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Management Control and the Influence of Firm Characteristics

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Abstract

Five key words: Management control systems, Simons' Levers of Control, Firm characteristics, Strategy, External environment

Purpose: This study examines the effect of different firm characteristics on the management control of firms. The study uses Simons' levers of control framework to investigate how the different control systems are used depending on different firm characteristics.

Methodology: The paper is based on a single questionnaire sent to firms using strategic random sampling approach in Norway and Sweden. The questions used to collect data is previously validated by previous research (Bedford, 2015; Bedford & Malmi, 2015; Bedford et al. 2016; Kruis et al. 2016; Malmi et al. 2020).

Theoretical perspective: The theoretical framework is devolved from existing theory within firm characteristics and management control. More specifically firm characteristics (Chenhall, 2003; Williams & Seaman, 2001; Speckbacher & Wentges 2012; Wijnbenga et al. 2003; Graves et al. 1990; OECD, 1996) and usage of Simons' (1994) Lever of Control (Bedford, 2015; Bedford & Malmi 2015; Bedford et al. 2016; Kruis et al. 2016; and Malmi et al. 2020).

Empirical foundation: The data for this study was collected through a survey mapping out how the top management of 36 different firms balance their levers of control.

Conclusion: The results illustrates that the prioritization of the levers is very similar when analyzing the different characteristics, however, the balancing of the levers is most interesting when analyzing our data. The results found are in line as well as contradicting with that of previous research. Small firms are found to use high levels of diagnostic control systems and belief systems, instead of more personal and interactive control systems as shown by previous researchers. A low level of boundary systems is found for large, governmental, complex, and hostility firms, where previous research suggest this control system to have a high usage. Firms using a product differentiation strategy should according to previous research show high usage of interactive control systems, which is not found in our research.

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1 Introduction

1.1 Background

Managing a firm is a complex and demanding task, nevertheless, there are several managers that have found their managing style and their own recipe for success. There has been much research conducted in management control (MC) and strategy, where the contingency approach has been used (Bedford et al. 2016). Whereas the research has often been successful in identifying relations between MC and strategy, developing an understanding of choices and consequences have however undergone little progress (Bedford et al. 2016). Our research is also following the long tradition of using the contingency approach for researching management accounting (Grabner & Moers, 2013). What might make contingency research so widely used can be partially due to the assumption that there is no overall singular best way to organize, and that one way of organizing is not equally effective under different conditions (Ginsberg & Venkatraman, 1985). Elaborating on this contingency-based research theory, we can assume that though one way of balancing the framework suits one firm, this does not necessarily mean it will suit another firm. There has been an emerging stream of research that has revealed how management control systems (MCS) might play a central role in explaining how management of innovation works (Bedford, 2015).

Even though there are many different MCS, we have in this paper chosen to focus on Simon's Levers of Control (LOC) framework (Simons, 1994). In our research we are using all four levers that constitute this framework, hence diagnostic control system, interactive control system, boundary system and belief system. The reason for this being that these levers should not be used individually (Simon, 1995), and that "dynamic tension generated from the interplay between opposing levers are necessary to effectively balance competing strategic priorities" (Bedford, 2015, p.26). The strength of the framework lies in how the four levers work together in a complementing manner to achieve balance whilst also creating tensions. In our research, we want to take a closer look at several different firm characteristics to achieve a more comprehensive understanding of what impact these may have on management control through the Simons LOC framework. We have studied several articles, to get a better understanding of which firm characteristics that potentially can influential the balance of MCS (Bedford, 2015; Bedford & Malmi, 2015; Bedford et al, 2016; Kruis et al. 2016; Malmi, 2020). The five firm characteristics that we found to

potentially have an influence on the balance of the LOC framework are industry, size, ownership, strategy, and external environment in the form of predictability, complexity, and hostility.

Even though Kruijs et al (2016) have conducted research on the balance of MCS, there is still a need for further research regarding the balancing of MCS. We are conducting our research on the balance of the LOC framework with the influence of firm characteristics with the contingency theory approach. In the following paper, we will look further into how firms are balancing and managing their firm to achieve an understanding of how different firm characteristics may influence this balance. It is important to mention that even though we are not measuring performance, however, our goal is to get an understanding of how firms are balanced, and that this knowledge may contribute to providing optimized conditions for future firms.

1.2 Purpose

The purpose of this study is to investigate how different firm characteristics influences the balancing and usage of the levers of control. Through our research we seek to contribute to a greater knowledge of how different firm characteristics influence the balance of the control systems, and if there are any significant differences. Currently, the research regarding the influence of different firm characteristics on the whole LOC framework and its balancing and usage is very limited. This makes our research contribute to achieving and developing a greater understanding of management control based on the whole LOC framework and how it may be affected under different conditions.

1.3 Outline of the thesis

To provide an overview of how the remainder of the thesis is structured, an outline of the contents is presented. Section 2 contains literature reviews where the most central and relevant literature to our study is presented, together with the framework used for this thesis. Section 3 presents the method. It contains an overview of how we conducted the research together with a description of how the survey was designed, how the data was collected, and the variable measurements. Section 4 presents the findings from our study and discusses the different patterns within the different groups observable from the results as well as an analysis of the results from our survey. Section 5 contains a discussion and concluding remarks, with a summary of the findings together with an overview of the contributions, limitations of our research and suggestions for future research.

2 Literature review

2.1 Simons levers of control

Back in 1987, Simons found evidence for different usage of control systems depending on the strategy followed by different firms, however, with a less developed typology of strategies than today using prospector and defender (Simons, 1987). In 1990 Simons introduced Interactive and diagnostic control systems (Simons, 1990) and studied the managerial usage of these two control systems (Simon, 1991). Simons found that as the attention within organizations are limited, top managers only made a few important systems interactive. This allows for top managers to signal where to focus the attention and organizational learning, and control new emergent strategies (Simons, 1991). In 1994, Simons researched the causal relationship between MCSs and strategy, and constructed a framework referred to as Simons Levers of Control (Simons, 1994). The levers of control that are part of Simon's framework are belief systems, boundary systems, diagnostic control systems and interactive control systems. The starting point for the design of the belief, boundary, diagnostic and interactive control systems vary with analyzing the core values, risks to be avoided, analyzing critical performance variables, and strategic uncertainties, respectively. Management control systems are described as:

“The formal, information-based routines and procedures used by managers to maintain or alter patterns in organizational activities” (Simons, 1994, p.170).

In his article Control in the Age of Empowerment (1995), Simons writes about the conflict between creativity and control. The author mentions that a lot of managers tend to define controls narrowly and rely on diagnostic control systems to see their results compared to predefined plans. However, the usage of the other three parts of MCSs are equally important according to Simons.

2.1.1 Diagnostic control systems

As explained by Simons (1994), diagnostic control systems can be described as formal feedback systems used to monitor and alter deviations from set performance targets. Diagnostic control systems are typically used in the form of budgets or types of performance measurement systems. However, diagnostic control systems alone are not enough to ensure effective control over the organization, instead they increase the pressure on employees that are both rewarded and held accountable based on these performance targets (Simons, 1995). Employees that are exposed to

this pressure to perform without any other control systems in place may and have historically resulted in fraudulent behaviors that can prove highly costly for organizations. According to Simon (1995), to counterbalance the tension that arises with these pressures and temptations of fraudulent behavior managers must communicate the values and beliefs they want their employees to embrace as well as set boundaries for their employees.

2.1.2 Belief systems

Belief systems are formal systems used to define and communicate the organizational values, purpose, and direction. These are typically communicated through, i.e., a mission statement (Simons 1994). Belief systems are designed to be broad and appeal to all employees within the organization. The broad and inspirational design of the system is often met with critique for its lack of matter; however, the meaning of the belief system is to inspire employees to commit to the core values (Simons, 1995). It is important that managers use the mission statement as living documents, to make sure employees feel that the stated values are truly meaningful for the organization, otherwise there could be doubts amongst the employees. The usage of belief systems has become increasingly important as today's firms often are larger and more decentralized. Having an improper belief system may result in employees feeling a lack of direction within the organization. Belief systems help employees in the creation of new opportunities. A clearly stated purpose and mission allows for the employees to come up with new ideas that may help the organization gain a competitive advantage.

2.1.3 Boundary systems

Boundary systems are formal systems used to set limits and rules that must be followed within the organization (Simons, 1994). The way these limits and rules are formulated are typically in a negative manner, and can take form as i.e., codes of conduct. The boundary system, which is designed to inform employees what not to do, functions as the organization's brakes (Simons, 1995). Instead of creating operating standard procedures that will harm the entrepreneurial process of employees, boundary systems are used to allow for emergent strategies to take form, within certain limits. However, the usefulness of boundary systems is, as Simons shows in his article not always obvious to managers. He describes that most of the boundaries set by managers take place after a severe crisis has taken place within the organization. In other words, after the damage has

already been done. If managers use boundary systems effectively however, they can prevent crises within the organization. Simons states that belief and boundary systems have a yin and yang relationship, together they empower the search for new opportunities while discipline employees that perform actions that are outside of the organization's boundaries.

2.1.4 Interactive control systems

The last control system, interactive control systems, are used by managers to focus attention continuously and personally on activities of subordinates (Simons, 1994). As mentioned by Simons in his article, any type of diagnostic control systems can be made interactive if the top managers focus attention and continuously have a dialog with subordinates and others. Interactive control systems are used by top managers to share information and discuss creative ideas that may result in future competitive advantages (Simons, 1995). By making a control system interactive, managers focus their attention and get involved in the decision-making of subordinates. Simons describes four characteristics that make interactive different from diagnostic control systems. It focuses on continuously changing information labeled as strategically important by managers. The information needs frequent and continuous attention due to its significance, the information collected by the system is most effectively interpreted by having a dialog with others, and lastly that the control system works as a catalyst for debates regarding data, assumptions, and action plans. Tracking strategic uncertainties using an interactive control system may prove a powerful tool for managers that can shape how an organization chooses to compete and act in the future. However, the system can look very different depending on the strategic uncertainties associated with the organizations core strategy.

2.1.5 Balancing the levers of control

According to Simons (1995), a clearly formulated belief system is a powerful source to get employees to see how they can add value to the organization. By having a proper belief system in place, employees know what the organization wants and stand for which can lead to new product innovation. The use of a boundary system sets clear boundaries for which the employees know not to override, however, without setting any standard operating procedures that harm new ways of reacting to problems that arise within or outside the organization. Diagnostic control systems then create more control as mentioned by Simon, using budgets, goals, and profit plans. Other than

setting appropriate goals and monitoring any deviations from targets, managers do not have to spend much time on this control system. This time aspect is appropriate for larger firms where the time available among the top managers are limited, which enables managers to focus their attention on the strategically significant information that is gathered through the interactive control systems. Together the four levers create powerful forces that strengthen each other, and through an effective use managers harness innovation and creativity without compromising with control.

Kruis et al. (2016) study the Simons LOC framework through a survey and analyze the balance between the levers. The four levers from Simons LOC have been criticized to be ambiguous and vague. However, the levers are not supposed to be used separately but balanced together (Simons, 1995). Simons LOC framework is an MCS that is about integrating the four levers to achieve control and predictability. A well-balanced control structure should be a helpful tool to support ambidexterity, where a firm can handle both predictable goal achievement as well as strategic renewal and innovation (Kruis et al. 2016). Finding the right balance between these four levers can be difficult.

The normal definition of balance is to equally distribute the weight onto the different relevant parts. In the case of this empirical study on the Simons LOC framework, balance has been defined as: “a limited number of configurations that include combinations of all four control levers that are internally consistent, but that is not necessarily equally emphasized” (Kruis et al. 2016, p.28). Therefore, a well-balanced use of the LOC framework does not necessarily need an equilibrium focus on the different parts of the framework, however, different parts need to be included to some degree. Support for this understanding is found in other studies, suggesting all four levers are necessary for the control package to be effective and work in dynamic tension (Bruining et al. 2004; Tuomela, 2005; Widener, 2007). The research on this joint use and balancing of Simons LOC framework suggests some beneficial outcomes for the organizations, such as organizational learning and performance (Widener, 2007), development of organizational capabilities (Mundy, 2010), and creativity (Speklé et al. 2017). There is still some silence about the right way to balance these four levers, but there might be interpreted some broad indications. This might be because of the potentially wide range of factors that can influence a firm's performance and finding one single balancing formula is impossible.

Further research has been conducted by Bedford (2015) where he has studied the use of MCSs across different modes of innovation. Firms can be divided into four different categories based on exploitation and exploration. These are non-innovating firms, exploratory innovation firms, exploitative innovative firms, and ambidextrous firms. A firm does not necessarily fall into one category; however, it can be leaning more toward one of these four (Bedford, 2015). He uses the Simon's LOC framework to investigate how top managers use the exploitation and exploration term. A common distinction between these two terms is exploitation entails "refinement and extension of existing competencies" (March, 1991, p.85) whereas exploration requires "experimentation with new alternatives" (March, 1991, p.85). When talking of innovation there are two ways to go. Inventing new products or inventing new ways to improve old solutions. This is the difference between exploring and exploiting.

Bedford (2015) connects the diagnostic control system and boundary system of Simons LOC framework to the exploitation focused firms. This is because these two control systems are relying on earlier financial results and limit employees to improve the efficiency of the existing processes and resources. Bedford (2015) connects interactive control systems and belief systems from Simons LOC framework to exploration firms. He finds support for interactive control systems having a positive association with performance for exploratory innovation firms, but he finds no support for a similar effect for belief systems.

Bedford and Malmi (2015) have also conducted a study on how management controls operate together as a package of interrelated mechanisms. Their research explores how the different accounting and control mechanisms, which they view as a component of a larger control package, are combined and the usage of these in relation to different firm characteristics. It is necessary to understand the effect of the external conditions together with internal components and how these behave in relation to each other. Using a broader control package which includes both internal and external firm characteristics this can provide a more comprehensive understanding of organizations.

Bedford and Malmi (2015) cluster firms on simple-, results-, action-, devolved- and hybrid control. These different clusters emphasize different aspects of MCS and have different firm characteristics which they need to handle. However, even if they are managing their firm differently, they can all provide great performance. When looking into how the several firm characteristics are affecting

the MCS. The analysis shows that the existing framework has much to contribute within contemporary practice, however, it also reveals the reality that organizations have a much more complex image that might be perceived as messy and confusing.

2.2 Characteristics

2.2.1 *Industry*

The term industry has been given an unambiguous meaning only when describing perfect competition and perfect monopoly according to microeconomic theory (Nightingale, 1978). Differing from these extremes is no theoretical concept where the term “industry” can be usefully applied. Although even if this is the case, the industry term is still widely used throughout the economic community. Further there are several different ways of describing what industry is, however, most commonly it is defined as “a group of firms that offer similar products or services” (Messner, 2016, p.104). To define industry in this manner can be contested because "similarity" is not an objective fact, but a matter of perspective and judgement (Messner, 2016).

The research conducted by Williams & Seaman, (2001) does provide 3 sectors, which are manufacturing, industrial and service. Where they look at management accounting and control systems (MACS) changes. For manufacturing, Williams & Seaman found a significant relationship between the variable number of changes in MACS, controlling and decision making, which they connect the significance to decreasing competition, more centralization and organizational capacity. Further, they find a significant effect in the industrial subsample for changes in MACS, costing and direct components. Where the significant effect is connected to centralization according to Williams & Seaman (2001). For the last sector, the service sector, Williams & Seaman found variance in the planning components which was significantly associated with the competition.

When we are defining the different groups in which this paper is dividing industries, we have the following definitions. Service industries have been defined as production of intangible products that cannot be stored and must be produced at time of consumption (Sundbo, 1994). Further, manufacturing can be defined as production of tangible products that can be stored, transported, and resold (Sundbo, 1994). Retail is the third and last industry group we have chosen to divide the

different participating firms in. The retail industry is defined as purchasing and reselling to consumers or end users, usually in smaller quantities than purchased (Stats.oecd, 2013).

2.2.2 *Size*

Firms that have undergone growth in size, tend to improve on efficiency. Larger firms often provide better opportunities for specialization and dividing of the workforce. A greater size can also provide the organization with more weight and influence in the industry, giving them a more advantageous position regarding controlling the environment in which the firm operates, to a higher extent. It may also provide the organization with the opportunity to mass-produce their product and hence decrease uncertainty (Chenhall, 2003).

However, larger firms measured by the number of employees place a greater demand on leader-responsibilities. This increased liability may lead to the implementation of company controls such as rules, documentation, or specialization of roles and functions (Child et al. 1972). Organizations that are great in size often have strong relations with their suppliers and customers. This can lead to the boundaries between the firm and supplier becoming blurred, which in turn can give third parties the perception that the firm constitutes a larger entity. Further, size will often provide the resources and opportunities for the organization to expand into a global operation. This can however bring additional administrative concerns due to the increased complexity of the production and management which will naturally follow from such an expansion (Chenhall, 2003).

Studies have identified two forms of control in connection to size: administrative with larger firms, and personal with smaller firms (Burns et al. 1975). The administrative control entails more sophisticated technologies, formalized operation procedures, high levels of specialists and work-related rules. The interpersonal control involved centralized decision making, giving individuals the perception of having more interaction on budget-related matters. This leads to individuals being more satisfied with the manager-employee relationship (Chenhall, 2003). Research suggests that size in relation to MCS, is that larger organizations are associated with more diversified operations, formalizations of procedures and specialization of functions (Chenhall, 2003).

2.2.3 *Ownership*

In our study, we are looking at different characteristics in relation to the Simons LOC framework. So, we have in the questionnaire asked about strategy, external environment and ownership or more precisely which owner is the most influential to the firm. A normal definition of ownership is “a legal way to possess an object”. However, we are looking at firms that usually have several owners together owning different stakes of the company and have different influences. Therefore, throughout our paper we are defining ownership as “the most influential entity in the firm”. We have chosen family-owned, government, larger institutional investors, and venture capitalists (VC) as our main categories for ownership.

2.2.3.1 *Family-owned firms*

Family-owned firms are firms where the main owner usually is the founding family. In situations where firms are family-owned, there might be a greater motivation to monitor the managers compared to if ownership is dispersed due to the personal involvement. In situations where every member of the top management team (TMT) is a part of the founding family, formal governance mechanisms might be redundant due to the possibility of a closed transfer of owner interests into management decisions (Fama & Jensen, 1983). There have been some speculations as to whether family-owned firms are one of the most efficient forms of organizational ownership as well as having significantly less exposure to agency costs compared to other ownerships (Becker, 1974; Daily & Dalton, 1992; Daily & Dollinger, 1992). However, there has also been argued that there are drawbacks to family-owned firms, such as using their position for private gains at the expense of minority shareholders (Anderson & Reeb, 2003; Gomez-Mejia et al. 2001; Villalonga & Amit, 2006) as well as the dynamic between family and non-family in the TMT can provoke subgroup conflicts harming the efficiency of the firm (Lau & Murnighan, 1998; Minichilli et al. 2010). Researchers have argued that the size of the firm has an impact on how effective informal and personal strategies are (Speckbacher & Wentges, 2012). They suggest that these strategies are more suited and effective for small firms. Therefore, is the proposed effect family involvement have in the TMT on larger firms significantly weaker and might not be any major differences for larger family-owned firms compared to larger non-family-owned firms.

2.2.3.2 *Venture capital firms*

“Venture capital plays a catalytic role in the entrepreneurial process, offering fundamental value creation that triggers and sustains economic growth and revival” (Wijbenga et al. 2003, p.231). VCs investing in a venture, normally claim a seat on the board of directors. These VCs are then often characterized as outside ownership and are in many cases investors with special expertise and useful network (Rosenstein et al. 1993). Because the VCs are active board members does it give them the influence and ability to follow what happens within the firm such as which strategy they are using and the results they are providing. There has been found that VCs have three different involvement strategies: the “Laissez-faire” group that is hardly involved, the “Moderates” group which is moderately involved and the “Close trackers” group which is highly involved (MacMillan et al. 1989, p.27). The active involvement of the VCs in the board might force the manager to do comprehensive research on the proposals before delivering them to the board (Wijbenga et al, 2003). Further, VCs can deliver special expertise as well as an outside perspective to help improve strategies and processes. This can be especially helpful for firms locked in a narrow way of thinking about strategy and decision-making processes (Baysinger & Hoskisson, 1990).

Previous studies conducted looking at the effect of VC investors on the decision-making process of the firms report that the VC plays an important role in financing start-ups, growing firms and especially within the fields of high technology (Cassar, 2004; Davila, Foster & Gupta, 2003; Hellman & Puri, 2002). VC investors have great power over important business areas, such as development, strategies, and management control (Silvola, 2008). Further VCs provides a lot of support for partner companies in which they have invested earlier. They are helping with developing business plans, supporting them with acquisitions, giving strategic advice in partnerships and designing human resources (Kaplan & Strömberg, 2001).

Previous research has also revealed that the external pressure VCs have on firms, drives the development of organizations to have more organized control processes and management accounting as well as control systems (Davila, 2005; Gorman & Sahlman, 1989; Granlund & Taipaleenmäki, 2005; Smith, 2005). Because the VCs usually actively monitor the progress of the organization, reliable control and reporting systems are required. This may also be connected to the physical distance VCs often have to the organization. VCs are interested in the budgeting, the processes and reporting systems which the organizations use to provide reports that presumably

are reliable. Instead of how they in the past mainly were only interested in the financial report that gave the VCs a narrow perception (Granlund & Taipaleenmäki, 2005).

2.2.3.3 Government ownership

Firms that are government-owned or most influenced by the government in Sweden have some characteristics and requirements compared to other firms. The fundamental objective of the Swedish system is that the Swedish citizens should have faith in central government activities. Therefore, the Swedish government has specific requirements that citizens should be able to examine them critically (Oecd-ilibrary, 1996). The decentralization of central government activities has been done with the goal of making the decision-making process closer to the individual citizens as well as making it more efficient. By law are agencies required to provide information regarding their activities upon request. This is something that must be safeguarded by the management controls.

Agencies owned by the government are required to follow their rules and regulations. Because the management team needs to follow these rules and regulations, this might make them more restricted compared to privately owned firms. Where privately owned firms should have more freedom should it be more predictable and secure working for government agencies. The government are also usually owners of socially important entities that do not necessarily earn money but are important to citizens.

2.2.3.4 Institutional ownership

Institutional owners have a different view than the other ownership forms. While family-owned has a personal relation, Government takes care of necessary agencies, VC focuses on growth and building up firms to be profitable is the institutional view more concerned on what is on the next quarter bottom line. Since institutional owners are investing to earn money quickly, this often provides them with a short-term time horizon. Short-term time horizons can make firms make management decisions that earn money quickly, however, might put them in a difficult situation in the future. Research has found several arguments making “a long-term focus, long investment period for research and development, product and market development, and capital equipment investment” (Graves et al. 1990, p.75) are very important for the competitiveness of firms. Based on this evidence, are companies with a short-term time horizon being provided with a worse base than organizations with a long-term time horizon.

2.2.4 *Strategy*

Using strategy correctly can be an important tool for managers to achieve a competitive advantage. Chenhall (2003) refers to strategy as a means for managers to use to influence the nature of the environment, technologies, structure, and culture. The strategy also plays an important role in how the organization manages criticism (Chenhall, 2003). It has been recognized in research that there are several strategic choices managers are expected to handle when managing an organization. Examples of such decisions are if the organization's current strategy leaves them too exposed to uncertainty risk, whether it would be more beneficial for the organization to have a different strategic approach to remove pressure from the environment, and if the organization's potential returns are proportional to the amount of risk the organization undertakes.

The balance between risk and payoff might change over time, especially for organizations working in markets with a high degree of competition, making strategy a factor the managers constantly need to be aware of. In this regard, copying the competitor's strategies can be unwise as strategies are customized to suit a specific organization and management. Hence, the effect may not be the same for the copying organization.

The research argues that firms must derive competitive advantages in one of two ways: product differentiation or low-cost production. Product differentiation refers to ensuring high customer satisfaction by providing superior quality, product flexibility, delivery, and product design. Low-cost production refers to firms competing in offering their products at the lowest price (Porter; 1980, 1985). Though Porter suggests firms should choose one of these two strategies, many firms will practice different hybrid solutions in which the two strategies are mixed. When firms are in pursuit of exploiting their different competitive advantages, they try implementing manufacturing processes and administrative functions that both fit and support their strategies. Versions of these manufacturing processes and administrative functions will most likely, to some degree, be taken to use by the competitors as well. Hence, when using broader philosophies like just-in-time and quality management, some firms may experience difficulties in defining and researching management techniques.

There are several ways management techniques can be classified, however in the articles written by Hayes et al. (1988), De Meyer et al. (1989) and Miller et al (1992), management techniques are

classified into broad categories. The categories are as follows: improving existing processes, quality systems, manufacturing systems innovations, integrating systems, team-based structures, and human resources management policies. Even though the functions and processes between competitors can be similar, the combination and management style may differ. Earlier research suggests that there is evidence for a link between strategy, cost control and performance evaluation (Chenhall, 2003).

Organizations using product differentiation strategies as their main strategy are focusing on satisfying customer needs for high-quality products, providing specialized design features, fast and reliable delivery as well as having effective post-sales support (Porter, 1980, 1985). Focusing on all these aspects makes the product differentiation a complex strategy that is both demanding for the employees and requires competence and knowledge to fulfill. In this regard, employees are more likely to develop a customer focus if there is a high degree of empowerment encouraged by the organization (Hamel & Prahalad, 1994). There are two different broad approaches organizations can use that may lead employees to a high degree of empowerment. These are team-based structures and human resource management (Chenhall & Langfield-Smith, 1998). These approaches constitute two different ways the organization can steer the employee to engage in helping the customers. The team-based structure encourages the employees to participate and take initiative and forces the workforce to cooperate and often requires team-members to take responsibility and ownership in their work. This may motivate and steer the employees to have coincident interests with the organization itself. Human resource management policies introduce and establish the organization's customer focus through environment and culture. The organization provides training and implements procedures to encourage the employees to have the same focus as the firm. Traditionally, it is unlikely that product differentiation strategic firms use financial accounting measures. The numbers provided from these financial measures are usually not sufficient and do not provide effective feedback (Chenhall & Langfield-Smith, 1998).

High performing low-price strategy firm are primarily focusing their time and energy on making their production as cost-efficient as possible. There are several methods used to increase cost-efficiency. Firms can downsize the operation to reduce cost quickly. However, some firms may need more long-term and permanent solutions to increase cost-efficiency. Such solutions can be new manufacturing processes or investing in new plants (Hamel & Prahalad, 1994), while other

firms may reorganize existing manufacturing processes to ensure cost-effective operations such as reducing non-value-adding activities (Hayes et al, 1988). Another path organizations may take to reduce cost, is outsourcing manufacturing to an external firm at a lower cost (Quinn & Hilmer, 1994). Outsourcing allows firms to reduce cost whilst keeping the required delivery standards and product quality.

Traditional accounting techniques, such as budgetary performance measures and variance analysis, suit low-price strategies particularly well (Kaplan & Johnson, 1987). Another widely promoted management accounting technique is activity-based. Activity-based techniques are provided to help managers understand the relation between their firm activities and costs. It can provide managers with useful information that can help with control, restructure existing processes, or even help managers to figure out new ways to achieve cost advantages (Cooper, 1995). Further, activity-based techniques can also help with business relations, such as relations with suppliers (Shank & Govindarajan, 1992). This can also lead to outsourcing of the production to improve cost efficiency for the low-price strategy firms.

2.2.5 External environment

The external environment is a reference to every outside factor affecting the organization, which the organization not necessarily are able to affect in any significant way. Different outside factors could be one of many that influence the management task and is what makes it so complex and challenging. Managers might need to be patient and see the whole picture to have a greater chance of being successful. Whereas managers not considering how these firm characteristics influence the firm will most likely have a more incomplete and inaccurate picture of the firm, which gives them a less informed base from which they are making the decision. While managers that have access to the right information increases the chance of making good decisions. Research has found support for the assumption that the greater the environmental complexity, the greater the level of planning extensiveness is needed (Elbanna & Child, 2007). It is limited how much the decision-maker can influence environmental variables. Research finds that internal firm characteristics such as firm size and type of ownership might have a more significant effect than environmental variables (Elbanna & Child, 2007).

To find sufficient results there is a need for a wider perspective and the use of several variables. The research has been unclear whether the environmental characteristics do have a significant influence or not. Firms are exposed to more than just what happens within the organization, they need to be aware of the external environment and able to handle changes (Chenhall, 2003). The external environment has been widely researched; however, the external environment is ever-changing and therefore can today's challenges be different from the past. When studying the external environment there are some distinctions that are important to consider. There is a difference between risk and uncertainty, while risk can be connected to a specific event occurring can uncertainty be defined as situations where probabilities cannot be predicted (Chenhall, 2003).

Uncertainty and risk do not provide a comprehensive description of the environment; however, studies have provided a useful taxonomy for environmental variables. These include turbulence (risky, unpredictable, fluctuating, ambiguous), hostility (stressful, dominating, restrictive), diversity (variety in products, inputs, customers), and complexity (rapidly developing technologies) (Khandwalla, 1977). These elements are what firms need to consider from the external environment. Arguably firms experiencing a very hostile environment have a different management style compared to firms dealing with uncertainty (Chenhall, 2003). Uncertainty is often connected to the usefulness of broad scope and timely information. Earlier research suggests there is a combination of budgetary controls and more interpersonal and flexible controls used to handle environmental uncertainty. Research has found a link between environmental uncertainty and the pressure to meet financial targets (Merchant, 1990), while environmental hostility has been strongly associated with meeting budgets (Otley, 1978) as well as been related to formal controls (Chenhall, 2003).

The past 20 years of research seem to confirm a link between handling uncertainty and a more open, externally focused, nonfinancial style of MCS. Studies, therefore, suggest that the more uncertainty the external environment has, the more open and externally focused the MCS should be (Chenhall, 2003). While complex and competing forms of the external environment have little research showing what is appropriate designs of MCS to assist managers. The hostile and turbulent external environment appears to be best assisted by formal and budgetary controls. Therefore, the more hostile and turbulent the external environment the greater the reliance on formal controls and an emphasis on traditional budgets.

3 Method

3.1 Research design

For our research, a survey with previously validated measures was considered the most useful way to gather information about the firm characteristics and usage of the control systems (Bedford, 2015; Bedford & Malmi, 2015; Bedford et al. 2016; Kruis et al. 2016; Malmi et al. 2020). Our study is conducted in two countries, Sweden, and Norway, and uses the same instruments and data collection procedures in both countries (Schaffer & Riordan, 2003). We use this information about the firm characteristics to analyze how they influence the usage of MCSs, more specifically, the Simon's levers of control framework (Simons 1994, 1995).

3.2 Survey

To capture various factors of firm characteristics our questionnaire gathered information about ownership, external environment, and strategy. Additional characteristics such as industry and size, were collected through the databases Retriever and Orbis. We have used previous research (Bedford, 2015; Bedford & Malmi, 2015; Kruis et al. 2016; Malmi et al. 2020) as a baseline for our questionnaire. Our survey was first created in English and then translated to Swedish and Norwegian, to make the survey instruments consistent in the two questionnaires. During the procedure of developing the survey, test-pilots representing our sample were used to provide feedback that were used to make the survey better for the respondents (Schaffer & Riordan, 2003). This also gave us an outside perspective on how the questionnaire was being perceived. Based on the feedback received from the test-pilots, we changed some of the Norwegian and Swedish translations to better capture the meaning from the original questions formulated in English.

When making the survey we decided to have questions with fixed answers measured on a Likert scale from 1 to 7, like previous research by Bedford (2015), Bedford and Malmi (2015), Kruis et al. (2016), and Malmi et al. (2020). A 1 to 7 Likert scale has been frequently used within this research, making the results easily comparable with past studies within this area. The usage of fixed answers is also suggested for the ease of use for participants as well as the comparability between results and between respondents from different groups, enabling an effective analysis of the results gathered (Bryman et al. 2019). As our scale ranges from "Not at all" to "Very high extent" for most of the questions, our respondents will easily be able to choose the response option most fitting for their firm.

3.3 Sampling and selection of participating companies

The stratified random sampling approach is suitable when the sample should be distributed by one or more stratifying criteria and the process of doing so is simple (Bell et al. 2019). Since the study uses both industry and size, in the form of employees, as a variable when analyzing the usage and balancing of the four levers of control a stratified random sampling approach was seen most suitable for our research. Through the Retriever & Orbis databases the option to sort companies based on NACE codes for different industries was available as well as the option to sort by number of employees. For Sweden and Norway, Retriever and Orbis were used respectively. The usage of a stratified random sampling enabled us to first sort companies based on NACE industry codes and size then randomly select companies to contact. Industry and size were the only variables that our stratified random sample could be based on since the other variables that are researched are strategy and how the company views its environment. When sorting based on NACE industry codes and size, we divided the industries into groups of 10 meaning that 10 NACE codes were used to create one group, the companies were then filtered to have a minimum of 10 employees. Since the collection of data is made using a voluntary survey, the actual dispersion of the participating companies is beyond our control.

3.4 Data collection

The survey was sent out and we started collecting data during April to May 2022, which meant that we had a data collection period of three weeks for each country. The targeted group of respondents were CEOs, CFOs, and Business controllers, these roles were chosen due to their broad knowledge about the managerial workings of the firm. Total 352 firms were invited to answer our questionnaire, with 36 organizations choosing to participate. For the participants taking part in the survey, we had no follow up questions or interviews. For an overview of the firm's country, industry classification, size, and type of role for the respondent, see table 1.

Table 1: Respondent overview

Panel A			
Country	Sample size	Responses	Response rate
Norway	207	24	11,59%
Sweden	145	12	8,28%
Total sample	352	36	10,23%

Panel B			
Industry classification	Service	Manufacturing	Retail
Norway	15	6	3
Sweden	5	6	1
Total sample	20	12	4

Panel C			
Size of firms	Small (10-49)	Medium (50-249)	Large (250+)
Norway	5	15	4
Sweden	1	3	8
Total sample	6	18	12

Panel D			
Respondents	CEO	CFO	Other top management
Norway	11	9	4
Sweden	3	6	3
Total sample	14	15	7

The respondents of the questionnaire will start in section one, by filling out control questions. In this section, we map out who the respondents are, as well as which firm they represent and the ownership structure of the firm. Section two concerns the firm's strategy while section three concerns the firm's external environment. The last three sections concern the MCS. These questions are formulated to gather information about the usage of Simon's LOC. Hence, section four covers diagnostic and interactive control systems, section five covers boundary systems and section six covers belief systems. Regarding section four, we decided to combine the two levers, diagnostic and interactive, as they are often used together (Simons 1994, 1995). The diagnostic and interactive section includes questions regarding identifying and using the critical performance

indicators, hence, how the firm's performances in the past are used to manage the firm's future dispositions. Section five contains questions regarding boundary systems. These questions are aimed and formulated to discover to what extent the management is controlling subordinates' actions and behaviors. As a reference, the employees of innovative firms are likely to have more freedom to experiment than employees of a firm with repetitive tasks. Section six contains questions regarding the firm's belief systems. In this section, we try to discover whether managers are successful in ensuring that the subordinates and the firm share a common goal. We, therefore, try to map out to what extent the firm is using different measures to enforce the firm belief systems onto the subordinates.

3.5 Variable measurement

Our survey uses previously validated measures to gather information about ownership, strategy, external environment, and Simons LOC (Bedford, 2015; Bedford & Malmi, 2015; Bedford et al. 2016; Kruis et al. 2016). Ownership is assessed by asking about the most influential owner in the organization. Emphasis is put on the options family-owned, government, large institutional investor, and venture capitalist, but there is an option to answer with a different owner if the participants feel that they cannot relate to any of the options. Strategy is assessed by asking five questions. One related to the use of low-cost strategy on products/services, two questions related to the use of product differentiation, and lastly two questions related the use of customized products and aftermarket services and support. These questions enable us to identify what type of strategy is used within the firm and divide the participants into groups.

External environment is assessed by asking five questions. One related to how predictable changes in the external environment in which the organization operates, one question related to how competitors' strategies and tactics differ, one question related to how customer's demands differ between their products/services, one question related to how hard it is for the organization to acquire necessary resources, and lastly one question related to how intense the competition is for their main product/service. These questions map out how the organization views its external environment and enable us to make distinctions between firms in hostile or less hostile environments.

The questions about diagnostic control systems and interactive control systems are merged in the same sections since they are often used together. These two control systems are assessed by asking

eight questions about how budgeting and/or performance measurements, both financial and non-financial, are used for the following. One question is related to the identification of critical performance variables, one question relates to the formulation of goals for critical performance variables, one question relates to monitoring of formulated performance goals and correction of deviations. Two questions relate to the use of diagnostic and interactive control systems to continuously present an agenda for activities at the highest managerial level and the subordinate level. One question related to enabling continuous challenging and debate of underlying data, assumptions, and action plans with subordinates. One question related to focus on strategic uncertainty, and lastly one question related to encouraging and facilitating dialog and information sharing with subordinates. These questions enable us to analyze how and to what degree the participating organizations are using diagnostic and interactive control systems.

The usage of the boundary system is assessed through four questions. One question relates to the usage of code of conduct or similar declarations to define appropriate behaviors for subordinates. One question relates to the usage of written guidelines that define specific areas for, or limits, on opportunity search and experimentation. One question relates to the communication of risks and activities to be avoided through written guidelines, and the last question relates to the use of punishments against subordinates that engage in risks and activities outside organizational policy. These questions enable us to analyze the extent and use of boundary systems within organizations.

The usage of the belief system is assessed through four questions. One question relates to the codification of values in formal documents within the organization. One question relates to the communication of the organization's values through formal value documents. One question relates to the use of values to motivate and guide subordinates in the search of new strategic opportunities, and the last question relates to the use of formal value documents to create commitment to the long-term goals of top management.

Unidimensionality has been evaluated using factor analysis and principal component analysis (PCA) weightings. Internal consistency between the measures is assessed using Cronbach alphas, where applicable (Jarvis et al. 2003; Rossiter, 2002). PCA shows that the weights are positive and above the 0.3 limit (Hair et al. 2017). Cronbach alphas are ($\alpha > 0,62$) and spans from 0,6161 to 0,8615, showing good internal consistency (See Appendix 1).

To analyze the data from our research, the measures that have been used to assess different constructs have been transformed into variables for their respective construct. Meaning that questions relate to i.e., diagnostic control system have been merged into one variable measuring diagnostic control system usage. For the characteristic strategy the items low price, product differentiation, and customer satisfaction have been divided into three groups. The first group consists of firms that are classified as using low price strategy. The second group consists of firms that are classified as using a combination of product differentiation and customer focus. The third group consists of firms that have similar levels of low price and product differentiation strategies, the distinction for what is considered similar is drawn at a difference in value of 1,5 between the two and are labeled hybrid. For the external environment characteristics, we have divided the items predictability, complexity, and hostility into three groups. Responses smaller or equal to the mean minus one standard deviation have been given the value one, responses higher than or equal to the mean plus one standard deviation have been given the value three, and responses within the mean plus/minus one standard deviation have been given the value two. Ownership has been divided into five different groups based on the different ownership structures and one added category called “Other influential owners”. Size of the organization has been divided into three groups based on the data.oecd (2022) definition of small, medium, and large organizations. Firms with 10-49, 50-249, and 250+ has been assigned the value 1, 2, and 3 respectively. Respondents have been divided into three different groups based on their industry. Service, manufacturing, and retail have been given the value 1, 2, and 3 respectively. Descriptive statistics for the full sample and each of the variables are presented in table 2.

Table 2: Summary statistics

Variable	N	Mean	SD	Min	Max
Low Price Strategy	36	3,50	2,02	1,00	7,00
Product Differentiation Strategy	36	4,74	1,25	2,25	7,00
Environmental Predictability	36	4,28	1,50	1,00	7,00
Environmental Complexity	36	3,79	1,17	1,00	6,00
Environmental Hostility	36	4,78	1,20	1,00	7,00
Diagnostic Control System	36	5,29	1,08	2,67	7,00
Interactive Control System	36	4,91	0,80	3,00	6,00
Boundary System	36	4,66	1,05	3,25	7,00
Belief System	36	5,14	1,06	2,50	7,00

3.6 Analysis of data

For the analysis of the data, we have used one-way anova to compare the difference in the usage of the levers between groups. The one-way anova F-test returns a probability telling if there is a significant difference in usage between the groups. When the anova returns a significant test result, we perform a pairwise comparison of means using Tukey's method. It tests for all pairwise differences of means for all combinations of the groups and tells us if there is a significant difference in the usage between them. Since we have unequal sample sizes between the groups the Tukey-Kramer test is used in these cases (Tukey, 1953; Kramer, 1956). For analyzing the difference in the overall balancing of the levers between groups, a multivariate test on means is used that provides a F-statistic telling the significance.

4 Results & analysis

4.1 Industry

The effect of the different industry groups on the usage of the four levers shows no significant difference for interactive control systems, boundary systems and belief systems with p-values of 0,779, 0,462, and 0,860 respectively. However, the results show that there is a difference between industry groups on the usage of diagnostic control systems at the 10% level of significance with a p-value of 0,0516. Meaning that usage of interactive control systems, boundary systems and belief systems between the different industries is very similar in our sample. Analyzing the difference between the industries on the usage of diagnostic control systems, the results show that there is a positive and significant difference at the 5% level between the manufacturing and service industry at 0,9444 points with a p-value of 0,042. Meaning that the diagnostic control system usage in the manufacturing industry is significantly higher than for the service industry. The results show no significant difference between the manufacturing and retail industry or the service and retail industry. Meaning that the usage of diagnostic control systems between these industries does not have a significant difference.

Analyzing the usage of all the levers between the different industry groups, we find significant results. For the service industry there is a significantly higher usage of belief systems compared to boundary systems at the 5% level with a p-value of 0,0377. For the manufacturing industry we find that the usage of diagnostic control systems are significantly higher than interactive control systems

and boundary systems at the 1% level and belief systems at the 5% level with p-values of 0,0016, 0,0033, and 0,0208 respectively. For the industry results see table 3.

Table 3: Results industry

Industry	Diagnostic	Interactive	Boundary	Belief	Sig. ¹	Difference
Service	4,92	4,91	4,46	5,05	0,0377**	Be > Bo
Manufacturing	5,86	4,82	4,92	5,25	0,0016***, 0,0033***, 0,0208**	Di > In, Bo, Be
Retail	5,42	5,15	4,88	5,25	0,001***	Di > Bo
Sig. ²	0,042**	0,779	0,462	0,860		
Difference	Ma > Se	-	-	-		

*** p<0,01, ** p<0,05, * p<0,1

¹ pairwise comparison of means

² multivariate tests on means

The results for the manufacturing industry does not come as a surprise, since manufacturing firms often have a desire to develop production processes and correct deviations to maximize their outputs (Ahrens & Chapman, 2004). The balanced usage of the levers except for boundary systems within the service industry is as expected. Firms within the service industry tends to perform more complicated tasks and therefore require a more balanced usage of the levers to take advantage of the forces created from the different control systems (Simons, 1995). The higher usage of diagnostic control systems for manufacturing firms compared to service firms, also pointing to the increased importance of diagnostic control within this industry. The usage of the levers in retail firms is expected and is overall well balanced.

4.2 Size

The effect of the different firm size groups on the usage of diagnostic control systems, interactive control systems, boundary systems, and belief systems shows no significant difference for any of the individual levers with p-values of 0,505, 0,922, 0,254, and 0,352 respectively. Meaning that there are no significant differences in the level of usage between the size groups for the individual levers in our sample. When analyzing the usage of all levers within the size groups, we find some significant differences between the levers. For small size firms we find that both diagnostic control system and the belief system have significantly higher usage compared interactive control system at the 5% level of significance with p-values of 0,0284 and 0,0202 respectively. Meaning that small firms are putting more emphasis on diagnostic control systems and belief systems compared to interactive control systems. For medium sized firms, diagnostic control systems have a

significantly higher usage than boundary systems at the 10% level of significance with a p-value of 0,0683. For large firms, diagnostic control systems and belief systems have significantly higher usage compared to boundary systems at the 5% level of significance with p-values of 0,0148 and 0,0101 respectively. Meaning that large firms are putting more emphasis on diagnostic control systems and belief systems compared to boundary systems. Analyzing the difference in balancing of all the levers between the small, medium, and large firms, we find no significant difference. Meaning that there is no significant difference in the overall balancing and usage between the different firm sizes. For the strategy results see table 4.

Table 4: Results size

Size	Diagnostic	Interactive	Boundary	Belief	Sig. ¹	Difference
Small	5,67	4,93	5,29	5,58	0,0284**, 0,0202**	Di, Be > In
Medium	5,09	4,91	4,60	4,90	0,0683*	Di > Bo
Large	5,39	4,88	4,44	5,27	0,0148**, 0,0101**	Di, Be > Bo
Sig. ²	0,505	0,992	0,254	0,352		
Difference	-	-	-	-		

*** p<0,01, ** p<0,05, * p<0,1

¹ pairwise comparison of means

² multivariate tests on means

The higher usage of diagnostic control systems for small sized firms is surprising since previous research indicates that smaller firms use more personal control which is connected to interactive control systems (Burns et al. 1975). For smaller firms the power distance tends to be shorter and emphasizes interpersonal control with centralized decision making. This often gives employees the perception of more interaction towards decisions, which leads to individuals being more satisfied with the management-employee relationship (Chenhall, 2003). Therefore, it is surprising that in our research we find that small firms prioritize interactive control systems least and use diagnostic control systems in combination with belief systems most. The results for large firms are not surprising, previous research indicates that large firms have more administrative control which is connected to diagnostic control systems (Burns et al. 1975). However, less emphasis on boundary control might be surprising due to large firms tending to have more formalized procedures and therefore could be expected to have more boundary systems (Chenhall, 2003). Whereas small sized firms have less power distance, the opposite is usual for large firms. With larger power distance follows administrative challenges where leader-responsibilities demands greater effort. It is challenging for managers to manage many people on an interpersonal level, hence implementation

of boundary control systems and reliance on rules and regulation. These rules and regulations give the employees guidelines to follow without being personally directed by the manager. It is not surprising that medium-sized firms land somewhere in between that of small and large firms.

4.3 Ownership

The effect of the different ownership groups on the usage of the four levers shows no significant difference for interactive control systems, boundary systems and belief systems with p-values of 0,5989, 0,3858, and 0,4492 respectively. However, the results show that there is a difference between ownership groups on the usage of diagnostic control systems at the 10% level of significance with a p-value of 0,084. Meaning that usage of interactive control systems, boundary systems and belief systems between the different ownership groups is very similar in our sample. Analyzing the difference between the ownership groups on the usage of diagnostic control systems, the results show that there is a positive and significant difference at the 10% level between the large institutional investors and government owners with a p-value of 0,084. Meaning that the diagnostic control system usage in the large institutional investors is significantly higher than for the government. The results show no significant difference between the remaining ownership groups. Meaning that the usage of diagnostic control systems between these owners does not have a significant difference.

When analyzing the usage of all levers within the ownership groups, we find some significant differences between the levers. For family-owned firms, belief systems have a significantly higher usage than interactive control systems and boundary systems at the 1% and 5% level of significance with a p-value of 0,0083 and 0,0557 respectively. For government owned firms, interactive control systems and belief systems have a significantly higher usage than boundary systems at the 5% and 10% level of significance with a p-value of 0,0276 and 0,058 respectively. For large institutional investor-owned firms, diagnostic control systems have a significantly higher usage than interactive control systems and boundary systems at the 5% and 5% level of significance with a p-value of 0,0122 and 0,0112 respectively. For venture capital owned firms, diagnostic control systems have a significantly higher usage than interactive control systems at the 5% level of significance with a p-value of 0,0489 respectively. For firms in the group other influential owners there is no significant difference between diagnostic control systems, interactive control systems, boundary systems and belief systems. For the ownership results see table 5.

Table 5: Results ownership

Ownership	Diagnostic	Interactive	Boundary	Belief	Sig. ¹	Difference
Family	5,08	4,68	4,72	5,34	0,0083***, 0,0357**	Be > In, Bo
Government	4,63	4,91	4,08	4,72	0,0276**, 0,058*	In, Be > Bo
Large institutional investors	5,83	5,10	5,02	5,42	0,0122**, 0,0112**	Di > In, Bo
Venture capitalists	5,83	5,40	4,88	5,62	0,0489**	Di > Bo
Other influential owners	5,27	4,60	4,65	4,70	n/a	
Sig. ²	0,084*	0,5989	0,3858	0,4492		
Difference	LII > Go					

*** p<0,01, ** p<0,05, * p<0,1

¹ pairwise comparison of means

² multivariate tests on means

Higher usage of belief systems is not surprising if the family members are part of the TMT or working within the company (Fama & Jensen, 1983). If family members are working in the company, the need for interactive control systems to enable discussions with subordinates and boundary systems to set limits on acceptable behaviors is limited. These formal control systems can be replaced by a close dialog of the family members. Speckbacher and Wentges (2012) argues that the size of the firm could have an impact on how effective informal and personal strategies are, but in our sample, we find a lower usage of interactive control systems and boundary systems for these firms. The low usage of boundary systems for government firms comes as a surprising result since governmental-owned firms have strict regulations and rules that they must follow. Because the fundamental objective for government in Sweden is for the Swedish citizens to have faith in the central government activities. Therefore, citizens should be able to examine them critically. To have this criterion connected to the activities could it be expected that firms influenced by the government need to follow strict rules and have certain limitations. However, according to our results boundary control is what is least emphasized, which can be viewed as surprising. High usage of interactive control systems and belief systems does not come as a surprise since the values of these often socially important entities are highly emphasized as well as the importance of dialog with subordinates. The higher usage of diagnostic control systems for large institutional investors is not surprising since the investors want the company to meet targets and correct deviations to maximize profits and short-term gains (Graves et al. 1990). Overall, the usage of the levers is high for these firms and the somewhat lower emphasis on boundary systems is expected to allow employees to come up with creative ideas without making too standardized procedures (Simons, 1995). The result for venture capitalist firms is expected and is in line with

previous research that VCs drives the organization to have more organized control processes and management accounting as well as reliable control and reporting systems (Davila, 2005; Gorman & Sahlman, 1989; Granlund & Taipaleenmäki, 2005; Smith, 2005).

4.4 Strategy

The effect of the different firm strategy groups on the usage of diagnostic control systems, interactive control systems, boundary systems, and belief systems shows no significant difference for any of the individual levers with p-values of 0,2459, 0,1636, 0,7834, and 0,9809 respectively. Meaning that there are no significant differences in the level of usage between the strategy groups for the individual levers in our sample.

When analyzing the usage of all levers within the strategy groups, we find some significant differences between the levers. For low price firms, we find that there is no significant difference between diagnostic control systems, interactive control systems, boundary systems and belief systems. Meaning that low price firms are not putting more emphasis on any of the different levers in their balancing. For product differentiation strategy firms, diagnostic control systems have a significantly higher usage than interactive control systems and boundary systems at the 5% and 1% level of significance with a p-value of 0,0415 and 0,0022 respectively. Also, between belief systems and boundary systems there are difference at the 5% level of significance with a p-value of 0,0281. Meaning that product differentiation firms use diagnostic control systems significantly more than interactive control and boundary systems as well as using belief systems more than boundary systems. For hybrid strategic firms, there is no significant difference between diagnostic control systems, interactive control systems, boundary systems and belief systems. Meaning that hybrid firms are not putting more emphasis on any of the different levers in their balancing. For the strategy results see table 6.

Table 6: Results strategy

Strategy	Diagnostic	Interactive	Boundary	Belief	Sig. ¹	Difference
Low price	4,53	4,28	4,35	5,05	0,7891	
Product differentiation	5,44	4,98	4,72	5,15	0,0415**, 0,0022***, 0,0281**	Di > In, Bo and Be > Bo
Hybrid	5,36	5,05	4,69	5,15	0,3958	
Sig. ²	0,2459	0,1635	0,7834	0,9809		
Difference	-	-	-	-		

*** p<0,01, ** p<0,05, * p<0,1

¹ pairwise comparison of means

² multivariate tests on means

The results for low cost are surprising, since past research indicates that low price strategy is viewed as exploitative, which is connected to diagnostic control systems and boundary systems (Bedford, 2015). There are several ways to exploit resources for firms working to achieve a competitive advantage. The primary focus for low price strategy firms is to use their time and energy to be as cost-efficient as possible. This can be done by trying to reduce the costs of manufacturing processes and administrative functions, downsizing the operation or might invest in new plants to produce more at a lower cost. According to Kaplan & Johnson, (1987) is traditional accounting techniques, such as budgetary performance measures and variance analysis well suited for these kinds of tasks. Therefore, the low-price strategies have a higher emphasis on diagnostic control systems. However, in our findings this is not the case, for low price strategy, where there are no significant differences. This indicates that low price firms use close to the same emphasis on all four levers, which can be viewed as surprising.

The results for product differentiation are surprising, since past research indicates that product differentiation strategy is viewed as explorative, which is connected to interactive control systems (Bedford, 2015). The product differentiation strategy's main goal is to satisfy the customer. To achieve a competitive advantage using a product differentiation strategy, firms need to deliver superior quality, product flexibility, specialized product design, reliable on-time delivery, and post-sale support (Porter, 1980, 1985). These tasks are demanding and require employees with competence and knowledge to fulfil. To increase the likelihood for the employees to have the same customer focus as the firm, a high degree of empowerment is encouraged. To achieve a high degree of empowerment employees should get a sense of involvement and contribution. This can be achieved through working in teams or implementing human resource management policies, which can establish customer focus through environment and culture. Traditionally budgetary controls are not sufficient to provide the preferred feedback. Therefore, interactive control systems and belief systems are used often. Through our research, we find that belief systems are somewhat highly emphasized, surprisingly, the interactive control is less emphasized than we should expect according to previous research. The hybrid strategy results are expected since it is a combination between the low price and product differentiation strategy.

4.5 External environment

4.5.1 Predictability

The effect of predictability on the usage of the levers shows no significant differences for diagnostic control systems, interactive control systems, boundary systems, and belief systems between the different groups. With p-values of 0,107, 0,602, 0,646, and 0,598 respectively, meaning that there is no significant difference in the usage of the individual levers for the different predictability groups.

Analyzing the usage of all the levers between the different predictability groups there are some significant results. For the participants scoring low on predictability there is a significantly higher usage of diagnostic control systems compared to boundary systems at the 10% level of significance with a p-value of 0,0661. For medium predictability there is a significantly higher usage of diagnostic control systems and belief systems compared to boundary systems at the 10% and 1% level respectively with p-values of 0,0875 and 0,0041. For high predictability firms there is a significantly higher usage of diagnostic control systems compared to interactive control systems and belief systems at the 1% and 5% level of significance with p-values of 0,0096 and 0,0338. The two latter have a significantly higher use than boundary systems at the 5% and 10% level of significance with p-values of 0,0451 and 0,0985 respectively. For the predictability results see table 7.

Table 7: Results predictability

Predictability	Diagnostic	Interactive	Boundary	Belief	Sig. ¹	Difference
Low	5,92	5,25	4,81	4,63	0,0661*	Di > Bo
Medium	5,05	4,83	4,72	5,21	0,0875*, 0,0041***	Di, Be > Bo
High	5,89	5,00	4,29	5,17	0,0096***, 0,0338**, 0,0451**, 0,0986*	Di > In, Be > Bo
Sig. ²	0,107	0,602	0,646	0,598		
Difference	-	-	-	-		

*** p<0,01, ** p<0,05, * p<0,1

¹ pairwise comparison of means

² multivariate tests on means

We are connecting firms that are highly predictable with firms that face low risk because this gives them the ability to adjust for the future, and low predictability as firms with higher risk because these firms do not have the same possibility. Previous research suggests that situations where there is little risk or where it is easy to predict the outcome can be connected to budgetary controls

leading us to believe that increased predictability should have a higher emphasis on diagnostic control systems. There is also a difference between risk and uncertainty, while the risk is connected to a specific event occurring is uncertainty connected to a situation where probability cannot be predicted (Chenhall, 2003). Whereas Aherns & Chapman, (2004) suggest that high forms of uncertainty lead to high usage of interactive control systems, might less predictable firms still rely on high usage of diagnostic control systems, because of the increased risk not increased uncertainty. However, the low usage of boundary systems is somewhat surprising. Because we expect firms experiencing more risk to be more careful and limit employees.

4.5.2 Complexity

The effect of complexity on the usage of the four levers shows no significant difference for diagnostic control systems, interactive control systems, boundary systems, and belief systems with p-values of 0,734, 0,387, 0,907, and 0,560 respectively. Meaning that there is no significant difference in the usage of the individual levers between the complexity groups.

Analyzing the usage of all the levers between the different complexity groups, there are significant differences. For the low complexity firms there is a significantly higher usage of diagnostic control systems compared to boundary systems at the 10% level of significance with a p-value of 0,0927. For medium complexity firms the usage of diagnostic control systems is significantly higher than interactive control systems and boundary systems at the 10% and 5% level with p-values of 0,0681 and 0,0359 respectively. For high complexity firms the usage of belief systems is significantly higher than boundary systems at the 5% level of significance with a p-value of 0,0163. For the complexity results see table 8.

Table 8: Results complexity

Complexity	Diagnostic	Interactive	Boundary	Belief	Sig. ¹	Difference
Low	5,61	5,27	4,83	5,46	0,0927*	Di > Bo
Medium	5,21	4,77	4,64	4,99	0,0681*, 0,0359**	Di > In, Bo
High	5,25	5,00	4,59	5,31	0,0163**	Be > Bo
Sig. ²	0,734	0,387	0,907	0,560		
Difference	-	-	-	-		

*** p<0,01, ** p<0,05, * p<0,1

¹ pairwise comparison of means

² multivariate tests on means

Previous research shows that a higher usage of planning and control is common when faced with complexity (Elbanna & Child, 2007) making our results somewhat surprising. What makes our result contradictory to that of previous research is that the balancing of the control systems seems to be more balanced for the low and high complexity firms. Meaning that the emphasis on diagnostic control systems is not that predominant as one would expect for high complexity firms. The differences between the complexity groups in our sample do not show a significantly higher usage of diagnostic control systems as the level of complexity increases which is also contradictory, and they are all on the higher end of the spectrum. The lower usage of boundary systems for low complexity firms is expected since lower complexity needs less boundaries to limit employees. The result for medium complexity is not surprising, as the need for planning and control increases with complexity (Elbanna & Child, 2007).

4.5.3 *Hostility*

The effect of hostility on the usage of the levers shows no significant differences for interactive control systems, boundary systems, and belief systems between the different groups. With p-values of 0,106, 0,640, 0,715 respectively. Meaning that usage of interactive control systems, boundary systems and belief systems between the different hostility groups is very similar in our sample. However, for the hostility groups on the usage of diagnostic control systems, the results show that there is a positive and significant difference at the 10% level between low and high hostility with a p-value of 0,054. Meaning that the diagnostic control system usage in the high hostility group is significantly higher than for the low hostility group. The results show no significant difference between the low hostility and medium hostility groups and the medium and high hostility groups. Meaning that the usage of diagnostic control systems between these hostility groups does not have a significant difference.

Analyzing the usage of all the levers between the different hostility groups there are some significant results. For the participants scoring low on hostility there is a significantly higher usage of belief systems compared to interactive control systems at the 1% level of significance with a p-value of 0,0033. For medium hostility there is a significantly higher usage of diagnostic control systems compared to interactive control systems and boundary systems at the 10% and 5% level respectively with p-values of 0,0877 and 0,0121. As well as belief systems are significantly higher than boundary systems at the 5% level of significance with a p-value of 0,0483. For high hostility

firms there is a significantly higher usage of diagnostic control systems compared interactive control systems, boundary systems and belief systems at the 5%, 5% and 10% level of significance with p-values of 0,0138, 0,217 and 0,0562. For the hostility results see table 9.

Table 9: Results hostility

Hostility	Diagnostic	Interactive	Boundary	Belief	Sig. ¹	Difference
Low	4,67	4,57	4,63	5,25	0,0033***	Be > In
Medium	5,22	4,83	4,57	5,03	0,0877*, 0,0121**, 0,0483**	Di > In, Bo and Be > Bo
High	6,05	5,46	5,00	5,39	0,0138**, 0,0217**, 0,0562*	Di > In, Bo, Be
Sig. ²	0,054*	0,106	0,640	0,715		
Difference	Hi > Lo	-	-	-		

*** p<0,01, ** p<0,05, * p<0,1

¹ pairwise comparison of means

² multivariate tests on means

Previous research suggests that environmental hostility is strongly associated with meeting budgets (Otley, 1978) as well as being related to formal controls (Chenhall, 2003). Therefore, is it not surprising that the medium and high level of hostility has high usage of diagnostic control systems, because diagnostic control systems are related to budgetary control. Whereas this is not needed in the same manner for low levels of hostility. However, the lower usage of boundary systems for medium and high levels of hostility is more surprising. It is easy to presume that firms operating in high hostility environments prefer to have as few unpredictable variables as possible. Therefore, we can expect these firms to have a strict and well-emphasized boundary system in place to limit the employees to stay within the intended frames. Our research contradicts this assumption and puts less emphasis on boundary systems than could be assumed. This is a somewhat surprising finding, however, the presumption of the high emphasis on diagnostic control systems is as expected.

5 Discussion & Conclusion

A balanced framework is good for predictable goal achievement and strategic renewal and innovation (Kruis et al. 2016). An optimal balance of the LOC framework does not necessarily mean a combination of the levers in equilibrium. Looking at the influence of firm characteristics on the LOC framework, we find that the usage of diagnostic control systems tends to be high for most of the characteristics and their respective subgroups. The usage of belief systems is quite high for most of the characteristics and their respective subgroups. Interactive control system is the third

most prioritized control system, with the usage of boundary systems being the least used system. Worth mentioning is also the fact that interactive control systems in our sample shifted between being the second most used and the third most used, suggesting that the system could be more influenced by different firm characteristics.

As mentioned in Simons (1994), any type of diagnostic control system can be made interactive. Interactive control systems can often be time-consuming and more difficult to interpret the results than normal budgetary controls, it also requires the managers to have additional knowledge regarding these forms of performance measures to reach the full benefits from the usage. The time aspect and the difficulty related to interactive control systems could therefore lead product differentiation firms to prioritize it less in their management control than previous research would suggest (Bedford, 2015). Boundary systems have negativity connected to them because they set limitations for employees to guide and control them in the right direction. Managers usually prefer employees that are motivated and willing to work, being too strict and limiting toward employees could counteract this. Hence, it can be a contributing factor to boundary systems being the least used control system. One additional factor could be that managers do not realize the usefulness of boundary systems (Simons, 1995).

The results that we find for the balancing of the levers of control shows the importance of budgetary controls and performance measurements independent of the characteristics of the firm. The same results are found for the usage of belief systems, which also were highly used independent of the firm characteristics. The interactive control systems varied a bit and were both the second highest used as well as the third highest used control system in most of the cases, with the least used being boundary systems. This means that in our sample, the levers that were used the most often remain the same, the different levels of usage are what varies more and it's there that we find the interesting results in our study.

The purpose of this study was to investigate how different firm characteristics influence the balancing and usage of the levers of control. The results contribute to previous research regarding the influences of firm characteristics on MCSs as well as questioning previous findings. First, previous research finds that small firms use more personal control and interactive control systems (Burns et al. 1975), whilst we find that diagnostic control systems together with belief systems is the most used for this type of firm and interactive control systems being the least used. Second, for

large firms, governmental firms, complexity firms, and hostility firms we find little usage of boundary systems, where previous research suggests the usage to be high (Child et al. 1972; Oecd-ilibrary, 1996; Elbanna & Child, 2007; Chenhall, 2003). Third, for product differentiation we find less usage of interactive than we would have expected, opposite to that of previous research (Bedford, 2015).

The fact that we find the prioritization of the levers very similar for the different characteristics, leads us to conclude that the need for future research remains, especially with a larger sample size. A larger sample size could potentially lead to a greater variation in the balancing.

5.1 Limitations

This study is not without limitations. First, the number of participants in our research is rather small with 36 respondents, however, this result is much due to the time limitations faced. The small number of participants means that the tests and analysis have a lower power compared to that of a larger sample. Second, our research relies on a single respondent from each firm, meaning that the data collected based on the different participants' views are subjective. There is always a possibility of participants interpreting the questionnaire differently. Having one respondent for each firm may cause common method bias (CMB). We have attempted to minimize the possibility of this by using test pilots and carefully designing the survey instruments, but this bias cannot be ruled out (MacKenzie & Podsakoff, 2012). Third, we are also using the same firms to analyze different characteristics, which could affect the results of our research. Fourth, our research is only based on survey answers meaning that we cannot confirm the underlying data of the respondents' answers which could have been made using interviews.

5.2 Suggestions for future research

Suggestions for future research is to analyze the influence of characteristics on the usage of management control systems on a larger scale involving more participants. What we have found in our research is in alignment with previous research, but we have also found some surprising results. Therefore, large scale research in this matter could further improve our knowledge regarding how management control is affected by different characteristics within the firm and in the external environment. A deeper understanding of how firms are balancing their control systems could be useful to get better knowledge, if combined with levels of performance, about what makes some

firms successful while others fail and under what circumstances one should use a specific balancing.

6 Appendix

Appendix 1: Questionnaire items, Factor loadings and Cronbach alpha		FA/PCA	Cronbach
Survey items		loadings	alpha
Strategy			
	<i>To what extent does your firm compete with...</i>		
Low-cost	A1: lowest price products/services?	n/a	n/a
Product differentiation	A2: product innovation?	0,4062	0,6161
	A3: new products/services?	0,6039	
Customer focus	A4: customized products/services?	0,4093	
	A5: after-sales services and support to costumers?	0,5503	
External environment			
Predictability	B1: How predictable are changes in the external environment in which your firm is operating?	n/a	n/a
Complexity	B2: How diverse are the strategies and tactics for your main competitors?	0,7071	n/a
	B3: To what extent varies the customer's claim between products/services?	0,7071	
Hostility	B4: How difficult is it to obtain necessary resources?	0,7071	n/a
	B5: How intense is the competition for your main products/services?	0,7071	
Diagnostic control systems			
	<i>To what extent is budgeting and/or performance measures (financial and non-financial used to...</i>		
	C1: identify critical performance variables?	0,6101	0,8615
	C2: set targets for critical performance variables?	0,5825	
	C3: monitor results from performance targets and correct deviation?	0,5371	
Interactive control systems			
	<i>To what extent is budgeting and/or performance measures (financial and non-financial used to...</i>		
	C4: continuously present an agenda for activities at the top management level?	0,3433	n/a
	C5: continuously present an agenda for activities at the employee level?	0,4693	
	C6: enable continual challenges and debate of underlying data, assumptions and action plans with subordinates and peers?	0,5065	
	C7: focus on strategic uncertainties?	0,3482	
	C8: encourage and facilitate dialogue and information sharing with subordinates?	0,5330	
Boundary systems			
	<i>To guide and control employee's behavior, to what extent...</i>		
	D1: are codes of conduct or similar statements to define appropriate behavior for employees used?	0,4453	n/a
	D2: are policies or guidelines that stipulate areas for, or limits, opportunity search and experimentation used?	0,6036	
	D3: are risks and activities to be avoided communicated through written directives?	0,5845	
	D4: are sanctions or punishments applied to subordinates who engage in risks and activities outside organizational policy, irrespective of the outcome?	0,3094	
Belief systems			
	<i>To guide and control employees' values, to what extent...</i>		
	E1: is the organization's value base used to codify values and visions through formal documents in the company?	0,5243	n/a
	E2: are the organization's core values clearly communicate to the employees?	0,5281	
	E3: are subordinates motivated and guided to search for new opportunities within the firm?	0,4563	
	E4: are formal documents used to bind employees to top management's long-term goals?	0,4879	

7 References

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