Management Control Systems, Performance and Uncertainty

A quantitative study on the role of MCS in uncertain contexts
Master Thesis in Business Administration

Title: Management Control Systems, Performance and Uncertainty: A quantitative study on the role of MCS in uncertain context

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Date: 2023-05-22

Key terms: Contingency theory, Institutional theory, Levers of control, Management control systems, Organizational learning, Performance, Uncertainty

Abstract

Background: Management Control Systems are shown to be valuable tools for managing different contexts and enhance organizational performance. To succeed with intended strategies, organizations must balance different levers of controls (LOC). The right balance is argued to be dependent on the external environment and contingent factors that surrounds the organization. To understand the role of MCS, one must explore different contexts. Hence, this paper broadens the knowledge about the role of MCS by studying the unexplored context of post-Covid-19. When facing uncertainty, MCS are claimed to be especially important for organizational performance – something that tested in this paper.

Purpose: The purpose of this paper is to contribute to a more comprehensive understanding of the relationship between MCS, organizational performance, and the external environment. Also, this paper tests if uncertainty has a moderating effect on these relationships.

Method: This study is based within the positivistic paradigm and follows a deductive research approach. It addresses a quantitative methodology where data is gathered from 164 Swedish managers through a structured questionnaire. The empirical data is analysed using multiple linear regressions with- and without moderating effect.

Conclusion: The results partly support the alleged positive relationship between the use of MCS and organizational performance. Three out of four LOC are found to be positive correlated with organizational performance. The study did not find support for the claim that uncertainty has a moderating effect on these relationships. This occurrence can be explained by the phenomenon of organizational learning.
Acknowledgements

We would like to dedicate this section to thank everyone involved in the process of writing this thesis.

Firstly, we want to thank all the managers that participated in our study for taking their valuable time to contribute with their experience of using management control systems. Without you, this study would not be possible.

Secondly, a big thank to the fellow seminar students who has given us valuable feedback and interesting discussions during the seminars. Additionally, we also want to thank Toni Duras for helping us with the statistical analyses.

Finally, we want to express our deepest gratitude to our supervisor Miguel Gil. Thank you for your engagement and all the feedback, knowledge, and guidance you have provided us with during these weeks. We are beyond grateful for your support!

Jönköping International Business School

22nd of May 2023

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1. Introduction

The first chapter of this paper provides a background on the topic of management control systems. This is followed by a discussion of the theoretical problem and thereafter the purpose and research questions of this study are presented. The chapter ends with a description of the disposition of this paper.

1.1 Background

Control is a word that frequently appears in management literature, and the function refers to the tools managers use to ensure a well-performing organization (Malmi & Brown, 2008). These tools are fundamental in all organizations as they encompass managers' approaches to monitor, influence, and evaluate their employees. One way to operate control is through management control systems (MCS). MCS facilitates and includes all the tools and systems managers use to define, communicate, and reinforce behaviors in desirable ways (Simons, 1995). They enable the efficient utilization of resources (Simons, 1995) and facilitate effective monitoring and reporting processes within organizations (Jokipiï, 2010). Control systems may be formally designed and implemented through rules, standard operating procedures, and budgeting systems with either a feedback or forward-looking nature. Financially oriented controls often focus on output and results, while controls of non-financial characters, such as rules, standard operating procedures, and ongoing monitoring of activities, often have a forward-looking approach (Langfield-Smith, 1997). Managers can create and communicate different control systems through formal documents and statements of purpose to give direction to search for new opportunities and enforce wanted and unwanted behavior (Simons, 1995).

MCS plays a crucial role in assisting managers in formulating strategies, defining operational actions needed for strategy implementation, establishing clear expectations, prioritizing operational enhancements, and setting performance targets that can impact current and future performance (Simons, 2014). Controls can enhance desirable behaviors, motivate, and guide employees to create value for the organization. It can be used as a constraining force to avoid taking risks and maintain a balance to run the organization efficiently (Baird et al., 2019; Widener, 2007). Additionally, establishing a culture of active dialogue and communication
within the organization is essential for effectively recognizing and capitalizing on new strategic opportunities (Davila, 2000). Cross-functional integration and collaborative discussions can improve organizational performance. Simons (1995) proposes that one achieves control when the tension between creative innovation and expected goal achievements are converted into profitable growth. Hence, a high degree of learning and control will contribute to the effectiveness of the organizations.

Organizations operate in business environments that are constantly changing and are not always easy to predict (Otley & Soin, 2016). Organizations may encounter uncertainty in the context of their operations, which can swiftly and dramatically change. This can make it difficult to forecast economic fluctuations, competitor behavior, and the timing of potential technological advancements. Additionally, organizations operate within systems of stakeholders who influence one another in the business environment (Otley, 2016). In this dynamic landscape, MCS is utilized by managers to drive organizational performance and achieve desired outcomes (Chenhall, 2003). Organizations need to adapt to their unique environmental conditions, which often involves adopting different control systems based on the specific context. The selection of appropriate control techniques is contingent upon the circumstances surrounding the organization (Otley, 1999).

The outbreak of Covid-19 and the environmental consequences that followed can be seen as a big crisis. During the pandemic, several countries were shut down to decrease the spread of infection, which affected the business environment worldwide. Sweden adopted another strategy to decrease the spread of infection and implemented recommendations rather than specific rules (Adler et al., 2022). Nevertheless, recommendations, including social distancing, avoidance of using public transportation, and remote work, were communicated (FHM, 2020). Unexpected events and disasters can challenge an organization's performance, making achieving goals and sustaining competitiveness difficult (Aksoy & Saglam, 2020). Recently, scholars have turned their attention towards the Covid-19 pandemic's ongoing crisis (e.g., Delfino & Van Der Kolk, 2021; Gomez-Conde et al., 2022; Kober & Thambar, 2022; Passetti et al., 2021), discovering that MCS can serve as a valuable approach to handling uncertainties. For instance, Passetti et al. (2021) have found that MCS can be helpful by coordinating actions and processes essential for crisis management.
From April 2022, the Public Health Authority (FHM, 2022) no longer classified Covid-19 as a pandemic. However, uncertainties still remain, and the aftermath of the pandemic together with the Ukraine war (Regeringskansliet, 2023) has forced organizations to deal with, e.g., large disruptions in the supply chains and higher costs due to inflation (European Commission, n.d). The period of uncertainty that has followed the pandemic until this day is referred to as post-Covid-19. Hence, the post-Covid context is continuously characterized by high uncertainty that organizations must manage. Irrespective of the circumstances, one can assume that for-profit organizations constantly strive to achieve optimal outcomes. However, to achieve high performance, it is essential that they possess the appropriate tools. This becomes even more crucial in times of turbulence and uncertainty, as witnessed in the post-Covid-19 era. Therefore, research on the role of MCS assumes significance to help organizations navigate through such challenging times and emerge successfully.

1.1 Theoretical Problem

Since Robert Anthony released his seminal work (1965) describing the concept of “management control”, many studies have emerged addressing the topic (Ferreira & Otley, 2009). Different controls are implemented to protect against threats (Merchant & Otley, 2006) and steer organizations in their environment to achieve their short- and long-term goals (Otley & Soin, 2014). Together these form different types of Management Control Systems (MCS), which are defined as “formal, information-based routines” (Simons, 1995). According to Simons, there are four such Levers of Control (LOC): belief systems, boundary systems, diagnostic control systems, and interactive control systems.

Simons’ LOC framework (1995) is useful for studying how managers deal with strategic change and renewal (Arjaliés & Mundy, 2013; Barros & da Costa, 2021; Laguir et al., 2022; Tuomlea, 2005). Throughout the years, researchers have found different positive influences on organizational performance resulting from the effective use of levers of controls (e.g., Langfield-Smith, 1997; Simons, 1995; Tuomela, 2005; Widener, 2007). Control systems and performance measurements are used by managers to make strategic decisions, reach organizational goals, and set the direction of the company (Simons, 2014). The four levers of control constituting a MCS need to be balanced for organizations to implement strategies effectively (Simons 1995).
Since the 1970’s, contingency theory has been used to explain organizations’ variating use of MCS (Davila, 1980). Otley and Soin (2014), argue that the existence of change in the external and internal environment in which organizations operate implies that there will be a constant change in the design and use of control systems as organizations adapt. Fundamental differences in how organizations use control systems are found due to the different environments and circumstances surrounding organizations (Simons, 1995). It is not implicated that each lever of control is used simultaneously, and they could be used to a differing degree (Barros & Ferrerira, 2022; Kruis et al, 2016). Depending on the appropriateness and contingent fit of MCS in a specific context, there could be a link to enhanced performance of the organization (Chenhall, 2003). There is no single best solution for the design of MCS, and Fisher (1998) denotes that the success of MCS will contribute to higher performance for organizations that properly fit the contingent factors by adapting to environmental changes. Evidence supporting the assumptions derived from contingency theory can be found in current research. Different constellations of MCS are claimed to be valuable in different contexts, e.g., for strategy implementation (Ditillo, 2004; Simons, 1994), in collaborative settings (Malmi & Brown, 2008), for exploitative and explorative organizations (Bedford, 2015; Bedford et al., 2016; Chenhall & Moers, 2015), and innovation and new product development (Davila, 2000).

To understand the role of MCS, it is essential to study the contemporary dimensions of MCS within the context in which organizations operate (Chenhall, 2003). It is also important to gain sufficient knowledge to succeed with strategies and reach organizational goals in different contexts. Lately, researchers have focused on the recent crisis associated with the Covid-19 pandemic (e.g., Delfino & Van Der Kolk, 2021; Gomez-Conde et al., 2022; Kober & Thambar, 2022; Passetti et al., 2021) and found MCS to be valuable tools for dealing with uncertainties. This paper contributes to these findings by exploring the Swedish post-Covid-19 context. It is an unexplored context characterized by new sorts of uncertainty and uncertainties resulting from the previous crisis. After the Covid-19 pandemic, a decrease in economic growth and enhanced inflation in countries in the European Union have been noticed (Hordofa et al., 2022). Post-Covid-19 is also characterized by uncertainty regarding varying customer demands and inconsistency, price volatility, and supply chain delays (Raj et al., 2022). Widener (2007) found that as uncertainty increases, the information deficit leads to a higher reliance on the mechanisms that provide and process necessary information. Therefore, interactive- and diagnostic controls are shown to be more frequently used and
essential in uncertain settings (Bisbe & Otley, 2004; Janke et al., 2014; Simons, 1991; Widener, 2007). Further it is also essential to clearly communicate the organization’s core values and direction (Heinicke et al., 2016). However, boundary systems are needed to maintain control and encourage reasonable creativity (Simons, 1995). Hence, MCS are arguably crucial for the performance of organizations as uncertainty increases, which is tested in this paper.

Based on the assumptions from Contingency theory, it is necessary to study different contexts and address contemporary issues to fully understand the role of MCS. As crises significantly threaten organizations’ survival (Delfino & Van Der Kolk, 2021), it is important to gain knowledge about how to cope with such contexts. This paper addresses this and studies the relationship between MCS and performance in Swedish organizations in an unexplored post-Covid-19 context. As most researchers have approached a contingent view discussing the importance of contingent factors, this paper contributes by exploring other perspectives as well. Post-Covid-19 is a context that follows a long period of uncertainty, which makes it interesting to study the phenomenon of organizational learning and impact of institutional forces.

This paper also contributes methodologically. Researchers have mainly focused on examining the use and tensions between two levers of control, e.g., interactive- and diagnostic control systems (Abernethy & Brownell, 1999; Henri, 2006; Müller-Stevens, 2020). Other studies have been carried out as “case studies” examining data on only one- or a few companies (Barros & Ferreria, 2022; Pešalj et al., 2018). Such studies can be criticized for lacking generalizability and inability to provide a body of gathered knowledge (Langfield-Smith, 1997). By studying a larger number of organizations’ use of all four levers of controls, this paper fills this gap. To conclude, this research contributes by broadening the understanding of the relationship between MCS, organizational performance, and the context in which organizations operate.
1.2 Research Purpose and Question

As the benefit of a constellation of MCS is argued to depend on external circumstances, it is important to study different contexts to understand the role of MCS for performance. Thus, this paper aims to contribute to a more comprehensive understanding of the relationship between MCS, organizational performance, and the external environment. Given the argued impact of the external environment, this paper tests if uncertainty moderates this relationship.

This paper aims to answer the following two research questions:

- What relationships exist between the use of MCS and organizational performance in uncertain contexts?
- Does uncertainty impact the relationship between MCS and organizational performance?
1.3 Disposition

Chapter 1
The first chapter of this paper provides a background on management control systems. This is followed by a discussion of the theoretical problem, and thereafter, the purpose and research questions of this study are presented.

Chapter 2
The second chapter presents the theoretical foundation for this paper. The LOC framework is addressed for studying MCS, and institutional- and contingency theory explains the link between management control and the environment surrounding the organization. Further the phenomenon of organizational learning is discussed. Finally, the chapter ends with a discussion of the relationship between LOC, performance, and uncertainty.

Chapter 3
The third chapter consists of the methodology covering the study's underlying research philosophy and approach. It presents the research design, including the data collection method, sampling, research- and survey design, and regression models. The chapter also includes an analysis of the research quality regarding the validity, reliability, and ethical considerations. It finishes by outlining the data-gathering process.

Chapter 4
The fourth chapter presents the empirical findings generated from the quantitative study. It includes a reliability test, descriptive statistics tables, and a Pearson correlation matrix. Finally, the chapter ends with multiple regression analyses of the two models of this thesis.

Chapter 5
The fifth chapter discusses the study's empirical findings together with prior research. Each hypothesis is discussed separately before overall discussions of each model are presented.

Chapter 6
The sixth chapter presents the conclusions of this paper. It also discusses this study's theoretical-, empirical-, methodological-, and practical contributions. Finally, the thesis ends with an analysis of the limitations and suggests future research.
2. Literature Review

The second chapter presents the theoretical foundation for this paper, where the main theoretical framework used for discussing management control is the LOC framework. Institutional- and contingency theories explain the link between management control, organizations’ institutional environment, and contingent factors. After this, a discussion of organizational learning and the relationship between MCS and organizational performance follows. Lastly, literature on the relationship between the use of MCS and performance in uncertainty is presented.

2.1 Literature Review Method

The literature review is performed through structured- and unstructured reviews (Li et al., 2008). In this thesis, the unstructured review consists of articles from previous courses, from our supervisor, and our previous research on the topic. Eight articles are retrieved from previous course literature on the topic of MCS. Further, 20 articles are found from the authors’ previous research. In total, the unstructured review consists of 28 articles that are collected without any identifiable structure (Sint et al., 2009).

The structured review consists of articles and books found through different search engines using keywords. Keywords help identify relevant sources of information and for narrowing the search (Jesson et al., 2011). The search engines used are Google Scholar, Scopus, Emerald, and the school library Primo. The keywords used Contingency theory, Institutional theory, Levers of control, Management control systems, Organizational learning, Performance, Uncertainty. These keywords are used separately and in different combinations to exclude topics that are not necessarily relevant (Brooke et al., 2009), often by including the key term "Management control system.". As the topic of management control is comprehensive, we chose the most highly cited articles for our initial sample. Also, a "snowballing" method is used, meaning that some references are found by reading other references included in this paper. Finally, articles written by well-known authors on the topic were searched for, for instance, "Robert Simons" and "David Otley." From the structured review, a sample of 67 articles and books were used in the paper.
The PRISMA 2020 model is used as a guideline for structuring the literature review, e.g., by specifying the inclusion and exclusion criteria (Page et al., 2021). The initial sample consisted of 95 articles and books, including 28 from the unstructured review and 67 from the structured review. After this, duplicates and articles that did not fit our purpose and low-quality articles were removed. Additionally, in the process of writing the thesis, some more references were found and added to the literature review resulting in a final sample of 61 references. The quality check was performed by using the ABS list (Appendix 1). To ensure that the references are trustworthy, one should only select literature that is peer-reviewed or articles from journals that are highly rated (Jesson et al., 2011). Most of the articles included in the ABS list have a rating of 3 or 4, and only a few have a lower rating of 1 or 2, which means that the articles used are published in good journals. 79% of the references included in the literature review are rated in the ABS list. The remaining 21% are either highly cited books, chapters published by well-known publishers, or written by well-known researchers on the topic.

Figure 1 - Literature Review
2.2 Contingency Theory

Since Robert Anthony released his seminal work (1965) on management control systems, many studies have been done on the topic (Ferreira & Otley, 2009). MCS literature is varied and rich including several different frameworks. The use of MCS has been studied in many different settings and research has shown what works and what does not work in these settings (Merchant & Otley, 2006). In the original form, MCS is seen as a sort of internal activity within an organization that aims to coordinate the managers’ actions (Otley & Soin, 2014). Otley and Soin define management control as “the process of steering organizations through the environments in which they operate, to achieve both short-term and long-term goals”.

Contingency theory within management accounting began to develop in the 1970s with a focus on trying to explain the varieties within the practice of that time (Otley, 2016). At that time, contingency-based research studies mainly discussed the deployment and the use of budgets as it was the dominant technique used. Otley (2016) further states how the topic has broadened in its scope and rather than focusing solely on management accounting techniques within the contingency discussion, it seems sensible to include aspects of MCS. It is also sensible to argue that all research within the topics of management accounting must take a ‘contingency’ approach as universal solutions to problems in organizational control generally do not exist (Otley, 2016).

When defining the core of the theory, studies rely on a few assumptions that have been explicitly stated. It tells us that there is no best way to organize and that there is no universally appropriate accounting system that can be applied in all organizations, during all circumstances. Further, organizations need to adapt and devote organizational structures appropriate to the environmental conditions and work performed to manage the organization effectively, in which the organizations will find themselves (Otley, 1980). This means, according to Otley, (1980) that the theory must identify specific aspects of an accounting system to be associated with assured circumstances and demonstrate an appropriate matching.

Something that has caused difficulty in this regard is the definition of what constitutes an appropriate matching. Otley (2016) states that the simplicity of existence has been taken as indicating such a matching. This will in turn assume the achievement of long-run equilibrium. Another track within more sophisticated studies has examined the firm performance as a point of reference to whether an appropriate matching has been found (Otley, 2016). The way of
using performance as an indicator of perfect matching is potentially problematic in some ways. MCS is argued to have a small impact on performance, and it is also argued that performance is an independent contingent variable, in its own right (Otley, 2016). On the contrary, do other researchers show how the use of MSC enhances performance for organizations that achieve a proper fit with the contingent factors by adapting to e.g., innovation modes and the environment (Bedford, 2015; Felicio et al, 2021).

Otley (2016) aligns the contingency theory with the environmental factors as well. Organizations operate in environments that are constantly changing and are not always easy to predict (Otley & Soin, 2014). Sometimes the context is uncertain and could change very radically and quickly. It can be hard to predict the actions of competitors, technical innovations that may occur and on what time scale (Otley, 2016). Organizations do neither operate alone as they are surrounded by stakeholders such as all affecting each other in the business environment. The overall environment has further grown to be both global and increasingly unpredictable which strengthens the contingent approach. Fisher (1998) also identifies external environment uncertainty as a contingent factor. Hence, the contingency theory suggests that organizations must adapt to environmental conditions and adopt different systems depending on the environment. The choice of appropriate control techniques will depend upon the circumstances surrounding the specific organization (Otley, 1999).

Fisher (1998) further identifies interdependencies and firm industry such as size, diversification, and structure as contingent factors. Performance measures regarding the use of budgets have been discussed prior in the literature and Otley (1980) illustrated examples with contradictory evidence. Hopwood (1972) concluded that a more flexible style of budgeting was likely to lead to more effective organizational performance while Otley, 1978 argued for better organizational performance using a more rigid style of budgeting. These opposite results from the two studies display an important situational difference in line with the contingency approach as the studies was performed in different industries with different organizational design regarding e.g., interdependencies.

More recent literature from Otley (2016) states that budgetary control has reduced in significance as a performance measure, rather, non-financial measures have increased in importance. Simons (1995) constructed a broader framework focusing on a much wider set of controls. It is further argued that different levers of control are combined and used by the organization and that the right balance between them is crucial for organizational functioning
and performance (Henri, 2006; Mundy, 2010; Simons, 1995). Organizations face different contingency factors which is the reason for the different use and combinations of the controls (Kruis et al, 2016). The fundamental body within the contingency theory holds that “it all depends” on situational factors and that there is not a universally “best” system that every organization can use (Otley, 1980).

2.3 Institutional Theory

While research on MCS from a contingency perspective argues that organizations must adapt to the environmental conditions by finding the right combination and use of controls, other research advocates the institutional perspective where it is assumed that organizations are passively conforming to normative, coercive, and mimetic pressures (Damayanthi & Gooneratne, 2017). Institutional theory is a popular theoretical foundation and has been proven to be a constructive theory for entrepreneurial research (Bruton et al., 2010). Two important works that can be seen as foundation works of the new institutional theory are the ones by Meyer and Rowan (1977) and DiMaggio and Powel (1983). However, the ideas of the institutional theory have existed for many years, and one of the earliest versions is the work by Selznick in 1957.

In modern society, organizations' formal structures arise in highly institutional contexts (Meyer & Rowan, 1977). Organizations' structures, as a result of their operating environment, tend to match this environment through the use of technical interdependencies. This phenomenon is called "isomorphism" (Meyer & Rowan, 1977) and can be defined as "the resemblance of a focal organization to other organizations in its environment" (DiMaggio & Powell, 1991). Organizations that have a similar structure within the same organizational field become isomorphic with their institutional environment (Suddaby, 2010), meaning that organizations become more homogenous (Mizruchi & Fein, 1999).

DiMaggio and Powell (1991) propose three sorts of isomorphism: coercive, mimetic, and normative. Coercive isomorphism arises due to pressures from other organizations that the organization depends on and the pressure from society regarding cultural expectations (Mizruchi & Fein, 1999). The second type of isomorphism suggested by DiMaggio & Powell is a mimetic isomorphism. Mimetic isomorphism arises in situations where the leaders of the organization are uncertain about how to act. In such uncertain contexts, a typical response is to mimic a peer that the organization experience as successful (Mizruchi & Fein, 1999).
Finally, the third type of isomorphism is normative. Normative isomorphism is associated with the organization's professionalization, meaning that people who are members of a profession, e.g., lawyers, are trained similarly, leading to common worldviews (Mizruchi & Fein, 1991). It is also related to the interaction of members of the same profession, which enhances the spread of ideas within the profession (DiMaggio & Powell, 1991).

Another claim about the homogeneity of organizations is that when their institutional- and task environment conflict, the organization decouples their structure from their work activities (Boxenbaum & Jonsson, 2017). For instance, in highly institutionalized environments, MCS is found to be decoupled from strategy and the organization's daily operations (Tucker & Parker, 2015). Decoupling is defined as "separating formal structure from actual practice" (Meyer & Rowan, 1977). By decoupling, organizations can relieve the tension that arises from external pressures to change while at the same time keeping flexibility (Jamali, 2010).

Institutional theory is helpful for understanding in what ways and why individuals are responding in a certain way to management control practices (Barros & Ferreira, 2023). Also, management controls are formed and implemented in organizations due to tensions between the internal dynamics within the organization and the external institutional forces. Internal tension tends to arise as there are different interests within the organization, such as the interest of managers as well as intra-organizational assumptions, rules, and norms (Gamage & Gooneratne, 2017). In contrast to the contingent view, the institutional perspective assumes that organizations must conform to institutionalized expectations. This phenomenon has been shown to impact the choice of MCS and mechanisms for coordination within the organization. When choosing MCS, the organization might rather see it as a solution to a legitimacy problem related to institutional expectations rather than a solution to a control problem (Tucker & Parker, 2015).

2.4 Organizational Learning

Research within organizational learning draws on and contributes to developments in various fields, e.g., organizational behavior and theory, economics, information systems, and strategic management. Argote and Miron-Spector (2011) convey that the core of most definitions is that organizational learning is a change in the organization's knowledge that appears as the organization obtains experience. Organizational learning occurs in a context that includes the organization and the environment surrounding the organization. At a practical level, the
ability to learn and adapt is argued to be critical to the performance and long-term success of the organization (Argote & Miron-Spector, 2011). Within strategic management, a fundamental premise is an alignment between the organization and its environment that maintains the competitiveness and survival of the firm in the long run (Hambrick, 1983). To adjust to the changing environment and to make appropriate strategic choices, organizations must become aware, make sense of the environment (Daft & Weick, 1984), and draw the proper lessons, i.e., make the best strategic choices (Child, 1997).

To assess viable strategies, organizations need to learn as it enables them to build an understanding and interpretation of their environment. Fiol and Lyles (1985) describe four contextual factors that affect the probability that learning will occur. These have a circular relationship with learning as they create and reinforce learning and are created by earning. First, it is asserted that culture influences learning and predicts actions. This is supported by Miles and Snow (1978), who contend that an organization's strategic posture is intimately related to its culture. Hence, belief systems and norms partially determine strategy and the direction of organizational change. Second, it is asserted that strategy and strategic posture partially influence learning capacity. This influences learning by setting boundaries for decision-making and a context for how the world is perceived and interpreted. It further assists by defining the goals and objectives. The third factor is structure, which allows both innovativeness and new insights. It frequently functions as a result of learning and is essential in establishing these processes. Organizations can further be designed to promote learning and reflective action-taking. The last factor is the environment, and the paper describes how learning involves the creation and manipulation of tension between both change and stability. The level of stress and the degree of uncertainty about past successes determine the effectiveness of the conditions of learning discussed, and they also influence how the environment is perceived and interpreted (Daft & Weick, 1984).

Research further argues that organizations must invest in developing institutionalized learning mechanisms to revise and elaborate their knowledge. This should be done by facilitating information gathering and elaboration or by intensifying processes of information dissemination, storage, and retrieval (Lipshitz et al., 2002). Organizations should further use mechanisms to support information interpretation and exchange views and attitudes to transfer individual knowledge and create new organizational knowledge (Nonaka, 1994). Hence, establishing cross-functional teams, allowing employees to interpret information, and sharing
different views, attitudes, and data is argued to make the environment more predictable (Edmondson, 1996).

2.5 Management Control Systems

There are a lot of different definitions and interpretations of what constitutes an MCS (Malmi & Brown, 2008). Chenhall (2003) defines MCS broadly and explains it as the systematic use of a Management Accounting System (MAS) and the use of personal and clan controls. Chenhall defines MAS as "the systematic use of practices such as budgeting or product costing to achieve some goal." Further, MCS are typically viewed as tools for strategy implementation (Simons, 1995). Studies show that control systems are used as tools contributing to the successful implementation of intended strategies and for the emergence of new strategies (Henri, 2006).

Malmi and Brown (2008) join in on the broad definition of MCS and state that management controls consist of the systems and devices that managers use in organizations to control that the behaviors of their employees correspond to the organization's strategy and objective. Two examples of MCS suggested by Malmi and Brown are the balanced scorecard and budgeting. Merchant and Van der Stede (2007) provide a narrower definition of MCS. The authors describe that MCS is formed to deal with employees' behavior. Management controls are essential for guarding organizations against unwanted actions of their employees or the possibility that they fail to succeed with their assignments. Further, the authors argue that MCS would be unnecessary if one could trust that employees always act in the organization's interest. (Merchant & Van der Stede, 2007).

In today's literature, there are many different views on how management control functions. Some authors argue that MCS operates as a package (Bedford & Malmi, 2015; Chenhall, 2003; Malmi & Brown, 2008), while others look at the control components separately (Simons, 1995). Malmi and Brown (2008) claim that management controls should be seen as a package of systems rather than one single system. That is because different systems are introduced at different points in time and by different interest groups and should, therefore, not be seen holistically as one single system. In line with Malmi and Brown's approach to viewing MCS as a package, Bedford, and Malmi (2015), discusses management controls as a package of interrelated mechanisms and examine how these combinations are related in different contexts. However, one cannot assume that there is always a one-to-one relationship
between MCS and a context since the controls constituting a package could also combine differently with other controls in another context. (Malmi & Brown, 2015).

Although the contention is that controls are designed and used for adapting to changing environments, the impact of organizational change on MCS as a package has yet to be studied (Evans & Tucker, 2015). There are some challenges with studying MCS as a package. MCS as a package is difficult to study empirically due to its complexity and large size (Malmi & Brown, 2008). Malmi and Brown argue that developing survey instruments that can capture the underlying phenomena meaningfully is challenging. Contingent factors do not influence the design of an MCS package, rather, it is influenced by functional issues (Sandelin, 2008). In particular, MCS as a package instead reveals how conflicting functional demands are being balanced.

### 2.6 Simons Levers of control

Organizations achieve control in many ways, ranging from social- and cultural controls to direct surveillance of employees (Simons, 1995). In his framework from 1995, Simons presents four levers of control (LOC) that an organization must analyze to implement its strategies successfully. Top management must understand each of the four vital strategic variables: core values, risks to be avoided, strategic uncertainties, and critical performance variables. Each construct is controlled through different systems, so-called levers of control.

The four levers of controls forming the LOC framework described by Simons (1995) are belief systems, boundary systems, diagnostic control systems, and interactive control systems. These controls create opposite forces in implementing strategies, a phenomenon referred to as “the yin and yang.” These controls are either expressed in positive- or negative terms and are found to be important when managing evolutionary or revolutionary change. The belief systems and interactive control systems are positive forces, the “yang,” while the two other levers of control, boundary systems, and diagnostic control systems, are constraining and thus negative “yin.” Further, the belief systems and boundary systems are described by Simons as “design attributes of MCS.” In contrast, the diagnostic- and interactive control systems are instead seen as “attention patterns for performance measurement systems.” (Simons, 1995).

Belief systems enhance opportunity seeking, while boundary systems set rules of the competition, and combined, these frame the organization’s strategic domain. A similar relationship exists between the diagnostic- and interactive control systems where the
diagnostic controls’ primary focus is the implementation of intended strategies. On the contrary, interactive control systems focus on opportunity-seeking. Together, these two levers of control guide the formulation and implementation of the organizational strategy. (Simons, 1995).

Simons further argues that it is a crucial decision for top management to select and use these different levers of control properly. The author further argues for a combined use of the four levers as a core feature of the framework. When used together, it is possible to properly control the business strategy and effectively balance innovation and efficiency (Simons, 1995). The power of all four levers of control cannot be found in using each of them separately but in how they complement one another when used together (Simons, 2014). How managers choose to use these four levers of control reflects their values, impacts the probability that the organization will achieve its goals, and reveal management’s opinions of subordinates. It also influences the ability to adapt and prosper in the long term. (Simons, 1995).

As discussed, there must be a balance among the four levers of control to implement new business strategies effectively (Simons, 1995). This is one of the biggest challenges of management. While managers must allow sufficient innovation and adapt to changing circumstances in the market, they must also manage the ongoing operations of their business. MCS must include both strategies that are deliberately intended and incremental strategies that arise in different parts of the organization (Simons, 1994). Managers use MCS for various purposes. For instance, they are used to communicate organizational goals or plans, to keep employees informed, or to monitor performance (Simons, 1995). Further, the use of MCS has been found valuable for strategic renewal (Simons, 1994), improving commitment (Simons, 1995), and in different stages of a business life cycle (Simons, 2014).

For an organization to achieve its financial- and non-financial goals, the managers must rely on the initiatives and efforts of their employees (Simons, 2014). Employees must be aware of the organization’s strategy and goals and their role in achieving these goals. When organizations grow, the importance of communication and control increases, and at the same time, they become more challenging to work with it. Therefore, an effective balance and use of management control systems and performance measures are critical to success. (Simons, 2014).
2.6.1 Beliefs Systems

The belief system is the first lever of control described by Simon’s LOC framework (1995). Managers use belief systems to communicate and systematically reinforce to spread the organization’s purpose and value and to clarify the direction of the organization. These controls are value-laden and inspirational forces used by top managers as formal controls. Belief systems are directed to the subordinates to adopt and are related to the organization’s business strategy. The communication is done through documents such as mission statements, credos, and purpose statements.

Belief systems are aimed to help determine what problems to tackle and what solutions to search for when problems arise in the organization’s implementation of a business strategy. They must be broad so that members of organizations can commit to the communicated values and purposes on their terms. It is equally important that they are inspirational for managers, salespeople, and, for instance, a production worker. (Simons, 1995). To learn new behaviors, e.g., when the manager is newly appointed or when facing strategic change, belief systems can provide a new frame of reference for changes and new emerging agendas. (Simons, 1994). However, belief systems are too vague to be used as formal standards by which one could measure performance. These positive and inspirational controls are transformed into purposive activity through the combination of another lever of control, boundary systems. (Simons, 1995).

2.6.2 Boundary Systems

The second lever of control, boundary systems, are negative forces used to avoid risks within organizations (Simons, 1994). In contrast to belief systems, boundary systems are negative forces that establish limits for opportunity-seeking based on the defined business risk (Simons, 1995). Boundary systems are necessary for enhancing creativity and opportunity-seeking in a controlled way. Without boundary systems, the positivity and inspiration communicated through belief systems risk dissipating the firm's resources and energy through unfocused search behavior. The dilemma described by Simons (1995) is that despite this risk, it is equally problematic to dictate and specify what subordinates should do. Therefore, boundary systems are minimum standards dictating what the subordinates should not do. Individuals in the organization are thus allowed to be creative within these boundaries. (Simons, 1995). Although these boundary systems are essentially negative and proscriptive,
they lead to creativity and flexibility, allowing managers to delegate decisions to subordinates (Simons, 1995).

One ordinary boundary system is the codes of conduct, including, for instance, proscribed behaviors regarding conflicts of interest and actions that risk compromising organizations' trade secrets or other confidential information (Simons, 1995). There is a tendency for boundary systems to be developed solely in response to discrete incidents or crises. Thus, boundary systems are often concrete in their prescriptions. However, boundary systems are generally effective when communicated clearly, and most organizational participants will not contravene these. (Simons, 1995). Although boundary systems are necessary for, in a controlled way, allowing creativity, they can hinder adaptation to changes in the market, environmental conditions, or product and technological developments if they are not set correctly. (Simons, 1995).

2.6.3 Diagnostic Control Systems

According to Simons (1994), diagnostic control systems are the third formal lever of control used by top managers to monitor the different organizational outcomes. They are referred to as “the backbone of traditional management control” and are designed to ensure that organizations achieve their goals. It is a system built on feedback and includes the correction of deviations from standards that are predetermined. Three features distinguish these levers of controls related to the ability to measure outputs, predetermined standards, and to correct deviations from standards. (Simons, 1995). One can use any formal information system diagnostically if it fulfills four criteria. These criteria are that one must; (1) be able to set the goal in advance, (2) measure outputs, (3) calculate or compute the variances of performance, and lastly, (4) be able to use this variance information as feedback-systems or align the performance with the goals of the organization. (Simons, 2014).

Diagnostic control systems are negative forces used to ensure that the organization achieves its goals for the intended strategy (Simons, 1995). It is negative because it constrains innovations and the search for opportunities. Managers can use diagnostic controls as a tool to evaluate results and achieve organizational goals. They are used to critically measure the achievement of certain performance variables necessary to succeed with the organizational strategy. Two examples of diagnostic control systems are the organizations’ budgets and
business plans. (Simons, 1994). The budget could be used as a diagnostic control to convey a sense of responsibility to the employees and to evaluate their performance. (Simons, 1995).

The diagnostic control systems can only be effective if managers devote sufficient attention to setting organizational goals, designing incentives, aligning performance measures, reviewing, and following up on important exceptions (Simons, 2014). However, there are some risks with using diagnostic control systems, including, for instance, the risk of measuring wrong variables. The old saying “what gets measured, gets managed” accurately describes this risk since attention is limited, and therefore, one must pay attention to the right things. (Simons, 2014).

2.6.4 Interactive Control Systems

According to Simons (1995), interactive control systems contrast with diagnostic control systems. While the diagnostic control systems are negative and constraining, the interactive control systems stimulate learning and advocate opportunity-seeking. Managers use these control systems to involve themselves regularly in their subordinates' decisions (Simons, 2014). The idea of interactive control systems is to force communication within the organization. According to Simons (1995), managers use these systems, for example, to focus on innovation like new technology and establish new programs. Also, they are used to implement new strategies, starting at the bottom. However, diagnostic- and interactive control systems are not different in how they are technically designed. It is the way managers use these controls that differs (Simons, 2014). Thus, the design of diagnostic and interactive control systems might look identical.

Diagnostic control systems are insufficient when organizations face competitive markets and external changes (Simons, 1995). In such conditions, Simons argues that there is a need for interactive control systems for the organization to survive. Further, Simons explains that four characteristics define the interactive control system. First, the system's information is essential and used in management. The second characteristic is that the system regularly requires attention from the organization's operational managers. Thirdly, the information provided by the system is discussed in face-to-face meetings, including with top managers and their subordinates. Finally, interactive control systems are characterized as "catalysts for the continual challenge and debate of underlying data, assumptions, and action plans." (Simons, 1995).
Interactive control systems are "the hot buttons" for managers as they pay much attention to the information it provides to create ongoing dialogues with their subordinates (Simons, 2014). The interactive dialogue occurs at different organizational levels when new information must be analyzed. It forces organizational learning and highlights when there is a need for changing routines, value propositions, or even the whole business strategy. Simons (1994) further argues that the interactive control system itself is not a unique set of controls. Instead, any control system can be used interactively by managers. For instance, profit planning systems, balanced scorecards, or project monitoring systems can be used interactively. (Simons, 2014).

2.7 Research on Simons’ LOC

Since Simons released his LOC framework in 1995, much research has been made on the role of different levers of controls (e.g., Bisbe & Otley 2004; Kruis et al., 2016; Tessier & Otley, 2012; and their combinations and interdependencies (e.g., Henri, 2006; Tuomela, 2005; Widener, 2007). Tessier and Otley (2012) build on Simons’ Levers of the Control framework and look at it holistically. The authors' comprehensive framework clarifies the definition of positive and negative controls by focusing on the dual role of these controls rather than solely their quality of them. Further, Tessier and Otley distinguish the managerial intentions from the employees' perceptions and argue that the quality of control is not the same as the perception of it. The presentation is a bridge between managers' intentions and the perceptions of their employees in a way where it influences the way employees perceive the controls.

A negative force can be associated with something inferior, but Tessier and Otley (2012) support the statement of Simons (1995) as they explain boundary systems in organizations like brakes on the car. A car cannot operate at high speed without brakes, which applies to organizational boundaries. Top managers need formal systems to establish explicit limits and rules for everyone to follow themselves. The authors define boundaries in a way that they can serve as strategic ways to delineate managers' search for innovative ideas. These systems can either stand alone as information systems or be incorporated as a part of planning guidelines, created, and communicated by business managers through different business conduct codes, strategic planning systems, and operating directives (Simons, 1994). According to Tessier and Otley (2012), boundaries contribute as social and technical controls of different types, which specifically will be used to manage compliance. Tessier and Otley further argue ambiguity
regarding the relationship between belief and boundary control systems as they operate at different levels of analysis. Belief systems can be used to encourage performance and manage compliance, while boundary systems are predominantly interested in compliance. (Tessier and Otley, 2012).

In their review of the use of Simons' LOC framework, Martyn et al., (2016) found that the framework has proven to help examine controls, both for qualitative- and quantitative studies. Although it is based on practices from 25 years ago, the framework is gaining popularity and is still suggested as helpful in explaining how organizations use MCS (Martyn et al., 2016). Several researchers have addressed the importance of balancing different levers of control. For instance, Kruis et al. (2016) examine the concept of balance and find that balance can be achieved through various combinations of levers. The levers have specific features and ways of displaying their attendance in practice, and it is in their interdependencies, which warrant consideration, that relevant aspects reside (Barros & Ferreira, 2022). Even though Simons (1995) implies that all levers of control are needed to achieve a balance, this balance does not necessarily mean that the use is of equal weight (Kruis et al., 2016). Kruis et al., conclude that the balance can be achieved by combining different controls, although these combinations are limited. To find this balance, managers must be able to choose how they use levers of control (Mundy, 2010). The manager's choice depends on individual, organizational, and external factors.

When examining the balance between Simons' LOC, Barros, and Ferreira's (2022) findings suggest that the presence of control systems that are diagnostic or interactive is stronger than the belief- and boundary systems. Managers do not have to make a trade-off between innovation and control, rather it is about finding the right balance. Further, the authors argue that an organization can be innovative and achieve high performance while having a high presence of all levers of control. (Barros & Ferreira, 2022). Rezania et al. (2016) findings support Simons' assumption that all lever of control is essential for different purposes. The interactive- and diagnostic control systems were found to be significantly crucial for performance. Also, one should put less emphasis on belief systems as it does not help managers to adapt as required to changes. Instead, belief systems are being balanced using other levers of control. (Rezania et al., 2016).
2.8 Hypotheses Development

2.8.1 MCS and Organizational Performance

The use of MCS and its positive implications for performance is commonly discussed in the literature (e.g., Baird et al., 2019; Bedford, 2015; Cardinal et al., 2004; Davila, 2000; Felicio et al., 2021). Findings show that control systems are crucial for performance, and the balance between them is even more critical for organizational functioning (Cardinal et al., 2004; Henri, 2006; Mundy, 2010). The researcher further discussed how organizational crises, performance problems, slower decision-making, and wasted resources were precipitated by periods of control system imbalance.

The concept of balance is the core of Simons’ framework, and it is argued that all four levers are crucial for an effective control system (Simons, 1995). Using the constraining and enabling levers aims to facilitate the two objectives of monitoring performance to enhance efficiency and effectiveness and encourage creativity crucial for performance. Hence, it is argued that the constraining levers, diagnostic and boundary, facilitate control, and the enabling levers, beliefs and interactive, facilitate experimentation and creativity (Mundy, 2010). Research made by Simons (1994) further shows how top managers can use MCS for renewal and strategic change and that MCS is necessary for managing both evolutionary and revolutionary changes.

Effectively deployed belief systems have a positive influence on the other three levers of control as they provide guidance and help motivate individuals to improve performance and search for opportunities (Widener, 2007). In an empirical analysis of the LOC framework, Widener (2007) found several relationships between different levers of controls, both inter-dependent and complementary. Although these inter-dependent and complementary relationships may exist, it does not necessarily mean that both conditional impact performance. Bedford (2015) argues that interactive- and diagnostic controls are often separated temporally and spatially. In exploitative firms, boundary and diagnostic control systems are independently related to organizational performance. It has been found that enabling controls, such as belief and interactive control systems, positively and indirectly influence performance as it provides new structures (Baird et al., 2019). However, the authors also found that constraining controls impact performance indirectly.
The use of belief systems may be promoted through mission statements to create organizational structures and routines and communicate core values to inspire and motivate employees to search, explore, create, and expend (Widener, 2007). Mission statements give the management a unity of direction to communicate and create a sense of shared expectations among all levels and generations of employees (Widener, 2007). Bart et al. (2001) concluded that the ultimate mission statement must have the proper rationale, constrain sound content, have organizational alignment, and bring about good behavioral change in the desired direction. Research shows that the development of mission statements has a positive relationship with organizational performance and contributes positively to it (Bart et al., 2001). Hence, we hypothesize:

\[ H1: \text{There is a positive correlation between the use of belief systems and organizational performance.} \]

In line with the contingent view, Felício et al. (2021) conclude that MCS must be adapted to the external environment and organizations' characteristics to achieve different levels of performance. Govindarajan (1988) found evidence supporting that when matching the organizational structure and control systems with the organization's environment, a higher performance can be reached. However, there is also a risk of changing structures excessively, as findings suggest that constant change in structure and organizations' routines may lead to unwarranted disruption that negatively influences organizations' performance (Baird et al., 2019). However, in dynamic environments, the use of boundary systems may be needed to provide structure and control and stop employees from engaging in high-risk behaviors (Baird et al., 2019; Widener, 2007). Having a well-defined code of conduct that communicates appropriate and off-limits behaviors as well as risks that should be avoided will balance the inspirational belief systems (Simons, 1995). The balance is needed to enhance efficient organizations meaning that boundary systems are equally important to affect organizational performance positively. This leads to the second hypothesis:

\[ H2: \text{There is a positive correlation between the use of boundary systems and organizational performance.} \]

To reach a balance, the use of diagnostic control systems is known to be a critical success factor (Simons, 1995). Diagnostic systems motivate employees, monitor their performance,
and provide appropriate rewards to ensure they work toward the organization's goals (Baird et al., 2019). According to Simons (1995), it is further used to provide information to "gain coherence over the multiple functional strategies that coalesce into realized strategies." The diagnostic use of budgets can be used to achieve effective performance outcomes by providing motivation, resources, and information to ensure that organizational strategies and goals are achieved (Bisbe & Otley, 2004; Davila, 2000; Simons, 1995; Widener, 2007). This leads to the third hypothesis:

**H3: There is a positive correlation between the use of diagnostic control systems and organizational performance.**

The literature on management control further argues for the importance of focusing on financial and non-financial measures when it comes to performance (Felicio et al., 2021). Davila (2000) argues that managers work with the implicit assumption that good performance in non-financials will drive good financial performance for the organization. Dossi and Patelli (2010) examined the contribution of non-financial indicators to the dialogue within organizations, which, according to the literature, is expected to impact international organizations' performance significantly. Their findings strengthened prior literature as performance measurement systems should be conceived more than just as measurement diagnostic tools or problem detectors. Instead, they should be used to foster dialogue between different units and corporate offices and to initiate collaborative discussions about strategic performance results. The authors provided evidence that non-financial indicators support this dialogue as it captures key performance drivers and complements the information content of traditional financial metrics. Davila (2000) supports these findings arguing that cross-functional integration and collaborative discussions are significantly related to performance. Collaborative discussions provide managers to learn of new strategic opportunities. As the strategy develops, objectives and critical success factors must be redefined and conveyed throughout the organization, meaning that interactive control systems become efficient in supporting structure (Chenhall & Morris, 1995). Henri (2006) also provides evidence of a direct relationship between interactive use and capabilities leading to strategic choice and organizational performance, which supports the fourth hypothesis:

**H4: There is a positive correlation between the use of interactive control systems and organizational performance.**
2.8.2 MCS, Organizational Performance, and Uncertainty

Langfield-Smith (2007) presents that several studies shed light on the importance of using MCS for influencing performance and strategic outcomes. Different levers of control are combined and used by the organization to maintain the right balance between ongoing operations and innovation to adapt to changing markets (Simons, 1995). The different combinations are because organizations are experiencing different contingency challenges and must therefore use levers of control differently (Kruis et al., 2016). To reach the most effective combinations, the balance of controls must be consistent with the strategic- and contextual challenges surrounding the organization.

In his LOC framework, Simons (1995) discussed the environmental variable “strategic uncertainty.” Simons defines strategic uncertainty as “the emerging threats and opportunities that could invalidate the assumptions upon which the current business strategy is based.” In strategic uncertainty and risks, the LOC framework argues to drive the choice and use of control systems, which in turn, influence the organization through organizational learning and the efficient use of management attention (Widener, 2007). When studying the first lockdown period during the Covid-19 pandemic, Passetti et al. (2021) found that MCS was used to maintain organizational control. Enabling and constraining controls were combined to cope with the problems caused by the Covid-19 pandemic efficiently. These findings add empirical evidence to an emerging stream of management control literature that discusses the concomitant and different use of multiple control mechanisms to deal with unplanned situations (Bedford & Malmi, 2015; Rikhardsson et al., 2021; Van der Kolk et al., 2015), investigating management control during the unfolding of a pandemic crisis.

Widener (2007) found that all four levers of control are shown to positively impact performance. Although diagnostic- and interactive control systems have received the most attention in research related to performance (Tessier & Otley, 2012), belief systems have been shown to positively influence all other control systems (Widener, 2007). For instance, the diagnostic- and interactive controls are supported through belief systems as they inspire the search for new opportunities in line with the organizations’ core values (Tuomela, 2005). In uncertainty, communicating core values and company direction might be fundamental (Heinicke et al., 2016). Although it is crucial to emphasize all levers of control, emphasis on the belief systems is the key. Belief systems set the direction for the other levers of control. (Heinicke et al., 2016). As belief systems are suggested to have a positive influence on all
other control systems, and one could expect that there is an increased need for communicating the company direction in times of uncertainty, it leads to the following hypothesis:

**H5: Uncertainty strengthens the positive correlation between the use of belief systems and organizational performance.**

While Henri (2006) looks at levers of control in different levels of uncertainty, Widener (2007) develops these findings, investigates the relationships among different levers of control, and studies how strategic risk and uncertainty impact the use and importance of diagnostic- and interactive controls. The interdependence among control systems is well-accepted (Otley, 1999). However, Widener (2007) contributes with evidence from her study of the LOC framework that these interdependencies are complementary. The idea that control features are complementary was demonstrated by Milgrom and Roberts in 1995. Complementarity activities mean that doing more of one activity increases the return of doing more of other activities. Implying this on control, the authors argue that if organizations emphasize one of the controls, they will also increase the benefits received from using other control components more frequently. (Milgrom & Roberts, 1995). For instance, a structure is necessary for interactive controls to be adequate (Chenhall & Morris, 1995; Widener, 2007).

Widener (2007) found in her study that boundary and diagnostic control systems provide a necessary structure for belief and interactive control systems. Further, interactive control systems influence both the use of boundary and diagnostic systems (Widener, 2007). Strategic performance measurement systems (PMS) can be used diagnostically and interactively, and their use might also have implications for belief and boundary control (Tuomela, 2005). A similar conclusion is made by Simons (1995) as he found that belief and boundary systems are ineffective to use separately. To avoid the risk of unfocused exploratory search behavior within the organization, boundary systems must be placed to maintain control and encourage reasonable creativity (Simons, 1995). Delfino and Van der Kolk (2021) found in their study that constraining controls over employees increased during the Covid-19 pandemic. In line with Delfino and Van der Kolk’s findings, it could be expected that in an uncertain context like post-Covid-19 where organizations cannot control the external environment, there is significant importance in maintaining control within the organization. Also, as belief systems are claimed to be valuable in uncertain contexts and are complementary to boundary systems,
increasing the emphasis on belief systems is expected to increase the benefits received from using boundary systems. This leads to the following hypothesis:

\[ H6: \text{Uncertainty strengthens the positive correlation between the use of boundary systems and organizational performance.} \]

Simultaneous to the relationship between belief- and boundary systems, Widener (2007) discuss that diagnostic control systems are necessary for providing a structure for interactive control systems. Even though the diagnostic control systems work against deploying capabilities, these can lead to higher organizational performance through monitoring achievements of goals, controlling risk-taking, and setting boundaries (Henri, 2006). Diagnostic control systems can be used for promoting mutual involvement and handling uncertainties in the external environment and thus lead to higher performance in terms of higher competitiveness (Laguir et al., 2022). Therefore, it can be expected that using diagnostic control systems has a significant impact on performance in uncertainty. We hypothesize:

\[ H7: \text{Uncertainty strengthens the positive correlation between the use of diagnostic control systems and organizational performance.} \]

As reviewed, it is vital to control risk-taking in organizations. However, when firms face high environmental uncertainty and value flexibility, the organization benefits from dynamic tension by balancing diagnostic and interactive performance measurements (Henri, 2006). In uncertainty, including constant change and high competition, firms need to be creative and innovative. Thus, interactive use and flexible values are particularly significant in such contexts. In line with this, empirical research shows that when a firm faces various types of risk and uncertainty regarding, for instance, competition, market, and environmental issues, the interactive control systems are effective (Bisbe & Otley, 2004; Simons, 1991; Widener, 2007). However, Henri (2006) concludes that this dynamic tension might not fit organizations that are experiencing a low amount of uncertainty. Instead, in a stable environment, the dynamic tension between interactive and diagnostic use could be more useful as organizations are well-known and have established internal processes. (Henri, 2006). Thus, it can be concluded that interactive control systems are especially important when organizations face different sorts of uncertainty. They are used to scan the environment in which the organization
operates, for organizations to strategically position themselves (Widener, 2007), and are needed for finding creative solutions in uncertain contexts (Henri, 2006). Since it is argued that it is essential to be creative and flexible in uncertainty, for instance, when facing high competition, using interactive control systems might be even more critical for achieving high performance in uncertain settings. This leads to the following hypothesis:

\textit{H8: Uncertainty strengthens the positive correlation between the use of interactive control systems and organizational performance.}
2.9 Research Models

2.9.1 Research Model 1

The first model of this paper illustrates the expected relationship between the four LOC and organizational performance. As stated in hypotheses 1 to 4 that are deducted from the theoretical framework presented above, each variable is expected to correlate with organizational performance positively. However, as researchers argue (Kruis et al., 2016; Mundy, 2010; Rezania, 2016; Simons, 1995), all levers of control must be combined and balanced for organizations to succeed with their strategies. Also, Widener (2007) suggests that interdependencies and complementary relationships exist among the LOC, meaning that using one control might increase the effect of using another control. Therefore, all LOC are included in Model 1 when studying their respective relation to organizational performance. Model 1 displays hypotheses 1, 2, 3 and 4.

Model 1 - LOC and Organizational Performance
2.9.2 Research Model 2

The second research model is an extended version of Model 1 which includes a moderating effect. Like Model 1, this model illustrates the combination of all LOC as researchers assume that a balanced use of LOC is essential in uncertain environments (e.g., Henri, 2006; Simons, 1995; Widener, 2007). Model 2 extends Model 1 by displaying hypotheses 5, 6, 7 and 8 where this study tests whether uncertainty moderates the expected positive relationship between each LOC and organizational performance.
3. Method

The third chapter consists of the methodology covering the study's underlying research philosophy and approach. It explains the research design, including the data collection method, sampling, research- and survey design. Further, the multiple regression models are explained, including the different variables. The chapter also includes an analysis of the research quality regarding the validity, reliability, and ethical considerations and concludes by outlining the data analysis process.

3.1 Introduction

This study aims to examine the use of MCS in the post covid context in relation to organizational performance. The research follows a contingency-based approach and is conducted using Simons's levers of control framework (Simons, 1995). Depending on the environment and circumstances surrounding the organization, it is argued to be fundamental differences in how organizations use control systems. However, it is also argued that the use of MCS will enhance organizational performance. Each lever of control can be used to a different degree (Barros & Ferrerira, 2022; Kruis et al., 2016), which allows researchers to explore them separately. It is further assumed that a balance between the levers of control in uncertain environments will contribute to the overall organizational performance (Henri, 2006; Simons, 1995; Widener, 2007). The idea of the study conducting a theory and hypothesis-testing approach and use of scientific methods, which generally coincide with a quantitative research strategy (Antwi & Hamza, 2015), will be discussed in the following sections.

3.2 Research Philosophy

As research became more severe, the scientific method was developed to investigate things that could be tested (Antwi & Hamza, 2015). This research approach underpins the positivism paradigm, and quantitative research mainly follows ontological and epistemological views related to the positivistic paradigm (Choy, 2014). A positivistic approach aims to use quantification to enhance precision in describing parameters and the relationships among them, which is why thinkers adopt scientific methods and systematize the knowledge generation process (Antwi & Hamza, 2015). Within the positivistic approach, the quantitative researcher tends to follow an ontological view assuming that knowledge is objective and
quantifiable. It further follows an epistemological view arguing that the goal of science is to develop the most objective methods possible to get the closest approximation of reality (Antwi & Hamza, 2015). It is suitable to embrace a positivistic approach and conduct objective research for this study. Hence, the aim is to get the closest approximation of reality and to yield pure data and facts uninfluenced by human interpretation or bias (Saunders et al., 2019). Prior studies within the field have objectively analyzed MCS accordingly to Simons's levers of control framework (Henri, 2006; Müller-Stewens et al., 2020; Widener, 2007), which are used as benchmarks within this study.

This study is partly based on the contingency approach, arguing that no universally appropriate control systems can be applied during all circumstances. It is sensible to argue that all research on the topic must take a 'contingency' approach as organizations are complex and work in uncertain environments (Otley, 2016). Hence, using an objective approach to conducting quantitative research will generate a greater number of answers which will contribute by taking more perspectives into account. It further facilitates the aim of observing patterns and being able to draw more general conclusions (Bryman & Bell, 2015). Gathering quantitative data also allows the performance of comparisons as it is possible to conduct statistical tests of the data. This study aims to contribute to the developed framework of Simons (1995) by examining the use and possible interrelations within MCS in relation to performance. Accordingly, the most appropriate way to investigate organizations' use of MCS and its relationship to performance is by utilizing a positivist strategy with quantitative, objective data in numerical form (Bell et al., 2022).

3.3 Research Approach

Concepts are essential for organizing, signaling research interests, and providing discipline about the study's aims (Bell et al., 2022). The relationship between theory and the research could be described as involving a choice between theories that can be used as a driver of the research process in all its phases. This can be depicted as the choice between either inductive or deductive approaches. For this study, a deductive approach is applied. When using a deductive approach, the researcher deduces hypotheses based on what is known about the topic (Bell et al., 2022). Based on their hypotheses, researchers use deductive reasoning to deduce the observable consequences that are expected to occur with the study's new empirical data (Antwi & Hamza, 2015). According to Bell et al. (2022), a deductive approach fits well with the positivist paradigm, which this research applies.
3.4 Research Methodology

Within research methodology, there are two general approaches: qualitative and quantitative. The Quantitative methodology is a strategy that emphasizes the quantification of collecting and analyzing data (Bryman & Bell, 2015). On the contrary, the qualitative methodology focuses on words rather than quantity. A quantitative method was chosen for this study since it provides results that can be summarized and generalized easily (Bryman & Bell, 2007). The advantage of using a quantitative methodology is that it limits the influence of the researcher's subjective interpretations (Bryman & Bell, 2015). Such methods allow interpretations of numbers before conclusions are drawn (Watson, 2015). The idea of quantitative research is that it operates under the assumption of objectivity (Antwi & Hamza, 2015). Also, as noted by Bell et al. (2022), using a quantitative method allows the researcher to collect a lot of data even during a short period and receive generalized results.

This paper aims to study organizations' use of MCS in relation to the external environment and its impact on organizational outcomes. The idea is to study these relationships deductively and positively to draw generalized conclusions from the new empirical data provided in this research. The purpose is not to look deeply into several factors. Instead, it is to emphasize a few factors and study how they are related. Therefore, a quantitative method provides a good fit for this paper.

Although the quantitative methodology best suits this paper's purpose, some things could be improved with this choice. First, quantitative research is criticized for using a "narrow-angle lens," focusing only on a few factors (Antwi & Hamza, 2015). For instance, it is criticized for "failing to distinguish people and social institutes from the world of nature" (Bell et al., 2022). When using a quantitative methodology, it is traditionally assumed that behavior and cognition can easily be predicted and explained (Antwi & Hamza, 2015). Thus, a possible limitation of using a quantitative method is that it solely provides a narrow view of the concept and use of MCS without considering the unpredicted behavior of people and organizations. With qualitative methods, things can be studied in their natural settings where one can make interpretations and where the researcher is the instrument of data rather than standardized instruments (Antwi & Hamza, 2015).
3.5 Choice of Theory

Simons LOC (1995) is chosen as the main theoretical framework for this study. The framework has been frequently used in literature over the years (Tessier & Otley, 2012). Its popularity indicate that it is useful when it comes to understanding the role- and use of MCS (Curtis et al., 2017). Many studies use it to understand the role of MCS in specific contexts and the influence of the external environment (Martyn et al., 2016). It is suitable to use the LOC framework for studying the specific context of post-Covid-19 because it allows us to make comparisons with previous research and thus, broaden the understanding of the role of each LOC in different contexts and external environments. Also, because this paper aims to provide generalized conclusions about the role of MCS, it is important to address controls that can easily be measured. Therefore, the LOC framework is suitable as it only focuses on formal, measurable controls (Simons, 1995).

Additionally, the contingency theory is chosen as the leading theory to support the research of MCS in the context of uncertainty. External environmental uncertainty, existing in e.g., the post-Covid-19 context, is identified as a contingent factor (Fisher, 1998). Contingency theorists propose that organizations should adjust to these contingent factors and employ various systems suitable for the environment. As such, the use of suitable control methods is contingent on the specific circumstances of the organization (Otley, 1999). Moreover, as the post-Covid-19 context and the uncertainty that follow affect all organizations in Sweden, the institutional theory was chosen to discuss potential institutionalized behavior of organizations coping with uncertainty. Also, organizations operating in the post-Covid-19 context have been surrounded by uncertainty for a long time, both during and after the pandemic. Hence, post-Covid-19 constitutes an interesting context for studying if the idea of organizational learning (Argote & Miron-Spector, 2011) is supported.

Finally, the use of MCS, its relationship to organizational performance in this post-covid-19 context, and the concept of contingency are tested in regression with uncertainty as a moderating variable. The choice of using a moderating variable relies on the notion that uncertainty would positively strengthen the relationship between the four levers of control and organizational performance. It is argued that the use of MCS is of significance in times of uncertainty to reach organizational performance (Delfino & Van der Kolk; 2021; Heinicke et
al., 2016; Henri, 2006; Laguir et al., 2022; Widener, 2007), which is why a moderating variable of uncertainty is used in regression.

3.6 Research Design

3.6.1 Method of Data Collection

The data for the quantitative method is collected through a survey. This method requires a structured approach, e.g., the survey is designed in advance based on what results the study aims to find. Further, a self-completion questionnaire is used, meaning that the respondent answers the questions by completing the survey independently (Bell et al., 2022). The questionnaire is completed using an online survey called "Google Forms." Since no interviewer is present, a self-completion survey reduces the risk of biased answers among the respondents. This is because the survey looks the same for all respondents, and the researcher cannot influence the answers through, e.g., biased formulations of questions. However, with self-completion questionnaires, there is a greater risk of missing data as respondents might actively decide not to answer questions. (Bell et al., 2022). To avoid this, all questions in the survey were made mandatory to answer.

The data was primarily collected by sending out the survey directly to managers' email addresses that were found on different company websites. Different business registers found through UC Select were used to find all the registered companies in Swedish municipalities. Also, the survey was published on LinkedIn and Facebook and sent directly to managers in our social networks. The reason for aiming for answers from Swedish managers is that there needs to be more research on MCS in the context of Sweden, especially in uncertain environments. Further, the approach to sending out the survey directly to managers was addressed as it has been a successful strategy used by researchers on the topic previously (e.g., Bedford & Malmi, 2015; Henri, 2006; Widener, 2007). The reason for publishing the survey on social media platforms was primarily to reach out to managers in our networks. Finally, as an attempt to increase the response rate, the participants got the opportunity to fill in their email addresses using a separate link presented at the beginning of the survey to take part in the results. This approach was inspired by Widener's (2007) data collection for her article, as she promised all respondents to provide a summary of the results from her study.
3.6.2 Sampling

The survey was conducted over 14 days in February 2023 with a sample consisting of managers of organizations located in Sweden. Research within MCS mainly conducts empirical studies on managers as they are considered knowledgeable in perceived uncertainty, performance, and use of control systems within the organization (Henri, 2006; Mundy, 2010; Widener, 2007). The sample selection is further based on the philosophy of collecting a sufficient amount of data. It is also assumed that all kinds of managers with a comprehensive insight into the organization have the knowledge to respond to the survey, which argues for not limiting the sample. It is considered that research on the topic conducted in Sweden is very limited. Hence, the study aims at organizations' use of control systems in general and is not limited to a specific industry or company size.

The sampling was conducted to gather data that can be analyzed statistically to generalize and draw conclusions based on the organization's use of MCS. The study aims to use the practice of surveying one individual per organization to find out about the whole organization (Bell et al., 2022). This method is covered under non-probability sampling, argued to have limitations, and is being criticized for not being a good representative. On the other hand, it is argued to be helpful when randomization is challenging due to a large population. Hence, it appears to be an appropriate choice when considering the limited amount of time, resources, and connections available for the study (Etikan et al., 2016). One of the techniques used was convenience sampling, as the population we first targeted was easily accessible, available, and willing to participate in the study. To complement this method, a purposive sampling technique was further used to increase the population by identifying and selecting individuals with desired characteristics and knowledge (Etikan et al., 2016).

The survey was first sent to contacts in the authors' networks. Further, the survey was distributed through Facebook and LinkedIn social media platforms. On these platforms, the survey was promoted, asking contacts with a manager position to respond. It further encouraged people to share and spread the survey to reach even more managers. Additionally, the survey was sent to different managers, mainly CEOs and CFOs but also other types of managers through email. Email addresses were conducted through company websites all over Sweden to gather a sufficient sample. In total, the survey was sent to 738 managers using this method. However, some of these were no longer up to date. These companies were found
either from their recognition or through the UC company register. The emails also contained a promotion to spread the survey to other managers suitable to participate in the study, implying that a snowball sampling was conducted as well (Bell et al., 2022).

As illustrated in the descriptives Table 1 in Chapter 4, the sample consists of 164 participants. The minimum size of the sample depends on the researcher's purpose for using multiple linear regression. (Knofczynski & Mundfrom, 2008). Estimating the significance and the hypothesis tests often improves with a larger sample size (Eberly, 2007). Tabachnick and Fidell (2013) give guidance to calculate the sample size using a formula. The number of independent variables used in the multiple linear regression model is considered: \( N > 50 + 8m \) (where \( m = \) the number of independent variables). In this case, the number of independent variables is four meaning that the minimum sample size is 82. This is achieved with a doubled sample size of 164.

### 3.6.3 Pilot study

A pilot test was conducted before the survey was distributed on a full scale. It was sent to family, friends, and the supervisor with comprehensive knowledge to fill out the survey and give suggestions, identify voice problems, or respond with feedback if specific questions were unclear and needed adjustments (Bell et al, 2022). The pilot test also served as a technical check to measure the average time it took to respond to it and correct minor errors. Finally, after getting feedback from the pilot study participants, some adjustments to improve the survey were made before the final document could be distributed on a full scale.

The adjustments made to improve the survey were minor. Some additional industries were added to make the respondents feel more included. The question about years in the current position was also reformulated to improve and clarify. To withdraw the risk of respondents missing filling out questions, they were all made mandatory to increase the response rate. Lastly, a message at the end of the survey thanking the respondents for their participation was added.

### 3.7 Survey Design

The survey is a self-completion questionnaire comprising 37 mandatory questions divided into eight sections, including one introductory section. The survey starts with control questions, followed by questions about managers' experienced external uncertainty, their use
of management control systems, and the organizations’ economic performance. The survey was initially constructed in English (Appendix 2) and was then translated to Swedish (Appendix 3) to simplify for the respondents as it was directed to managers in Sweden. Both the Swedish and English versions are used for collecting data. However, only a small fraction of the sampling is made through the English survey.

For all questions, standard instruments from reliable articles are used to ensure valid questions and measurements (Bornton & Greenhalgh, 2004). However, some questions are somewhat modified to fit the purpose of this study. Most questions in the survey are closed questions. The motivation for choosing closed questions is because it simplifies both the researchers when processing answers and the respondents to complete (Bryman & Bell, 2015). Further, using a Likert scale enhanced the comparability of answers, and the questions were coded automatically as pre-codes from 1 – 7 were placed to the side of the scale.

The survey starts with an introductory text introducing the respondents to the research topic. This is followed by some clarifications regarding expected benefits and risks for the respondents as well as information about how data will be treated with discretion and anonymity. At the end of this section, the respondents must answer whether they agree to participate in the study. This is followed by questions related to the control-, dependent-, independent-, and moderating variables.

3.7.1 Control Questions

The survey consists of 7 control questions working as a power of explanation to ensure the responses' accuracy and reliability by identifying and eliminating unreliable data. It provides a picture of who the respondent is when it comes to age, gender, education level, industry, work position, work experience, and company size. The control questions about gender, education level, and company size were close-ended, while the questions about the managers' age, work experience, company industry, and work position were open questions. Open questions were chosen when one could expect a large variety among the respondents (Reja et al., 2003). Also, it allows the respondent to answer on their own terms (Bryman & Bell, 2015).

Age: The respondents were asked about their age in an open question as studies show that age can affect the perception of ethical conduct exercised in, e.g., boundary systems (Deshpande, 1997). Demographic variables, as well as demographic similarity may influence the
leadership-subordinate relationship and subsequent performance, which is why the control variable age was tested (Bernerth et al., 2007).

Gender: Respondents were further asked about their gender as this additionally can impact the management style and their perception of ethical conduct exercised in, e.g., boundary systems (Davidson & Ferrario, 1992; Deshpande, 1997; McColl-Kennedy & Anderson, 2005). The question was close-ended with the alternatives of being a man, woman, or "other." They were coded with 0 = Women and 1 = Man, as no one responded to be "other."

Educational level: To discover patterns when it comes to the degree of education and use of control systems, the respondents were asked about the level of completed education (Deshpande, 1997). The question was close-ended and coded with 1= High School, 2 = University, and 3= Postgraduate.

Industry: Further, questions are asked about the organization's industry (Alla Bolag, n.d.). This question was included to determine possible patterns regarding perceived uncertainty, use of control systems, and performance depending on the industry (Henri, 2007). The question was asked as multiple alternative questions with the possibility to answer open-ended if no alternative appeared suitable. The control variable was later removed from the data analysis due to the large number of different answers.

Work position: Respondents were asked about their work position to control their manager position. As the survey was directed to all types of managers, it was interesting to chart what kind of managers the respondents were. The question was close-ended and coded with 3= Top managers, 2=Divisional manager, 1= Another manager, 0=Other.

Work experience: The survey included one open control question asking the respondents about years in their current work position. This was included to examine differences in the data regarding their experience at the company and in the same position. The same control question is used in similar research used as benchmarks (e.g., Foster & Davila, 2007; Henri, 2006).

Company size: The respondents were lastly asked about the organization's size with alternatives categorized following the EU standards (European Union, 2022). This control
question is used in prior studies used as benchmarks, and it is found to be relevant to examine wheatear there is a difference in the use of control systems depending on the size of the company (e.g., Foster & Davila, 2007; Henri, 2006). The variables are coded from 1-5 depending on the number of employees. 1 = 1 – 10; 2 = 11 – 49; 3 = 50 – 249; 4 = 250 – 500; 5 = More than 500.

3.7.2 LOC, Uncertainty and Performance

The control questions are followed by questions relating to different types of uncertainty, using Simons’ LOC and organizational performance. All questions, except the control questions, are close-ended, where the respondent either evaluate assumptions or grade on a Likert scale from 1 to 7 (Joshi et al., 2015). This scale is used because it has been frequently and successfully adopted by researchers in the field of MCS (Widener, 2007; Bedford & Malmi, 2015; Henri, 2007) and thus is a reliable instrument (Hadi & Chatterjee, 2012). Using existing questions is beneficial as it allows us to compare research within the field (Bryman & Bell, 2015). Also, by using existing questions, one can be sure that the questions have been tested successfully before.

First, the respondents get to answer questions about experienced environmental uncertainty, e.g., economy, competitors, and technology (Bedford & Malmi, 2015). For these questions, number 1 on the Likert scale indicates that the uncertainty factor mentioned in the question is very predictable, while number 7 states it is very unpredictable. These questions are part of the survey as the aim is to study uncertainty as a moderating effect on the relationship between the use of LOC and organizational performance.

This is followed by questions related to each of the four LOC. The purpose of including questions related to Simons’ LOC framework (1995) is to provide a general overview of how managers use MCS. The questions related to the belief- and boundary systems are retrieved from the study by Widener (2007). Further, the diagnostic- and interactive control systems are retrieved from Henri’s article (2006). All questions related to the LOC are stated as assumptions and are measured on a Likert scale from 1 to 7 (1 = Strongly disagree, 7 = strongly agree). Lastly, the questions about organizational performance are retrieved from Carmeli (2008) and Delaney and Huselid (1996). Similar to the questions about LOC and uncertainty, these are measured on a Likert scale from 1 to 7. However, for these questions, the idea is to compare the organization to competitors (1 = Much worse than our competitors,
Much better than our competitors). The questions further measure the performance financially, the performance in human resources, and the performance within service development and quality to take several perspectives into account. This was then added together to get the overall organizational performance.

3.8 Regressions

This paper bases the analysis on two different multiple linear regression models with belonging hypotheses. This section describes the control variables, independent variables, dependent variable, and moderating variable. Finally, the two regression models of this paper are presented.

3.8.1 Control Variables

Control variables have a central role in research. They are often used to receive more accurate and purified estimates of observed relationships. A control variable is a variable that is extraneous and is not related to the hypotheses or theories that the researcher aims to test. Instead, the role of a control variable is to produce distortion within the observed relationships. (Spector & Branni, 2011).

The control variables included in this paper are gender, age, education, work experience, and company size. In the first research model, uncertainty is also included as a control variable, while it acts as a moderating variable in the second research model. These specific control variables are chosen as they are believed to provide a good overview of the sample, both about the individual respondents (gender, age, education, and work experience) and also about what type of organizations are represented by the respondents (company size). Also, even though these control variables are not related to the hypotheses or research questions of this paper, their inclusion of them in the analysis could strengthen and purify the observed relationships (Spector & Branni, 2011).

3.8.2 Independent Variables

The independent variables reflect the factors that are suggested to influence the dependent variable (Gamst et al., 2008). The independent variables are the “predictors of behaviors, attitudes, and characteristics” (Wetcher-Hendricks, 2011). The four independent variables \( x \) of this study is the four LOC: belief systems, boundary systems, interactive control systems, and diagnostic control systems. As stated in the hypotheses, using each of these independent
variables is assumed to have a significantly positive impact on the dependent variable \( y \) performance. As four independent variables are used in this study, one can make a more precise prediction (Sahay 2016).

### 3.8.3 Dependent Variables

The dependent variable refers to the “behaviors, attitudes, and characteristics predicted by the independent variables” (Wetcher-Hendricks, 2011). In this study, the dependent variable is organizational performance. The dependent variable \( y \), organizational performance, can be predicted using the independent variables. In this paper, four independent variables are used in the model, enabling the researchers to use more information provided in the model (Sahay, 2016).

### 3.8.4 Moderating Variable

A moderating variable can be described as “a subset of a class of variables termed, in the social sciences, test or specification variables” (Sharma et al., 1981). A relationship is moderated when the relationship between the variables \( x \) and \( y \) varies due to a third variable (Robison et al., 2013). It has an impact on either or both the form or the strength between the dependent and the independent variable. (Sharma et al., 1981). In this study, the moderating variable is uncertainty. This paper defines uncertainty as “the emerging threats and opportunities that could invalidate the assumptions upon which the current business strategy is based” (Simons, 1995).

This variable uncertainty is suitable as a moderation effect as several researchers have found that the use of MCS is especially important in a different context characterized by uncertainty (Bisbe & Otley, 2004; Janke et al., 2014; Simons, 1991; Widener, 2007). Further, research implies that relationships exist between the use of LOC and organizational performance (e.g., Baird et al., 2019; Bedford, 2015; Cardinal et al., 2004; Davila, 2000; Felicio et al., 2021). These two directions of research on MCS thus make it interesting and suitable to test for the relationship between LOC and organizational performance with a moderation effect uncertainty. Uncertainty is also chosen as a moderating variable to be able to test the assumptions of the contingent view.
3.8.5 Regression Models

The multiple linear regression model describes the relationship between the dependent variable $y$ and multiple independent variables $x_1, x_2, \ldots, x_k$, where $y$ is the response variable, and the $x$ variables are the predictors (Hadi & Chatterjee, 2012). It contains one dependent variable and at least two independent variables (Sahay, 2016). The multiple linear regression model provides an approximation of the true relationship between these variables. Linear regression models are primarily used as empirical models to estimate unknown and somewhat complex relationships (Montgomery et al., 2012). If $y$ increases as a response to the increase of $x$, there is a positive relationship between the variables (Hadi & Chatterjee, 2012). The multiple linear regression model in its original form is as follows:

$$ y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_k x_k + \epsilon $$

$\beta_0$ equals the mean response when all predictors are held 0, which is the intercept. Each $\beta_k$ represents the slope associated with $\beta_k$ and is commonly referred to as partial regression coefficients (Eberly, 2007). Furthermore, it indicates “the average change in $y$ for each unit change in $x_1$ when $x_k$ is constant. $\epsilon$ stand for “error” and explains all the variability in $y$ that the linear relations of the independent variables cannot explain (Sahay, 2016).

3.8.6 Model 1 – Direct Effect

This paper's first multiple linear regression model describes the relationship between the dependent variable $y$ performance and the independent variables $x_1, x_2, x_3, \text{ and } x_4$, namely: belief systems, boundary systems, interactive control systems, and diagnostic control systems. Model 1 represents hypotheses 1 to 4, assuming that positive relationships exist between the use of all individual LOC and organizational performance. The regression models include all LOC since they work together and must be balanced to succeed with strategy (Kruis et al., 2016; Simons, 1995). They are complementary and thus relate to each other (Widener, 2007). Therefore, Model 1 looks as follows:

$$ Performance = \beta_0 + \beta_1 Belief + \beta_2 Boundary + \beta_3 Diagnostic + \beta_4 Interactive + \epsilon $$
3.8.7 Model 2 – Moderating Effect

The second multiple linear regression model of this paper describes the relationship between the dependent variable y performance and the multiple independent variables x1, x2, x3, and x4, namely: belief systems, boundary systems, interactive control systems, and diagnostic control systems with the moderating variable uncertainty (Unc). Model 2 represents hypotheses 5 to 8, assuming that the positive relationship between the use of LOC and organizational performance is strengthened by uncertainty. Thus, Model 2 is as follows:

\[
\text{Performance} = \beta_0 + \beta_1 \text{Belief} \times \text{Unc} + \beta_2 \text{Boundary} \times \text{Unc} + \beta_3 \text{Diagnostic} \times \text{Unc} \\
+ \beta_4 \text{Interactive} \times \text{Unc} + \epsilon
\]

3.9 Data Analysis

To test the models and hypotheses that were developed in chapter 2, some statistical tests were performed. The data can be analyzed using some database, e.g., statistical packages such as the Statistical Package for the Social Science (SPSS) used in this study. Before performing the tests in SPSS, the data was transferred to Excel, where it was reviewed and coded. Firstly, the incomplete and unqualified answers were removed from the dataset before being translated into codes (Vogt et al., 2014).

Coding can be described as “the analytical task of assigning codes to non-numeric data” (Geisler, 2018). The researcher must decide how many details the coding scheme should consider. When doing so, one must consider the research questions and hypotheses to ensure the coding fits the purpose. A detailed coding scheme will likely provide a better overview of coding errors and reliability, but it could also lead to a sparse data set and statistical problems. (Weingart et al., 2004).

This paper manually performed the coding using Excel, a traditional tool for coding data (Geisler, 2018). As a Likert scale from 1 to 7 was used for all questions, except for the control questions in the questionnaire, codes were assigned directly as the respondent filled in the survey. Thus, no coding was needed for this set of questions. Regarding the control questions, the data was coded into relatively large categories. The reason for that is that this research aims to make general conclusions rather than looking specifically at individual variables. Thus, the control variables’ primary purpose is to provide an overview of the sample and as a tool for checking the generalizability.
For the questions about age and work experience, no coding was done as the questions were on an ordinal level of measurement and provided numbers that could be used for the analysis (Wetcher-Hendricks, 2011). The closed questions regarding gender, education, and company size were presented on a nominal level of measurement, meaning that the questions permitted only a few inferences and consisted of no numerical value (Wetcher-Hendricks, 2011). As only a few alternatives were provided, categories were automatically created, then manually translated into codes. For instance, for “women” and “men” the numbers 0, respectively 1 were used. The remaining question about work position was categorized into four categories, where 3 is the code for top managers, and 0 is the code for other managers. All explanations of the coding can be found in Appendix 4 and are also discussed in the descriptive statistics section 4.2.

After finishing the coding process, the data was exported to SPSS for further analysis. To get an overview, the empirical data is summarized into descriptive statistics. These descriptive statistics tables present the minimum-, maximum-, and mean values as well as a standard deviation for the dependent, independent, moderating, and control variables. The empirical data is then statistically analyzed in SPSS (Watson, 2015) using linear regressions (Hadi 6 Chatterjee, 2012) and Pearson correlation. To ensure that the data analysis was correctly performed, both researchers of this paper and the supervisor analyzed the same data separately, enabling comparison between the outcomes.

3.10 Research Quality

For research to be valid, it must avoid being misleading and should be trustworthy (Roberts et al., 2006). Reliability and validity are two ways of demonstrating the trustworthiness of research findings (Roberts et al., 2006). Except from considering these two concepts, the research quality is also ensured through consultation with this paper's supervisor regarding the survey questions. Further, both authors of this paper and the supervisor have analyzed the empirical findings to ensure that the results show the same and guarantee that the analysis is correctly performed.

3.10.1 Reliability

Reliability can be used to describe to what extent a particular test, e.g., a survey, will produce results that are similar in different circumstances under the assumption that all else is equal (Roberts & Priests, 2006). One reliability index is Cronbach’s alpha coefficient (Tavakol &
Dennick, 2011), developed by Cronbach in 1951. Cronbach’s alpha measures the internal consistency of a test, which means that it measures to what extent the question in the test measures the same concept. Cronbach’s alpha is expressed in a number between 0 and 1 (Tavakol & Dennick, 2011), where a reliability of 0.9 indicates that 90% of the variability in the values is true. The Cronbach’s alpha on the empirical findings of this paper is presented in Table 1. The threshold for an acceptable value of Cronbach’s alpha is often suggested to be 0.6 or 0.7 (Taber, 2018); therefore, one can conclude that all variables measured in the survey were above the recommended threshold. The only borderline case is the variable “uncertainty,” which has a Cronbach’s alpha of 0.627 (Table 1).

Further, to assure high reliability, the questions were, although with minor modifications, retrieved from previous research on the topic in highly cited articles and published in journals rated in the ABS-list (e.g., Bedford & Malmi, 2015; Henri, 2006; Widener, 2007). By using instruments that have been repeatedly tested by researchers, the stability and thus the reliability increase (Heale & Twycross, 2015). Finally, the regression equations have been formulated and analyzed in consultation with Toni Duras, statistics teacher at Jönköping International Business School, as well as the supervisor of this thesis, Miguel Gil.

3.10.2 Validity

The other research terminology discussed is validity. Validity describes whether the research measures what was intended to be measured (Roberts & Priests, 2006). There are two types of measures, internal- and external validity. Internal validity addresses the reasons why the research had its outcomes (Roberts & Priests, 2006), while external validity refers to “the possibility of generalizing the conclusions to situations that prompted the research” (Schram, 2005).

This study ensures internal validity by using questions from previous, well-known research in the survey (Roberts & Priests, 2006). Further, criterion-related validity is considered as the instrument used, the Likert scale (Vogt et al., 2014), is commonly used for research on MCS (e.g., Bedford & Malmi, 2015; Henri, 2006; Widener, 2007). External validity is considered in the sampling for this research. As external validity refers to the ability to generalize the empirical findings and apply them to other populations, one must consider factors such as the representation of participants, the measurements, and the settings (Findley et al., 2021). As illustrated in Table 2 in the result section of this paper, there is a broad representation of
participants regarding, e.g., work experience and company size. The control variable industry included in the survey was removed due to difficulties in categorizing as it was an open question resulting in many different answers. Although the gender distribution for managers is not precisely representative of Sweden (SCB, 2018), the survey questions focus on organizations as a whole rather than individuals. Therefore, it should not affect the validity excessively.

3.11 Ethical Considerations

In May 2018, the EU general data protection regulation (GDPR) was imposed. A binding regulation on processing personal data protects individuals' rights when obtaining, possessing, and destroying personal data (Sveriges Riksdag, 2022). Several ethical rules need to be considered when conducting research. These are usually categorized into four main areas: harm to participants, lack of informed consent, invasion of privacy, and involved deception (Bell et al., 2022). Ethical issues likely originate from interactions between the participants and researchers (Bell et al., 2022), which in this study arise when the respondents fill out the survey. Hence, conducting a survey consists of the central point for ethical considerations. Considering the ethical rules, we first ensured that all the participants got the information about conducting the survey voluntarily, and they also had to confirm their voluntary participation. Sufficient information about the survey, this study, and the research was further presented in the beginning to ensure that the participants got all the necessary information to be able to contribute.

When designing the survey, neutrality in the questions was considered to ensure that the participants were not influenced by their answers (Bell et al., 2022). Closed questions present different fixed alternatives and therefore face a risk of spontaneity loss. Also, closed questions force the respondent to choose an alternative even though they might not agree with any of them (Bell et al., 2022). Therefore, open questions were carefully considered. Any personal information was not collected in the survey in line with GDPR to ensure the anonymity of the participants. This paper's authors applied to processing personal data in thesis work by filling out a form provided by Jönköping International Business School. The supervisor of this paper certified that this thesis's design meets the data requirements by signing this form. The answers cannot be traced back to any respondent, yet the data will be erased when the research is concluded. Finally, the data is handled carefully, and individual answers are only available to the authors of this paper, the supervisor, and the examiner.
4. Empirical Findings

The fourth chapter presents the empirical findings generated from the quantitative study. It starts with a reliability test of all different variables measured. This is followed by descriptive statistics table to get an overview of the sample and a Pearson correlation matrix. Finally, the chapter ends with multiple regression analyses of the two models of this paper, including model fit- and hypothesis tests.

4.1 Reliability Test

To test the reliability of this study, the tool Cronbach’s alpha is used. Cronbach’s alpha measures the internal consistency of a test, which means that it measures to what extent the question in the test measures the same concept (Tavakol & Dennick, 2011). Table 1 below presents Cronbach’s alpha of all the variables measured. As previously described, each variable is represented by a set of questions measured in the survey.

<table>
<thead>
<tr>
<th></th>
<th>Cronbach's Alpha</th>
<th>N of items</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variable</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>0,698</td>
<td>7</td>
</tr>
<tr>
<td><strong>Independent Variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belief</td>
<td>0,873</td>
<td>4</td>
</tr>
<tr>
<td>Boundary</td>
<td>0,857</td>
<td>4</td>
</tr>
<tr>
<td>Diagnostic</td>
<td>0,918</td>
<td>4</td>
</tr>
<tr>
<td>Interactive</td>
<td>0,838</td>
<td>5</td>
</tr>
<tr>
<td><strong>Moderating Variable</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uncertainty</td>
<td>0,628</td>
<td>6</td>
</tr>
</tbody>
</table>

*Table 1 - Reliability Test*

As mentioned in Chapter 3, the lowest acceptable value of Cronbach’s alpha is around 0,6 or 0,7 (Taber, 2018). The reliability of each of the variable’s measures is therefore acceptable.

As presented in Table 1, Cronbach’s alpha is high for all independent variables and lower for the dependent- and moderating variables. Thus, the consistency and reliability of this test are good.
4.2 Descriptive Statistics

Descriptive statistics consists of graphical- and numerical techniques that aim to present and analyze the data from research. It helps present a sample description, generalize the results, and make meaning of the results. (Fisher & Marshall, 2009). It provides valuable information about the distribution and tendency through minimum, maximum, mean, and standard deviation. When reflecting on the standard deviation as high or low relative to the mean value, the coefficient of variation is used (Anderson et al., 2020).

After removing non-qualified answer, the total number of observations remaining are 164 answers. Five answers did not qualify due to either lack of consent or because the participant lacked a manager position. This section is divided into four parts: control variables, independent variables, dependent variables, and finally, the moderating variable.

4.2.1 Control Variables

<table>
<thead>
<tr>
<th>Control Variables</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>164</td>
<td>0</td>
<td>1</td>
<td>0.71</td>
<td>0.45</td>
</tr>
<tr>
<td>Age</td>
<td>164</td>
<td>22</td>
<td>67</td>
<td>48.48</td>
<td>10.11</td>
</tr>
<tr>
<td>Education</td>
<td>164</td>
<td>1</td>
<td>3</td>
<td>1.71</td>
<td>0.64</td>
</tr>
<tr>
<td>Work position</td>
<td>164</td>
<td>0</td>
<td>2</td>
<td>1.42</td>
<td>0.70</td>
</tr>
<tr>
<td>Experience</td>
<td>164</td>
<td>0</td>
<td>40</td>
<td>9.12</td>
<td>8.64</td>
</tr>
<tr>
<td>Size</td>
<td>164</td>
<td>1</td>
<td>5</td>
<td>2.77</td>
<td>1.08</td>
</tr>
</tbody>
</table>

*Table 2 - Descriptive Statistics Control Variables*

The control variable gender ranges from 0 to 1, where 0 represents women, and 1 represents men. The mean gender equals 0.71, indicating that 71% of the participants are men. Further, there is a substantial difference between the participants’ ages, with the youngest manager being 22 and the oldest 67 years. Hence, the standard deviation to the mean value is low, indicating that data are clustered close to the mean (Anderson et al., 2020). The opposite applies to their work experience, where the mean work experience is 9.12 years with a high standard deviation of 8.64. This indicates that the respondent's work experience is widely scattered to the mean. For the control variable work position, the range goes from 0 to 2, where 2 represents top managers, 1 represents divisional managers, and 0 represents other managers. The mean value is 1.42 with a low standard deviation meaning that most of the sample consists of top managers such as CEOs and divisional managers, e.g., CFOs.
For the control variable education, one is equivalent to completing a high school education, two is completing a university education, and finally, three is for completing other post-graduate education. Education has a mean value of 1.71 with a low standard deviation of 0.64, meaning that most of the sample have post-graduate education. As mentioned in Section 3, the control variable size is categorized following the EU standards. For example, one indicates a small company with 1 to 10 employees, while 5 indicates a larger company with more than 500 employees. Looking at Table 2, one can conclude that the mean value regarding company size is 2.77 with a relatively low standard deviation of 1.08, meaning that a large part of the sample worked at organizations having 50 – 250 employees.

4.2.2 Independent Variables

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belief</td>
<td>164</td>
<td>1</td>
<td>7</td>
<td>5.19</td>
<td>1.18</td>
</tr>
<tr>
<td>Boundary</td>
<td>164</td>
<td>1</td>
<td>7</td>
<td>5.36</td>
<td>1.27</td>
</tr>
<tr>
<td>Diagnostic</td>
<td>164</td>
<td>2</td>
<td>7</td>
<td>5.79</td>
<td>1.20</td>
</tr>
<tr>
<td>Interactive</td>
<td>164</td>
<td>2.80</td>
<td>7</td>
<td>5.60</td>
<td>0.85</td>
</tr>
</tbody>
</table>

*Table 3 - Descriptive Statistics Independent Variables*

The four independent variables consist of Simons lever controls: belief systems, boundary systems, interactive control systems, and diagnostic control systems. Belief systems and boundary systems range from a minimum of 1 to a maximum of 7, meaning that the sample varies regarding the use of these control systems under this measure. It further shows a mean value of 5.19 with a low standard deviation of 1.18 for belief systems and a mean value of 5.36 with a low standard deviation of 1.27 for boundary systems. Each belief and boundary systems variable consists of 4 merged questions indicating that data are clustered close to the mean under this measurement.

Regarding diagnostic control systems, no respondent strongly disagreed with the full extent of the use of this measure. The range goes from a minimum of 2 to a maximum of 7, with a mean value of 5.79 and a low standard deviation of 1.20. The use of interactive control systems is also high, with a mean value of 5.60 and a low standard deviation of 0.85, indicating that the data are clustered close to the mean, making it more reliable (Pallant, 2020).
4.2.3 Dependent Variable

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>164</td>
<td>3.29</td>
<td>6.86</td>
<td>5.20</td>
<td>0.68</td>
</tr>
</tbody>
</table>

*Table 4 - Descriptive Statistics Dependent Variable*

The dependent variable of this study is organizational performance. The variable is measured through a set of 7 questions referring to different sorts of organizational performance, e.g., revenue growth, innovation rate, and relationships within the organization. Merging the answers regarding perceived organizational performance, the variable ranges between a minimum of 3.29 to a maximum of 6.86. The mean value of the variable organizational performance is 5.20 with a low standard deviation of 0.68, indicating that the data are clustered close to the mean (Anderson et al., 2020).

4.2.4 Moderating Variable

<table>
<thead>
<tr>
<th>Moderating Variable</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncertainty</td>
<td>164</td>
<td>2</td>
<td>6</td>
<td>3.99</td>
<td>0.87</td>
</tr>
</tbody>
</table>

*Table 5 - Descriptive Statistics Moderating Variable*

The variables are calculated through 6 questions regarding perceived environmental uncertainty regarding customers, suppliers, competitors, technology, economy, and regulations. The moderating variable uncertainty ranges between the minimum value of 2 to the maximum value of 6, meaning that the sample varies in uncertainty. It further means that no respondent under this measure perceived a highly predictable environment to the full extent nor a highly unpredictable environment to the full extent. Merging the answers to each of the questions regarding uncertainty, the mean value equals 3.99 with a low standard deviation of 0.87, meaning that the responses regarding perceived uncertainty are clustered close to the mean.

4.3 Pearson Correlation

A Pearson correlation is conducted to test the degree of correlation between the variables. It is known for being one of the most frequently used procedures in statistics and can be applied in various circumstances. It can be used to determine the strength and direction of a linear
relationship as it shows whether there is a statistically significant positive or negative relationship between two variables (Pallant, 2020). Hence, it also measures the degree of statistical significance attached to a correlation. (Armstrong, 2019).

The range of correlation lies between a perfectly negative correlation (-1) and a perfectly positive correlation (1). If the correlation is perfectly positive, it indicates that as one of the variables increases, the other variable reacts by increasing by the same amount (Bryman & Bell, 2015; Pallant, 2020). It also means that no other variables are related to these two variables. As illustrated in Table 6, a high positive correlation exists between experience (i.e., years in the current manager position) and age (.532**). Other interesting findings show a positive correlation between belief systems and all the other levers, meaning the more use of belief systems, the more use of boundary systems (.343**), diagnostic control systems (.498**), and interactive control systems (.512**). Belief systems are further positively correlated with organizational performance (.377**)—the more use of belief systems, the better performance of the organization. A positive correlation is also shown between interactive controls and boundary systems (-251**) and diagnostic- and interactive control systems (.569**). Diagnostic control systems (.416**) and interactive control systems (.471**) are separately correlated positively with organizational performance. This means that the more managers use diagnostic and interactive control systems, the better organizational performance is achieved.

If the correlation between two variables is below 1, one variable increases, and the other decreases. It also means that one of these variables correlates with at least one other variable (Bryman & Bell, 2015; Pallant, 2020). As illustrated in Table 6, a negative correlation is shown between company size and experience (i.e., years in the current manager position) (- .208**). The larger the company (i.e., the more employees), the fewer years the manager works in the current position. This indicates that managers in larger organizations tend not to remain in the same position for too long. On the contrary, managers working in smaller organizations stay in the same position for more years.
<table>
<thead>
<tr>
<th></th>
<th>Gender</th>
<th>Age</th>
<th>Education</th>
<th>Position</th>
<th>Experience</th>
<th>Size</th>
<th>Uncertainty</th>
<th>Belief</th>
<th>Boundary</th>
<th>Diagnostic</th>
<th>Interactive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.190*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>-.144</td>
<td>.009</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position</td>
<td>.131</td>
<td>.146</td>
<td>.016</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experience</td>
<td>.163*</td>
<td>.532**</td>
<td>.021</td>
<td>.160*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>.051</td>
<td>-.197*</td>
<td>.017</td>
<td>-.380**</td>
<td>-.208**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uncertainty</td>
<td>-.041</td>
<td>-.026</td>
<td>.035</td>
<td>-.065</td>
<td>-.121</td>
<td>.060</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belief</td>
<td>-.183</td>
<td>-.077</td>
<td>.108</td>
<td>.060</td>
<td>-.107</td>
<td>.088</td>
<td>-.080</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boundary</td>
<td>.034</td>
<td>-.048</td>
<td>-.026</td>
<td>-.054</td>
<td>-.073</td>
<td>.120</td>
<td>-.186</td>
<td>.343**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagnostic</td>
<td>-.098</td>
<td>-.006</td>
<td>.009</td>
<td>.081</td>
<td>.072</td>
<td>-.022</td>
<td>-.087</td>
<td>.498**</td>
<td>.170*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interactive</td>
<td>-.067</td>
<td>-.065</td>
<td>.103</td>
<td>.191*</td>
<td>.098</td>
<td>-.108</td>
<td>-.097</td>
<td>.512**</td>
<td>.251**</td>
<td>.569**</td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>.037</td>
<td>.005</td>
<td>-.054</td>
<td>.264**</td>
<td>.048</td>
<td>-.099</td>
<td>-.108</td>
<td>.377**</td>
<td>.159*</td>
<td>.416**</td>
<td>.471**</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed)
**Correlation is significant at the 0.01 level (2-tailed)

Table 6 - Pearson Correlation
4.4 Regression Analysis

This paper analyzes the empirical data using multiple linear regression analysis. It is a statistical technique for estimating relationships between dependent and multiple independent variables (Uyanik & Güler, 2013). It is also helpful as it allows the researcher to explain and predict the dependent variable (Orme & Orme, 2009). When the relationship between two or more variables is known, one can use it to predict outcomes. In multiple regression, one can predict the dependent variable Y using the independent variable X. (Sahay, 2016). In this case, the dependent variable Y is predicted using independent variables, i.e., belief systems, boundary systems, diagnostic control systems, and interactive control systems. Multiple linear regression assumes that there is a linear relationship between the variables. (Sahay, 2016). The multiple linear regression analysis is performed on both models. The first model addresses the four first hypotheses without the moderation effect, while the second model addresses hypotheses 5 to 8 that consider the moderation effect uncertainty.
4.4.1 Model Fit

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th></th>
<th>Model 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standardised Coefficient</td>
<td>Std.Error</td>
<td>Standardised Coefficient</td>
<td>Std. Error</td>
</tr>
<tr>
<td>Belief</td>
<td>0.159†</td>
<td>0.051</td>
<td>0.187*</td>
<td>0.053</td>
</tr>
<tr>
<td>Boundary</td>
<td>0.007</td>
<td>0.040</td>
<td>-0.040</td>
<td>0.043</td>
</tr>
<tr>
<td>Diagnostic</td>
<td>0.176*</td>
<td>0.049</td>
<td>0.160†</td>
<td>0.052</td>
</tr>
<tr>
<td>Interactive</td>
<td>0.264**</td>
<td>0.073</td>
<td>0.274**</td>
<td>0.075</td>
</tr>
<tr>
<td>Belief x Uncertainty</td>
<td>-0.145</td>
<td>0.057</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boundary x Uncertainty</td>
<td>0.084</td>
<td>0.057</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagnostic x Uncertainty</td>
<td>-0.006</td>
<td>0.056</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interactive x Uncertainty</td>
<td>-0.059</td>
<td>0.057</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>0.066</td>
<td>0.108</td>
<td>0.079</td>
<td>0.109</td>
</tr>
<tr>
<td>Age</td>
<td>0.005</td>
<td>0.006</td>
<td>0.027</td>
<td>0.006</td>
</tr>
<tr>
<td>Education</td>
<td>-0.091</td>
<td>0.074</td>
<td>-0.091</td>
<td>0.075</td>
</tr>
<tr>
<td>Work position</td>
<td>0.176*</td>
<td>0.073</td>
<td>0.161*</td>
<td>0.074</td>
</tr>
<tr>
<td>Experience</td>
<td>-0.021</td>
<td>0.007</td>
<td>-0.013</td>
<td>0.007</td>
</tr>
<tr>
<td>Size</td>
<td>0.017</td>
<td>0.048</td>
<td>-0.018</td>
<td>0.048</td>
</tr>
<tr>
<td>Uncertainty</td>
<td>-0.037</td>
<td>0.054</td>
<td>-0.019</td>
<td>0.055</td>
</tr>
<tr>
<td>F-value</td>
<td>6.425***</td>
<td></td>
<td>5.012***</td>
<td></td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>0.268</td>
<td></td>
<td>0.270</td>
<td></td>
</tr>
<tr>
<td>Highest VIF value</td>
<td>1.837</td>
<td></td>
<td>1.969</td>
<td></td>
</tr>
</tbody>
</table>

n=164                      n=164

Note: *** p < 0.001; ** p < 0.01; * p < 0.05; † p < 0.10
Note: ' Unstandardised coefficient

Table 7 - Model Fit

A model must have a good fit to achieve a valid research model (Kenny, 2015). A good fit refers to a reasonably consistent model with the sample data (Schermelleh-Engel et al., 2003). One could look at the F-value to see if the models are statistically significant. The F-test is performed to test the overall significance of the two regressions (Sahay, 2016). Table 7 shows that the F-value of Model 1 and Model 2 are 6.425 and 5.012 and are, therefore, both statistically significant at p < 0.001.

After looking at the F-value, the adjusted R2 is addressed. When measuring the model adequacy, the adjusted R2 is preferred. The adjusted R2 helps estimate the variance explained in the sample population (Akossou & Palm, 2013). While the R2 estimates the model fit
optimistically, the adjusted R2 corrects the optimistic overestimation. It is thus always equal to or less than R2. If the value of the adjusted R2 is less than or equal to 0, the regression model lacks predictive value. (IBM, 2023). A value of 1 indicates a perfect model fit, while a value of 0 indicates that there is no linear fit (Harel, 2009). The adjusted for both models are 0.268 and 0.270.

Table 7 illustrates which dependent and independent variables are statistically significant and which are not significant. The significance, or p-value, of a variable in a regression, implies whether a relationship exists between the regressor variables and the response variable (Montgomery et al., 2012). If the significance value is less than the significance level, the result is judged to be statistically significant (IBM, 2023). The choice of significant level in multiple regression analysis depends on the desired confidence level. A significance level of 0.05 means there is less than a 5% chance that the statistically significant results will occur from chance (IBM, 2023). A lower significance level of 0.01 could be appropriate if the research requires a high confidence interval. This research is somewhat exploratory, and the cost of making a type I error is relatively low. Hence a significance level of 0.1 is used. As illustrated in Table 7, only one control variable is statistically significant for both models. Work position positively correlates with the dependent variable in Model 1 (0.176*) and Model 2 (0.161*).

Looking at the significance of the standardized betas for the independent variables in Model 1, one can see that belief systems, interactive control systems, and diagnostic control systems are somewhat significant. A high beta indicates a strong effect of the independent and dependent variables, i.e., organizational performance (Chan, 2004). The only independent variable that is not significant is boundary systems, indicating that there is no significant effect between the use of this variable and the dependent variable. Belief systems, diagnostic control systems, and interactive control systems are all positively correlated to the dependent variable (performance). In Model 2, there is no significant independent variable, and the moderating variable uncertainty neither strengthens nor weakens the relationship between the independent and the dependent variables.

Table 7 also presents the standard error. The standard error is used to estimate how much a test statistic’s value varies from one sample to another and shows the uncertainty of the test statistics (IBM, 2023). The standard error is below 0.1 for all variables in both models, except
for the control variable gender, where it is 0.108 (Model 1) and 0.109 (Model 2), meaning that there is some unexplained variability in the sample (Sahay, 2016).

A threat to estimating relationships sought by regression techniques is multicollinearity (Farrar & Glauber, 1967). Multicollinearities occur when a multiple regression model contains two or more predictor variables that are highly correlated (Daoud, 2017). Performing a diagnostic test to assess multicollinearity is further essential to avoid type I error. Multicollinearity can be measured through the tool VIF. If the VIF value is above 5, there is a high correlation, while a VIF value of 1 means no correlation. (Daoud, 2017). All VIF values are below 5, indicating no threat of high correlation in the sample. Since the VIF values only indicate zero or a meager degree of correlation, as the highest observable VIF value for models 1 and 2 is 1.837, respectively 1.969, one can conclude that the research design is good.

### 4.4.2 Hypothesis Testing Model 1

Table 8 provides an overview of the regression analysis of Model 1, including the four first hypotheses of this paper. As discussed in the previous section, 4.4.1, it was found that three of the four independent variables are significant in Model 1. The independent variable belief systems have a significance level of p<0.10 (0.159†). This indicates a weak positive effect on the dependent variable (organizational performance) when increasing the variable belief systems. However, the empirical findings support the first hypothesis:

*H1: There is a positive correlation between the use of belief systems and organizational performance.*
The second independent variable, boundary systems, did not significantly affect the dependent variable (0.007). This means that increasing the predictor variable boundary systems will have no significant effect on the outcome variable, not positive or negative. Thus, the second hypothesis is not supported:

\[ H2: \text{There is a positive correlation between the use of boundary systems and organizational performance.} \]

The third independent variable analyzed in the regression analysis is diagnostic control systems. As presented in Table 8, this variable shows a standardized coefficient of 0.176*. It is, therefore, significant on a significance level of \( p < 0.05 \). The standardized coefficient is positive and indicates that an increase in this predictor variable will lead to an increase in the outcome variable. In other words, diagnostic control systems are positively correlated to organizational performance. Therefore, we support the third hypothesis:

\[ H3: \text{There is a positive correlation between the use of diagnostic control systems and organizational performance.} \]

Simultaneously with the first and third independent variables in Model 1, the fourth independent variable also shows statistical significance. The fourth independent variable presented in Model 1 is interactive control systems. This variable has a standardized coefficient of 0.264** and is statistically significant. It shows an even more substantial effect on the dependent variable and is thus the variable that has shown the most substantial effect on performance. This results in support of the fourth hypothesis:

\[ H4: \text{There is a positive correlation between the use of interactive control systems and organizational performance.} \]

To summarize Model 1 and the four first hypotheses of this paper, hypotheses 1, 3, and 4 are supported, while hypothesis 2 is not supported.
4.4.3 Hypothesis Testing Model 2

Table 9 - Hypotheses Testing Model 2

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent Variable</th>
<th>Standardized Coefficient (B)</th>
<th>Hypothesis</th>
<th>Supported</th>
<th>Not Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>Belief x Uncertainty</td>
<td>-0.145</td>
<td>H5</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Boundary x Uncertainty</td>
<td>0.084</td>
<td>H6</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diagnostic x Uncertainty</td>
<td>-0.006</td>
<td>H7</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interactive x Uncertainty</td>
<td>-0.059</td>
<td>H8</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Note: ***p<0.001; **p<0.01; *p<0.05; † p < 0.10

Model 2 represents the following four hypotheses, hypotheses 5 to 8. In Model 2, the independent variables are impacted by a moderation effect, namely uncertainty. Thus, the values essential to study for Model 2 are the independent variables with a moderation effect. The first independent variable with a moderation effect is belief systems (belief systems x uncertainty). As illustrated in Table 9, this variable is insignificant (-0.145), meaning that uncertainty does not moderate belief systems' relationship with performance. This means that uncertainty does not strengthen or weaken the relationship between using belief systems and organizational performance. Therefore, we reject the fifth hypothesis:

**H5: Uncertainty strengthens the positive correlation between the use of belief systems and organizational performance.**

No significant moderating effect could be found when adding uncertainty to the relationship between boundary systems and organizational performance. The standardized coefficient (B) equals 0.084; therefore, one can conclude that uncertainty does not impact this relationship positively, as expected, or negatively. Thus, the sixth hypothesis of this paper is not supported:

**H6: Uncertainty strengthens the positive correlation between the use of boundary systems and organizational performance.**

Simultaneously to the boundary system, uncertainty does not affect the relationship between the diagnostic control system and organizational performance. The standardized coefficient
(B) equals -0.006 and shows that uncertainty does not moderate this relationship. We must therefore reject the following hypothesis.

\[ H7: \text{Uncertainty strengthens the positive correlation between the use of diagnostic control systems and organizational performance.} \]

The last hypothesis, with the use of interactive control systems and the moderating effect of uncertainty, was argued to be positively correlated with organizational performance. The standardized coefficient (B) equals -0.059 without significant effect. Thus, uncertainty does not moderate this relationship, and the last hypotheses must be rejected.

\[ H8: \text{Uncertainty strengthens the positive correlation between the use of interactive control systems and organizational performance.} \]

To summarize Model 2, uncertainty did not moderate the relationship between each LOC and organizational performance. Therefore, all four hypotheses related to Model 2 and the moderation effect are rejected, as uncertainty does not strengthen this relationship.
5. Discussion

The fifth chapter discusses the study's empirical findings together with earlier research and theory presented in the literature review and from the methodology chapter. Firstly, a short summary of Model 1 is presented. This is followed by discussion and analysis of each of the four first hypotheses represented in Model. Thereafter, the same procedure follows for Model 2 including an overall summary and deeper discussion of the four last hypotheses.

5.1 Discussion Model 1

The relationship between MCS and performance is commonly discussed in the literature on management accounting (e.g., Baird et al., 2019; Bedford, 2015; Cardinal et al., 2004; Davila, 2000; Felicio et al., 2021). However, researchers shed light on the need for and importance of unpacking the complexity of the use of MCS in different contexts to understand their role and learn the proper fit (Chenhall, 2003). This paper examines the use of MCS in relation to firm performance in a Swedish post-Covid-19 environment, which is a new and unexplored context. Going back to normality after an extensive environmental crisis can be challenging and characterized by various sorts of uncertainties. Implemented strategies and the use of controls contribute by enhancing desirable behaviors and creating value for the organization. Based on earlier research and ideas of MCS, the use of Simons' four levers of control is argued to support organizational performance (Baird et al., 2019; Davila, 2000; Dossi & Patelli, 2010; Henri, 2006; Widener, 2007). However, contingency theorists argue that to enhance performance, the organization must find a proper contingent fit to the external environment (Otley, 1980). This paper addresses performance as an indicator of a good match between MCS and the external environment (Otley, 2016). Hence, finding the right balanced use of controls adapted to the external environment is expected to contribute to the performance of organizations, which is tested and supported in this paper. Further, the assumptions from institutional theory, e.g., the phenomena of isomorphism, can be noticed in the sample.

5.1.1 Hypothesis 1

Prior research has found strong links between belief systems and organizational performance. Widener (2007) found evidence for belief systems as a guide to help motivate individuals to
improve their performance and search for opportunities. Bart et al. (2001) support their paper by showing a positive relationship between the development of mission statements and organizational performance. Within this study, hypothesis 1 (H1) argued for a positive correlation between using belief systems and organizational performance. The result shows to be positively significant in regression, and the hypothesis can be accepted. As organizations emphasize belief systems, their performance improves. Thus, this paper supports the assumptions made by, e.g., Baird et al. (2001), and belief systems are indeed crucial for organizational performance in a post-Covid-19 context. Relying on the assumptions of contingency theory, this could be explained as organizations in Sweden have managed to find a good fit for contingent factors (Otley, 1980). For instance, it could be by adapting to their operating environment (Bedford, 2015; Felicio et al., 2021).

Belief systems are recognized for being communicated through mission statements, credos, and purpose statements containing, e.g., core values to inspire the workforce and spread purpose, value, and clarify the organization's direction (Simons, 1995). The descriptive statistics showed that managers in the sample perceived a moderately high use of belief systems with a low standard deviation, meaning that the data is closely clustered (Anderson et al., 2020). This means that most of the respondents in the sample perceived a similar use of belief systems which can be explained by the institutional structures (Meyer & Rowan, 1977). The result can be explained by mimetic isomorphism, as managers tend to follow and mimic a successful peer when uncertain about how to act. Managers tend to follow what other managers do as they might be trained similarly to lead an organization which can be supported by normative isomorphism. The result can further be explained by coercive isomorphism, as organizations adapt to other organizations' pressure and societal and cultural expectations (Mizruchi & Fein, 1999). Prior research suggests that mission statements may legitimately be viewed as statements for communication of means with the external audience, such as essential stakeholders (Morphew & Hartley, 2006). This implies that organizations use belief systems to communicate core values, purpose, and the direction of the organization not only to the workforce but also to the stakeholders as a result of institutional pressure (Meyer & Rowan, 1977). Having a workforce that is inspired by the core values to search, explore, create, and expand reflects how they behave around customers, suppliers, and other stakeholders to improve organizational performance. Hence, belief systems are social controls used to encourage performance and manage organizational compliance.
Hypothesized and supported by Widener (2007), the more a firm emphasizes the belief systems to communicate the intended strategy and inspire employees to search for opportunities, the more the firm will emphasize the other three levers in the LOC framework. The empirical findings of this paper support these assumptions. When analyzing the empirical data, a positive correlation could be found between using belief systems and the three other LOC. Placing more emphasis on belief systems increases the emphasis on boundary systems, diagnostic control systems, and interactive control systems. To conclude, Belief systems positively influence all other LOC and have a direct positive relationship with organizational performance in a post-Covid-19 context. This additionally supports the need for balance between the levers to achieve performance.

5.1.2 Hypothesis 2

Boundary systems work as an opposing and constraining force to avoid organizational risks. According to prior literature, it is necessary to enhance creativity and opportunity-seeking in a controlled way (Simons, 1995). Creativity is allowed but within specific boundaries to enhance efficiency. Having a boundary system to keep up the balance with the inspirational belief system may be needed to provide structural control and stop employees from engaging in high-risk behaviors" (Baird et al., 2019; Widener, 2007). It is also important as the constant change in structures and routines may lead to unwarranted disruptions that negatively influence organizations' performance (Baird et al., 2019). Hence, it is hypothesized that boundary systems would enhance organizational performance.

The empirical result showed no significant relationship between the use of boundary systems and organizational performance, leading to the rejection of hypothesis 2 (H2). Hence, boundary systems do not directly improve organizational performance in a post-Covid-19 context. There could be several possible explanations for this occurrence. As discussed, contingency theorists argue that using MSC enhances performance for organizations that properly fit the contingent factors (Bedford, 2015; Felicio et al., 2021). Based on the contingent view, it could be argued that organizations in Sweden have yet to manage to find the right balanced use of boundary systems in the post-Covid-19 context. However, the more credible explanation is presumably that boundary systems themselves are design attributes rather than formal controls, as suggested by Simons (1995). Prior literature is focused on the importance of balance between the use of all levers to enhance efficient organizations (Cardinal et al., 2004; Henri, 2006; Mundy, 2010; Simons, 1995). This may imply that
boundary systems are equally needed with the other control systems to enhance organizational performance, but not directly on their own.

The importance of a balance between the use of all four levers is further supported in the correlation table, where it is shown that boundary systems are positively significant with all the other three levers. The highest significant correlation is between belief systems and boundary systems, indicating that the more managers used belief systems, the more they used boundary systems, which supports prior literature (Baird et al., 2019; Widener, 2007). The empirical results show a similar but a notch higher mean value of using boundary systems compared to belief systems. The standard deviation is accordingly low, conforming to the institutional pressure of managers acting similarly (DiMaggio & Powell, 1991; Mizruchi & Fein, 1991). Using a boundary system may be stamped by a national culture where Sweden is grouped with the Nordic (Hofstede, 1983). Research further finds Sweden as a country that does not pursue prescriptive codes to a high degree, and the intensity of codification is distinctly lower compared to Anglo countries (Singh et al., 2005). This may explain the moderate use of boundary systems for most respondents supported by institutional pressure.

5.1.3 Hypothesis 3

Although researchers shed light on the importance of finding a balance between all four LOC (Henri, 2006; Mundy, 2010; Simons, 1995), Kruis et al. (2016) argued that this balance does not mean equal weight. For instance, Barros and Ferreira (2022) found a more substantial presence of diagnostic- and interactive control systems than belief- and boundary systems. As presented in the descriptive statistics, the empirical data of this paper support these findings. The mean values of the diagnostic- and interactive control systems are higher than the belief- and boundary systems. This indicates that the diagnostic- and interactive control systems are used to a greater extent than belief- and boundary systems, and therefore, this paper supports the findings made by Kruis et al. (2016) and Barros and Ferreira (2022).

The empirical data showed a positive relationship between the use of diagnostic control systems and organizational performance in a Swedish post-Covid-19 context. Although the diagnostic control systems are seen as constraining (Simons, 1995), they are essential both for motivating and monitoring employees and have, therefore, a significant impact on organizational performance (Bisbe & Otley, 2004; Davila, 2000; Simons, 1995; Widener, 2007), which have been noticed after the pandemic. The empirical findings, therefore, support
previous research and the third hypothesis suggesting a positive correlation between the use of diagnostic control systems and organizational performance. The contingent view would explain these findings as a result of a proper fit for contingent factors and the external environment (Otley, 1980). Simultaneously as with belief systems, it could be the case that Swedish organizations have found the right balanced use of MCS in aligned with their contingent environment. The positive impact on performance indicates a good contingent fit (Cardinal et al., 2004; Henri, 2006; Mundy, 2010; Simons, 1995).

As reviewed, the institutional theory assumes that organizations passively conform to normative, coercive, and mimetic pressures (Damavanthi & Gooneratne, 2017). The phenomena of isomorphism could explain the different amount of emphasis placed on the diagnostic- and interactive control systems compared to the belief- and boundary systems. As previously discussed, the standard deviations of all the independent variables, LOC, are relatively low, indicating that the data is clustered close to the mean and the respondents’ answers are not widely spread on the Likert scale. As suggested by institutional theorists, organizations become isomorphic or homogenous with their institutional environment (DiMaggio & Powell, 1999; Mizruchi & Fein, 1999; Suddaby, 2010). Because there is a homogeneity observed in the sample, the assumptions regarding isomorphism and homogeneity belonging to institutional theory seem to be supported.

The empirical findings indicate that the organizations have generally found a proper contingent fit. Hence, the positive relationship between diagnostic control systems and organizational performance is in line with contingency theory, claiming that organizations have found a good balance in using these controls that fits in this specific post-Covid-19 context.

5.1.4 Hypothesis 4

Interactive control systems are argued to have great significance on performance (Chenhall & Morris, 1995; Davila, 2000; Henri, 2006). Therefore, fostering a dialogue within the organization is crucial for, e.g., recognizing and implementing new strategic opportunities (Davila, 2000).

This paper's fourth hypothesis suggests a positive correlation between the use of interactive control systems and organizational performance. When analyzing the empirical data of this
paper, one can conclude that the data support this hypothesis. Among all four LOC, the interactive control systems have the strongest significance for organizational performance. These empirical findings are in line with the conclusions made by Rezania et al. (2016). When analyzing the LOC framework provided by Simons (1995), the authors found that each LOC is necessary for different purposes. However, one can conclude that diagnostic- and interactive control systems are especially important for organizational performance (Rezania et al., 2016). In line with the contingent view (Otley, 1980), the high use of interactive belief systems compared to the other LOC provides an excellent fit for contingency factors. In a post-Covid-19 context, interactive control systems are the most important LOC for organizational performance.

As the empirical data showed indications of homogeneity among the respondents, the assumptions of the institutional theory seem applicable. The standard deviation is shown to be lower for interactive control systems compared to the other independent variable, LOC. The conclusion could therefore be made that the homogeneity is high when it comes to the use of interactive control systems. The Pearson correlation table showed a slight positive correlation between the use of interactive control systems and work position (0.165*). This indicates a relationship between the use of interactive control systems and the manager's position. This can be interpreted as support for the assumptions about normative isomorphism. Normative isomorphism assumes that people within the same profession are trained similarly, contributing to the homogeneity of organizations (DiMaggio & Powell, 1991; Mizruchi & Fein, 1991). Although this paper does not focus on comparing different industries or professions, one could apply this assumption too, for instance, top managers assuming that their networking with other top managers might contribute to the spread of ideas within the profession, leading to a homogenous use of interactive control systems (Dimaggio & Powell, 1991).

Interactive control systems are further significant at a high level which additionally supports the arguments about constraining and enabling levers and the importance of a balance between them (Baird et al., 2019). Interactive control systems belong together with belief systems to the enabling levers that need to be controlled and limited to a certain degree to keep a finite balance (Mundy, 2010). Also, diagnostic- and interactive control systems are shown to be one of the most frequently used levers of control (Barros & Ferreira, 2022). Milgrom & Roberts (1995) argue that these two control features are complementary, which
could be one explanation for the numbers in the descriptive statistics indicating a similar use of the interactive- and diagnostic control systems. Also, as both diagnostic- and interactive control systems are found to be positively correlated to organizational performance, the assumption made by Milgrom and Roberts (1995) regarding complementarity seems to be true. A structure is needed for interactive control systems to be efficient (Chenhall & Morris, 1995; Widener, 2007). The structure could be in the form of diagnostic control systems.

5.2 Summary Model 1

As hypothesized, a positive relationship between MCS and organizational performance is supported by this paper’s empirical data. More specifically, three of the four LOC, belief systems, diagnostic control systems, and interactive control systems all impact organizations’ performance positively. Based on the contingency theory, the enhanced performance can be seen as an indicator of a proper contingent fit (Otley, 2016). Hence, Swedish organizations have managed to find a good balanced use of their MCS, which dependents on their external environment. The homogenous sample could be explained by the phenomena of isomorphism. The normative isomorphism can perhaps explain the similar use of e.g., interactive control systems. Because all respondents have similar work positions, they tend to be similarly trained which contribute to homogeneity of organizations (DiMaggio & Powell, 1991). As the post-Covid-19 context contain several new situations, one could also argue that organizations learned and mimic each other to deal with the uncertainty. Organizations tend to mimic each other when uncertain how to deal with new situation (Mizruchi & Fein, 1999).

As discussed, boundary systems are unexpectedly not positively correlated with organizational performance. This could either be explained by the contingent view, arguing that organizations have not yet managed to find a good contingent fit to the post-covid-19 (Otley, 2016) context or it could be explained by the Swedish culture and norms that are generally not based on prescriptive codes (Singh et al., 2005). Finally, it could also be explained by the argument that boundary systems are design attributes rather than formal controls (Simons, 1995) and thus, cannot impact performance directly.
5.3 Discussion Model 2

The empirical findings show that there is a positive relationship between organizational performance and three out of four LOC: belief systems, diagnostic control systems, and interactive control systems. In accordance with the contingent view, this indicates that the organizations have found an excellent fit for their external environment (Bedford, 2015; Felicio et al., 2021; Otley, 1980). When adding uncertainty, stronger positive relationships were expected since using control systems in uncertain environments is argued to be of particular importance for organizational performance (Heinicke et al., 2016; Henri, 2006; Laguir et al., 2022; Tuomela, 2005; Widener, 2007). Prior research has examined how MCS is used in uncertain contexts (i.e., during the Covid-19 crisis) and found that it can be mobilized to identify and embrace opportunities but also how MCS could assist comprehensively and effectively in crisis management (Kober et al., 2021; Passeti et al., 2021). However, the empirical findings in this study showed that uncertainty had no moderation effect and, thus, no impact on these alleged positive relationships. The findings in the post-Covid-19 context could be interpreted as a result of the phenomena of organizational learning. During the pandemic, organizations might have learned how to deal with different sorts of uncertainty and thus gathered knowledge about how to balance their use of MCS depending on the context, which could explain why uncertainty does not impact the relationship between LOC and organizational performance in a post-Covid-19 context, or general, periods following a crisis.

5.3.1 Hypothesis 5

Belief systems are positive forces that enhance opportunity-seeking (Simons, 1995). These systems are essential for tackling problems and implementing new business strategies (Simons, 1994). In uncertainty, it is especially important to communicate the core values and direction of the company (Tuomela, 2005). Because the post-Covid-19 pandemic is characterized by high uncertainty, e.g., economic instability and challenges within the supply chain, it was hypothesized that belief systems could be a more powerful tool for achieving organizational performance than in periods of low uncertainty. However, the empirical findings did not show support for this argument. Nevertheless, uncertainty has been shown to have no moderating effect on the relationship between belief systems and organizational performance.
As reviewed, some researchers argue that communicating core values is the key to adapting to changing circumstances (Simons, 1994), while others suggest that belief systems could disturb the process of adapting (Rezania et al., 2016). This paper does not fully accept or reject either of these arguments. Instead, the controversy might be explained by the contingent view. Contingency theory argues that to manage the organization effectively; organizations must adapt and devote their structures to their external environment (Otley, 1980).

Organizations can achieve a proper contingent fit and enhance organizational performance by adapting MCS to their environment (Bedford, 2015; Felicio et al., 2021). Thus, despite their different views, both Simons (1994) and Rezania et al. (2016) could be right. It is possible that belief systems do not have the same relationship to organizational performance in all contexts. Therefore, it might not only be essential to balance the use of MCS (Simons, 1994) but also to find a proper fit with the environment (Bedford, 2015; Felicio et al., 2021; Otley, 1980).

In the context studied in this paper, post-Covid-19, the empirical findings showed that using belief systems positively impacts organizational performance. It also showed that during the past year, all organizations had experienced uncertainty regarding unpredictable factors, e.g., the economy, suppliers, and regulations. However, uncertainty did not impact this relationship positively or negatively. These findings could be interpreted as contradictions to the contingency theory. As discussed, contingency theorists argue that organizations must adapt and devote their structures to environmental conditions to manage the organization effectively (Otley, 1980). Moreover, since the post-Covid-19 context is characterized by new sorts of uncertainties such as inflation, supply chain problems, and changed consumer behavior (European Commission, n.d.; Gupta & Mukherjee, 2022), one could argue that uncertainty would impact the relationship between belief systems and organizational performance if relying on the assumptions of the contingency theory. This implies that organizations only sometimes adapt their use of MCS to changing environments in order to find an excellent contingent fit and enhance performance. Hence, the contingent view is not fully supported in this paper.

On the other hand, regardless of whether organizations experience high or low uncertainty, belief systems were found to affect performance positively. This could be interpreted as the organizations represented in this study have found a good balance of their use of belief systems with other LOC and a contingent fit. Although this study is performed in an uncertain
context, where one could expect belief systems to be essential for organizational performance, the uncertainty may not be that surprising for the organizations. Moreover, as uncertainty did not significantly impact the relationship between belief systems and organizational performance, one could argue that it is because organizations have already adapted their use of MCS to contingent factors during the pandemic and learned how to cope with uncertainty.

Further support for this explanation is the phenomena of organizational learning. Like contingency theory, research on organizational learning argues that organizations must become aware of their environment to make appropriate strategic choices. The ability to learn and adapt is critical for the success of organizations (Argote & Miron-Spector, 2011; Child, 1997). Learning is defined as "a change in the organization's knowledge that occurs as the organization acquires experience (Argote & Miron-Spector, 2011). As discussed, uncertainty did not affect the relationship between using belief systems and organizational performance. Relating this to organizational learning, one could argue that organizations learned how to deal with uncertainty during the pandemic, which prepared them to deal with the post-Covid-19 challenges. In this post-Covid-19 context, organizations have already learned and adapted their use of belief systems to uncertainty, leading to no change in the observed positive relationship between belief systems and organizational performance.

### 5.3.2 Hypothesis 6

In times of uncertainty, boundary systems are argued to prevent the risk of unfocused exploratory search behavior. Thus, boundary systems must be placed to maintain control and encourage reasonable creativity (Simons, 1995). When the external environment is turbulent in times of uncertainty, keeping up the balance within the organization is further essential. This means that using belief systems that inspire the workforce to search and explore need boundaries to avoid taking too high risks (Simons, 1995). When the environment surrounding the organization is unexpected and challenging to control, maintaining internal control using boundary systems is of higher importance. Hence, it was hypothesized that uncertainty would strengthen the correlation between the use of boundary systems and organizational performance.

The empirical data showed no significant relationship between the use of boundary systems and organizational performance with uncertainty as a moderating effect, leading to rejecting
hypotheses 6. Research within MCS is characterized by a contingent view that organizations must adapt their control systems to the external environment (Otley, 1980). However, organizations have been forced to deal with uncertainty for an extended period starting with the outbreak of Covid-19. The uncertainty of dealing with the pandemic required organizations to strategic change and boundaries communicating nonacceptable behavior was implemented from one day to another supported by the contingent view (Adler et al., 2022; Otley, 1980). Because no relationship can be found between boundary systems and organizational performance and the fact that uncertainty did not change this, the assumptions of contingency theory might not be fully supported. As a result, organizations do not seem to have adapted their use of boundary systems to their environment, as no significant relationship with performance could be found. Also, as uncertainty did not affect these findings, boundary systems are quite static rather than dynamic.

As mentioned, the post-Covid-19 period has been characterized by other uncertainties and economic turbulence (European Commission, n.d; Gupta & Mukherjee, 2022). This type of external uncertainty may not require boundaries to the same degree as in other contexts studied to impact performance, which could explain the contradicting findings. Another explanation of the result may be connected to Sweden's cultural norms and values. During the pandemic, Sweden was characterized for running a coronavirus strategy based on the understanding that an appeal to citizens' self-restraint and sense of responsibility would be sufficient since Swedes have high confidence in public institutions and governmental agencies (Adler et al., 2022). Swedish organizations tend to have a relatively high degree of trust in their external stakeholders, such as suppliers, customers, and regulators. This trust is based on a long tradition of collaboration and consensus-building in Swedish society, which has led to a relatively stable and predictable business environment. (Singh et al., 2005). The authors further find Sweden as a country that does not pursue prescriptive codes to a high degree, and the intensity of codification is distinctly lower compared to Anglo countries. When dealing with uncertainty, some societies are more accepting of it, while others are more inclined to try to avoid it. Societies more inclined to avoid uncertainty are likelier to have more laws and formal rules to guard against unpredictability (Hofstede, 1983). Given the context that Swedish organizations have high confidence in public institutions and governmental agencies. They may not feel the need to use boundary systems to deal with uncertainty and enhance performance, as they trust that their external stakeholders will act predictably and reliably.
5.3.3 Hypothesis 7

Diagnostic control systems are designed for implementing intended strategies. A balanced use of diagnostic control systems is essential for the success of an organization (Simons, 1995). They help motivate the workforce, monitoring strategies, and achieve goals (Bisbe & Otley, 2004; Davila, 2000; Simons, 1995; Widener, 2007). In contexts characterized by high uncertainty, researchers highlight the importance of interactive control system (Bisbe & Otley, 2004; Simons, 1991; Widener, 2007). In addition, diagnostic controls are necessary for these interactive controls to be effective (Widener, 2007). This led to the hypothesis that uncertainty strengthens the positive correlation between diagnostic control systems and organizational performance.

Similar to the previous two hypotheses, uncertainty showed no moderation effect on the relationship between diagnostic control systems and organizational performance. As presented in the discussion of Model 1, diagnostic control systems showed a positive relation to performance. This relationship looked the same when adding uncertainty to the equation.

Even though it was hypothesized that the positive relationship between diagnostic control systems and organizational performance is strengthened by uncertainty, the contradictory findings could be logically explained. Diagnostic control systems are argued to be necessary for managing uncertainties in the organization’s external environment and could lead to competitive advantages and improved performance (Laguir et al., 2022). Even if it contains new sorts of challenges, the context of post-Covid-19 studied in this paper occurred after a crisis that was also characterized by different types of uncertainty. As discussed, the non-impact of uncertainty on the relationship between LOC and organizational performance indicates that organizations already have considered uncertainty in their balanced use of MCS. This supports organizational learning, where organizations become aware of their environment, learn lessons, and make the best strategic choices (Child, 1997; Daft & Weick, 1984).

It also supports the assumptions of the contingent view implying that a positive effect on performance can be noticed when finding an excellent contingent fit (Cardinal et al., 2004; Henri, 2006; Mundy, 2010; Simons, 1995). The findings supported a positive relationship between diagnostic control systems and organizational performance. It indicates that
organizations have already learned how to balance their use of diagnostic controls following their environment and contingent factors. However, as previously discussed, the post-Covid-19 environment is not entirely similar to the one during the pandemic. New challenges occurred, and organizations are trying to find the new normal after a protracted crisis. Going back to the contingency theory, one could argue that the findings of this paper partly reject its assumptions.

5.3.4 Hypothesis 8

The use of interactive control systems is argued to be of particular significance when organizations face various types of risk and uncertainty (Bisbe & Otley, 2004; Simons, 1991; Widener, 2007). Sometimes, organizations are exposed to constant change and high competition, creating a need for creativity and innovation. When organizations face different sorts of uncertainty, interactive control systems can be used to scan the environment in which the organization operates and support them in strategic positioning (Widener, 2007). It is further argued that in stable environments, the dynamic tension between interactive and diagnostic use is less useful as organizations are well-known and have established internal processes (Henri, 2006). Thus, it was hypothesized that uncertainty would strengthen the relationship between interactive control systems and performance.

The result from the empirical data rejected the hypothesis, as no significant relation was found between the use of interactive control systems and organizational performance in the context of uncertainty. Hence, it is shown that uncertainty neither strengthens nor weakens the relationship between interactive control systems and performance. This is a surprising result when discussing from a contingent view suggesting that organizations must adapt their control systems and devote organizational structures appropriate to the environmental conditions and work performed to manage the organization effectively (Otley, 1980). Higher performance will then be reached for organizations that properly fit the contingent factors by adapting to the environment using MCS (Bedford, 2015; Felicio et al., 2021).

Research has shown cross-functional planning meetings as a critical feature of crisis management (Kober & Thamber, 2021). However, the short-term/operational logic of MCS is strengthened while the long-term/strategic logic is weakened (Makrygiannakis & Jack, 2016). This is also supported by Müller (1985), who highlights how the pressure of a crisis inclines managers to adopt a firefighting mentality, focusing on immediate actions to achieve
immediate results. Hence, the cross-functional discussions used in organizations to deal with uncertainty in this context may focus on trying to solve short-term and urgent problems. This may imply that the use of interactive control systems in the uncertain context characterized by, e.g., delays in supply chains, changed consumer behavior, inflation, and other economic turbulence (European Commission, n.d; Gupta & Mukherjee, 2022), does not strengthen organizational performance more than under normal circumstances.

These findings could suggest that contingency theory cannot always explain the use of MCS. It could be argued that if interactive control systems were that critical for organizational performance during uncertainty as argued (Henri, 2006; Widener, 2007) and if the assumptions of contingency theory were accurate, the findings would show an adaptation of the use of these controls to fit the contingent factors and a positive impact on performance. Therefore, the assumptions about MCS being flexible and adaptable to the environment may not be accurate.

Another explanation could be found by looking at the context before the one studied. The business environment has been characterized by a high degree of uncertainty starting from the beginning of the Covid-19 pandemic (Passetti, 2021). Organizations have been operating in uncertain environments regarding the economy, suppliers, customers, regulations, etc. (European Commission, n.d). Hence, through a contingent view, they have been forced to adapt to the changed conditions and a new environment to keep up with competitors and reach a new operational and strategic logic (Otley, 1980). Therefore, it can be argued that organizations have learned to navigate and learned to survive in an uncertain environment. Experience from a prior period of uncertainty has increased the knowledge in organizations. The ability to learn and adapt is argued to be critical in the performance and long-term success of the organization (Argote & Miron-Spector, 2011). It is further argued that organizations must develop institutionalized learning mechanisms to revise and elaborate their knowledge (Lipshitz et al., 2002). The establishment of cross-functional teams to interpret information and share different views may be used to deal with uncertainty (Edmondson, 1996). It is then possible that organizations already have these mechanisms in place from the period of uncertainty during covid-19. Hence, organizations may not need to implement new strategies and control systems. This can be a possible explanation of the result indicating that uncertainty does not affect the relation between interactive control systems and organizational performance.
5.4 Summary Model 2

The findings of this paper supported none of the hypotheses in Model 2. This means that uncertainty do not moderate the alleged positive relationships between the use of MCS and organizational performance. The uncertainty incused by the post-covid-19 context neither strengthens nor weakens the relationship and, as a result, has no impact. The phenomenon of organizational learning could explain these findings in the post-Covid-19 context. During the pandemic, organizations may have learned how to handle various types of uncertainty and how to balance their use of management control systems (MCS) depending on the context. This may explain why uncertainty did not influence the connection between LOC and organizational performance in the post-Covid-19 context or during periods following a crisis.

The implications of these findings indicate that contingency theory may not always be able to account for the employment of MCS. As the result shows, none of the levers of controls were indeed crucial for organizational performance during this period of uncertainty. If the assumptions of contingency theory were correct, the results would have shown the adaptation of the use of these controls to fit the contingent factors and a positive effect on performance. Thus, the assumptions regarding the flexibility and adaptability of MCS to the environment may not be entirely accurate.
6. Conclusion

The sixth chapter presents the final conclusions of this paper. It also discusses the theoretical-, empirical-, methodological-, and practical contributions of this study. The thesis ends with an analysis of the limitations and provides suggestions for future research.

6.1 Thesis Summary and Main Conclusions

In line with previous research on MCS and organizational performance (e.g., Baird et al., 2019; Bedford, 2015; Cardinal et al., 2004; Davila, 2000; Felicio et al., 2021), this thesis found evidence supporting the alleged positive relationship between MCS and organizational performance. This paper aims to contribute to a more comprehensive understanding of the relationship between the use of MCS and organizational performance in relation to environmental context. Different constellations of MCS are valuable in different contexts (Ditillo, 2004; Simons, 1994). Thus, it is important to study different contexts to understand the role of MCS and its relation to performance (Chenhall, 2003). This paper studies the unexplored and uncertain context of post-Covid-19 in Sweden. Based on data collected from 164 managers of Swedish organizations, one can conclude that emphasizing belief systems, diagnostic control systems, and interactive control systems enhances organizations’ performance. Moreover, by addressing performance as an indicator of a good match between MCS and the external environment (Otley, 2016), these findings could be interpreted as support for the assumptions from the contingency theory, suggesting that organizations must adapt their use of MCS and find a proper fit to contingent factors to improve performance.

Surprisingly, the findings show that boundary systems alone do not lead to higher performance. There could be several explanations for this occurrence. The non-existing relationship between boundary systems and organizational performance could result from a non-fit between the use of boundary systems and the organizations’ external environment. For instance, the findings could be related to Swedish norms and values, leading to less reliance on prescriptive codes. However, as boundary systems are described as design attributes rather than formal controls (Simons, 1995), a more likely explanation is that boundary systems are not enough to impact performance directly. The findings of this paper further support the assumption that controls work together (e.g., Kruis et al., 2016; Mundy, 2010; Simons, 1994; Simons, 1995; Widener). A positive correlation between all LOC could be found, meaning
that as managers place more emphasis on one of the LOC, they tend to increase the use of the other LOC as well. Based on the assumptions from contingency- and institutional theory and research on the LOC framework, this thesis suggests that there might not be a uniform set of controls. Managers must be able to choose the right balance of controls to succeed, which is impacted by internal and external factors (Mundy, 2010). This thesis also shows evidence of institutional forces influencing organizations’ use of MCS. The institutional phenomena of isomorphism (Meyer & Rowan, 1977) could explain the relatively homogenous sample as the emphasis placed on the different LOC is generally relatively similar for the organizations represented.

As researchers highlight the importance of different MCS during uncertain circumstances (Henri, 2006; Heinicke et al., 2016; Kruis et al., 2016; Simons, 1995), this thesis studies the relationship between LOC and organizational performance in a post-Covid-19 context and incorporates uncertainty as a moderator. Since researchers argue that MCS is positively related to different sorts of organizational performance (e.g., Baird et al., 2001; Chenhall, 2003; Fisher, 1998; Mundy, 2010; Widener, 2007) and valuable for managing uncertainty and change (e.g., Henri, 2006; Laguir et al., 2022; Simons, 1995; Tuomela, 2005), LOC was expected to be even more positively related to organizational performance when experiencing high uncertainty. However, the empirical data supported no moderating effect when including uncertainty.

Therefore, it can be concluded that in contexts where organizations have experienced uncertainty for a long time, using LOC is not more important for organizational performance. This could be explained by contingency theory as well as organizational learning. As discussed, the findings support the phenomena of organizational learning. It indicates that organizations learn and develop their knowledge about how to cope with uncertainty and are, therefore, prepared for the challenges that follow a crisis. Also, the assumptions of contingency theory can explain this occurrence. Since a positive relationship could be found between three out of four LOC and organizational performance, it can be concluded that when organizations recently have managed to find a good balance in their use of MCS (Simons, 1995) with its context and contingent factors (Otley, 1980), facing new sorts of uncertainty does not have an impact. On the other hand, the findings also imply that contingency theory cannot always be used to explain the use of MCS as organizations do not seem to react by
adapting their use of MCS to the new sorts of uncertainties that characterize the post-Covid-19 context.

6.2 Theoretical Contributions

Research on the LOC framework has shown that no correct balance of MCS exist, managers must combine controls suitable for their specific organization (Kruis et al., 2016; Mundy, 2010; Simons, 1995). Simultaneously, contingency theorists argue that there is no universally appropriate use of control for organizations to apply during all circumstances (Otley, 2016). Organizations must adapt to their environment and adopt different controls depending on the circumstances surrounding the organization (Fisher, 1998; Otley, 1999). This paper contributes by supporting this through the findings showing a positive relationship between organizational performance and three out of four LOC: belief systems, diagnostic control systems and interactive control systems, indicating a proper contingent fit (Otley, 2016) and a good balance of MCS (Simons, 1995). This paper further contributes to contingency theory by providing insight that institutionalism and organizational learning also contributes to the choice of MCS and its relationship with performance. Also, in line with contingency theory and research on MCS and uncertainty, it was hypothesized that LOC are especially important for organizational performance when facing uncertainty. Through the findings it was concluded that uncertainty has no effect on these relationships, indicating that organizations that have faced uncertainty for a long period of time, like in the post-Covid-19 context, seem resistant to new sort of uncertainty. Thereby, this paper also contributes with some critique against contingency theory.

The paper contributes by discussing how the phenomenon of isomorphism may provide an explanation for the relatively similar emphasis placed on different types of management control systems (i.e., LOC) in the organizations included in the study. This suggests that institutional forces, such as normative pressures for conformity (Damayanthi & Gooneratne, 2017) may influence organizations' adoption and use of MCS, resulting in homogeneity in their practices. This aligns with the fundamental premise of institutional theory, which argues that organizations are influenced by social norms, cultural values, and external pressures, all of which can shape their behavior and practices, including their adoption and utilization of management control systems.
This paper found evidence supporting the phenomena of organizational learning. It is crucial for organizations’ performance and long-term success to have the ability to learn and adapt (Argote & Miron-Spector, 2011). Research on organizational learning suggest that organizations learn by facilitating information gathering and intensifying the process of disseminating information (Lipshitz et al., 2002). Organizational learning is observed in the empirical findings of this paper where the impact of uncertainty on the relationship between LOC and performance is tested. Because uncertainty did not show an impact on the positive relationship between organizational performance and belief-, diagnostic, and interactive control systems, it could be interpreted as an organization have already learnt how to deal with uncertainty during the pandemic. This indicate that organizations are aware of their environment and have learnt to make appropriate strategic choices (Daft & Weick, 1984). In conclusion, this paper contributes with evidence of organizational learning in contexts characterized with uncertainty for a long period of time, like the Covid-19- and post Covid-19 context.

6.3 Empirical & Methodological Contributions

Limited research studies all four levers of controls individually and their respective correlation with organizational performance (Abernethy & Brownell, 1999; Henri, 2006; Müller-Stevens, 2020), especially in Sweden. Additionally, limited research studies this relation in a post-crisis context characterized by a high degree of uncertainty. This thesis adopts a broad approach, resulting in several empirical contributions to the study's subject matter. First, the findings support the positive relationship between MCS and organizational performance. The findings are consistent with previous research on MCS and organizational performance (e.g., Baird et al., 2019; Bedford, 2015; Cardinal et al., 2004; Davila, 2000; Felicio et al., 2021) and contribute by further strengthening the understanding of the relationship between MCS and organizational performance in the specific context of post-covid-19 in Sweden.

Secondly, the study found that emphasizing belief systems, diagnostic control systems, and interactive control systems enhances organizational performance. The non-existent relationship between boundary systems and organizational performance also contributes as it challenges the assumption that boundary systems are sufficient for improving organizational performance. It also suggests that other types of MCS may be necessary for effective performance (Baird et al., 2019; Widener, 2007; Simons, 1995). Additionally, the study found
a positive correlation between different types of MCS, indicating that as managers emphasize one type of control, they also tend to increase the use of other types of controls. This complementary relationship supports the idea that controls work together and need to be balanced by managers to achieve optimal performance (e.g., Kruis et al., 2016; Mundy, 2010; Simons, 1994; Simons, 1995; Widener). Lastly, the study found no moderating effect of uncertainty on the relationship between MCS and organizational performance. It challenges the assumption that MCS is more important for organizational performance during uncertain circumstances (Henri, 2006; Heinicke et al., 2016; Kruis et al., 2016; Simons, 1995) and suggests that organizations may have learned and developed their knowledge about coping with uncertainty (e.g., Child, 1997; Daft & Weick, 1984), which can impact the effectiveness of MCS in the post-Covid-19 context.

The study further contributes with some methodological approaches to the subject matter. Several case studies have previously been exercised in the field of MCS (Barros & Ferreria, 2022; Pešalj et al., 2018) or focused on only some of the LOC (Abernethy & Brownell, 1999; Henri, 2006; Müller-Stevens, 2020). However, this thesis contributes by pursuing a quantitative approach in a new context, focusing on all four LOC. The thesis further pushes the idea of quantitative style with a moderating effect inspired by, e.g., Davila (2005) and Müller-Stewens et al. (2020). Incorporating uncertainty as a moderator adds to understanding how uncertainty may interact with MCS to influence organizational performance, providing insights into the role of uncertainty as a moderator in the research area. The findings show that uncertainty does not moderate this relationship, indicating that uncertainty neither strengthens nor weakens the relationship between the LOC and organizational performance. Despite these unexpected findings, this paper rearranges and finds reasonable explanations for this occurrence instead of excluding it or trying to disregard it, making it a methodological contribution.

6.4 Practical Contributions

One practical contribution of this thesis is related to the criticism of contingency theory and the phenomena of organizational learning in times of uncertainty discussed in the theoretical contributions. Although the findings support the contingency theory, this paper also shows that institutional forces play a part in MCS's design to fit the external environment properly. Further, the phenomenon of organizational learning is essential for managing uncertainty. Therefore, a practical contribution is that the organization can understand the importance of
the external environment when deciding on the use of MCS, which practically could lead to enhanced performance.

This thesis further makes a practical contribution to understanding the role of MCS and what factors impact Swedish organizations’ design and use of controls. In the post-Covid-19 context, using belief, diagnostic, and interactive control systems positively impact performance. This thesis provides guidelines for achieving higher performance by highlighting the relationship between MCS, organizational performance, and uncertain contexts. These findings have practical implications for managers of Swedish organizations operating in uncertain contexts.

6.5 Societal and Ethical Issues and Consequences

The consequences resulting from crises such as the Covid-19 pandemic has proven how fragile the modern society is. Both individuals and organizations in the society have been forced to deal with unexpected events and drastic changes. Organizations must adapt to their external environment and find a proper use of controls to efficiently reach intended goals and manage uncertainties (e.g., Fisher, 1998; Otley & Soin, 2014; Simons, 1995). This is not only important for the survival and success of organizations, but also for society. For instance, the post-Covid-19 pandemic is characterized by large disruptions in supply chains (European Commissions, n.d.) that occurred due to difficulties to adapt to the drastic changes. Such disruptions could lead to devastating consequences e.g., in the healthcare industry. In Europe, manufacturers of medical supplies were forced to deal with supply shortages of materials needed for their production (Spieske et al., 2022). Hence, as organizations’ actions impact the society as a whole, it is important to gain knowledge about how organizations efficiently can deal with uncertainties and succeed with intended strategies. This paper contributes by highlighting the benefits of organizations’ use of MCS and the importance of adapting to the external environment to succeed.

Further, this thesis addresses performance as a measure of a proper contingent fit (Otley, 1980). Although the participants of this study represent for-profit organizations, there are ethical issues related to how to measure performance. One can argue that performance is not only about the financial performance, but also other factors such as employee well-being and environmental impact. This paper addresses these ethical issues by using 7 different measures
of performance. These are related to financial performance, product quality, employee satisfaction, and internal relationship. However, this study can still be criticized for not addressing all relevant measures of performance.

6.6 Limitations

Given the relatively small sample studied in this thesis, the findings may not reflect how the use of MCS looks in Swedish organizations in general. Hence, one must address the conclusions with some caution. The same applies to generalizing the findings outside of this Swedish context. As discussed in Chapter 5, norms and values that characterize Sweden as a country could impact the use of MCS and response to uncertainty. Further, in line with contingency- and institutional theory, this could also be impacted by organizations' external- and institutional environment. Therefore, the findings might not be representative of countries other than Sweden.

There are also limitations of this thesis related to the sampling. Managers are chosen as representatives of the different organizations participating in the study. Because the managers are asked to rate questions regarding, e.g., their relationship with employees or the organization's economic performance, there is a risk of dishonesty. The respondents might want to portray themselves as good managers, which could impact the credibility of this thesis. Because respondents are held anonymous, there is a risk that several respondents represent the same organization in the study. This constitutes a limitation of this paper since the 164 responses analyzed are interpreted as representatives of different organizations. Finally, there is also a limitation related to the questionnaire. Because no question regarding what country the managers work in is included, there is a risk that the respondents represent an organization outside of Sweden, which goes against the purpose of this paper.

6.7 Future Research

Although the importance of MCS for organizational performance is commonly discussed in current literature (e.g., Baird et al., 2019; Bedford, 2015; Cardinal et al., 2004; Davila, 2000; Felicio et al., 2021), only limited research on how the context in which organizations operate impact this relationship exists. By exploring the contingent- and institutional view, it became clear that the external environment is crucial to study to understand the role of MCS. While this thesis addresses the role of MCS on organizational performance, another suggestion for future research is to consider internal factors. For instance, it could be to study internal factors
such as the structure and size of the organization (Dragnić, 2014) to broaden the understanding of how to find the most appropriate balance of MCS for organizational performance. Also, one could look at organizations' annual reports rather than relying on managers' perceptions when measuring organizational performance to increase the study's trustworthiness.

In contrast with contingency theory and the assumption that organizations' use of MCS is dynamic with the environment (Otley, 1980), this thesis found that organizations do not react to contingent factors, such as new sorts of uncertainty in the external environment when they have faced a long period of uncertainty before. Therefore, another suggestion for future research is to continue studying other contexts characterized by various types of uncertainty for a long period of time to test if this phenomenon, which this thesis interprets as organizational learning (Argote & Miron-Spector, 2011; Daft & Weick, 1984; Lipshitz et al., 2002), can be noticed elsewhere. The paper suggests that the relationship between MCS and organizational performance may vary across different contexts. Further research could conduct comparative studies across different countries, industries, and organizational types to explore MCS and performance and how contextual factors may influence this relationship. Finally, this paper examines organizational performance by measuring economic performance, service/product quality and development, and human resource performance. A suggestion for future research is to decompose performance and examine, e.g., financial performance or human resource performance individually in relation to the use of MCS. Lastly, it could be suggested to examine the relationship between the use of MCS and performance in uncertain contexts by conducting a qualitative research approach to get a deeper understanding of the interrelationships.
7. Reference List


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https://doi.org/10.1108/IJOPM-09-2016-0565

https://www.regeringen.se/regeringens-politik/rysslands-invasion-av-ukraina/


# 8. Appendix

## 8.1 Appendix 1 – Literature Review Table

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*The highest possible rating
8.2 Appendix 2 – Survey Questions English

Control Questions

*I am...*
(1) Female
(2) Male
(3) Other

*What is your age?*
(1) __________

*What is the highest degree or level of education you have completed?*
(1) Elementary school
(2) High school
(3) University
(4) Postgraduate
(5) Other post-secondary education

*What industry does your organization mainly operate in?*
(1) Energy and power supply e.g., oil, gas, and coal
(2) Materials e.g., chemistry, wood, paper, and metals
(3) Industry e.g., machines, trucks, vehicles, and parts
(4) Retail and rare items e.g., cars, appliances, and clothes
(5) Daily goods e.g., food, drink, and detergent
(6) Healthcare e.g., medical and biotechnology
(7) Finance and real estate e.g., banks and insurance companies
(8) Information technology and telecom operators e.g., computers, software, and telephone
(9) Construction, design, and interior
(10) Other__________

*What is your position at the organization?*
(1) Top manager
(2) Division manager
(3) Manager
(4) Other_________

For how many years have you held your current position?
(1) _________

How many employees work in the organization?
(1) 1 – 10
(2) 11 – 49
(3) 50 – 249
(4) 250 – 500
(5) More than 500

Perceived environmental uncertainty.
Over the past year, how predictable have important actions or changes in the external environment been? (1=Highly predictable; 7=Highly Unpredictable)

1.1 Customer (e.g., level of demand, customer requirements)

(1) (2) (3) (4) (5) (6) (7)

1.2 Suppliers (e.g., markets for key inputs, quality of resources)

(1) (2) (3) (4) (5) (6) (7)

1.3 Competitors (e.g., competitors entering or leaving, tactics/strategies)

(1) (2) (3) (4) (5) (6) (7)

1.4 Technological (e.g., R&D advances, process innovation)

(1) (2) (3) (4) (5) (6) (7)

1.5 Economic (e.g., costs, interest rates)

(1) (2) (3) (4) (5) (6) (7)

1.6 Regulation (e.g., new laws or rules)

(1) (2) (3) (4) (5) (6) (7)
Belief Systems

*Please indicate the extent to which the following items characterize your organization:*

*(1= Not very characteristic; 7= Very characteristic)*

2.1 Our mission statement clearly communicates the firm’s core values to our workforce.

(1) (2) (3) (4) (5) (6) (7)

2.2 Top managers communicate core values to our workforce.

(1) (2) (3) (4) (5) (6) (7)

2.3 Our workforce is aware of the firm’s core values.

(1) (2) (3) (4) (5) (6) (7)

2.4 Our mission statement inspires our workforce.

(1) (2) (3) (4) (5) (6) (7)

Boundary Systems

*Please rate the extent to which you agree or disagree with the following:*

*(1= Strongly disagree; 7= Strongly Agree)*

3.1 Our organization relies on a code of business conduct to define appropriate behavior for our workforce.

(1) (2) (3) (4) (5) (6) (7)

3.2 Our code of business conduct informs our workforce about behaviors that are off-limits.

(1) (2) (3) (4) (5) (6) (7)

3.3 Our organization has a system that communicates to our workforce risks that should be avoided.

(1) (2) (3) (4) (5) (6) (7)

3.4 Our workforce is aware of the firm’s code of business conduct.

(1) (2) (3) (4) (5) (6) (7)
Diagnostic Control Systems

*Please rate the extent to which you agree or disagree with the following. In our organization we... (1= Strongly disagree; 7= Strongly Agree)*

4.1 Track progress towards goals

(1) (2) (3) (4) (5) (6) (7)

4.2 Monitor results

(1) (2) (3) (4) (5) (6) (7)

4.3 Compare outcomes to expectations

(1) (2) (3) (4) (5) (6) (7)

4.4 Review key measures

(1) (2) (3) (4) (5) (6) (7)

Interactive Control Systems

*Please rate the extent to which you agree or disagree with the following. In our organization we... (1= Strongly disagree; 7= Strongly Agree)*

5.1 Enable discussion in meetings of superiors, subordinates, and peers.

(1) (2) (3) (4) (5) (6) (7)

5.2 Enable continual challenge and debate underlying data, assumptions, and action plans.

(1) (2) (3) (4) (5) (6) (7)

5.3 Provide a common view

(1) (2) (3) (4) (5) (6) (7)

5.4 Enable focus on common issues

(1) (2) (3) (4) (5) (6) (7)

5.5 Enable focus on critical success factors

(1) (2) (3) (4) (5) (6) (7)
Organizational Performance

How would you compare the organizations performance over the past year to that of the organizations that do the same kind of work?

(1= Much worse than the competitors; 7=Much better than the competitors)

6.1 Growth in sales/revenues
(1) (2) (3) (4) (5) (6) (7)

6.1 Return on sales/revenues
(1) (2) (3) (4) (5) (6) (7)

6.3 Quality of products/services
(1) (2) (3) (4) (5) (6) (7)

6.4 Development of new products/services
(1) (2) (3) (4) (5) (6) (7)

6.5 Ability to attract and retain talented employees
(1) (2) (3) (4) (5) (6) (7)

6.6 Relations between management and employees
(1) (2) (3) (4) (5) (6) (7)

6.7 Relations among employees
(1) (2) (3) (4) (5) (6) (7)
8.3 Appendix 3 – Survey Questions Swedish

Kontrollfrågor

Jag är en...
(1) Kvinna
(2) Man
(3) Annat

Hur gammal är du?
(1) __________

Vilken är den högsta utbildningsnivå som du avklarat?
(1) Grundskola
(2) Gymnasieutbildning
(3) Högskole-/universitetsutbildning
(4) Forskarutbildning
(5) Annan eftergymnasial utbildning

Vilken bransch verkar organisationen inom?
(1) Energi och kraftförsörjning tex. el, olja, gas och kol
(2) Material tex. kemi, trä, papper och metaller
(3) Industri och tillverkning tex. maskiner, lastbilar, fordon och delar
(4) Detailhandel och sällanköpsvaror tex. kläder, inredning, bilar och vitvaror
(5) Dagligvaror tex. mat, dryck och tvättmedel
(6) Hälsovård tex. sjukvård och bioteknik
(7) Finans och fastigheter tex. banker, försäkringsbolag och fastigheter
(8) Informationsteknik och teleoperatörer tex. datorer, mjukvara och telefon
(9) Bygg, konstruktion och design
(10) Annat __________

Vilken är din roll i organisationen?
(1) Högsta chef
(2) Avdelningschef
(3) Annan typ av chef
Hur många år har du haft din nuvarande roll?

_________

Hur många anställda arbetar i organisationen?

(1) 1 – 10
(2) 11 – 49
(3) 50 – 249
(4) 250 – 500
(5) Mer än 500

Upplevd osäkerhet i organisationens omgivning

_Hur förutsägbara har viktiga händelser eller förändringar i organisationens omgivning varit under det senaste året? (1= mycket förutsågbart; 7=väldigt oförutsågbart)_

1.1 Kunder (tex. efterfrågan, kundkrav)

(1) (2) (3) (4) (5) (6) (7)

1.2 Leverantörer (tex. marknader för nyckeltillgångar, kvalitet på resurser)

(1) (2) (3) (4) (5) (6) (7)

1.3 Konkurrenter (tex. konkurrenter som dyker upp eller försvinner, taktik/strategier)

(1) (2) (3) (4) (5) (6) (7)

1.4 Teknik (tex. forsknings- och utvecklingsframsteg, teknisk och processinnovation)

(1) (2) (3) (4) (5) (6) (7)

1.5 Ekonomi (tex. Kostenader, räntor)

(1) (2) (3) (4) (5) (6) (7)

1.6 Regleringar (tex. nya lagar eller regler att förhålla sig till)

(1) (2) (3) (4) (5) (6) (7)
Styrsystem för att engagera anställda i organisationens vision och kärnvärden

Ange i vilken utsträckning följande påståenden beskriver din organisation:
(1= Håller inte alls med; 7= Håller med fullt ut)

2.1 Vår verksamhetsplan/strategi förmedlar tydligt organisationens kärnvärden till vår personal

(1) (2) (3) (4) (5) (6) (7)

2.2 Toppchefer kommunicerar kärnvärden till vår personal.

(1) (2) (3) (4) (5) (6) (7)

2.3 Vår personal är medveten om organisationens kärnvärden

(1) (2) (3) (4) (5) (6) (7)

2.4 Vårt verksamhetsplan/strategi inspirerar vår personal.

(1) (2) (3) (4) (5) (6) (7)

Återhållande system

Vänligen betygsätt i vilken utsträckning du håller med/inte håller med om följande:
(1= Håller inte med alls; 7= håller med fullt ut)

3.1 Vår organisation förlitar sig på en uppförandekod för att förmedla lämpligt beteende för vår personal.

(1) (2) (3) (4) (5) (6) (7)

3.2 Vår affärsuppförandekod informerar personalen om beteenden som är förbjudna.

(1) (2) (3) (4) (5) (6) (7)

3.3 Vår organisation har ett system som kommunikerar ut vilka risker som bör undvikas till personalen.

(1) (2) (3) (4) (5) (6) (7)

3.4 Vår personal är medveten om organisationens uppförandekod.

(1) (2) (3) (4) (5) (6) (7)
Styrsystem för att övervaka att organisationens mål uppnås

Vänligen betygsätt i vilken utsträckning du håller med/inte håller med om följande. vår organisation... (1= Håller inte med alls; 7= Håller med fullt ut)

4.1 Följer upp framsteg mot satta mål

(1) (2) (3) (4) (5) (6) (7)

4.2 Kontrollerar/mäter resultat

(1) (2) (3) (4) (5) (6) (7)

4.3 Jämför resultat med förväntningar

(1) (2) (3) (4) (5) (6) (7)

4.4 Utvärderar nyckeltal

(1) (2) (3) (4) (5) (6) (7)

Interaktiva styrsystem

Vänligen betygsätt i vilken utsträckning du håller med/inte håller med om följande. Vår organisation... (1= Håller inte med alls; 7= Håller med fullt ut)

5.1 Möjliggör diskussion på möten med överordnade, underordnade och jämlika.

(1) (2) (3) (4) (5) (6) (7)

5.2 Möjliggör kontinuerlig utmaning och diskuterar underliggande data, antaganden och handlingsplaner.

(1) (2) (3) (4) (5) (6) (7)

5.3 Förmedlar ett gemensamt synsätt

(1) (2) (3) (4) (5) (6) (7)

5.4 Möjliggöra fokus på vanliga frågor

(1) (2) (3) (4) (5) (6) (7)

5.5 Möjliggöra fokus på kritiska framgångsfaktorer

(1) (2) (3) (4) (5) (6) (7)
Organisationens prestation

_Hur skulle du beskriva organisationens prestation under det senaste året jämfört med de organisationer som utför samma typ av arbete när det kommer till..._

(1= Mycket sämre än våra konkurrenter; 7=Mycket bättre än våra konkurrenter)

6.1 Tillväxt i försäljning/intäkter

(1) (2) (3) (4) (5) (6) (7)

6.1 Tillväxt i resultat

(1) (2) (3) (4) (5) (6) (7)

6.3 Kvalitet på produkter/tjänster

(1) (2) (3) (4) (5) (6) (7)

6.4 Utveckling av nya produkter/tjänster

(1) (2) (3) (4) (5) (6) (7)

6.5 Förmåga att attrahera och behålla duftiga medarbetare

(1) (2) (3) (4) (5) (6) (7)

6.6 Relationer mellan ledning och medarbetare

(1) (2) (3) (4) (5) (6) (7)

6.7 Relationer mellan medarbetare

(1) (2) (3) (4) (5) (6) (7)
8.4 Appendix 4 – Coding

I am...
0 = Female, 1 = Male

What is the highest degree or level of education you have completed?
1 = High School, 2 = University, 3 = Postgraduate

What is your position at the organization?
0 = Other, 1 = Another manager, 2 = Divisional manager, 3 = Top manager

How many employees work in the organization?
1 = 1 – 10, 2 = 11 – 49, 3 = 50 – 249, 4 = 250 – 500, 5 = More than 500
### 8.5 Appendix 5 – Summary Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Perceived environmental uncertainty.** (Bedford & Maloni, 2015) | Over the past year, how predictable have important actions or changes in the external environment been?  
Customer (e.g., level of demand, customer requirements)  
Suppliers (e.g., markets for key inputs, quality of resources)  
Competitors (e.g., competitors entering or leaving, tactics/strategies)  
Technological (e.g., R&D advances, process innovation)  
Economic (e.g., costs, interest rates)  
Regulation (e.g., new laws or rules) |
| **Belief Systems** (Widener, 2007) | Please indicate the extent to which the following items characterize your organization:  
Our mission statement clearly communicates the firm’s core values to our workforce.  
Top managers communicate core values to our workforce.  
Our workforce is aware of the firm’s core values.  
Our mission statement inspires our workforce. |
| **Boundary systems** (Widener, 2007) | Please rate the extent to which you agree or disagree with the following:  
Our organization relies on a code of business conduct to define appropriate behavior for our workforce.  
Our code of business conduct informs our workforce about behaviors that are off-limits.  
Our organization has a system that communicates to our workforce risks that should be avoided.  
Our workforce is aware of the firm’s code of business conduct. |
| **Diagnostic control systems**  
(Henri, 2006) | Please rate the extent to which you agree or disagree with the following. In our organization we…  
Track progress towards goals  
Monitor results.  
Compare outcomes to expectations.  
Review key measures |
| **Interactive control systems**  
(Henri, 2006) | Please rate the extent to which you agree or disagree with the following. In our organization we…  
Enable discussion in meetings of superiors, subordinates, and peers.  
Enable continual challenge and debate underlying data, assumptions, and action plans.  
Provide a common view.  
Enable focus on common issues.  
Enable focus on critical success factors. |
| **Organizational performance**  
(Corneli, 2008)  
(Delaney & Huselid, 1996) | How would you compare the organizations performance over the past year to that of the organizations that do the same kind of work?  
Growth in sales/revenues.  
Return on sales/revenues.  
Quality of products/services.  
Development of new products/services.  
Ability to attract and retain talented employees.  
Relations between management and employees.  
Relations among employees. |