



The Levers of Control Framework: An exploratory analysis of balance



Anne- Marie Kruis^a, Roland F. Spekle^{a,*}, Sally K. Widener^b

^a Nyenrode Business Universiteit, Breukelen, The Netherlands

^b Clemson University, Clemson, SC, USA

ARTICLE INFO

Article history:

Received 25 November 2014

Received in revised form

20 November 2015

Accepted 6 December 2015

Available online 30 December 2015

Keywords:

Levers of Control Framework

Balance

Management control

Cluster analysis

Contingency theory

Configuration theory

ABSTRACT

The impact of the Levers of Control (LOC) framework on the accounting literature is undeniably large. The framework, however, has also been criticized for being vague and ambiguous. One of the central, but unclear, concepts in the LOC framework is the notion of balance. That is, the framework holds that control systems must be in balance in order to manage competing tensions such as that found between predictable goal achievement on the one hand and innovation on the other. The goal of our study is to examine the concept of balance and to provide empirically informed insights on different balancing arrangements that exist in a cross-section of business units. We develop a survey and administer it in person to a convenience sample of business unit managers. Using responses from 217 managers, cluster analysis reveals a stable solution with four distinct patterns of balance, which we interpret using configurational thinking. We label the clusters strategic vigilance, strategic exploitation, strategic responsiveness, and strategic stability respectively, and examine organizational and contextual factors that validate and help explain the observed patterns of balance. By identifying empirical manifestations of balance, our study sheds light on one of the key concepts in the LOC framework, providing an empirically informed starting point for future theoretical analysis and interpretation.

© 2015 Elsevier Ltd. All rights reserved.

1. Introduction

The central theme of the Levers of Control framework (LOC framework; [Simons, 1994, 1995](#)) is that control of business strategy is achieved by balancing the forces of four different levers of control, i.e. beliefs control, boundary control, diagnostic control, and interactive control. The power of these four levers, it is argued, does not lie in how each is used individually, but rather in how they work together, how they complement each other, and how they achieve balance ([Simons, 1995](#)). The levers are said to generate positive and negative forces that jointly create a dynamic tension between innovation and strategic renewal on the one hand, and predictable goal achievement on the other, both of which need to be managed to secure the organization's long-term success (e.g., [March, 1991; Raisch and Birkinshaw, 2008](#)).

The LOC framework has gained a prominent position in contemporary management control thinking. Although the influence of the LOC framework on control in practice is hard to document, its impact on the literature is undeniably large. For instance, [Tessier and Otley \(2012\)](#) found almost 800 citations of [Simons' 1995](#) book

in Google Scholar—a number that has more than tripled since their count in 2011. [Sweeney et al. \(2012\)](#) performed a comprehensive review of the leading academic accounting journals and found almost 30 empirical studies that explicitly used the LOC framework, either as their main theoretical perspective or to interpret relationships in the data. The framework, however, has also been criticized for its vague and ambiguous definitions, both at the level of individual constructs in the theory ([Bisbe et al., 2007; Ferreira and Otley, 2009](#)) and at the level of the framework as a whole (e.g., [Tessier and Otley, 2012](#)).

One central, but unclear, concept in the LOC framework is the notion of balance ([Sweeney et al., 2012](#)). [Simons \(1995\)](#) casts a major part of his discussion of the organizational and managerial challenges associated with strategy and control in terms of balance and trade-offs. For instance, he argues that organizations need to strike a balance between unlimited opportunities and limited managerial attention, between self-interest seeking and the desire to contribute, between intended and emergent strategy, and between innovation and predictable goal achievement. To manage these trade-offs, [Simons \(1995\)](#) suggests that organizations need to balance their reliance on the four levers of control to create an appropriate dynamic tension; that is, a tension that is likely to stimulate the right mix between compliant behavior and creative search efforts necessary for organizational success. However, despite these

* Corresponding author. Fax: +31 346 264204.

E-mail addresses: a.kruis@nyenrode.nl (A. Kruis), r.spekle@nyenrode.nl (R.F. Spekle), kwidene@clemson.edu (S.K. Widener).

frequent references to balance, Simons does not provide a definite notion of what balance is, nor how balance is reflected in the control system.

To provide a conclusive understanding of balance will require multiple studies to sort out how a balanced set of control levers produce complementarities resulting in dynamic tension and how that dynamic tension leads to enhanced performance. This is not an easy task since different balancing arrangements will result in different performance outcomes, fitting different underlying strategic objectives and agendas. The purpose of our study is to take a first step in exploring balance. We do so by examining the patterns of use of the four levers of control in order to provide empirical evidence on manifestations of balance (hereafter referred to as balancing arrangements) that exist in a cross-section of business units (units hereafter). We develop a survey and administer it in person to a convenience sample of unit managers (managers hereafter). Using responses from 217 managers, cluster analysis reveals a stable solution with four balancing arrangements, which we interpret through the lens of configurational thinking and label strategic vigilance, strategic exploitation, strategic responsiveness, and strategic stability. We draw on key variables from contingency theory, as well as industry factors, to validate and help explain the observed patterns.

This is an important project for several reasons. Referring to the notion of balance, prior research on the LOC framework has provided empirical evidence that, jointly, diagnostic and interactive uses of performance measurement systems can help enhance performance (Henri, 2006). Findings from other studies suggest that all four control levers are necessary in the control package in order to be effective and to result in a beneficial dynamic tension (e.g., Bruining et al., 2004; Tuomela, 2005; Widener, 2007). Although these studies have started to address the simultaneous use of multiple control levers, they leave the notion of balance among the levers implicit. We complement these studies through an explicit focus on the empirical manifestations of balance, adding to the empirical foundation of the LOC framework. In so doing, we respond to the call by Mundy (2010) to provide insights on different balancing arrangements that exist in a broad sample of firms and, furthermore, to examine the organizational factors associated with the observed patterns of balance. By shedding light on how balance empirically manifests itself, our study helps to explicate a hitherto underspecified theoretical claim in the LOC framework.

In addition to exploring the empirical manifestations of balance, our study also makes a theoretical contribution. By integrating management control and organizational literatures we expand on the meaning of balance and suggest that it can be defined as a limited number of configurations that include combinations of all four control levers that are internally consistent, but that are not necessarily equally emphasized. We posit that multiple combinations of levers can result in balance, which is consistent with configurational theory, and that these configurations are associated with different strategic challenges and contextual settings, which is consistent with contingency theory. Thus, we conclude that balance can mean different things to different organizations and can be achieved in different ways across units. Moreover, since different configurations of the levers align with different strategic and contextual challenges, multiple (but limited) types of balancing arrangements will be effective. This theoretical explication is a significant step in the further development of the LOC framework, adding to its explanatory expressiveness.

Finally, our study contributes to practice by showing that there is not just one balancing arrangement that suits all units, but that managers must decide which pattern of control best suits the strategic challenges they face and the circumstances in which they operate.

The remainder of this paper is structured as follows. The next section reviews the relevant literature. Then we describe the design

of our study. We subsequently present the results of the analysis and our interpretation of the findings. In the last section, we summarize our study, discuss the conclusions and limitations, and provide suggestions for further research.

2. Background Literature and Development of Research Question

In order to develop our research question about the meaning of balance and its empirical manifestations, we first examine Simons' (1995) concept of balance within the LOC framework and related empirical work. We then discuss literature on organizational ambidexterity, configurations, and contingency theory. We relate these literatures to frame our research question and to guide our empirical examination.

2.1. Balance and the LOC Framework

Since the emergence of the LOC framework, researchers have sought to provide evidence on its underlying principles. The notion of balance, however, remains rather vague. This is not to say, though, that the literature offers no clues at all to the idea of balance and how it can be achieved. Simons (1995) positions the control levers as being related to certain strategic objectives. So, for example, if firms are concerned with strategy as a plan they heavily emphasize diagnostic control, addressing such issues as how they are performing in turning their intended strategy into a realized strategy, and whether or not the implementation is on track. On the other hand, if top managers are focused on strategy as a pattern, they give emphasis to interactive control. The focus is on identifying opportunities for strategy to emerge. An emphasis on boundary control is associated with concerns with strategy as a position, ensuring that the strategy domain is firmly set, and that behavioral hazards are recognized and dealt with in codes of conduct. Finally, an emphasis on beliefs control is associated with a concern with strategy as a perspective. Top managers want to share the firm's vision and ingrain it deeply throughout the organization.

The concept of balance has begun to attract attention in the empirical literature. The initial focus in this literature has been on the examination of opposing forces created by the joint interactive and diagnostic uses of performance measurement systems. For example, Henri (2006, 531) states that "These two types of use [i.e., interactive and diagnostic] work simultaneously but for different purposes. Collectively their power lies in the tension generated by their balanced use which simultaneously reflects a notion of competition and complementarity" (italics added). Henri (2006), however, does not specify what balance looks like, but proxies for dynamic tension by interacting the diagnostic and interactive use of the performance measurement system and predicts a positive coefficient on the relation of the interaction term with the creation of organizational capabilities. Thus implicitly, he seems to be arguing that each possible combination between interactive and diagnostic control may represent balance, and that the combination displays more positive benefits as firms rely more on one or both of the control levers. Henri (2006, 547) states, "more research is needed to provide a deeper understanding of the dynamic interplay between the positive and negative effects of tension resulting from balanced use of [performance measurement systems] in a diagnostic and interactive fashion".

To enhance the findings from the examination of interactive and diagnostic uses of performance measures, studies have started to focus on the complete LOC framework, comprising all four control levers. In support of Simons' (1995) conceptualization, a primary insight from this literature is that the four levers work together and influence each other, but the notion of balance remains elu-

sive (e.g., Mundy, 2010; Tuomela, 2005; Widener, 2007). Widener (2007) operationalizes dynamic tension as the influence that one control lever has on another control. She concludes that performance is enhanced when the package of controls includes all four control levers, consistent with Simons' (1995) notion that balancing the four levers creates dynamic tension and subsequent performance. While her study provides evidence that the controls are positively related, she does not provide evidence on the relative emphasis placed on the individual controls to achieve this state of balance.

Mundy (2010) also emphasizes the importance of the notion of balance in Simons' work, and notes the lack of understanding regarding this notion. She seeks to shed light on this matter using a case approach and concludes that balance is shaped by how managers use the management control system. The simultaneous use of the management control system both to direct and to empower middle-level managers requires purposeful intervention by senior managers so as to create constructive tensions. Mundy (2010) suggests that future research should undertake a broader empirical examination of balance in order to flesh out what optimal balance may look like.

Also supporting Simons' (1995) contention that the four control levers work together is Speklé et al. (2014). They hypothesize and find that a system containing all four controls is positively related to creativity. Similar to Mundy (2010) they find that all four control levers have a significant role in the system, and that the combination of both the negative and the positive forces enhances creativity. This result is consistent with Simons' (1995) claim regarding the co-existence of creativity and control, and the possibility to pursue exploitation and innovation simultaneously.

In sum, the research on balance in the LOC framework has provided some empirical evidence that firms jointly use all four control levers (e.g., Mundy, 2010; Speklé et al., 2014; Widener, 2007). Furthermore, this joint use appears to be associated with desirable organizational outcomes including organizational learning and performance (Widener, 2007), development of organizational capabilities (Mundy, 2010), and creativity (Speklé et al., 2014). However, this literature is still largely silent on what balance looks like, providing at best some broad and implicit indications as to its properties and manifestations.

2.2. Organizational ambidexterity and configurations

Simons' perspective that balance is achieved by integrating positive and negative control forces is analogous to a broad stream of organizational research that holds that firms must be ambidextrous in order to be successful. For example, the organizational learning literature holds that firms need to balance both exploitation and exploration styles of learning (Lee and Widener, 2015; March, 1991). Similar notions of ambidexterity are found in the literatures on technological innovation, organizational adaptation, strategic management, and organizational design (Gupta et al., 2006; Raisch and Birkinshaw, 2008; Raisch et al., 2009). This line of work is important to our study as it corroborates our interpretation of balance.

Balance in Simons' LOC-framework is about integrating the four levers so as to achieve both control over predictable goal achievement (i.e. exploitation), and strategic renewal and innovation (i.e., exploration) simultaneously. A balanced control structure, therefore, is a system that combines the four levers so as to support organizational ambidexterity. Organizational ambidexterity, however, can reveal itself in different arrangements and can be achieved in different ways. Some studies suggest that balance involves the simultaneous pursuit of exploitation and exploration, i.e., by placing equal weights on them (Cao et al., 2009). Other studies document an alternative strategy in which organizations achieve

ambidexterity through alternation over time between periods of exploitation and exploration (Gupta et al., 2006; Raisch et al., 2009). In addition, whereas some studies show that structural differentiation (i.e., the subdivision of tasks over distinct organizational subunits that specialize in either exploitation or exploration) can result in ambidexterity, others emphasize the potential for simultaneous, within-unit exploration and exploitation (Raisch et al., 2009). Even though these different forms of ambidexterity likely require different control systems, it is not true that each conceivable combination of the levers should be considered as a potential instance of balance. First, balance requires that the combination fits a viable manifestation of ambidexterity, and even though ambidexterity can be achieved in different ways, it is unlikely that 'anything goes' and that each and every possible combination of exploration and exploitation will lead to desirable organizational outcomes (Simsek et al., 2009). Second, a key point in Simons' reasoning is that the four levers interact and need to be configured in such a way that they support each other. As mutually supportive relationships are few, this requirement further restricts the number of potentially balanced arrangements. Both considerations allude to configurational thinking, to which we now turn for further insights to inform our examination of balance.

Configurational research examines organizations not by focusing on firm-level structural or contextual variables, but by identifying groups of firms that resemble each other along important dimensions (Short et al., 2008). That is, configurational theories consider organizational issues at the level of clusters of organizational attributes 'in their entirety' rather than at the level of the individual attributes that comprise the system. The term 'configuration' refers to a constellation of distinct organizational attributes that commonly occur together (Meyer et al., 1993). For configurations to be stable, the organizational attributes that make up the configuration need to fit together, and the resulting structure must be internally consistent. The structures that surface are those that achieve complementarities in their internal design (Milgrom and Roberts, 1995), or that successfully avoid organizational incompatibilities (Hill et al., 1992). Internal consistency can only be achieved in a limited number of ways (Doty and Glick, 1994; Meyer et al., 1993), which implies that the number of feasible configurations is also limited. This, in turn, implies that the study of complex, multidimensional organizational phenomena can be framed as a comparative analysis of a manageable number of discrete organizational alternatives rather than some endless series of conceivable combinations between the individual attributes.

Configurational theory has gained a prominent position in the field of business and management (e.g., Miles and Snow, 1978; Mintzberg, 1979, 1983; see Short et al. (2008) for a recent overview) and also has a history in the study of management control. Examples include Burns and Stalker's (1961) mechanistic and organic organizations, Ouchi's (1980) market, bureaucracy, and clan mechanisms, and Speklé's (2001) arms' length, machine, exploratory and boundary control types. Also more recently, accounting researchers have called upon configuration theory to address complex phenomena of control (Bedford and Malmi, 2015; Grabner and Moers, 2013; Malmi and Brown, 2008; Kennedy and Widener, 2008; Kruis, 2008; Sandelin, 2008), providing some precedent to the idea that balance in the LOC framework can productively be studied from a configurational perspective.

In his writing, Simons uses a language with strong configurational overtones, referring to the need to study the control structure as a whole, integrating the four levers, and suggesting interdependencies between them. Consider for instance the following statement from Simons (1995, 153): "[c]ontrol of business strategy is achieved by integrating the forces of beliefs systems, boundary systems, diagnostic control systems, and interactive control systems. The power of the control levers does not lie in how each is

used alone but rather in how they complement each other when used together” (italics added). Or consider this quote from his writings: “[t]hese four systems, then, are mutually reinforcing. The creative tensions between learning and control, between guidance and proscription, between motivation and coercion, between rewards and punishment become the yin and yang—dynamic forces that simultaneously foster both stability and change” (Simons, 1995: 161). These quotes capture crucial points in Simons’ reasoning, and clearly imply a perspective in which the value of each individual lever depends on the use of the other three levers, and in which desired outcomes require the simultaneous presence of opposing forces (as opposed to the insulated presence of individual forces). Such a perspective is key to configurational thinking (Drazin and Van de Ven, 1985; Gerdin and Greve, 2004).

Another key element of configurational theory is also present in Simons’ framework, i.e., the idea that organizational attributes can only be combined in a limited number of ways. For example, his empirical study of how newly appointed CEOs mobilize the levers to gain control over the organization and its strategic direction results in a two-group classification of managers and their firms (strategic turnaround versus strategic evolution; Simons, 1994, 1995), suggesting a clustering of the use of the levers in just a few distinctive patterns. Furthermore, the very notion of balance suggests that only a few combinations are effective, i.e., only those that are somehow balanced and that create the appropriate dynamic tension to result in the desired blend of innovation and predictable goal achievement (Simons, 1995). Therefore, one would expect that empirically, firms will cluster in a limited number of groups, representing different forms of balance and displaying different patterns in their control systems, resulting in different vectors of dynamic tensions to suit different strategic agendas.

These patterns, however, will not just be influenced by strategic concerns, but also by the organizational and environmental setting in which they occur. Although this theme does not figure very prominently in Simons’ work, he does allude to it on several occasions, for instance when he claims that balance is a function of various organizational contingencies that determine the different levels of emphasis on each lever (Simons, 1995). This is why we now turn to contingency theory to further our exploration of balance.

2.3. Contingency theory

In his overview of the contingency-based literature, Chenhall (2003) identifies six groups of variables that have evolved historically as key to the understanding of management control systems: (1) the external environment, (2) technology, (3) structure, (4) size, (5) strategy, and (6) culture; and he develops propositions regarding the relationships between management control instruments and contextual variables. We draw and build on Chenhall (2003) to develop propositions relevant to our research question.¹

2.3.1. External environment

Chenhall (2003) considers the external environment to be at the heart of contingency-based research and notes that environmental uncertainty is the most widely researched aspect of the environment. Environmental uncertainty occurs when there is a gap between the information required and the information available to make sound decisions (Galbraith, 1973). Accordingly, there is increased need for control systems to supply additional information (Simons, 1995). Widener (2007) shows that uncertainty

¹ In an empirical study it is not feasible to examine every contingency variable. We focus our attention on at least one variable from each of the six groups that has adequate measurement properties and which literature has strongly linked to the design of the management control system.

is associated with increased emphasis on control systems. However, firms facing environmental uncertainty must balance their need for formal, tight control (e.g., Chenhall and Morris, 1986; Widener, 2007) with the flexibility necessary to allow them to cope with a changing and uncertain environment (e.g., Ezzamel, 1990). Chenhall (2003) brings the insights from this literature together in a proposition, on which we build to propose that:

P1. Units with high environmental uncertainty are likely to rely on formal structured control that is tight but flexible.

2.3.2. Technology

Technology relates to characteristics of the organization’s work processes (Chenhall, 2003). An important aspect of work processes is whether outputs are measurable in goal-consistent terms. Units that employ processes that have measurable outputs are able to rely on formal control since managers can be motivated through the allocation of decision rights and then held accountable for results (Ouchi, 1977). Ouchi (1977) provides an example of the evaluation of faculty based on their research outputs. Although the processes may be unclear, the goals are ‘crystallized’ (Thompson, 1967) and thus monitoring of outputs is feasible. Accordingly, we propose the following:

P2a. Units with high goal clarity and measurability of results are likely to rely on performance measurement and monitoring.

In addition to the characteristics of the unit’s processes, technology also includes the level of interdependencies among and between units (Chenhall, 2003). Chenhall and Morris (1986) empirically show that firms with high interdependencies rely less on formal budgets and more on interpersonal communications. Similarly, Macintosh and Daft (1987) show that low levels of interdependencies are associated with higher reliance on formal controls including budgets, standard operating procedures, and planning. Accordingly, Chenhall (2003) proposes that units that have low interdependencies are able to employ more formal and mechanistic control, while those with higher interdependencies must configure their control systems to allow for flexibility, open communication, and customization. Consistent with Chenhall’s (2003) proposition, we propose that:

P2b. Units with high interdependencies are likely to emphasize informal control and personal interactions.

2.3.3. Structure

Organizational structure is about who does what and how. Decentralization has traditionally been seen as the most important structural variable (Chenhall, 2003). With decision authority pushed out to operating units, agency problems can arise, and incentives and performance measures are called upon to mitigate those agency problems. In addition, communication and coordination become more important and thus formal, broad-scope, and integrated information is used (Chenhall and Morris, 1986). Consistent with Chenhall’s (2003) proposition, we propose that:

P3a. Units that are highly decentralized are likely to rely on formal structured control focused on measuring performance.

Structure also includes the motivation with which work is performed (Chenhall, 2003). An important structural variable is superiors’ leadership style. Superiors that practice a consideration style of leadership are concerned for their subordinates. These superiors want to have engaged employees that participate meaningfully in their tasks. Research has found that with a consideration style of leadership, subordinates participate more in the budgeting process (Chenhall, 2003). This style of leadership requires open lines of communication that provide information necessary for employees to take on responsibility and become empowered

decision-makers (Abernethy et al., 2010). Empirically, Abernethy et al. (2010) find that a consideration style of leadership is positively associated with an interactive use of the planning and control system but not with the use of the formal performance measurement system for accountability purposes. They also find the leadership style of initiating structure to be associated with an interactive use, but less so. In addition, this latter leadership style appears to be associated with an accountability-oriented use of the performance measurement system. Accordingly, we propose that:

P3b. Units that employ a consideration style of leadership are likely to emphasize interactive, personal, and flexible control; they likely employ 'loose' control. Units more oriented to initiating structure shift their emphasis towards monitoring and accountability.

2.3.4. Size

Size is an important contingency variable because it dictates the scope of communication and coordination challenges the organization faces. Accordingly, the larger the organization the more demanding becomes the need for information (Chenhall, 2003). To handle these problems, large organizations often institute formal and complex control systems (Chenhall, 2003). Consistent with Chenhall's (2003) proposition, we propose the following:

P4. Larger organizations are likely to have more sophisticated control systems.

2.3.5. Strategy

It is well-accepted that strategy must 'fit' with management control systems. Chenhall (2003) suggests that firms that compete on the basis of cost have formalized systems focused on their 'problem areas'. Empirical research has concluded that firms with a low-cost strategy monitor costs closely (Chenhall and Morris, 1995). In contrast, differentiation strategies are not as concerned with monitoring costs, but instead differentiators compete by offering a unique product or service that can command a premium price. Reputation is important since it aids the market in assessing the differentiator's ability to provide quality, innovation, delivery, service, and other value-enhancing attributes. Consistent with Chenhall's (2003) proposition that cost leadership strategies rely on formal performance measurement systems while differentiation strategies require more informal and interactive control systems, we propose the following:

P5. Units that emphasize a low cost-low price strategy are likely to employ formal performance measurement systems. Conversely, units that emphasize a differentiation or delivery/service strategy are likely to rely on interactive and communication-based controls, as well as controls to protect reputation.

2.3.6. Culture

Because ours is a single country study, national culture does not play a role in our control configurations. Instead, we examine organizational culture, which may actually have a stronger effect on the design of management control than national culture (Chenhall, 2003). Henri (2006) describes organizational culture in terms of flexibility versus control values. He finds that firms that emphasized flexibility use a diverse performance measurement system to focus attention and facilitate strategic decision-making. Such firms recognize the importance of their employees to be able to react quickly and make strategic decisions. They are adaptable, responsive, and organic (Lee and Yang, 2011). Accordingly, Heinicke et al. (2015) find that the beliefs system plays a key role in management control systems of firms that emphasize flexibility values. In contrast, firms that emphasize cultural values based on control are

more adept at using and relying on tight formal controls. Thus, we propose that:

P6: Units that emphasize flexibility are likely to rely on controls that emphasize the communication of values. Conversely, units that emphasize control values likely rely on tight intensive control.

In sum, consistent with the notion of configuration fit (Gerdin and Greve, 2004), we expect contextual variables to be interrelated with strategic agendas that, in turn, will be matched with an appropriate, internally consistent control arrangement, producing a limited number of system states. We will draw on this framework in our examination of balance and in our attempts to make sense of the control patterns we observe.

2.4. Research Question and Empirical Approach

Our main research question is this: what does balance in the LOC framework look like? Having explored the notion of balance theoretically, we now approach this question from an empirical perspective, looking for clusters of control patterns in a cross-section of units to specify an empirically grounded taxonomy of control. Implicit to this research approach are several important arguments and assumptions. First, we assume that organizations tend to have balanced control, at least on average. That is, we expect that the control systems that can be observed in reality tend to be broadly appropriate combinations of the levers that are relatively effective on average in supporting organizational goal achievement. Accordingly, we conform to a long-standing tradition in both economics and contingency research that assumes market selection pressures tending towards equilibrium and/or well-informed, rational managers pursuing effective control (Chenhall, 2003; Speklé, 2001). Second, balance can only be achieved in a limited number of configurations, and we expect to observe a distinct number of groups of firms with similar combinations of the four levers. Integrating the literatures discussed above allows us to legitimize these arguments and assumptions. The ambidexterity literature shows that organizations must balance competing tensions in order to achieve success (Gupta et al., 2006; Raisch and Birkinshaw, 2008; Raisch et al., 2009). To manage these tensions, control needs to be ambidextrous too, and a balanced control structure is a control structure that activates both the positive and negative forces that are simultaneously required to create the dynamic tension to effectively support organizational ambidexterity. We then introduced configurational thinking (e.g., Doty and Glick, 1994; Meyer et al., 1993; Short et al., 2008), supporting our expectation that a limited number of balance configurations exist, that we can empirically identify these configurations, and that the patterns we observe in our cross-section reflect an underlying, systematic and interpretable logic that can be substantiated through the use of contingency variables. These patterns, then, should provide an empirically informed starting point for further theoretical analysis and interpretation.

3. Research design, sample, and measurement

3.1. Research design and sample

The analysis is based on survey data from 217 business units in the Netherlands.² In building the questionnaire, we relied as far as possible on instruments validated in previous studies. Also,

² The original dataset contains 278 observations. We remove 28 not-for-profit units, four cases where the managers have been working less than half a year in their current position, one case with only 12 employees, and cases with missing values listwise. We are left with 219 observations. However, because the analytical techniques we plan to use (especially cluster analysis) are very sensitive to outliers,

Table 1A
Descriptive statistics: industries.

Construction	19	(8.80%)
Manufacturing	34	(15.70%)
Transportation, communication and utilities	30	(13.80%)
Wholesale and retail trade	39	(18.00%)
Finance, insurance and real estate	34	(15.70%)
Services	52	(24.00%)
Miscellaneous	9	(4.10%)
Total	217	(100%)

we pre-tested the survey instrument subjecting it to an academic review first, followed by two rounds of interviews with a total of seven potential respondents. We used different interview techniques to assess both the overall quality of the survey instrument (Three-Step Test-Interviews (TSTI), see [Hak et al., 2008](#)) as well as content validity (Validity-Feedback Interviews, see [Kruis, 2008](#)). The TSTI is a mechanism to pre-test questionnaires through observing actual interaction between the instrument and respondents. Because the cognitive process of completing a survey is hidden from the observer, 'thinking aloud' is used to make the thought process observable ([Hak et al., 2008](#)). We also presented four of the seven unit managers with a written description of their units and the management control structure based solely on their responses to our survey questions to verify whether our the survey was accurately depicting their unit. These Validity-Feedback Interviews ([Kruis, 2008](#)) help ensure content validity of our constructs and the survey as a whole. Our pre-test resulted in various changes to the survey instrument such as changing scales or including figures to illustrate relevant concepts.

Data were collected in 2012. Sample respondents are unit managers with full profit and loss responsibility, with at least 25 people reporting to them, and with at least one direct supervisor. Respondents manage units with on average 273 employees (the range is 25–4100 full-time equivalent employees) and have on average been working in their current position for 5 years (the range is 0.5–40 years). [Table 1A](#) provides an overview of the industries represented in the data.

The business unit is the appropriate level of analysis for our project. Especially in larger organizations, strategies, management control practices, and contexts may differ widely between various parts of the organization. This intra-organizational variety, however, is less of a problem at the level of the business unit, where business activities, strategy priorities, and performance management choices are generally more homogeneous.

To mitigate response problems and respondent identification issues, we rely on students from an MSc-program to contact potential survey participants³; hence, our sample is not random. To the best of our knowledge, however, this procedure has not introduced systematic selection biases, and we find sufficient variety in units' size, industry, et cetera, to expect appropriate variation in the contingency and control variables we use. Since our sample is not random we cannot be sure that we study all possible ways in which organizations use the control levers. However, we believe that the sample is at least informative of contemporary management control practices in the Netherlands.

we removed two more cases with D^2/df scores larger than 4. See [Hair et al. \(2010, 66–67\)](#).

³ All students were enrolled in the same course, in which they received clear and very strict instructions as to how to select respondents and administer the survey, and in which we took considerable care to ensure a strong awareness of the importance of following the protocol. The students are from a part-time program, are relatively mature (their ages range from 23 to 44 with a mean of 33) and hold responsible positions (most of them as controllers).

3.2. Research set up and measurement

To study the patterns of control, we measure the four levers and use cluster analysis in our search of configurations. To help interpret the findings of the cluster analysis we study differences in the contingency variables described earlier.⁴ In addition, we examine the performance of the clusters on a series of strategic performance dimensions that are especially relevant in the LOC framework, i.e., their performance on various strategic factors and the capacity to develop new strategic capabilities. These dimensions do not cover the full spectrum of potential performance dimensions and can, therefore, not be applied in a generic assessment of relative performance across the clusters. They are nevertheless informative in that they help to profile the clusters. Each variable has been measured using multiple items (except for organizational and business unit size). Most items are measured on a fully anchored 5 or 7-point semantic scale, and we apply Principal Component Analysis with oblique rotation throughout our study to explore the patterns in our data.⁵ When we find multiple factors we verify the factor structure with Confirmatory Factor Analysis, using maximum likelihood estimation in AMOS (untabulated). We consistently find that the multifactor models fit the data well. We form our constructs by taking the mean of the underlying item scores. [Appendix A](#) reproduces the relevant parts of the survey, and reports factor analysis results and item-level descriptive statistics. Descriptive statistics at the construct level are in [Table 1B](#).

3.3. Measurement of the Levers of Control

3.3.1. Beliefs and boundaries

Beliefs are measured with four questions about the organization's core values and mission statement, taken from [Widener \(2007\)](#). Factor analysis confirms unidimensionality of the construct and Cronbach's alpha is 0.855. To validate our measure we correlate it with two questions that ask whether (1) the core values are broadly supported within the organization, and (2) the fit with core values is taken into account when hiring new employees. As expected we find significant and positive correlations between each question and the beliefs metric ($r=0.658$ and $r=0.477$, both p -values <0.01).

To capture boundary control we use four questions about the organization's code of business conduct, also from [Widener \(2007\)](#). While this construct does not directly ask about the use of strategic boundaries, the instructions tell respondents that, for example, the code of business conduct can describe appropriate business practices, ethical behaviors, and policies. The items load on a single factor and Cronbach's alpha is 0.871. To validate our measure we correlate it with two questions asking (1) whether organizational members confront each other about compliance with behavioral codes, and (2) how often the manager relies on the organization's ethical codes. Both correlate positively with the measure for boundaries ($r=0.569$, $p<0.01$, and $r=0.320$, $p<0.01$ respectively).

3.3.2. Diagnostic control systems

To measure diagnostic control systems (DCS) we rely on [Henri \(2006\)](#). We use his questions that ask about the extent to which top management relies on performance measures to track progress, monitor results, compare outcomes to expectations, and evaluate

⁴ Since we are specifically interested in balance in the levers of control, we solely include the four levers in our cluster analysis. In so doing, we gain insight in the patterns in the control choices first, and then look for other differences, for instance, in the contingency variables.

⁵ The factor structure we find, however, is not dependent on this specific choice. Principal Axis Factoring (again with oblique rotation) results in the same structure.

Table 1B
Descriptive statistics: variables (see Appendix A for variable definitions and item-level details).

	Theoretical range	Actual range	Mean	Standard deviation	Cronbach's alpha	AVE
Beliefs	1–7	1.50–7.00	4.718	1.097	0.855	0.70
Boundaries	1–7	2.00–7.00	5.297	1.099	0.871	0.72
DCS	1–7	2.50–7.00	5.604	0.865	0.798	0.63
ICS	1–7	2.16–6.67	4.463	0.833	–	–
Strategic orientation	1–7	1.00–7.00	4.453	1.288	0.834	0.75
Managerial involvement	1–7	1.00–7.00	4.044	1.251	0.549	0.69
Facilitating use	1–7	1.20–7.00	4.891	0.989	0.840	0.61
Size organization	–	51–140,000	13,619	27,441	–	–
Size org (log)	–	1.71–5.15	3.378	0.853	–	–
Size unit	–	25–4100	272.69	517.22	–	–
Size unit (log)	–	1.40–3.61	2.087	0.486	–	–
Uncertainty	1–5	1.67–5.00	3.664	0.782	0.647	0.59
Goal clarity	1–5	1.50–5.00	4.018	0.553	0.676	0.51
Measurability	–	–2.22–1.31	0.000	0.746	0.734	0.56
Interdependencies	1–5	1.00–5.00	3.219	0.961	0.821	0.85
Decentralization	1–7	1.80–7.00	4.633	1.088	0.759	0.51
Considerate style	1–7	2.29–6.86	5.068	0.801	0.774	0.43
Initiating structure	1–7	1.60–6.80	4.339	1.024	0.776	0.53
Low cost-low price	1–5	1.50–5.00	3.618	0.916	0.650	0.74
Differentiation	1–5	1.25–5.00	3.902	0.677	0.622	0.47
Delivery & service	1–5	1.75–5.00	4.199	0.549	0.579	0.44
Flexibility values	2–14	4.00–14.00	10.210	1.653	–	–
Control values	2–14	5.50–13.00	9.339	1.577	–	–
Search for new strategic capabilities	1–7	1.00–7.00	4.871	1.122	0.810	0.84
Performance: Low cost-low price	1–5	1.00–5.00	2.826	0.772	0.635	0.73
Performance: differentiation	1–5	1.33–5.00	3.319	0.624	0.595	0.55
Performance: delivery & service	1–5	2.00–5.00	3.491	0.567	0.683	0.51

performance. This fits the concept of diagnostic control. The items load on a single factor and Cronbach's alpha is 0.798. Since DCS captures reliance on performance measures, we expect our measure to correlate with the prevalence of performance targets. Our respondents indicated the intensity of use for seven types of performance targets,⁶ and each type correlates positively with our measure of DCS. Correlation coefficients range from 0.133 to 0.309 with *p*-values of 0.056 to <0.01.

3.3.3. Interactive control systems

Interactive control (ICS) has been operationalized quite differently across studies (Bisbe et al., 2007). Bisbe et al. (2007) define ICS as a formative construct and distinguish several dimensions that capture an intensive use by both top and operating managers, a high level of face-to-face discussions, a strong focus on strategic uncertainties, and a non-invasive, inspirational involvement. To obtain a broad measure of ICS we use three constructs that together cover these dimensions and combine them into one formative construct. First we use two questions about higher management's involvement with performance measures from Widener (2007).⁷ These form one factor, although the Cronbach's alpha is low (0.549). A low Cronbach's alpha is an indication of possible measurement error, but may also be caused by the fact that the scale includes only two items. Therefore, we also assess the Pearson correlation between the two questions. The correlation is reasonably strong: 0.379 ($p < 0.01$), suggesting adequate measurement. Second, we work with five questions of Henri's (2006) attention-focusing role to pick up on a facilitating use of performance measures (FACILUSE).⁸ Factor analysis confirms the unidimensionality of this construct and the Cronbach's alpha is satisfactory (alpha = 0.840). Finally,

⁶ These included stock price, return, profit, revenue, cost, non-financial quantitative, and qualitative targets.

⁷ Widener (2007) uses two more questions about top management involvement, but we leave those out because of repetitiveness.

⁸ Henri (2006) uses seven items. We leave out one item that addresses critical success factors and that (conceptually) better fits diagnostic control. Another item cross loads in our sample with diagnostic control and is left out as well.

we ask about the focus on strategic uncertainties. Since there is no instrument available we develop our own. In a similar vein as Henri (2006), we ask about the extent to which higher management relies on performance measures to (1) signal key strategic areas for improvement, to (2) signal new strategic challenges, and (3) to discuss the impact of potential changes in the competitive environment. Together these three questions measure the focus on strategic uncertainties, they form a single construct, and the Cronbach's alpha is 0.834.

The next step to obtain our measure of ICS is to take the average of the scores on managerial involvement, facilitating use, and strategic orientation. Hence we obtain a formative construct that represents the multiple dimensions of ICS. To validate this formative measure we calculate Edwards' adequacy coefficient ($R2_a$; Edwards, 2001; MacKenzie et al., 2011). The $R2_a$ equals the cutoff value of 0.50, suggesting adequate construct validity. In addition, we correlate our formative measure with two possible outcomes of ICS. We ask about the business unit's ability to take advantage of new opportunities, and the importance of learning as a part of the manager's job. Both indicate the results from continual challenge and debate that arise from ICS (Simons, 1995) and both correlate significantly and positively with ICS ($r = 0.130$, $p = 0.057$, and $r = 0.129$, $p = 0.058$ respectively).

3.4. Common measurement bias and robustness

Since survey research carries the risk of common measurement bias (Podsakoff et al., 2003; Chang et al., 2010) we run a Harman's one factor test on all items related to the levers of control. The (untabulated) results show five factors, the first of which explains only 29% of the variance. Thus, we conclude there is little indication of common measure bias.

We also find that the scale for managerial involvement has a low Cronbach's alpha and might contain measurement error. Therefore, we run a robustness check on our cluster analysis (see below) using a measure of ICS that does not include managerial involvement. Our results are robust to this change and we opt for measuring ICS as

a formative construct comprised of all three dimensions. This may be challenged statistically, but is theoretically more encompassing.

3.5. Measurement of contingency variables

3.5.1. The external environment

We proxy for environmental uncertainty by asking about the impact of external factors on performance of the business unit (following Van Elten, 2012) and whether the BU needs to react often to outside pressures or experiences problems with long-range planning (following Kalleberg et al., 1996). The items form a single construct with a Cronbach's alpha of 0.647.

3.5.2. Technology

We measure goal clarity with the three-item instrument developed by Rainey (1983) with an additional item from Kruis (2008). Factor analysis supports the construct's unidimensionality. Cronbach's alpha is adequate with a score of 0.676. For measurability of outputs, we combine four questions from Kruis (2008) and Speklé and Verbeeten (2014). Because of scale differences, we standardize the responses. The factor analysis reveals unidimensionality, and we combine the items in one factor by averaging the (standardized) item scores. Cronbach's alpha is 0.734. To capture interdependencies, we rely on the instrument first used by Keating (1997). This instrument measures both the impact of other units' actions on the respondent's business unit, as well as the influence of the respondent's unit on the rest of the organization. Both items load on a single factor. Cronbach's alpha is 0.821.

3.5.3. Structure

We measure decentralization of decision rights with an instrument based on Gordon and Narayanan (1984) and further developed by Abernethy et al. (2004). This instrument captures managers' influence on decisions in five relevant domains (strategic, investment, marketing, internal processes, and human resource management). Factor analysis shows that all five items load on a single factor, and Cronbach's alpha is 0.759. We seek to capture the degree of formality in our organizational culture measure (see below) and through leadership style. We measure the latter construct with a scale from Stogdill and Coons (1957) in the version as it has recently been used by Abernethy et al. (2010). Factor analysis returns two factors, which we label considerate style (with an alpha of 0.774) and initiating structure (Cronbach's alpha = 0.776), respectively.

3.5.4. Size

The size of the organization is measured by the number of employees of the organization. We also measure the size of the unit as an additional metric for size, again based on the number of employees. To mitigate distributional issues, we apply a log transformation to both numbers before entering them in the analyses.

3.5.5. Strategy

To measure the units' strategic priorities, we apply the instrument developed by Chenhall (2005) based on the work of Miller et al. (1992). The analysis returns three interpretable factors that, however, deviate somewhat from Chenhall's solution (Chenhall, 2005). We label the components Low-cost-low-price (Cronbach's alpha = 0.650), Differentiation (Cronbach's alpha = 0.622), and Delivery & Service (Cronbach's alpha = 0.579), respectively.

3.5.6. Culture

We follow Henri (2006) and distinguish flexibility values and control values. Flexibility values reflect adaptability, openness to change and responsiveness, whereas control values reflect stability,

formality, and predictability (Henri, 2006). We use the instrument by Lee and Widener (2013), which covers three parts of the Organizational Culture Assessment Instrument (Cameron and Quinn, 1999): dominant characteristics, organizational glue, and strategic emphasis. We form four variables: group culture (one factor, Cronbach's alpha = 0.584), developmental culture (one factor, Cronbach's alpha = 0.704), hierarchical culture (one factor,⁹ Cronbach's alpha = 0.704), and rational culture (one factor,¹⁰ Cronbach's alpha = 0.560). Flexibility values scores are formed by the summation of the scores on group and developmental cultures. Control values scores are formed by adding up scores for hierarchical and rational cultures.

3.5.7. Dimensions of performance

The capacity to search for new strategic capabilities is measured with an instrument from Grafton et al., (2010). We asked respondents to indicate the extent to which their business unit is able to sense the need for strategic change, and to seek new capabilities in response to that need. These two items load on a single factor (Cronbach's alpha = 0.810). As part of the questions inquiring about the strategic priorities of the business units (see above), we also asked respondents to indicate how well they did relative to competitors on the various strategic dimensions. Factor analysis returns three factors that are similar to the ones we find in the strategic priority responses, and we label them correspondingly as Low-cost-low-price performance (Cronbach's alpha = 0.635), Differentiation performance (Cronbach's alpha = 0.595), and Delivery & Service performance (Cronbach's alpha = 0.683).

3.6. Research design: cluster analysis¹¹

In our search for how organizations balance their levers of control, we are interested in identifying groups of observations with similar LOC choices (or profiles). Cluster analysis is well-suited for this purpose. The inputs for the cluster analysis are the scores on the four levers. Since the levers use similar measurement scales, there is no need for standardization (Ketchen and Shook, 1996). We follow a two-stage procedure combining hierarchical and non-hierarchical cluster methods to obtain a refined cluster solution (Hair et al., 2010; Ketchen and Shook, 1996).¹² Visual examination of the dendrogram suggests two useable solutions: one with two clusters and one with four clusters. The two-group solution, however, leaves a large number of cases in one group (162 cases out of 217). The four-cluster solution splits this group into three smaller groups and returns a more precise solution that still has enough observations in each group to allow meaningful comparison between groups. We therefore select the four-group solution as our referent. For descriptions of the complete cluster analysis and robustness tests see Appendix B.

4. Findings: cluster profiles

Fig. 1 shows a bar chart that illustrates differences in the importance of the levers of control across the four clusters while Tables 2A–C provides descriptive statistics and ranking information, both between and within the clusters. As stated earlier, the central theme of the LOC framework is to control business strategy. Thus, consistent with Simons' (1995) theorizing that the control

⁹ After removing one item. Items used are to be found in Appendix A.

¹⁰ After removing one item. Items used are to be found in Appendix A.

¹¹ In our approach we closely follow the steps and logic of cluster analysis as discussed in Hair et al., 2010.

¹² Our approach is common in the accounting literature that uses cluster analysis. For a recent example, see Dekker et al. (2013).

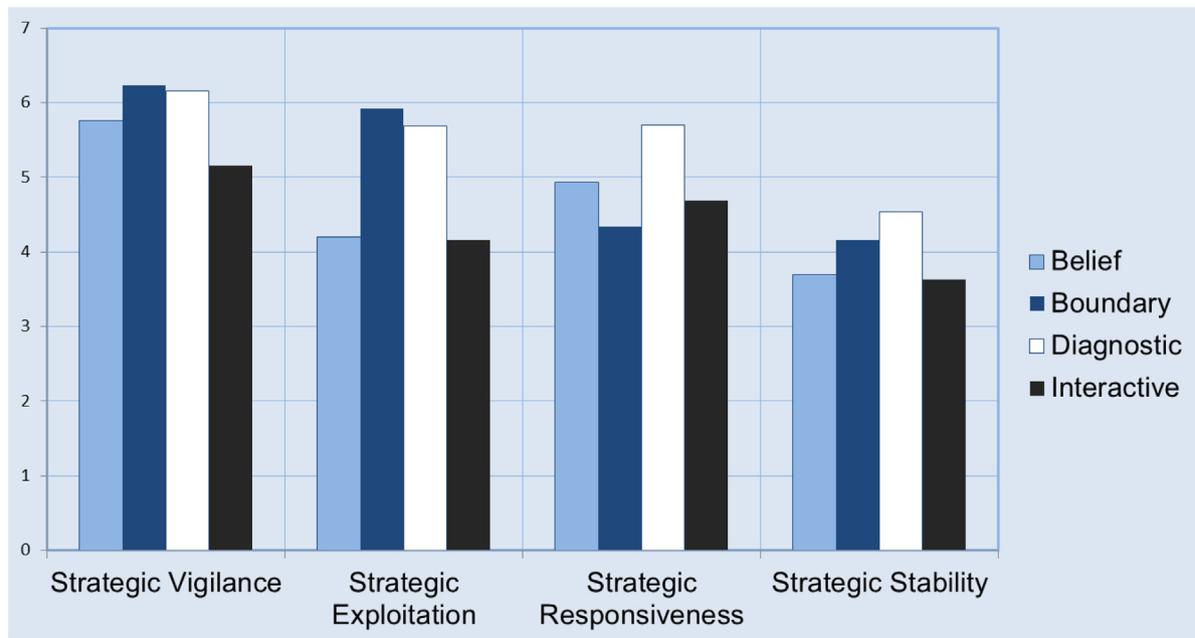


Fig. 1. Bar chart of clusters and their scores on the Levers of Control.

Table 2A

Descriptive statistics clusters: mean scores (standard deviations) of the levers of control.

	Cluster 1 strategic vigilance (n = 61)	Cluster 2 strategic exploitation (n = 63)	Cluster 3 strategic responsiveness (n = 52)	Cluster 4 strategic stability (n = 41)
Beliefs	5.762 (0.601)	4.198 (0.997)	4.933 (0.640)	3.689 (0.814)
Boundaries	6.234 (0.504)	5.925 (0.457)	4.341 (0.751)	4.152 (0.784)
DCS	6.152 (0.576)	5.689 (0.717)	5.704 (0.533)	4.531 (0.850)
ICS	5.153 (0.621)	4.152 (0.640)	4.686 (0.655)	3.630 (0.574)

Table 2B

Descriptive statistics clusters: importance of the levers; between cluster comparison.

	Cluster 1 strategic vigilance (n = 61)	Cluster 2 strategic exploitation (n = 63)	Cluster 3 strategic responsiveness (n = 52)	Cluster 4 strategic stability (n = 41)
Beliefs	1	3	2	4
Boundaries	1	2	3	3
DCS	1	2	2	3
ICS	1	3	2	4

Note: all ranking differences are significant at the 5% level or better (based on untabulated anova results). Rank 1 is highest. Significance of differences is assessed using Tukey HSD *post hoc* testing (but using Bonferroni instead returns qualitatively similar results).

Table 2C

Descriptive statistics clusters: importance of the levers; within cluster comparison.

	Cluster 1 strategic vigilance (n = 61)	Cluster 2 strategic exploitation (n = 63)	Cluster 3 strategic responsiveness (n = 52)	Cluster 4 strategic stability (n = 41)
Beliefs	2	3	2	3
Boundaries	1	1	4	2
DCS	1	2	1	1
ICS	3	3	3	3

Note: all ranking differences are significant at the 10% level or better (based on untabulated *t*-test results). Rank 1 is highest.

levers relate to certain strategic objectives (i.e., the four P's of strategy—plan, position, pattern, and perspective), we use the ranking information about the levers to label each cluster relative to its inferred strategic profile.

To provide support for our interpretation, we use a series of multinomial regressions to explore the key contingency factors identified earlier and their association with the clusters. We also examine industry effects. The descriptive statistics and results of this contextual and industry analysis are reported in Tables 3A–C and 4A and 4B. Finally, we examine how each cluster

performs on specific dimensions of performance. We report these results in Table 5. Taken together, the information from these analyses allows us to construct a rather rich description of the four clusters, the context in which they occur, and specific performance effects. For sake of brevity, we must be somewhat selective and choose to base the description on the propositions that are most helpful in supporting or challenging our interpretation of the clusters.

Table 3A
Descriptive statistics (by cluster: contextual factors: mean scores (standard deviation) per cluster.

	Cluster 1 strategic vigilance	Cluster 2 strategic exploitation	Cluster 3 strategic responsiveness	Cluster 4 strategic stability
Uncertainty	3.721 (0.850)	3.783 (0.716)	3.647 (0.812)	3.415 (0.702)
Goal clarity	4.320 (0.450)	3.950 (0.520)	3.918 (0.575)	3.799 (0.548)
Measurability	0.469 (0.585)	-0.130 (0.662)	0.024 (0.632)	-0.526 (0.809)
Interdependencies	3.344 (0.920)	3.048 (0.928)	3.490 (0.962)	2.951 (0.980)
Decentralization	4.810 (0.959)	4.314 (1.181)	4.704 (1.060)	4.770 (1.086)
Considerate style	5.490 (0.684)	4.955 (0.786)	5.102 (0.725)	4.571 (0.767)
Initiation structure	4.938 (0.990)	4.156 (0.861)	4.310 (0.963)	3.766 (0.963)
Size unit (log)	2.021 (0.441)	2.130 (0.528)	2.088 (0.508)	2.116 (0.459)
Size organization (log)	3.557 (0.923)	3.510 (0.915)	3.221 (0.777)	3.110 (0.636)
Low cost-low price	3.525 (0.915)	3.706 (0.957)	3.769 (0.860)	3.427 (0.905)
Differentiation	3.992 (0.629)	3.941 (0.702)	3.870 (0.631)	3.750 (0.756)
Delivery & service	4.348 (0.529)	4.214 (0.498)	4.125 (0.619)	4.049 (0.519)
Flexibility values	11.027 (1.420)	9.931 (1.645)	10.029 (1.625)	9.655 (1.631)
Control values	9.828 (1.541)	9.548 (1.757)	9.212 (1.218)	8.451 (1.391)

Table 3B
Descriptive statistics (by cluster): industry effects: counts (percentages).

Industry	Cluster 1 strategic vigilance	Cluster 2 strategic exploitation	Cluster 3 strategic responsiveness	Cluster 4 strategic stability	Total
Construction	2 (10.5%)	7 (36.8%)	3 (15.8%)	7 (36.8%)	19
Manufacturing	12 (35.3%)	10 (29.4%)	6 (17.6%)	6 (17.6%)	34
Transportation, communication and utilities	7 (23.3%)	8 (26.4%)	9 (30.0%)	6 (20.0%)	30
Wholesale and retail trade	4 (10.3%)	7 (17.9%)	20 (51.3%)	8 (20.5%)	39
Finance, insurance and real estate	14 (41.2%)	14 (41.2%)	3 (8.8%)	3 (8.8%)	34
Services	19 (36.5%)	14 (29.9%)	8 (15.4%)	11 (21.2%)	52
Miscellaneous	3 (33.3%)	3 (33.3%)	3 (33.3%)	0 (0%)	9
Total	61 (28.1%)	63 (29.0%)	52 (24.0%)	41 (18.9%)	217

Note: the distribution of business units over the clusters in (1) wholesale and retail trade and (2) finance, insurance and retail differ significantly from the total sample distribution ($\chi^2 = 22.28, p < 0.01$ and $\chi^2 = 10.52, p < 0.05$, respectively). For all other industries, the distributions are not significantly different.

Table 3C
Descriptive statistics (by cluster): performance dimensions: mean scores (standard deviation) per cluster.

	Cluster 1 strategic vigilance	Cluster 2 strategic exploitation	Cluster 3 strategic responsiveness	Cluster 4 strategic stability
Search for new strategic capabilities	5.344 (0.844)	4.849 ((1.180)	4.635 (1.229)	4.500 (1.049)
Performance: low cost-low price	2.918 (0.748)	2.758 (0.788)	2.952 (0.794)	2.2625 (0.732)
Performance: differentiation	3.426 (0.545)	3.191 (0.671)	3.321 (0.692)	3.350 (0.554)
Performance: delivery & service	3.652 (0.519)	3.373 (0.532)	3.524 (0.601)	3.381 (0.596)

Table 4A
Multinomial regression results: odds ratios of the clusters versus each other.

	Likelihood ratio χ^2	Vigilance (1)	Exploit (2) Versus stability (4)	Respons (3)	Vigilance (1) Versus Respons (3)	Exploit (2)	Vigilance (1) Versus exploit (2)
Uncertainty	6.212 [#]	1.887	2.356 ^{**}	1.602	1.178	1.471	0.801
Goal clarity	6.709 [#]	2.672	1.048	0.662	4.037 ^{**}	1.583	2.549 [#]
Measurability	23.175 ^{***}	9.887 ^{***}	2.086 [*]	4.447 ^{***}	2.224 [*]	0.469 [*]	4.740 ^{***}
Interdependencies	7.238 [#]	0.995	0.903	1.636 [*]	0.608 [*]	0.552 [*]	1.103
Decentralization	6.213 [#]	1.052	0.665 [*]	0.942	1.117	0.705 [*]	1.583 ^{**}
Considerate style	6.427 [#]	2.547 ^{**}	2.106 ^{**}	2.188 ^{**}	1.164	0.963	1.209
Initiating structure	18.020 ^{***}	3.013 ^{***}	1.020	1.561	1.930 ^{**}	0.653 [*]	2.954 ^{***}
Size unit	6.751 [#]	0.166 ^{**}	0.372	0.449	0.369 [*]	0.829	0.446
Size organization	9.104 ^{**}	2.522 ^{**}	1.739	1.104	2.285 ^{***}	1.575	1.450
Low cost-low price	5.061	1.589	1.457	1.889 ^{**}	0.841	0.771	1.091
Differentiation	6.636 [#]	0.381 [*]	1.065	0.753	0.506	1.414	0.358 ^{**}
Delivery & service	2.675	1.772	1.162	0.807	2.196	1.440	1.525
Flexibility values	13.997 ^{***}	2.096 ^{***}	1.196	1.240	1.690 ^{***}	0.964	1.753 ^{***}
Control values	9.045 ^{**}	1.610 ^{**}	1.607 ^{***}	1.275	1.263	1.261	1.002
Full Model	174.186 ^{***}						
Nagelkerke R^2	0.590						
McFadden R^2	0.292						

Note: Statistics of intercept not reported. Odds ratios report the likelihood of an observation falling in the comparison group relative to the chance of falling in the referent group as the variable increases. An odds ratio >1 (<1) indicates that the chance of falling in the comparison group increases (decreases) as the variable increases.

[#] $p = 0.10$.

^{*} $p < 0.10$.

^{**} $p < 0.05$.

^{***} $p < 0.01$.

Table 4B
Multinomial regression results: Ranking of the odds ratios and link to propositions.

	Cluster 1 strategic vigilance	Cluster 2 strategic exploitation	Cluster 3 strategic responsiveness	Cluster 4 strategic stability	Prop.	Primarily used to support or challenge the interpretations of clusters:
Uncertainty	1–2	1	1–2	2	P1	Clusters 2 and 4
Goal clarity	1	2	2	1–2	P2a	Clusters 1 and 4
Measurability	1	3	2	4		
Interdependencies	2	2	1	2	P2b	Cluster 3
Decentralization	1	2	1	1	P3a	Cluster 2
Considerate style	1	1	1	2	P3b	Clusters 1, 2, and 4
Initiating structure	1	3	2	2–3		
Size unit	2	1–2	1	1	P4	Cluster 1 and 3
Size organization	1	1–2	2	2		
Low cost–low price		No differences; insignificant likelihood ratio			P5	Clusters 1 and 2
Differentiation	2	1	1–2	1		
Delivery & service		No differences; insignificant likelihood ratio				
Flexibility values	1	2	2	2	P6	Clusters 1 and 4 vs. cluster 2
Control values	1	1	1–2	2		

Note: Rank 1 is highest.

Table 5
ANOVA analysis. Ranking performance dimensions; between cluster comparison.

	Cluster 1 strategic vigilance	Cluster 2 strategic exploitation	Cluster 3 strategic responsiveness	Cluster 4 strategic stability
Search for new strategic capabilities	1	2	2	2
Performance: low cost–low price			No differences	
Performance: differentiation			No differences	
Performance: delivery & service	1	2	1–2	2

Note: all ranking differences are significant at the 10% level or better (based on untabulated anova results). Rank 1 is highest. Significance of differences is assessed using Tukey HSD post hoc testing (but using Bonferroni instead returns qualitatively similar results).

4.1. Cluster 1: strategic vigilance

Cluster 1 groups 61 observations (28% of the sample). Units in this cluster score high on all levers (relative to units in the other clusters) and control appears to be tight and intensive. Within the cluster, the emphasis is on DCS and Boundaries, suggesting a dominant focus on strategy as a plan, as well as a concern for reputation risks. However, even though the reliance on beliefs and ICS is relatively low within the cluster (compared to the emphasis on DCS and boundaries), it is still high compared to units in the other clusters. This suggests that cluster 1 units actively scan their environments, looking for threats and new strategic opportunities, and stimulating experimentation and learning. The general pattern is consistent with ‘strategic vigilance’; units in this cluster are happy with their current strategy but are seeking to expand their strategic portfolio with new projects. These units are likely ambidextrous thus focusing both on exploitation as well as exploration; they want to learn how to operate more efficiently and effectively within their current operating paradigm as well as to learn how to perform new activities.

The multinomial regression results show that goal clarity and measurability have a significant positive effect on the chances of a particular unit to be in cluster 1 (only cluster 4 scores similar on goal clarity). Proposition 2a predicts that units characterized by these contingency variables emphasize performance measurement systems, which shows up in their high reliance on ICS and DCS. We also observe that units with leadership that emphasizes structure are more likely to reside in cluster 1, further underscoring the importance of monitoring and performance measurement in this cluster (cf. proposition P3b). Judging from the relatively high scores on goal clarity, measurability, and reliance on performance measurement, units in cluster 1 have built up a certain degree of routine in managing their business, which is consistent with the exploitation part of their strategic agenda. The units are furthermore characterized by a general tightness of control, which is indicative of a relatively

advanced control environment. Consistent with proposition P4, this may be explained from the fact that the units in cluster 1 are part of larger organizations, at least compared to units in clusters 3 and 4. We also measured unit size as an alternative size proxy and (somewhat paradoxically) find that units in cluster 1 tend to be smaller than those in clusters 3 and 4. For proposition P4, this suggests that organizational size is a better predictor of control sophistication than unit size.

Given the strong emphasis on formal control and performance monitoring, we would expect that units high in uncertainty (P1) and decentralization (P3a) are found in this cluster, but the results show that these contingency factors do not provide much insight on cluster membership, at least not for cluster 1 (cluster 1 ties with all other clusters on uncertainty and with two other clusters on decentralization).

The multinomial results further indicate that membership of this cluster is more likely to occur in units whose culture places importance on flexibility values, whereas the importance placed on control values does not set this cluster apart (only higher than cluster 4). This suggests that cluster 1 units balance the overall formality and tightness of their control structure with a relatively strong emphasis on flexibility values, implying that they also value openness, adaptability, and the willingness to make changes to their strategy (proposition P6). Apparently, the units are not just concerned with exploiting their current strength, but also looking for new strategic directions. This is compatible with the ambidexterity we ascribed to this cluster. In further support of this interpretation, the examination of performance dimensions shows that units in cluster 1 have the highest mean level of performance on searching for new strategic capabilities. Also, their comparatively strong reliance on interactive, beliefs, and boundary controls appears to support a relatively strong performance on delivery and service strategy (at par with cluster 3, but higher than clusters 2 and 4). There are no performance differences across clusters for the differentiation strategy. However, units in cluster 1 do not emphasize a

differentiation strategy—even though the relatively strong reliance on ICS and belief systems could support such a strategy (cf. proposition P5). In fact, units in cluster 1 are at the lower end of the differentiation strategy scale, at par only with units in cluster 3. A possible explanation is that units in cluster 1 are looking for diversification rather than differentiation given their search for new strategic opportunities.

Because units in cluster 1 emphasize boundary controls (both within their control system and relative to units in other clusters), we expect units that are particularly sensitive to potential changes in their strategic environment and/or may easily lose legitimacy to have a preference for this cluster. Interestingly, we observe that units in the financial services industry occur relatively often in this cluster. In the aftermath of the recent financial crisis, units in this industry have been subjected to intensified regulation. Also, these units share a need to retain their reputation. Compliance concerns and the need to safeguard legitimacy are well-served by the control structure of cluster 1, with its tight boundary control and clear direction from its DCS.

4.2. Cluster 2: strategic exploitation

Cluster 2 comprises 63 units (29% of the total sample). Overall control intensity is moderate (relative to units in the other clusters). Units in cluster 2 score high on boundaries relative to units in clusters 3 and 4. Within the cluster, the emphasis is on DCS and (particularly) on boundaries. Apparently, strategy as a plan is important, but there is also a strong desire to avoid reputation risk. Given the low intensity of the reliance on beliefs and ICS (both relative to DCS/boundaries within the cluster, and relative to clusters 1 and 3), strategic change and the desire to innovate are not high on the units' agenda. This pattern is consistent with 'strategic exploitation' in markets in which reputation is important. Units in this cluster seek to capitalize on their current assets and capabilities in existing and familiar markets, desire to do what they are currently doing in a more effective way, but do fear reputation risks.

We observe a certain preference in both clusters 1 and 2 for units within the financial services industry. This is consistent with the relatively strong emphasis on boundary systems that units in both clusters report. The fact that this emphasis is lower in cluster 2 (as compared to cluster 1) may be explained by the higher level of centralization; the multinomial regression results indicate that higher levels of centralization are positively associated with the likelihood of being in cluster 2.¹³ Centralization limits behavioral risks, and may, therefore, substitute for boundary control.

Proposition P1 links high uncertainty to control formality and tightness, but with less delegation of decision rights, formal performance measurement becomes less important (consistent with proposition P3a). Although environmental uncertainty is at the higher end of the spectrum for units in this cluster (that is, uncertainty is at par with units in clusters 1 and 3, but higher than in cluster 4), centralization may again help us understand why the overall control intensity and level of DCS within the cluster are moderate relative to the other clusters (although DCS scores high within the cluster). Furthermore, even though the emphasis on control values embedded in the units' culture suggests a preference for tight and intensive control (proposition P6), control intensity is moderate because centralization allows the realization of control objectives without recourse to such tight controls. Similarly, the importance of employing a structure-initiating leadership style (relative to clusters 1 and 3), is not as important (Proposition P3b).

Units that score lower on the ability to develop new strategic capabilities as well as on performance on delivery and service strategy (relative to units in cluster 1) are more likely to be in cluster 2. These results are compatible with the exclusive focus on exploitation we infer from the data for cluster 2, and with the lower reliance on beliefs and ICS prevalent in this cluster, both of which we would expect to be high to achieve high performance on service and delivery as implied by proposition P5.

4.3. Cluster 3: strategic responsiveness

Cluster 3 holds 52 units (24% of the total sample). In general, control intensity is moderate within this cluster. In cluster 3 the reliance on beliefs control and ICS is relatively high compared to the other clusters. Only units in cluster 1 report higher scores on these two levers, suggesting that units in cluster 3 also seek to inspire and motivate the search for new opportunities. Within this cluster, units emphasize DCS and, consequently, strategy as a plan. The units also emphasize beliefs, however, and are thus concerned with strategy as a perspective as well, suggesting that units seek to communicate the firm's vision and inspire positive actions. Given the low intensity of the reliance on boundaries (both within the cluster and relative to the other clusters), safeguarding against behavioral hazards is not high on the units' agendas. The label we propose for this pattern is 'strategic responsiveness'. The cluster comprises units that scan their environment for emergent opportunities and threats, but less intensively than units in cluster 1 (and less relative to the within cluster emphasis on diagnostic and beliefs). This suggests that cluster 3 units may not really be looking for new strategic projects (as the units in cluster 1), but rather for cues to decide on how to compete (as opposed to where to compete). The units have communicated their vision, are concerned with achieving that vision, and seek improvements in how to do so more effectively.

In support of this interpretation, the multinomial regression results show that units with high interdependencies are more likely to be in this cluster relative to the other clusters. Consistent with proposition P2b, units in this cluster (relative to clusters 2 and 4) rely on the communication of beliefs and the establishment of vertical information sharing channels to solve the coordination problems that accompany interdependencies. Furthermore, units from smaller organisations (at par with clusters 2 and 4, but smaller than units in cluster 1) are more likely to be in this cluster (proposition P4). This finding is consistent with the moderate rankings across all levers.

Interestingly, the industry analysis shows a strong representation of units from the wholesale and retail trade industry in this cluster. In our sample, approximately two-thirds of the firms in this industry are active in fashion or fast moving consumer goods. Such firms are concerned with ensuring that they achieve their intended strategy, but may rely on ICS to pick up on trends and types within the market segments in which they already operate to attune their current strategy continually to evolving changes in customer preferences and on beliefs control to communicate their strategic vision. Brand loyalty is quite important in these industries, which is consistent with the emphasis units in this cluster place on the use of beliefs control to communicate core values.

Cluster 3 ranks middle of the road in terms of performance. As would be expected, units in this cluster are more likely to have lower performance relative to cluster 1 on their ability to search for new strategic capabilities. But its performance does not differ significantly from the other clusters on the three strategic dimensions we consider in this study.

¹³ As can be seen in Table 4A, units that score low on decentralization are more likely to reside in cluster 2. Hence we conclude centralization (as the opposite of decentralization) is relatively high for units in this cluster.

4.4. Cluster 4: strategic stability

Cluster 4 holds 41 cases (19% of the total sample). Units in cluster 4 score significantly lower on all levers relative to cases in the other clusters, except for boundaries (units in cluster 3 score similarly low on this lever). Therefore, control appears to be relatively loose. Within the cluster, the emphasis is on DCS, suggesting a focus on strategy as a plan. Given the low intensity of the reliance on belief systems and ICS (both relative to DCS within the cluster and relative to units in other clusters), strategic change and the desire to innovate appear to be low on the units' agendas. Judging from the low score on boundary controls (relative to units in other clusters), reputation is somewhat less important for units in this cluster, although it does get emphasized relative to the other levers within the cluster itself (boundary systems rank second in emphasis). Overall, the pattern of control in cluster 4 is consistent with 'strategic stability' and predictable goal achievement. Units in this cluster seem comfortable with the strategic path they have chosen, know how to travel that path, and fear no imminent strategic or reputation threats.

The multinomial regression results indicate that units that score low on control values (at par though with units in cluster 3) and measurability of outputs are more likely to be in this cluster. Also, units are more likely to be in this cluster when they tend to score relatively low on the initiating structure style of leadership (taking a sort of midway position between clusters 2 and 3, but not deviating significantly from these clusters) and report lower levels of uncertainty than units in cluster 2. As these contingency variables are all associated with the degree of control formality (see propositions P1, P2a, P3b and P6), the relatively low scores of the units in cluster 4 on these factors may explain the generally low concern with formality and predictability we observe in this cluster. However, we do not observe a relationship with a considerate style of leadership. Such a style would have been consistent with loose control (cf. proposition P3b), but we find that units with strong considerate leadership are in fact less likely to be in this cluster, relative to all other clusters. We leave the exploration of this recalcitrant finding to future research.

Although 37% of the units in the construction industry reside in this cluster, the industry distribution is not significant. It is interesting to note, though, that significantly fewer units in the financial services industry reside in the stability cluster, as would be expected given the need for tight control in this industry.

Table 5 shows that performance for units in this cluster is similar to those in clusters 2 and 3. As expected for units that do not emphasize beliefs control or ICS, they lag units in cluster 1 on their performance in searching for new strategic capabilities. They also lag units in cluster 1 on their performance on deliveries and service, but even though their strategy is more focused on differentiation than units in cluster 1, they do not outperform them on this dimension.

5. Conclusions and discussion

Successful organizations must be ambidextrous; that is, they must be able to manage short-term demands efficiently while simultaneously staying alert and able to adapt to their changing environment (March, 1991). Similarly, Simons (1995) asserts that organizations must design and use their control systems to manage the competing tensions of predictable goal achievement on the one hand and innovation on the other. Simons (1995) holds that organizations can accomplish this control objective through the "balancing" of multiple control levers in the LOC framework. While this notion of control system design is consistent with main-

stream and well-acknowledged organizational literatures, the LOC framework does not explicate what balance looks like.

Our empirical examination reveals a stable solution consisting of four patterns of control, which we interpret from a perspective of configurational thinking as manifestations of balance. Units that employ tight control with relatively high emphasis on each of the four control levers (as compared to other clusters) cluster in a group labeled strategic vigilance (cluster 1). These units are focused not only on where they want to go, but are concerned with how they will get there. Behavioral hazards are a point of emphasis. These units want to achieve the intended strategy, but do so in the "right" way. The units in cluster 2 are similar to those in cluster 4 as they are focused on achieving their current strategic objectives; however, they are also exposed to more risk as they are highly focused on communicating those risks to their employees. Relative to the other levers in these units, safeguarding of their reputation is of utmost importance to these units. We label these units as strategic exploitation. We label units in group 3 as strategic responsiveness. In contrast to the units in cluster 2, these units are not focused on safeguarding against behavioral hazards, but are focused on ensuring that employees understand where they want to go and monitoring their progress in achieving that intended strategy. The intensity of control uses is not as high as those of the units in cluster 1, which indicates that the units in cluster 3 may be looking for opportunities, changes, and trends within their existing competitive position; instead of making a wholesale change of their competitive position. Finally, units in the strategic stability cluster (cluster 4) employ loose control with relatively low emphasis on each of the four control levers (as compared to other clusters). These units are low risk and stable. They are focused on achieving current objectives and experience little environmental uncertainty.

Because the cluster analysis technique is subject to researcher discretion, we took considerable care to examine the robustness of our findings. Although our clusters are remarkably stable across different empirical specifications, our results are subject to limitations. We emphasize that we do not claim that the clusters we find add up to a genuine typology, i.e. an exhaustive specification of the various archetypal configurations of the four levers that reflect balance, since our approach is empirical. Archetypes or ideal types are theoretical constructs rather than empirical artefacts that represent phenomena that might exist rather than actually existing ones (Doty and Glick, 1994). Also, our examination is bounded by our sample, and it is possible that we miss out on a configuration, simply because empirical manifestations of that particular type happen to be absent in our cross-section. Second, we use data gathered from a convenience sample, which facilitates validity and helps to obtain variation in the variables (Van der Stede et al., 2005). Although we are not aware of nor do we expect response bias in our sample, generalizing the results to a broader population should be undertaken with caution. Third, the use of a survey allows us to gather perceptions of unit managers, which is our interest (Van der Stede et al., 2005). We took steps to minimize measurement noise and, based on diagnostics of our measures, we have no expectations that our measures are biased. However, surveys undoubtedly contain noise and the results should be interpreted with this in mind. Our results are also subject to limitations in our measurement of the control levers. For example, we examine the diagnostic and interactive control levers only with respect to the performance measurement system, not to the other components of the management control system.

Despite these limitations, this research project and its findings provide important new insights. First, we elaborate on the concept of balance. We draw in related literatures on organizational theories (Gupta et al., 2006; Raisch and Birkinshaw, 2008; Raisch et al., 2009) and discuss how the concept of balance is theorized in other domains (e.g., organizational learning; March, 1991) to clarify the meaning of balance in the LOC framework. From our

synthesis of the literature and empirical observations we are able to provide a more encompassing definition of balance as a combination of all four control levers that are internally consistent, but not necessarily equally emphasized, and that align with different strategic and contextual challenges. This is consistent with [Simons \(1995\)](#) theorizing and implies that all levers are necessary to achieve balance, that balance does not mean equal weight, and that balance can be achieved through different combinations of emphasis. We conclude that balance as it is understood in the LOC framework may occur in multiple, yet limited, combinations, consistent with configurational theory. These multiple combinations exist because organizations experience different contingency challenges and thus must emphasize levers differently. When the alternative states of balance are constructed to be internally consistent and aligned with contextual and strategic challenges, then the different balancing arrangements will be effective. Given the importance of the LOC framework to the accounting literature, elaborating on one of its key concepts is an important stepping stone in furthering this research stream.

Second, we draw on configurational thinking to enhance our understanding of balance in a multivariate way ([Doty and Glick, 1994](#); [Meyer et al., 1993](#)). As [Meyer et al. \(1993, 1177\)](#) states, “By synthesizing broad patterns from contingency theory’s fragmented concepts and grounding them in rich, multivariate descriptions, the configurational approach may help consolidate the past gains of contingency theory.” Including all four levers of control in our examination allows us to provide insights on how balance is achieved using a holistic approach to control. Moreover, we draw on the contingency framework to provide a richer multivariate description of the control configurations. Finally, our empirical analyses reveal a taxonomy comprised of four different management control configurations. Through this taxonomy, researchers can now make more sense out of how units use combinations of levers in different ways to achieve a particular form of balance ([Meyer et al., 1993](#)), suited for their strategic objectives ([Simons, 1995](#)).

Our findings contribute to a growing and important line of literature on the LOC framework (e.g., [Mundy, 2010](#); [Tessier and Otley, 2012](#); [Widener, 2007](#)) as well as literature on combinations of control (e.g., [Malmi and Brown, 2008](#)). Moreover, our findings contribute to the broader literature on organizational classifications. [Meyer et al. \(1993, 1180\)](#) summarize this literature as follows:

“... from Weber’s (1947) notions of charisma, traditionalism, and bureaucracy, through Burns and Stalker’s (1961) distinction between mechanistic and organic structures, to [Mintzberg’s \(1979\)](#) distinctions between simple structure, machine bureaucracy, professional bureaucracy, divisionalized form, and ‘ad hoc’racy.’ Understanding all of these classification schemes, and many others, is the attempt to understand organizational diversity through typologies and taxonomies.”

Our project opens up various possibilities for future research. In this study, we have some information of specific dimensions of performance, but we do not have access to more complete performance data. We have assumed that units are making directionally appropriate decisions and that the four empirically identified patterns of control represent stable, perhaps even ideal, types of balance. Further empirical examination could shed insights on this assumption and the “ideal” state of balance. Our examination includes the interactive and diagnostic uses of performance measurement systems, belief systems as well as a primary focus on business conduct boundaries. Future research could delve more deeply into the control package by providing insights on the diagnostic and interactive uses of other control systems and/or the other levers, as well as including strategic boundaries. In addition, future research that examines additional contextual factors could enhance the description of the four clusters and provide further empirical evidence on the appropriateness of the labels. Finally, longitudinal research could shed insights on how units change balance over time and the determinants thereof. For example, it would be insightful to see if units classified as strategic responsiveness migrate over time to strategic exploitation. Understanding the how and why of this migration would provide interesting and important insights.

Acknowledgements

We are indebted to our students in the Nyenrode MSc in Controlling program for their invaluable help in collecting the data. This paper has benefited from insightful comments and suggestions from two anonymous reviewers and Theresa Libby (the associate editor). We gratefully appreciate helpful comments from David Bedford, Chris Chapman, Murray Lindsey, Jan Mouritsen, Julia Mundy, David Otley, Breda Sweeney, and the participants at the 2014 MAS research conference in Orlando, Florida, and the 2014 New Directions in Management Accounting conference in Brussels, Belgium.

Appendix A.*Abbreviated survey questions, item-level descriptives, and factor analysis results**Beliefs*

	Mean (1–7)	s.d.	Factor loadings
Our mission statement clearly communicates the organization's core values to our workforce	5.115	1.388	0.845
Higher management communicates core values to our workforce	4.935	1.275	0.844
Our workforce is aware of the organization's core values	4.613	1.297	0.799
Our mission statement inspires our workforce	4.207	1.294	0.852

Boundaries

	Mean (1–7)	s.d.	Factor loadings
Our organization relies on a code of business conduct to define appropriate behavior for our workforce	5.465	1.266	0.872
Our code of business conduct informs our workforce about behaviors that are off-limits	5.373	1.324	0.861
Our organization communicates to our workforce risks that should be avoided	5.323	1.297	0.803
Our workforce is aware of the organization's code of business conduct	5.028	1.291	0.862

Diagnostic Control Systems (DCS)

	Mean (1–7)	s.d.	Factor loadings
Please rate the extent to which higher management (including your supervisor) currently relies on your business unit performance measures (e.g., KPIs) to:			
Track progress towards goals	5.581	1.052	0.784
Monitor results	5.880	0.968	0.798
Compare outcomes to expectations	5.594	1.123	0.802
Evaluate performance on key measures (KPIs)	5.359	1.225	0.784

Interactive Control Systems (ICS)

	Mean (1–7)	s.d.	Factor loadings
<i>Strategic orientation</i>	4.453	1.288	
Please rate the extent to which higher management (including your supervisor) currently relies on your business unit performance measures (e.g., KPIs) to:			
Signal key strategic areas for improvement	4.539	1.478	0.831
Signal new strategic challenges we need to face	4.309	1.500	0.917
Discuss the impact of potential changes in our competitive environment	4.512	1.482	0.850
<i>Managerial involvement</i>	4.044	1.251	
Please indicate the extent to which you agree or disagree with the following statements concerning your business unit performance measures:			
Higher management pays day-to-day attention to my performance measures	3.281	1.655	0.830
Higher management interprets information from my performance measures	4.806	1.350	0.830
<i>Facilitating use</i>	4.891	0.989	
Please rate the extent to which higher management (including your supervisor) currently relies on your business unit performance measures (e.g., KPIs) to:			
Enable discussion in meetings of supervisors, subordinates and peers	5.106	1.211	0.748
Provide a shared view of the organization	4.959	1.252	0.787
Tie the organization together	4.719	1.361	0.845
Enable the organization to focus on common issues	4.912	1.208	0.810
Develop a common vocabulary in the organization	4.760	1.294	0.717

External environment: uncertainty

	Mean (1–5)	s.d.	Factor loadings
How often do external factors substantially influence your BU's performance?	3.783	0.935	0.793
The BU often needs to react to outside pressure	3.963	0.962	0.830
Making long-range plans for my BU is hindered by the difficulty of predicting future events	3.244	1.179	0.670

Technology: goal clarity

	Mean (1–5)	s.d.	Factor loadings
How clearly defined are the goals of this BU	4.205	0.681	0.796
How specific are the goals of this BU	3.995	0.736	0.782
Reversed scored: How easy is it to explain the goals of this BU to outsiders	3.885	0.770	0.557
The goals of my BU are clear to (almost) everyone who works in this BU	3.986	0.920	0.704

Technology: measurability

	Mean (1–5)	s.d.	Factor loading
Can the outputs/outcomes of the business unit be measured objectively and expressed in a number?	0.000	1.000	0.683
To what extent do performance measures relate to the true goals of your business unit?	0.000	1.000	0.795
The total of performance measures reflects which results my business unit has to get	0.000	1.000	0.772
The performance measures of my business unit are linked clearly to the goals of my organization	0.000	1.000	0.732

Technology: interdependencies

	Mean (1–5)	s.d.	Factor loadings
To what extent do your BU's actions impact on work carried out in other units of your firm?	3.226	1.050	0.921
To what extent do actions of other units of your firm impact on work carried out in your BU?	3.212	1.037	0.921

Structure: decentralization

Compared to higher management, how much say or influence do you have in the following decisions?	Mean (1–7)	s.d.	Factor loadings
Strategic decisions (e.g., business unit strategy, development of new products)	4.074	1.582	0.765
Investment decisions (e.g., buying new equipment, financing investment projects)	3.922	1.647	0.763
Marketing decisions (e.g., setting prices, selecting markets/customer groups)	4.481	1.701	0.719
Decisions on internal processes (e.g., setting production/sales priorities, resource allocation)	5.244	1.404	0.692
Human resources decisions (e.g., selection and training, employee career paths)	5.438	1.231	0.625

Structure: leadership style

Your supervisor:	Mean (1–7)	s.d.	Factor loadings
<i>Considerate style</i>			
Tries out his/her ideas in the group	4.922	1.336	0.584
Takes suggestions made by the business unit managers seriously	5.512	0.987	0.666
Makes his/her attitudes clear to the group	5.493	1.063	0.544
Treats all business unit managers as his/her equal	4.696	1.469	0.679
Gives advance notice of changes	4.742	1.261	0.756
Looks out for the personal welfare of business unit managers	4.696	1.388	0.702
Lets the business unit managers know what is expected of them	5.415	1.056	0.620
<i>Initiating structure</i>			
Encourages the use of uniform procedures	4.714	1.351	0.796
Assigns business unit managers to particular tasks	4.825	1.246	0.590
Schedules the work to be done	3.157	1.559	0.650
Maintains definite standards of performance	4.435	1.376	0.743
Asks that business unit managers follow standard rules and regulations	4.562	1.496	0.846

Strategy

How important are the following dimensions for your business unit?	Mean (1–7)	s.d.	Factor loadings
<i>Low cost-low price</i>			
Low production costs	3.885	1.050	0.861
Low price	3.350	1.079	0.861
<i>Differentiation</i>			
Provide high quality products	4.636	0.668	0.583
Provide unique product features/services	3.908	1.072	0.723
Make changes in design and introduce new products/services quickly	3.691	1.059	0.779
Make rapid volume and product mix changes	3.373	1.099	0.648
Customize products and services to customer needs (dropped because of high cross-loadings)			
<i>Delivery & service</i>			
Provide fast delivery	4.037	0.860	0.674
Make reliable delivery promises	4.585	0.588	0.674
Provide effective after-sales service and support	4.014	0.979	0.652
Availability of products/services we deliver	4.161	0.859	0.658

Organizational culture

	Mean (1–7)	s.d.	Factor loadings
<i>Group culture</i>			
A team environment describes my work environment	5.452	1.126	0.539
Loyalty is important in my work environment	5.558	1.057	0.823
Morale is important in my work environment	5.346	1.120	0.835
<i>Developmental culture</i>			
An entrepreneurial environment describes my work environment	4.691	1.392	0.735
In my work environment one is committed to innovation	4.465	1.408	0.812
In my work environment one is ready to meet new challenges	5.120	1.124	0.830
<i>Hierarchical culture</i>			
A bureaucratic environment describes my work environment	3.804	1.230	
My work environment is structured around formal policies	3.424	1.486	0.879
4.184	1.473	0.879	
<i>Rational culture</i>			
My work environment emphasizes goal accomplishment	5.535	0.829	
5.452	0.922	0.833	
There is a sense of stability in my work environment	5.618	1.066	0.833

Performance: search for new strategic capabilities

	Mean (1–7)	s.d.	Factor loadings
Able to sense the need for strategic change	4.991	1.194	0.917
Able to seek new capabilities in light of the need for strategic change	4.751	1.256	0.917

Performance on strategic dimensions

How well does your business unit perform relative to competitors?	Mean (1–5)	s.d.	Factor loadings
<i>Performance: low cost–low price</i>			
Low production costs	2.892	0.913	0.856
Low price	2.757	0.889	0.856
<i>Performance: Differentiation</i>			
Provide unique product features/services	3.435	0.857	0.733
Make changes in design and introduce new products/services quickly	3.355	0.831	0.744
Make rapid volume and product mix changes	3.165	0.835	0.752
Provide high quality products (dropped because of high cross-loadings)			
Customize products and services to customer needs (dropped because of high cross-loadings)			
<i>Performance: delivery & service</i>			
Provide fast delivery	3.463	0.797	0.702
Make reliable delivery promises	3.570	0.818	0.776
Provide effective after-sales service and support	3.435	0.830	0.704
Availability of products/services we deliver	3.495	0.717	0.681

Appendix B.*Description of cluster analysis*

Purpose	Test/Application	Results
First stage of cluster analysis	Ward's method (minimizes within-group variance; returns approximately equally sized, compact clusters (Hair et al., 2010).	Choose a four cluster solution which we corroborate using the agglomeration coefficients method (see for instance, Hair et al. 2010, 537).
Validate the initial cluster solution	Discriminant analysis and leave-one-out cross validation. ¹⁴	Shows that all four levers have a significant score in the discriminant functions that explain group membership. Moreover, using leave-one-out cross validation returns a strong result: 88.5% of cases are correctly classified. This suggests that the four-group solution has satisfactory discriminant properties.
Second stage of cluster analysis	K-means cluster analysis using the centroids from the initial Ward's cluster solution as seeds.	The results show agreement on group membership across both methods (Ward's and K-means) in 85.25% of the cases. A solution is considered stable when the agreement on group membership ranges from 80% to 90% of the cases (Hair et al., 2010, 540).
Robustness check on the K-means cluster analysis	Use extreme seeds; use cases that strongly emphasize just one of the four levers as seeds.	Since these cases are rare and different from the other observations in the sample, this procedure will maximize the probability of arriving at a different clustering outcome. This procedure, however, results in agreement in group membership for 82.95% of cases, in spite of the different seeds. A comparison with the initial Ward's solution shows agreement of cluster membership for 71.43% of cases. Therefore, we conclude at this stage that the cluster analysis results are remarkably stable.
Validate cluster solution	Split the sample in two and rerun the analysis ¹⁵ (i.e., Ward's cluster analysis and the K-means alternative).	For subsample 1 we again find a cluster solution with four groups. These are the same groups as in the initial solution and there is agreement on group membership in 92.85% of cases. Random sample 2 also returns the same result as the cluster analysis with the complete sample: we again find the same four groups and there is agreement on group membership in no less than 98% of the cases. These results could have been quite different, considering that cluster analysis outcomes are known to be sensitive to individual observations (Hair et al., 2010).
Robustness test for firm effects	Apply the Ward's method hierarchical cluster analysis pre-specifying a four-group solution for the 184 (85% of the sample; 91 unique firms) respondents who revealed their identity; perform a cross-tabulation of firms and clusters.	We find agreement on group membership for the full sample and the unique firm sample in 69.3% of the cases. This result qualifies as moderately stable (Hair et al., 2010, 540). The cross-tabs shows that typically, cases from the same firm are spread over different clusters. For only four firms we find that their cases end up in only one cluster. For three of these firms this implies that both the BUs fall into the same cluster, one firm has all three cases in one cluster. These findings lead us to conclude that the cluster analysis results are not driven by firm effects.

¹⁴ In leave-one-out cross validation k-1 subsamples are generated for which a discriminant function is estimated leaving out one observation at a time. Group membership for the observation that has been left out is predicted based on this function. The procedure is repeated for each observation at a time and an overall hit ratio for predicted group membership is calculated (see Hair et al. 2010, p374).

¹⁵ This random split results in two subsamples that are approximately equal in size: subsample 1 holds 112 observations, subsample 2 holds 105 observations.

References

- Abernethy, M.A., Bouwens, J., van Lent, L., 2004. Determinants of control system design in divisionalized firms. *Account. Rev.* 79, 545–570.
- Abernethy, M.A., Bouwens, J., van Lent, L., 2010. Leadership and control system design. *Manage. Account. Res.* 21, 2–16.
- Bedford, D.S., Malmi, T., 2015. Configurations of control: an exploratory analysis. *Manage. Account. Res.* 27, 2–26.
- Bisbe, J., Batista-Foguet, J., Chenhall, R., 2007. Defining management accounting constructs: a methodological note on the risks of conceptual misspecification. *Account. Organ. Soc.* 32, 789–820.
- Bruining, H., Bonnet, M., Wright, M., 2004. Management control systems and strategy change in buyouts. *Manage. Account. Res.* 15, 155–177.
- Burns, T., Stalker, G.M., 1961. *The Management of Innovation*. Tavistock Publications, London.
- Cao, Q., Gedajlovic, E., Zhang, H., 2009. Unpacking organizational ambidexterity: dimensions, contingencies, and synergistic effects. *Organ. Sci.* 20, 781–796.
- Cameron, K.S., Quinn, R.E., 1999. *Diagnosing and Changing Organizational Culture, Based on the Competing Values Framework*. Addison Wesley.
- Chang, S.-J., van Witteloostuijn, A., Eden, L., 2010. From the Editors: Common method variance in international business research. *J. Int. Bus. Stud.*, 178–184.
- Chenhall, R.H., 2003. Management control systems design within its organizational context: findings from contingency-based research and directions for the future. *Account. Organ. Soc.* 28, 127–168.
- Chenhall, R.H., 2005. Integrative strategic performance measurement systems, strategic alignment of manufacturing, learning and strategic outcomes: an exploratory study. *Account. Organ. Soc.* 30, 395–422.
- Chenhall, R.H., Morris, D., 1986. The impact of structure, environment, and interdependence on the perceived usefulness of management accounting systems. *Account. Rev.* 61, 16–35.
- Dekker, H.C., Groot, T., Schoute, M., 2013. A balancing act? The implications of mixed strategies for performance measurement system design. *J. Manage. Account. Res.* 25, 71–98.
- Doty, D.H., Glick, W.H., 1994. Typologies as a unique form of theory building: Toward improved understanding and modeling. *Acad. Manage. Rev.* 19, 230–251.
- Drazin, R., Van de Ven, A.H., 1985. Alternative forms of fit in contingency theory. *Admin. Sci. Q.* 30, 514–539.
- Edwards, J.R., 2001. Multidimensional constructs in organizational behavior research: an integrative analytical framework. *Organ. Res. Methods* 4, 144–192.
- Ezzamel, M., 1990. The impact of environmental uncertainty, managerial autonomy and size on budget characteristics. *Manage. Account. Res.* 1, 181–197.
- Ferreira, A., Otley, D., 2009. The design and use of performance management systems: an extended framework for analysis. *Manage. Account. Res.* 20, 263–282.
- Galbraith, J., 1973. *Designing Complex Organizations*. Addison-Wesley Publishing Company, Reading, MA.
- Gerdin, J., Greve, J., 2004. Forms of contingency fit in management accounting research: a critical review. *Account. Organ. Soc.* 29, 303–326.
- Gordon, L.A., Narayanan, V.K., 1984. Management accounting systems, perceived environmental uncertainty and organization structure: an empirical investigation. *Account. Organ. Soc.* 9, 33–47.
- Grabner, I., Moers, F., 2013. Management control as a system or a package? Conceptual and empirical issues. *Account. Organ. Soc.* 38, 407–419.
- Grafton, J., Lillis, A.M., Widener, S.K., 2010. The role of performance measurement and evaluation in building organizational capabilities and performance. *Account. Organ. Soc.* 35, 689–706.
- Gupta, A.K., Smith, K.G., Shalley, C.E., 2006. The interplay between exploration and exploitation. *Acad. Manage. J.* 49, 693–706.
- Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., 2010. *Multivariate data analysis. In: A Global Perspective*, seventh ed. Pearson Prentice Hall, Upper Saddle River, NJ.
- Hak, T., van der Veer, C.G., Jansen, H., 2008. 'The three-step test- interview (TSTI): an observational instrument for pretesting self-completion questionnaires'. *Survey Res. Methods* 2, 143–150.
- Heinicke, A., Guenther, T.W., Winder, S.K., 2015. An examination of the relationship between the extent of a flexible culture and the levers of control system: the key role of beliefs control. *Work. Pap.*
- Henri, J.F., 2006. Management control systems and strategy: a resource-based perspective. *Account. Organ. Soc.* 31, 529–558.
- Hill, C.W.L., Hitt, M.A., Hoskisson, R.E., 1992. Cooperative versus competitive structures in related and unrelated diversified firms. *Organ. Sci.* 3, 501–521.
- Kalleberg, A.L., Knoke, D., Marsden, P.V., Spaeth, J.L., 1996. *Organizations in America: Analyzing Their Structures and Human Resource Practices Based on the National Organizations Study*. Sage Publications, Inc., Thousand Oaks, CA.
- Keating, A.S., 1997. Determinants of divisional performance evaluation practices. *J. Account. Econ.* 24, 243–273.
- Kennedy, F.A., Widener, S.K., 2008. A control framework: Insights from evidence on lean accounting. *Manage. Account. Res.* 19, 301–323.
- Ketchen Jr., D.J., Shook, C.L., 1996. The application of cluster analysis in strategic management research: an analysis and critique. *Strat. Manage. J.* 17, 441–458.
- Kruis, A., 2008. *Management Control Systems Design and Effectiveness*. Nyenrode Business University, Breukelen.
- Lee, M., Widener, S.K., 2013. Culture and management control systems in today's high performing firms. *Management Accounting Quarterly* (winter).
- Lee, M., Widener, S.K., 2015. The performance effects of using business intelligence systems for exploitation and exploration learning. *J. Inf. Syst. (Online In Press-September 2015)*.
- Lee, C., Yang, H., 2011. Organization structure, competition and performance measurement systems and their joint effects on performance. *Manage. Account. Res.* 22 (2), 84–104.
- Macintosh, N., Daft, R.L., 1987. Management control systems and departmental interdependencies: an empirical study. *Account. Organ. Soc.*, 23–48.
- MacKenzie, S.B., Podsakoff, P.M., Podsakoff, N.P., 2011. Construct measurement and validation procedures in MIS and behavioural research: integrating new and existing techniques. *MIS Q.* 35, 292–334.
- Malmi, T., Brown, D.A., 2008. Management control systems as a package—opportunities, challenges and research directions. *Manage. Account. Res.* 19, 287–300.
- March, J.G., 1991. Exploration and exploitation in organizational learning. *Organization Science* 2, 71–87.
- Meyer, A.D., Tsui, A.S., Hinings, C.R., 1993. Configurational approaches to organizational analysis. *Acad. Manage. J.* 36, 1175–1195.
- Miles, R.E., Snow, C.C., 1978. *Organizational Strategy, Structure, and Process*. McGraw-Hill, New York.
- Milgrom, P., Roberts, J., 1995. Complementarities and fit: Strategy, structure, and organizational change in manufacturing. *J. Account. Econ.* 19, 179–208.
- Miller, J.G., Meyer, A., Nakane, J., 1992. *Benchmarking Global Manufacturing: Understanding International Suppliers, Customers and Competitors*. Irwin, Homewood, IL.
- Mintzberg, H.T., 1979. *The Structuring of Organizations*. Prentice-Hall, Englewood Cliffs, NJ.
- Mintzberg, H.T., 1983. *Structure in Fives: Designing Effective Organizations*. Prentice-Hall, Englewood Cliffs, NJ.
- Mundy, J., 2010. Creating dynamic tension through a balanced use of management control systems. *Account. Organ. Soc.* 35, 499–523.
- Ouchi, W., 1977. The relationship between organisational structure and organisational control. *Adm. Sci. Q.* 22, 95–113.
- Ouchi, W.G., 1980. Markets, bureaucracies, and clans. *Adm. Sci. Q.* 25, 129–141.
- Podsakoff, P.M., MacKenzie, S.B., Lee, J., Podsakoff, N.P., 2003. Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J. Appl. Psychol.* 88, 879–903.
- Rainey, H.G., 1983. Public agencies and private firms: incentive structures, goals, and individual roles. *Adm. Soc.* 15, 207–242.
- Raisch, S., Birkinshaw, J., 2008. Organizational ambidexterity: antecedents, outcomes, and moderators. *J. Manage.* 34, 375–409.
- Raisch, S., Birkinshaw, J., Probst, G., Tushman, M.L., 2009. Organizational ambidexterity: balancing exploitation and exploration for sustained performance. *Organ. Sci.* 20, 685–695.
- Sandelin, M., 2008. Operation of management control practices as a package—a case study on control system variety in a growth firm context. *Manage. Account. Res.* 19, 324–343.
- Short, J.C., Payne, G.T., Ketchen, D.J., 2008. Research on organizational configurations: past accomplishments and future challenges. *J. Manage.* 34, 1053–1079.
- Simons, R., 1994. How new top managers use control systems as levers of strategic renewal. *Strat. Manage. J.* 15, 169–189.
- Simons, R., 1995. *Levers of Control*. Harvard Business School Press, Boston.
- Simsek, Z., Heavey, C., Veiga, J.F., Souder, D., 2009. A Typology for aligning organizational ambidexterity's conceptualizations, antecedents, and outcomes. *J. Manage. Stud.* 46, 864–894.
- Speklé, R.F., 2001. Explaining management control structure variety: a transaction cost economics perspective. *Account. Organ. Soc.* 26, 419–441.
- Speklé, R.F., H.J. van Elten and S.K. Widener (2014). *Creativity and control: a paradox. Evidence from the Levers of Control Framework*. Working Paper.
- Speklé, R.F., Verbeeten, F.H.M., 2014. The use of performance measurement systems in the public sector: effects on performance. *Manage. Account. Res.* 25, 131–146.
- Stogdill, R.M., Coons, A.E., 1957. *Leader behavior: its description and measurement. In: Columbus Bureau of Business Research*. Ohio State University, Columbus.
- Sweeney, B., Curtis, E., Martyn, P., 2012. *Challenges in the application of Simons' Levers of Control Framework*. Working paper.
- Tessier, S., Otley, D., 2012. A conceptual development of Simons' levers of control framework. *Manage. Account. Res.* 23, 171–185.
- Thompson, J.D., 1967. *Organizations in Action*. McGraw Hill, New York.
- Tuomela, T., 2005. The interplay of different levers of control: a case study of introducing a new performance measurement system. *Manage. Account. Res.* 16, 293–320.
- Van der Stede, W.A., Young, S.M., Chen, C.X., 2005. Assessing the quality of evidence in empirical management accounting research: the case of survey studies. *Account. Organ. Soc.* 30, 655–684.
- Van Elten, H.J., 2012. *Relative Performance Evaluation in Management Control: Explanations and Evidence for RPE Use and Effectiveness*. Nyenrode Business University, Breukelen.
- Widener, S.K., 2007. An empirical examination of the levers of control framework. *Account. Organ. Soc.* 32, 757–788.