contracts clearly specify how compensation is related to subordinate performance relative to performance targets			0.797		

Subjective / Objective Based Compensation

1.	What is the usual basis for determining performance-based or bonus compensation for subordinates?	Determined Subjectively (based on top management assessment) / Intermediate / Determined Objectively (based on pre-determined formulas or targets)	Single item	n/a	n/a	Simons (1987); Govindarajan & Gupta (1985)
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Short / Long Term Based Compensation

1.	Indicate the emphasis on short-term performance (one year or less) relative to long-term performance (three years or more) for subordinate compensation.	Based on short term performance / Equal emphasis / Based on long term performance	Single item	n/a	n/a	Govindarajan & Gupta (1985)
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Structural

Decentralization

	Indicate the emphasis on short-term performance (one year or less) relative to long-term performance (three years or more) for subordinate compensation.		Formative	n/a	n/a	Gordon & Narayanan (1984); Abernethy et al. (2004)
1.	Development of new products or services	Top management has all influence / About the same / Subordinates have all influence				
2.	The hiring and firing of managerial personnel					
3.	Selection of large investments					
4.	Resource allocations					
5.	Pricing decisions					

Communication

1.	Indicate how control information is typically communicated in your SBU	Through highly structured, formal channels of communication / Through very open, informal channels of communication	Reflective	0.716	0.745	Burns & Stalker (1961); Covin et al. (2001); Chenhall & Morris (1995)
2.	Indicate the accessibility of operational information in your SBU	Highly restrictive access to important operational information / Free flow of important operational information throughout the SBU		0.780		

3.	Indicate the content of work-related communication between top management and subordinates	Top management decisions and mandates, instructional, direction giving / Information and idea sharing, consultative, advice giving	0.786		
4.	In general, the operating management philosophy in my SBU favours	Emphasis on giving the most say in decision making to formal line managers / Emphasis on giving the most say to the expert in a given situation even if this means bypassing formal line authority	0.729		
<i>Integrative Liaison Devices</i>					
	To what extent are the activities between sub-units in your SBU coordinated through...		Formative	n/a	n/a
1.	Liaison personnel whose specific job is to coordinate the efforts of several sub-units	N/A / Very low extent / Very high extent			Scott (2003); Galbraith (1973); Abernethy & Lillis (1995)
2.	Temporary task forces or committees set up to facilitate collaboration on specific projects				
3.	Permanent cross-functional teams				
4.	Matrix structures entailing multiple lines of authority, multiple responsibility assignments and overlapping team membership				
<i>Hierarchy</i>					
1.	The number of hierarchical levels divided by the natural logarithm of the number of employees		Single item	n/a	n/a
					Scott & Tiessen (1999)

Policies and Procedures

<i>Autonomy</i>					
	To what extent...		Reflective		0.736
1.	Do subordinates conduct non-routine activities independent of top management involvement?	Very low extent / Very high extent		0.890	Kober et al. (2007); Ito & Peterson (1986)
2.	Do subordinates have the freedom to create their own methods of getting work done if no standard procedures exist?			0.890	
<i>Boundary Systems</i>					
	To what extent...		Formative	n/a	n/a
1.	Are codes of conduct or similar statements relied upon to define appropriate behaviour?	Very low extent / Very high extent			Simons (1995); Widener (2007)
2.	Are there policies or guidelines that stipulate specific areas for, or limits on, opportunity search and experimentation?				
3.	Does top management actively communicate risks and activities to be avoided by subordinates?				
4.	Are sanctions or punishments applied to subordinates who engage in risks and activities outside organisational policy, irrespective of the outcome?				

Standardization

	To what extent...		Reflective	0.667	
1.	Are the work activities of subordinates determined by standardised procedures or processes? To what extent are the activities between sub-units in your SBU coordinated through...	Very low extent / Very high extent	0.727		Doty et al. (1993); Simons (1987); Abernethy & Lillis (1995); Gerdin (2005)
2.	Pre-planning of activities between sub-units	N/A / Very low extent / Very high extent	0.844		
3.	Standardised rules, programs or procedures that are formally or informally understood between sub-units		0.748		

Pre-Action Reviews

			Formative	0.633	
1.	To what extent are formal pre-action reviews used to assess projects undertaken by subordinates?	Very low extent / Very high extent	0.856		Merchant & Van der Stede (2007)
2.	How detailed are the reports or plans required from subordinates before initiating specific projects?	Little detail / Highly detailed	0.856		

Socio-Ideological

Selection

			Reflective	0.705	
1.	How extensive is the recruitment and selection process (e.g. search for candidates, use of tests, multiple interviews) for a managerial position?	Not very extensive / Very extensive	0.879		Snell (1992); Widener (2004); Harrison & Carroll (1991); Chatman (1991)
2.	How much importance is placed on selecting managers who have attitudes and values aligned to the SBU, not just on technical competence?	Very little / A great deal	0.879		

Socialization

	To what extent are...		Formative	n/a	n/a
1.	training and development processes used to reinforce SBU objectives, expectations and norms?	Very low extent / Very high extent			Chatman (1991); Gottschalg & Zollo (2007); Harrison & Carroll (1991)
2.	Social events and functions used to develop and maintain commitment to the SBU?				
3.	Mentoring, orientation and induction programs used to acclimatise new managers to acceptable behaviours, routines and norms?				

Belief Systems

	To what extent...		Formative	n/a	n/a
1.	Are the values, purpose and direction of the SBU codified in formal documents? (e.g. mission/value statements, credos, statements of purpose?)	Very low extent / Very high extent			Simons (1995); Widener (2007)
2.	Does top management actively communicate core values to subordinates?				
3.	Are formal statements of values used to create commitment to the long-term vision of top management?				

4. Are formal statements of values used to motivate and guide subordinates in searching for new opportunities?

Social Control

		Reflective	0.868	
To what extent...				
1. Is there a sense of shared values, beliefs and expectations among employees?	Very low extent / Very high extent		0.874	Kober et al. (2007); Schein (2004)
2. Is there a consensus among employees on SBU objectives and direction?			0.860	
3. Are employees committed to the values and objectives outlined by top management?			0.902	
4. Does top management rely on the shared values and norms of employees to provide direction when faced with uncertainty?			0.776	

Technology

Outcome Measurability

		Reflective	0.752	
Please indicate the extent to which you agree or disagree with the following statements:				Snell (1992); Eisenhardt (1985)
1. Standards of desirable performance for subordinates are well defined	Strongly disagree / Strongly agree		0.758	
2. Results measures accurately depict how well subordinates have performed			0.855	
3. Top management has several sources of objective data available that indicate how well subordinates are performing			0.841	

Task Programmability

		Reflective	0.781	
Please indicate the extent to which you agree or disagree with the following statements:				
1. The actions subordinates take to achieve results are visible to top management	Strongly disagree / Strongly agree		0.828	
2. Effective and ineffective subordinates can be distinguished by observing the actions they take			0.807	
3. The relationship between the actions that subordinates take and the eventual outcomes are well known by top management			0.867	

Environment

Unpredictability

		Formative	n/a	n/a	
Over the past three years how predictable or unpredictable have important actions or changes in the external environment been?					Doty et al. (1993); Gordon & Narayanan (1984); Miller & Friesen (1983)
1. <i>Customers</i> (e.g. Level of demand, customer requirements)	Very predictable / Very unpredictable				
2. <i>Suppliers</i> (e.g. Markets for key inputs, quality of resources)					
3. <i>Competitors</i> (e.g. Competitors entering or leaving, tactics/strategies)					
4. <i>Technological</i> (e.g. R&D advances, process innovations)					
5. <i>Economic / Regulatory</i>					

Turbulence

Over the past three years how many changes have occurred that have had a material impact on the nature of your business?		Formative	n/a	n/a	Doty et al. (1993); Miller & Friesen (1983)
1. <i>Customers</i> (e.g. Level of demand, customer requirements)	Very few changes / Very many changes				
2. <i>Suppliers</i> (e.g. Markets for key inputs, quality of resources)					
3. <i>Competitors</i> (e.g. Competitors entering or leaving, tactics/strategies)					
4. <i>Technological</i> (e.g. R&D advances, process innovations)					
5. <i>Economic / Regulatory</i>					
<i>Complexity</i>					
1. How diverse in nature are the product/service requirements of your customers to each other?	Very similar / Very diverse	Formative	n/a	n/a	Doty et al. (1993); Miller & Friesen (1983)
2. How diverse are the strategies and tactics of your key competitors to each other?					
<i>Hostility</i>					
1. How intense is the competition for your main products/services?	Very low intensity / Very high intensity	Formative	n/a	n/a	Miller & Friesen (1983); Khandwalla (1973)
2. How difficult is it to obtain the necessary inputs for your business?	Very low difficulty / Very high difficulty				
3. How many strategic opportunities are currently available to your business?	Very few / Very many				
Strategy					
<i>Low Cost</i>					
Indicate the emphasis your SBU places on the following strategic priorities relative to your competitors		Reflective		0.782	Chenhall & Langfield-Smith (1998); Chenhall (2005); Ittner et al. (2003)
1. Low cost products / services	Very low emphasis / Very high emphasis		0.866		
2. Low price			0.891		
<i>Innovation</i>					
	Very low emphasis / Very high emphasis	Reflective		0.735	
1. Being first to market with new products / services			0.741		
2. Extensive range of products / services			0.667		
3. Rapid volume or product / service mix changes			0.75		
4. Experimenting with new products / services			0.814		
<i>Customer Focus</i>					
	Very low emphasis / Very high emphasis	Reflective		0.769	
1. Providing high quality products / services			0.643		
2. Accurately meeting delivery agreements			0.745		
3. Providing effective after-sales services and support			0.667		
4. Providing fast delivery of products/services			0.733		
5. Superior customer services			0.832		

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