MANAGEMENT CONTROL IN NORDIC SMALL AND MEDIUM-SIZED ENTERPRISES:

A CONTINGENCY-BASED APPROACH

Master Thesis

MSc. EBA - Accounting, Strategy and Control

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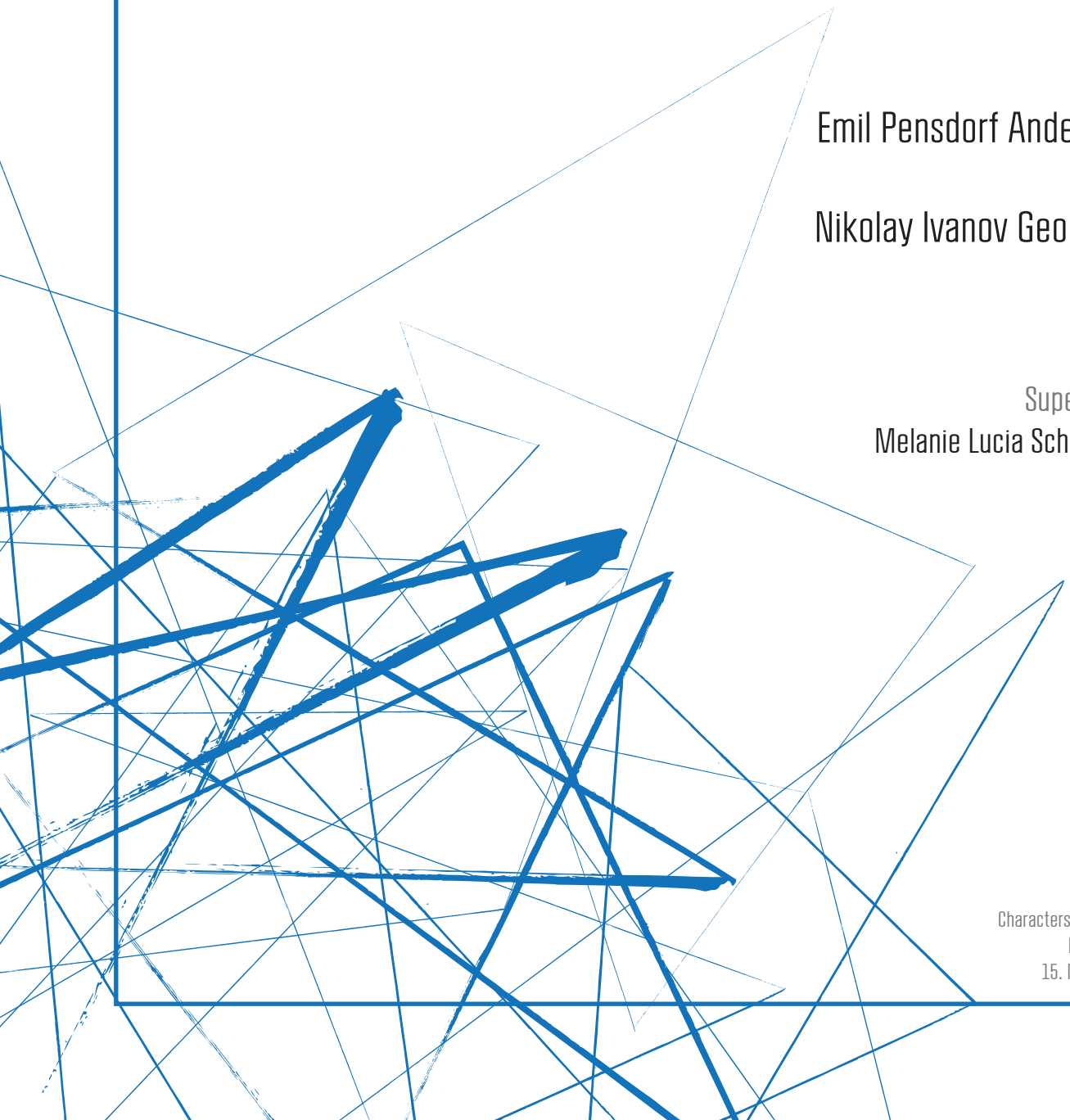

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Abstract

This thesis examines the associations between management control (MC) practices and contextual factors within small and medium-sized Nordic enterprises and their effect on Return on Assets (RoA). More specifically, practices related to performance measurement and organizational structure are analysed in relation to organizational strategy and technology. Using survey data of 502 companies, a Cartesian and Configuration approach to contingency theory is combined by utilizing regression and profile deviation analysis. Out of 16 hypotheses developed, 4 are supported. The thesis contributes to the existing SME literature by providing one of the most comprehensive management control analyses of smaller companies. It provides exploratory findings on actual MC configurations on a country and industry level, as well as findings on the contingent association between context and MC – on a holistic systems level and on a specific, bivariate level.

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1. Introduction

It is widely recognized that small and medium-sized enterprises (SMEs) are a central part of developed countries' economies (European Comission, 2016; Mulhern, 1995). However, despite the fact that a consensus exists on the importance of SMEs, they have not received much attention from the MC literature (Chenhall, 2007). Researchers have so far focused on arguing for the overall applicability and significance of MC in smaller companies (Garengo et al., 2005; Hudson & Smart, 2001). While such literature is undoubtedly important, it mostly ignores the existing contingent association between the effectiveness of MC and company context (Otley, 2016) by only focusing on the size dimension. Additionally, most existing work is characterized by case studies, conceptual discussions or small sample sizes (Armitage et al., 2016; Garengo & Bititci, 2007; Hudson et al., 2001). As a result, it has been argued that smaller companies provide many opportunities for contingency-based MC research (Chenhall, 2007).

This study aims to address the lack of empirical, quantitative studies in the field by examining the association of technology and strategy with MC practices related to performance measurement and organizational structure. This is done by complementing a standard, bivariate (Cartesian) approach to fit with a systems (Configuration) approach, which takes into account interdependence between MC practices. Additionally, this thesis' objective is to also provide clarity on the actual MC configuration of SMEs, as research on how small companies are set up is generally absent (Garengo & Bititci, 2007). To do so, a survey has been administered to five Nordic country – Denmark, Finland, Iceland, Norway and Sweden, which resulted in 502 net respondents. Based on existing MC literature, 14 hypotheses concerning bivariate interactions between contextual factors and MC practices, and two hypotheses concerning multivariate interactions, were created. Support was found for three hypotheses associated with Cartesian approach, and one for the Configuration approach.

This thesis makes several contributions to existing literature. First, it provides one of the most comprehensive exploratory study on the MC configurations of SMEs, which previously has been lacking. Second, it supports the relevance of contingency theory in an SME context by finding a positive association between defenders and high cost control and low decentralization, as well as a positive association between companies with low task uncertainty and narrow measurement diversity. Third, support is found for the relevance and fit of the developed optimal theoretical

configuration in the context of prospectors and high technological uncertainty. Fourth, the results of the multivariate analysis also contribute to existing literature by putting into question the relevance of "pure" defender / low task uncertainty MC configurations for SMEs, which are found to be detrimental for performance regardless of context. Fifth, support is found for Van De Ven & Drazin's (1985) claim that combining Cartesian and Configuration approach provides complementary information. Finally, the thesis is structured around Malmi & Brown's (2008) framework, which provides high comparability and helps pave the way to a more systematic research in the field (Otley, 2016).

The remaining of the paper is structured as follows. In Section 2, the research questions will be derived. As such, relevant literature will be reviewed, including the formal conceptualization of MC, contingency theory and SME papers, in order to introduce the core concepts of the paper. In Section 3, the MC practices that will be subsequently used are defined and conceptualized. Similarly, the typologies used for the contextual factors are presented with argumentation for the particular choices. In Section 4, existing literature on the association between MC practices and contextual factors is reviewed and hypotheses are developed. For each MC practice, one hypothesis is created per contextual factor adding up to 14. Additionally, two hypotheses are created based on a systems approach to fit. Section 5 introduces the Methodology of the thesis. This section therefore includes epistemological considerations, details on data collection, sample characteristics, variable measurement and preliminary analyses done. Section 6 (Analysis and Results) is split in three main parts. First, exploratory analyses are carried out on general company characteristics, MC practices and contextual factors, while industry and country differences are examined. Second, regression analyses are undertaken to test the hypothesized associations, with multiple robustness checks included. Finally, the systems analysis output is described with each step of the process being detailed. In Section 7, theoretical and practical contributions are discussed. Also, the limitations of the thesis are explicitly outlined, with possible future research directions proposed that might further contribute to the SME and MC field. Last, Section 8 provides concluding remarks.

1.1. Development of Management Control Literature

Since the 1970's the nature and role of management accounting and control has transformed significantly (Otley, 2016). The alterations, brought about by a number of changes in the environment of the companies – such as rapid technological development, increased global and local competition and deregulation, instigated a revolution in the scientific approach towards more field founded research and theory development (Ferreira & Merchant, 1992). The environmental transformations subsequently caused changes in organizational hierarchies and decision making, with organizations displaying increasingly decentralized characteristics and an increased focus on their core business (Otley, 2016). Following this movement into less extensive presence in supply chains, Management Accounting and Control has evolved from a simplistic state of solely focus on numbers and budgets, to more advanced approaches such as activity-based costing, value-based management and focusing increasingly on the strategic impact of both financial and non-financial measures (Otley, 2016). Thus, the most recent trend in Management Accounting and Control has been the adoption of Balanced Scorecard-like techniques, to encompass both strategic and operational control concerns in an attempt to optimize decision making and behavioural alignment with the organization. However, while the theoretical literature on control mechanisms has evolved rapidly, the field research has lacked similar pace (Bedford & Malmi, 2015; Malmi & Brown, 2008). Hence, relatively few scholars have attempted to investigate real world applications of management control and how it is configured and performing in different contextual settings (Bedford & Malmi, 2015; Malmi & Brown, 2008).

1.2. Management Control Conceptualization and Frameworks

Despite the use of the term "management control systems (MCS)" being widely used, defining it has not been straight-forward and it has been conceptualized differently throughout existing research. Since Anthony's (1965) narrow conceptualization, MCS's definition has developed and broadened to encompass strategic and operational controls (Malmi & Brown, 2008; Merchant & Otley, 2007) such as inventory and quality controls, as well as "softer" controls like personnel or clan-controls. Chenhall (2007), for example, takes a broad view on MCS and argues that it includes all management accounting systems plus personal and clan controls. His conceptualization could include practices that contribute solely to efficient decision-making. Similarly, Merchant & Otley (2007) state that "almost everything in the organization is included as part of the overall control system" (p. 785). However, a clear distinction between control and decision-making is lacking in most of the existing definitions according to Malmi & Brown (2008). Following their discussion,

which attempts to address this, MC in this thesis is defined as "all the devices and systems managers use to ensure that the behaviours and decisions of their employees are consistent with the organisation's objectives and strategies, but exclude pure decision-support systems" (p. 290), where "pure decision-support systems" are those that are designed to support efficient decision making and are then left unmonitored (Malmi & Brown, 2008). Additionally, Malmi & Brown (2008) touch upon the distinction between a package and a system. MC practices form a system if they are intentionally coordinated and designed with their interdependence taken into account (Grabner & Moers, 2013). Packages are formed from the total set of MC practices and MCS in the organization, which do not necessarily need to be interdependent, as they can address multiple control issues and be added at different times, by different people.

Despite "package" and "system" frequently regarded as interchangeable within existing literature, there are both theoretical and empirical downfalls of the two being wrongly differentiated (Grabner & Moers, 2013). For the remainder of the thesis, the term MCS will be used in reference to the internally coherent systems within the organizations. For MC practices[1] to form a system, they should be designed and coordinated intentionally, thus tightly coupled and interrelated (Grabner & Moers, 2013; Malmi & Brown, 2008). Also, "package" will refer to the complete set of MC practices and systems within the organization, with no assumption regarding their interrelations or coherence. As such, MC package's definition is referenced to Grabner & Moers (2013) discussion and assumes that organizations' control configurations are comprised of control mechanisms that are added for different purposes, for different people, at different times and as such are not necessarily coherent or interdependent.

Since the introduction of MCS as a term in 1965 by Anthony (1965), several suggestions of how to holistically capture the elements in a framework have been provided by scholars (Ferreira & Otley, 2009; Flamholtz, 1996; Flamholtz et al., 1985; Malmi & Brown, 2008; Otley, 1980; Simons, 1995). The intent of the frameworks is to provide an overview of the different control elements in an organization's MC and highlight the interdependency between contextual factors and the MC of a

[1] The term "practices" is used following Friis' et al. (2015) discussion and definition – "practice often denotes a recursive pattern of human behaviour that is constituted by multiple structural elements". It is argued that practices is a relatively aggregated term encompassing multiple elements and is appropriate for quantitative, contingency studies (Friis et al., 2015).

company (Bedford & Malmi, 2015). The typologies associated with them also provide basis to extend existing theoretical proposition, hypothesize on ideal configurations or create framings for contingency approaches (Bedford & Malmi, 2015). A common characteristic of the frameworks is their attempt to apprehend all levels of MC, ranging from vision statements and overall budgets to personal incentive schemes, by dividing them into smaller subcategories with different purposes and control domains (Willert, 2016). The four most cited frameworks are those of Simons (1995) (Levers of Control); Otley (1999) (Five Key Questions), Malmi & Brown, (2008) (Management Control System Package) and Ferreira & Otley, (2009) (The Performance Management Systems Framework) (Willert, 2016). This thesis adopts the framework developed by Malmi & Brown (2008). As it can be seen below in Figure 1, the framework provides a classification of controls that affect employee behaviour and arranges them in five categories: Cultural Controls, Planning, Cybernetic Controls, Administrative Controls and Reward and Compensation. Each category has different subcategories that all together comprise the collective MC package of a company. Although this thesis will not examine MC as a package, and therefore not all elements of the package are relevant, this framework serves to frame the analysis and discussion, with subsequent constructs chosen in line with the relevant control categories.

<table>
<tr><td colspan="7">Cultural Controls</td></tr>
<tr><td colspan="2">Clans</td><td colspan="3">Values</td><td colspan="2">Symbols</td></tr>
<tr><td colspan="2">Planning</td><td colspan="4">Cybernetic Controls</td><td rowspan="2">Reward and Compensation</td></tr>
<tr><td>Long range planning</td><td>Action planning</td><td>Budgets</td><td>Financial Measurement Systems</td><td>Non Financial Measurement Systems</td><td>Hybrid Measurement Systems</td></tr>
<tr><td colspan="7">Administrative Controls</td></tr>
<tr><td colspan="2">Governance Structure</td><td colspan="3">Organisation Structure</td><td colspan="2">Policies and Procedures</td></tr>
</table>

Figure 1 - Management Control Systems as a Package Framework(Malmi & Brown, 2008, p. 291)

1.3. Contingency Theory within Management Control

Contingency theory is one of the most established concepts of Management Accounting (Otley, 2016). The idea of contingent contextual factors originates from the organizational structure literature, which attempts to explain how organizational structures are most efficient under certain

circumstances (Chenhall, 2007; Otley, 2016). Pioneer scholars such as Burns & Stalker (1961), Perrow (1970) and Lorsch & Lawrence (1967) argued for the effects of environment and technology on a company's structure. From this, management accounting contingency began to develop in the 1970's. Initially, Waterhouse & Tjessen (1978) and Otley (1980) found environment, technology, structure, and size to be the key factors in designing MCS. Subsequently, additional dimensions such as strategy and national culture have been added to the field of research.

From its initial position constrained to describe the variances of management accounting practices, contingency theory has advanced towards attempting to uncover optimal fit between MC and the context of a company (Otley, 2016). Otley (1980) states that "contingency theory must identify specific aspects of an accounting system, which are associated with certain defined circumstances and demonstrate an appropriate matching" (p.413). Hence, contingency theory considers there to be no universal unified theory of how to design an optimal MCS (Chenhall, 2007). In the field contingency theory, research has mainly attempted to assess the effectiveness of control in relation to the characteristics of its environment, technology, size, structure, strategy and culture (Chenhall, 2003). In regards to the MC configurations of companies, research has focused on a wide range of aspects such as performance measurement systems, activity-based costing / activity-based management, balanced scorecards, variance analysis, economic-value added (EVA), budgeting and links to incentive schemes or reward packages (Chenhall, 2007). Recent research is characterized by an increase in the number of variables examined and by high diversity. However, Otley (2016) summarizes the existing contingency literature as not systematic, with MC practices and systems arbitrarily being examined.

1.3.1. Management Control Design and Company Performance

As shown from the above discussions, a central concept within MC contingency theory is the idea of fit between organizational control configuration and the organizational context. A fundamental assumption is thus that an optimal fit subsequently ensures an optimal performance of the MCS (Chenhall, 2003). However, some contingency studies take a "congruence approach" and thus omit the use of organizational performance in their analysis. As such, MCS are assumed to be related to the contextual environment of the organization without any examination of the effects on performance. The implicit, core assumption of these studies is that "natural selection" forces exist (Chenhall, 2007; Gerdin & Greve, 2004), which results in only best-performing companies

surviving . However, this method has been criticized, since a “Darwinism” approach is a very inexact proxy for performance (Gerdin & Greve, 2004).

More sophisticated studies use some variant of performance to argue for the fit between variables. Fit therefore occurs when organizations design their MCS in such a way that it has a positive performance impact in comparison to other design options (King et al., 2010, p. 46). Despite “broad leaps of logic” existing between effective MCS and enhanced organizational performance (Chenhall, 2007, p. 168), MC plays an important role in firm performance (Gong & Ferreira, 2014) with studies showing a positive effect on company efficiency, morale, and effectiveness (Chenhall, 2007; Dalton et al., 1980; Otley, 2016; Van De Ven et al., 1976). Also, if MCSs are designed appropriately, they are likely to provide better satisfaction, enhanced information, decision-making and thus better performance (Chenhall, 2007). Taking an agency perspective, MCS is also central to aligning incentives and achieving congruence of goals and tasks within the organization. This therefore assures the lower level of agency costs, higher effort allocation and motivation by employees (Lazear & Gibbs, 2015).

1.3.2. Approaches to Contingency Fit

The broadest distinction that can be made between approaches to fit is between the Cartesian and the Configuration approach (Gerdin & Greve, 2004), which have essentially different methodologies and assumptions behind them. The Cartesian approach, also termed as “interaction approach”, focuses on relationship between single contextual factors and single structural attributes (in this case, MC practices) (Gerdin & Greve, 2004). The two variables are described as continuous with multiple lines of fit between the two. It is assumed that MC practices are independent and can be examined in isolation (Grabner & Moers, 2013). Therefore, the value of one practice is only affected by one additional (usually contextual) factor and not influenced by other existing practices. This has been labelled as a “reductionist method” (Dawson, 1985; Grabner & Moers, 2013). As it is generally accepted that interdependence does exist within MCSs (Chenhall & Moers, 2015; Otley, 1980), this approach fails to consider the coherence of the whole system (Chenhall & Langfield-Smith, 1998).

Early opponents of the reductionist approach (Miller, 1981; Van De Ven & Drazin, 1985) have argued that the only way to properly understand the relationship between context, management practices and performance is to examine multiple variables – and their interrelation - simultaneously (Dawson, 1985) To address this issue, the configuration approach to analysing MC has emerged, also labelled as the "systems approach" by Drazin & Van De Ven's (1985) seminal paper. Contrasting the reductionist approach, the systems approach takes a holistic view and abandons the bivariate analysis of variables (Gerdin & Greve, 2004). As multiple MC practices are examined simultaneously, the value of one MC practice depends both on the present contextual factors, as well as on all other, existing MC practices. The goal of this approach is then to "identify the feasible set of organizational structures and processes that are effective for different context configurations and to understand which patterns of organizational structure and process are internally consistent and inconsistent" (Van De Ven & Drazin, 1985a, p. 521). The variables are thus not continuous and the states of fit are few.

The figure below (Figure 2) visualizes the two approaches as discussed above, with the plot on the left showing the Cartesian approach, while the one on the right – the Configuration approach.

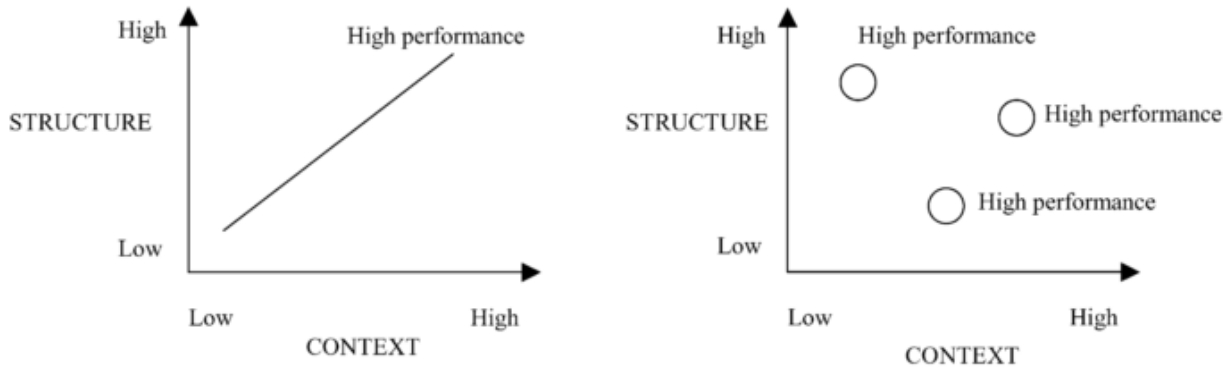

Figure 2 - Comparison Between Cartesian and Configuration Approach (Gerdin & Greve, 2004, p. 306)

This thesis will combine the two approaches – the Cartesian (interaction) approach and the Configuration (systems) approach. Several reasons are considered. First, despite the differences in assumptions, the two approaches have been argued to provide complementary and unique information (Govindarajan, 1988; Van De Ven & Drazin, 1985b). "Whenever the contingency theory in question is based, even remotely, on structural types, then interaction results should be compared with systems results. If the interaction results are not significant, but the systems results

are, then it can be reasonably concluded that fit does not occur at the level of any individual variable alone, but rather at the level of deviation from an overall pattern of several variables" (Van De Ven & Drazin, 1985a, p. 523). Second, the Cartesian approach offers a much higher degree of specificity of interaction effects, while with the systems one, variables are stated to fit without any information on the precise form (Gerdin & Greve, 2004). Variables in the systems approach are also not continuous, which could lead to information loss. Correspondingly, the Cartesian method[2] provides information on the changes in the relationship between variables, while the Configuration one provides details on the optimal levels of the variables (Gerdin & Greve, 2004). Finally, taking a systems approach assumes that two choices are being evaluated by management when designing the control systems (Grabner & Moers, 2013) - first, selecting the MC practices that fit the external context and second – assuring the MC practices are internally consistent. This thesis will argue for the explored MCSs' internal coherency, interdependency and intentional coordination. Therefore, ignoring the interdependency of MC practices might results in spurious findings (Grabner & Moers, 2013).

1.4. Management Control within Small and Medium-Sized Enterprises

The importance of SMEs within developed countries has been continuously acknowledged (Armitage et al., 2016; Mulhern, 1995). Furthermore, within Europe they have been labelled as the backbone of the economy (European Comission, 2016). The latest EU report shows that on average in the European sectors, SMEs account for 99,81% of total enterprises. In regards to their social and economic contributions, they accounted for a two-thirds of the total employment, while also contributing to three-fifths of value added[3] (European Comission, 2016; OECD, 2017). The northern European countries are usually generalized as having larger companies in comparison to their southern peers (Mulhern, 1995). However, as it can be seen from Table 1 the Nordic SMEs' impact is nothing but small.

[2] Under the assumption that a moderated regression analysis is used.

[3] Excluding the financial sector.

Country	% of Total Enterprises	% of People Employed	% of Value Added
Denmark	99,7%	65,4%	60,9%
Iceland	99,8%	74,0%	68,0%
Finland	99,7%	64,6%	61,5%
Norway	99,8%	67,7%	71,4%
Sweden	99,9%	66,0%	61,3%
EU Average	99,8%	66,8%	57,4%

Table 1 – Summary of SMEs Contribution per Country (European Comission, 2016)

Despite the crucial role SMEs play in developed economies, the focus of the overall management research has predominantly been on larger companies (Chenhall, 2007). Smaller companies were previously largely ignored, though interest in them has increased since the 1990's (Armitage et al., 2016; Hisrich & Drnovsek, 2002). Existing literature is characterized by high variation in methodological approaches and wide diversity of topics examined (Hisrich & Drnovsek, 2002). A large strand of the existing research focuses on the determents of performance in small firms (Almus & Nerlinger, 1999; Birley & Westhead, 1990; Ebben & Johnson, 2005; Meijaard et al., 2005; Roper, 1999). Many factors have been argued to be the associated with higher performance, for example – managerial skills (Barth, 2003; Roper, 1999), gender (Rosa et al., 1996), external help (Robson & Bennett, 2001), decision rapidity (Baum & Wally, 2003), government support and legislation (Gibb, 1993; Van Den Berg et al., 1990).

In regards to MC, Meijaard et al. (2005) reason that in broad terms, one of the main determinants of performance in small companies is the effective use of labour to create sellable products or services. As it has been discussed above, MC can therefore play a central part in influencing behaviour in order improve effectiveness and efficiency of employees within SMEs. However, as Chenhall (2007) argues, the contingency-based[4] MC literature in SMEs has received little attention, despite its many opportunities. The existing literature is mainly conceptual (Garengo & Bititci, 2007),

[4] As argued by Otley, (2016), one might classify all literature as contingent – "it might be suggested that all research in management accounting is essentially contingent, in that it seeks to discover when specific techniques might be most appropriate for particular organizations in their specific circumstances" (p. 47). Therefore, to frame the discussion to reasonable limits, in the context of this thesis, SME research is considered contingent if it examines factors other than the implied size dimension (for example, Meijaard et al., 2005; Reid & Smith, 2000).

while the predominant empirical analysis is done based on case studies (Coyte et al., 2012; Garengo & Bititci, 2007), with very limited sample sizes (Meijaard et al., 2005). Furthermore, within the existing empirical studies, systematic approach is lacking, with researchers using different taxonomies and frameworks, which makes the comparability between SME specific research challenging. Correspondingly, Birley & Westhead (1990) concluded that more research is needed to capture the heterogeneity of SME configurations. He argues that more detailed understanding of specific contingencies is needed, rather than seeking generalizable theories. Similarly, Armitage et al. (2016) examine broad management accounting practices and conclude that very little is known about their diffusion and use in SMEs, while Garengo & Bititci (2007) note that "the literature offers a long list of what boards of directors should and could do, but evidence on what boards actually do in SMEs is not yet well documented" (p. 810).

One of the most widely established types of control, that were associated with effects on performance, based on the SME literature review, are found to be cybernetic controls (performance measurement systems) (Armitage et al., 2016; Garengo & Bititci, 2007; Hudson et al., 2001; Hudson et al., 2001; Sérgio et al., 2006) and organizational structure (Audretsch, 2001; Barth, 2003; Barth & Puerto, 1999; Baum & Wally, 2003; Meijaard et al., 2005). However, similar to the overall SME research, the case of performance measurement systems (PMS) and structure's link to performance follows the same limitations of lack of empirical studies.

Performance measurement is a central part in any organization's control (Ittner & Larcker, 1998) and are naturally the most common formal information source at top-management level (Bedford et al., 2016). It plays a vital part in evaluating strategic choices, achievements of the organization and employees. Even the act of measurement - without any action related to it - is argued to have control implications. In an SME context, though limited to a single case company, Hudson et al. (2001) showed that a theoretically consistent performance measurement system helped advance continuous improvements. It also led to strategic improvements and facilitated fast and resource efficient strategic flexibility. Similarly, in a field study involving 8 SME, Hudson et al., (1999) found that even though most financial-measures were considered irrelevant from control perspective, informal and non-financial measures were "invaluable in helping operations run smoothly" (p. 222). Also, they found that customer related information emerged in direct response to problems affecting customers, thus supporting organizational objectives. Similarly, cost

information was used that controlled and reduced product costs and framed customer quotas. Overall, Hudson et al. (1999) reported that companies were able to focus efforts and reach consensus fasters, due to their PMS. Other research has focused on the inherent uncertainty SMEs operate in and it's relation to PMS (Garengo et al., 2005). It is argued that SMEs need to give special attention to measurement systems, which supports managers to deal with uncertainty, sustain evolution and change. Garengo & Bititci (2007) provide one of the few contingency findings in the field, with their analysis of 4 Scottish SMEs, though they do not examine a dimension of performance, but rather take a congruence approach to fit. They conclude that advanced PMS is implemented when there is occurrence of strategic change. Finally, another contingency-based study by King et al., (2010) found that budgeting practices in SMEs were positively related to performance, when achieving fit with high decentralization levels, cost leadership and low perceived environmental uncertainty (PEU).

Organizational structure has been referred to as one of the fundamental choices management has to make (Dalton et al., 1980). Meijaard et al. (2005) also note that as soon as employees are hired within SMEs, some kind of organizational structure develops either deliberately or unconsciously, with the design of this structure having important effects on performance (Jensen & Meckling, 1992). Meijaard et al. (2005) studies the effects of organizational structure in 1411 Dutch companies. Similar to previous findings (Birley & Westhead, 1990), they find that SMEs occur in a wide variety of structural configuration, with significant effects on performance, though clear generalizable results could not be made. They conclude that "it is quite clear that the relationship between organizational structure and small firm performance is more relevant and more complex than commonly assumed" (Meijaard et al., 2005, p. 94) Similarly, Barth (2003) studies the fit between structure and strategy in SMEs. Though he finds a general fit between the two concepts, association with high performance could not be proven. Finally, Miller & Toulouse (1986) study organizational structures and conclude that flexible, informal structures in SMEs lead to association with high performance, when stability was low, contrasting previous propositions (Perrow, 1967; Waterhouse & Tjessen, 1978). Bruns & Waterhouse (1975) for example, argued that smaller companies' more personal controls fosters innovation and flexibility. Chenhall (2007) also notes that structures in SMEs lead to higher level of satisfaction in superior-subordinate relations, if accurately designed.

The number of MC practices that combine to create Malmi & Brown's (2008) MC package are extensive. However, the large amount of control variables poses "a need to balance parsimony and exhaustiveness of coverage" (Venkatraman, 1989, p. 433). To circumvent this issue, Bedford & Malmi (2015) suggest a selection the theoretical categories a priori. The theoretical category relating to "Cybernetic controls" and "Organizational Structure" have been chosen for this thesis. They have been argued to be key in organization's MCS design (Gong & Ferreira, 2014), with a with a strong need for balance between the two (Zimmerman, 2011) and an effect on company performance (Gong & Ferreira, 2014). Additionally, as the literature review above shows, their relevance in the SME sector has been previously acknowledged.

1.5. Development of Research Questions

As it has been shown above, the importance and magnitude of SME in developed economies is large and the lack of attention the field is receiving is paradoxical. Similar to Chenhall (2007) and Armitage et al. (2016), the conducted literature review indicated that very little is known of the extent of MC practices' use and their impact on SMEs. Additionally, as Blank (2013) argued, the notion that SMEs are smaller versions of large companies is wrong, with the two being differentiated in many fundamental ways (Garengo et al., 2005). As such, there is a need to establish the relevance of MC control in SMEs and its effects on performance.

As stated, cybernetic controls (performance measurement systems) and organizational structure will be examined. Furthermore, this thesis will address the problem outlined by Birley & Westhead (1990) relating to the lack of research that captures SMEs heterogeneity. While the bulk of existing literature attempting to generalize the relevance of practices across SMEs overall (Birley & Westhead, 1990), this thesis will take a contingency-based approach to fit. Thus, two context factor's moderating effects will be examined, the internal contingencies – strategy and technology (Chenhall, 2007). In a general contingency context these have been highly established within MC (Chenhall, 2007) and have been found to affect the design and performance of the above mentioned MC practices (Bedford et al., 2016; Chenhall, 2007; Garengo et al., 2005; Garengo & Bititci, 2007). The two have also been found to be particularly relevant for the SME context (Armitage et al., 2016; Garengo & Bititci, 2007; Hudson et al., 2001). Finally, the relationship between context and MC will be evaluated in relation to a dimension of performance. Although previous literature has argued for the relation between MCS and performance, few studies elaborate on the actual

consequences, thus “few would disagree that understanding the performance implications of the alignment among MCS choices is an important research issue” (Gong & Ferreira, 2014, p. 498).

The aim of this study is to expand the limited SME literature, while examining companies within the Nordic countries. A focus is placed on the configuration of MC (for example, tightness, broadness, diversity of control) and not specific techniques used (ABC, BSC, TQM, etc.) This allows for higher comparability between companies, higher relevance of the survey questionnaire and broader conclusions of the interaction between control and context.

The thesis makes several contributions to existing research. First, through employing a survey on SMEs in the Nordics, the MC practices of 502 companies are examined. The large sample size contrasts to the predominantly conceptual or case-study research done in the field. Therefore, this study contributes with one of the few empirically derived exploratory analyses on existing MC practices in SMEs. Second, analysis is carried out on a country and industry level, thus outlying significant control differences in the different areas. Third, previous studies have omitted the effects of strategy and technology when examining the effects of MC. In this study, fourteen hypotheses are developed, which capture the interaction of performance measurement and structure with strategy and technology and their effects on performance. The thesis thus provides one of the most comprehensive contingency-based studies in the SME literature. Fourth, this study contributes to the emerging body of literature that focuses on interdependence of MC practices (Grabner & Moers, 2013). As recommended by Van De Ven & Drazin (1985), a systems approach to fit is taken, to examine the joint linkage between theorized optimal configuration of MC practices and their effect on performance. Thus, combining systems and Cartesian approach to contingency, the fit between MC practices and context is more rigorously examined. Fifth, by analysing the MC configuration, a practical contribution is made toward guiding the appropriate design of MC in SMEs. Finally, this study is the first quantitative SME study to frame its analyses based on Malmi & Brown's (2008) framework, which can facilitate the comparability of its results and pave the way to a more systematic research of smaller companies.

Based on the above problem formulation, this thesis' research questions are formulated as follows:

R1: How are management control practices configured in SMEs?

R2: How do those management control practices interact with different contexts to affect performance?

R3: Do SMEs that are aligned with a theoretically derived optimal management control configuration achieve higher performance than others?

In Figure 3 below, a visual representation of the research model is shown, which provides an overview of this thesis' subsequent theoretical propositions. As the figure illustrates, contextual factors are expected to have a moderating effect on the relation between MC and company performance. Control variables that will be used include size, age, industry and country of origin.

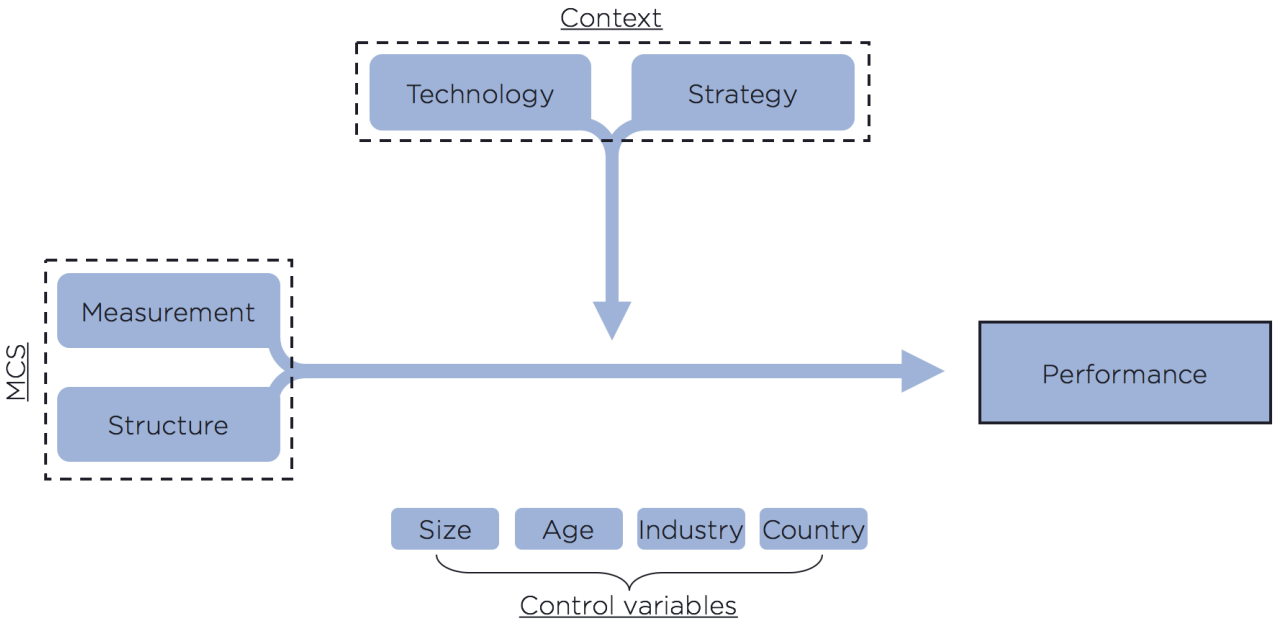

Figure 3 - Research Model. Visualisation of the moderated relation between MCS and company performance by contextual factors.

2. Operational Definitions and Taxonomy of Concepts

The following section will provide a theoretical base for this thesis' analyses. The sub-elements of performance measurement and structure will be defined and classified. Additionally, taxonomies and definitions will be provided for the contextual factors used in this thesis and argumentation for the choice of typologies. Finally, arguments for the choice of performance measurement will presented.

2.1. Management Control Practices

2.1.1. Performance Measurement

Performance measurement is conceptualized in line with Malmi & Brown's (2008) cybernetic controls and Bedford & Malmi's (2015) configuration of control. It is formally defined as "a process in which a feedback loop is represented by using standards of performance, measuring system performance, comparing that performance to standards, feeding back information about unwanted variances in the systems, and modifying the system's comportment" (Welsh & Green, 2015, p. 289). From this conceptualization it is thus clear that performance measurements falls both under the decision making and control domain of accounting (Malmi & Brown, 2008), however focus is given to the control aspects, through the operationalization of the sub-elements of performance measurement – diagnostic use of measurements, interactive use of measurements, tightness of control, diversity of measurements and focus on cost control. These will be defined and examined below.

Diagnostic and interactive use of performance measurement systems were popularized by Simons's (1990) seminal research. In his paper, Simons focused on the different use of measurement systems of two large companies in the same industry, pursuing different strategies. Continued research on the topic (Simons, 1991, 1994, 1995) resulted in the Levers of Control framework. While there are 4 levers in the framework, the two approaches to use, diagnostic and interactive, have received the most attention by researchers (Martyn et al., 2016). The diagnostic and interactive levers do not relate to technical design or attributes of the measurement system itself, but rather focus on the way it is used (Martyn et al., 2016). *Diagnostic use* resembles the traditional, formal role of performance measurement systems with a single-feedback loop and is defined by Simons (1995, p. 95) as "the formal information systems that managers use to monitor organizational outcomes and correct deviations from pre-set standards of performance". Diagnostic use is focused on reviewing critical performance factors (Henri, 2006). It involves delegating authority and restraining top-management involvement to situations where there are discrepancies between targets and actual results (Su et al., 2015).

In line with Simons et al. (2000), *Interactive use* is defined as "the formal information systems that managers use to personally involve themselves in the decision activities of subordinates" (p. 216). This approach is considered more informal and flexible, where the information gathered from

performance measurement systems is used by managers to challenge the plans and actions of subordinates, rather than evaluate them. Unlike the diagnostic use, this approach has a bottom-up focus and involves double-loop learning (Simons, 1995). The interactive use is enabled through continuous attention from top-management, facilitating dialogue and development of new ideas (Henri, 2006). Finally, diagnostic and interactive use are not dichotomous. Research has consistently found the two to have positive influence on performance when adopted together (Haas & Kleingeld, 1999; Martyn et al., 2016; Sakka et al., 2013; Simons, 1995).

Tightness relates to the accountability individuals must bear in achieving pre-established performance targets (Bedford & Malmi, 2015). In his paper, Van der Stede (2001) discusses the inconsistent operationalization and definition of the concept of tightness, mainly in regards to the broadness of the construct. It must be made explicit, therefore, that this thesis uses Merchant's (1985, 1998) conceptualization of tightness of control, which is considered to be a broad approach, and could encompass more aspects (Van der Stede, 2001). According to Van der Stede (2001), to achieve tight control, four aspects must be considered. First, targets must be well defined, congruent and complete. Second, communication must be effective, clear, frequent and well convincing. Third, subordinates must be monitored frequently, detailed and timely. Finally, tight control would imply strengthening the link between achieving targets and rewards, thus aligning incentives. This conceptualization differs from others as it allows the company to have tight control without it necessarily being restricted to budgetary tightness, but instead is restricted to targets in general (Anthony et al., 1998; Van der Stede, 2001).

Measurement diversity is associated with the width of a company's measurement scope (Bedford & Malmi, 2015). The concept relates to multiple dimensions as it encompasses information on drivers and outcomes, internal and external, subjective and objective measures (Henri, 2006; Kaplan & Norton, 1996). More specifically diversity of measurement refers to the extent to which top management measures financial and non-financial dimensions. Numerous research has criticized systems that focus only on financial measures (Kaplan & Norton, 1992). In comparison to non-financial measures, financial ones are more backward looking, harder to utilize to obtain accurate foresight, and reward and incentivise short-term focus and myopic behaviour (Henri, 2006). However, the research on the benefits of measurement diversity is not conclusive (Ittner et al., 2003). It has been demonstrated that not all company contexts are suitable for measurement

diversity and that it might relate to information overload and loss of focus (Chong, 1996), thus the choice of the measurement scope is not straight-forward but rather contingent.

Finally, *cost control* relates to the amount of focus placed on financial measures that reflect cost efficiency and effectiveness of the company (Bedford & Malmi, 2015). This thesis' operationalization of cost control resembles Simons' (1987) definition. Thus, high levels of cost control therefore relate to the extent of the use of three factors; the use of cost centres, the focus on cost variance as means to control operations and the scope of cost monitoring in operations. Cost control has historically been one of the main research areas within MC (Kober et al., 2007; Otley, 2016; Simons, 1990), which is not surprising considering the widespread focus on costs in the past. However, in more recent years the universal applicability and focus on cost control has been questioned (Kaplan & Norton, 1992; Lau, 1999; Otley, 2016).

2.1.2. Organizational Structure

Organizational structure falls under the three administrative control types discussed by Malmi & Brown (2008). Administrative controls according to Malmi & Brown (2008) "are those that direct employee behaviour through the organizing of individuals (organisation design and structure), the monitoring of behaviour and who employees are made accountable to for their behaviour (governance); and through the process of specifying how tasks or behaviours are to be performed or not performed (policies and procedures)" (p. 292). This thesis will therefore only focus on the overall organizing of individuals through the "specification of roles and the patterns of authority and communication" (Bedford & Malmi, 2015). Some literature treats the organizational structure as a contextual factor (Malmi & Brown, 2008; Otley, 2016). However, the structural specifications of an organization contributes to control by directly influencing decision rights, behavioural conformity and flexibility (Bedford et al., 2016). It is therefore treated as a MC concept, which is endogenously determined (Flamholtz, 1983). The two sub-dimensions of structure, which will be examined in this thesis are decentralization and communication. These will be defined below.

Decentralization is concerned with the locus of authority within the organization and it ranges within a continuum between centralized and decentralized (Gordon & Narayanan, 1984). As information required for decision-making purposes in an organization increases, the cost of acquiring this information in a timely manner increases as well (Jensen & Meckling, 1992). It is

then necessary for top management to delegate authority downward in the organization to individuals that are closer to that information. Thus, lower-level managers are provided with greater autonomy relating to matters like purchasing of capital items, pricing of product and services, and the hiring or firing of company personnel (Subramaniam & Mia, 2001). This delegation then creates the need for control and alignment of interest within the organization. As such, decentralization is a central aspect of any management control system or package. Organizations must balance the pros and cons of decentralization and align it with their organizational context in order to improve their effectiveness (Khandwalla, 1973).

Lastly, *communication* is defined by Bedford & Malmi (2015) as the "nature, direction and content of communication patterns" ranging from organic to mechanistic (Burns & Stalker, 1961). In communication setups classified as organic, information is communicated through informal, open channels of communication and is free flowing across the organization (Burns & Stalker, 1961). Additionally, the content of conversation is usually related to information sharing and advice giving, rather than communicating "orders" or mandates (Burns & Stalker, 1961). In contrast, in mechanistic structure, information is formal, structured and restricted. The content of communication mostly involves mandates and directions.

2.2. Contextual Factors

2.2.1. Organizational Strategy

Strategy is one of the most commonly examined contextual factors within MC (Chenhall, 2007). Yet strategy is not a purely contextual factor, but rather a way for management to influence and cope with the existing external environment. Consequently, strategic choices have been linked to the perceived environment uncertainty a company is situated in (Chong & Chong, 1997; Miller, 1988). Nonetheless, the contingency-based literature brands certain types of MC practices as more effective under some strategies and less under others.

There are many ways to define and operationalize strategy – for example, Langfield-Smith (2006) summarizes several layers – corporate, business and operational. At the most fundamental level, strategy is the "pattern of decisions about the organization's future which take on meaning when it is implemented through the organization's structure and processes" (Langfield-Smith, 2006). Additionally, it is argued that strategic decisions happen at all levels of the organization, where

resources and decisions are being allocated in consideration of the environmental context and the organization's stakeholders (Johnson, 1987). First, corporate strategy is defined as the way organizations invest and divest in resources and assets in order to take advantage of competitive advantages (Andrews, 1980). It is concerned with what types of business to operate it and how to structure and finance the organization (Langfield-Smith, 2006). Second, operational strategy "address how the various organizational functions contribute to the specific business strategy and competitiveness of the organization" (Langfield-Smith, 2006). Finally, business strategy relates to how the organization or its strategic business units (SBUs) compete against their setting, i.e. how they position themselves in their industry and towards their competitors. In the existing literature, the specification of the strategic level of analysis seems to be lacking, yet the main focus of MC research has been implicitly focused on the business strategy (Langfield-Smith, 2006), which will be the focus of the thesis as well.

To research the association amongst strategy and MC practices, strategic typologies are most commonly relied on to frame the organization. This allows researchers to transform the complex empirical variety into manageable segments. The three most common strategic taxonomies that have been developed will be examined below.

Porter (1980) discusses three viable generic strategies – cost leadership, differentiation and focus. They are considered viable, as they have the potential to sustain an organization's competitive advantage. Cost leadership, as the name implies, relates to organization that focus on supplying low price or producing low cost items (Porter, 1980). This can be achieved by economies of scale, access to favourable materials or advanced technologies (Langfield-Smith, 2006). The differentiation strategy could be viewed as contrasting to the low-cost one. In these situations, companies focus on providing products that are seen as superior in some way or that are highly valuable to customers (Porter, 1980). This could entail superior customer experience, highly quality products and materials or high flexibility. The last strategy proposed is that of focus – in this scenario the company attempts to dedicate itself to a segment that is specialized, unique or poorly served by other competitors (Porter, 1980). Taking a focus approach, competitive advantage can be sustained through both cost leadership or differentiation.

The second strategic typology examined here is one proposed by Gupta & Govindarajan (1984), which focuses on the company's strategic mission (Langfield-Smith, 2006). This typology proposes 4 different variations – build, hold, harvest and divest. The general idea behind it is that organizations need to make trade-offs between building long-term market-share growth and short-term profits. Build relates to an "aggressive" strategic stance, where the company attempts to maximise its market share and improve its current competitive position, while also sacrificing short-term cash-flows (Langfield-Smith, 2006). A harvest strategy is a contrasting stance, as the organization attempts to maximize short-term gains and cash-flows. A hold strategy involves a defensive position, where market-share is being protected. This strategy usually comprises of companies that already have a high-market share and want to maintain it as long as possible (Gupta & Govindarajan, 1984). A divest strategy entails moving away from a particular segment or industry.

Finally, the typology provided by Miles et al. (1978) discusses 4 types of strategies – defender, prospector analyser and reactor. According to Miles et al. (1978), the reactor is not a viable strategic type and will therefore not be discussed. The defenders, according to the typology, have a narrow range of products and services and do not focus on new product development or innovation activities (Miles et al., 1978). They focus on cost-efficiency, vertical integration and continuous improvements. Defenders strive to remain in predictable and familiar environments, with stable demand and supply (Miles et al., 1978). Thus, they are susceptible to sharp sways in the market like new trends or technologies. Prospectors are contrasting to defenders. Their main focus areas are new products and service development. They create change and turbulence to which their competitors need to respond (Langfield-Smith, 2006). They focus on flexible technologies and a wide range of products and services. However, because of the focus on flexibility and development, prospectors are not considered to be efficient and run the risk of low profitability (Miles et al., 1978). Finally, analysers are argued to be a hybrid of prospectors and defenders, which lies in between the two types of strategies. Analysers invest little in product development and try to imitate successful products, thus attempting to minimize risk (Miles et al., 1978). They focus on dual-technology that tries to balance flexibility and efficiency. However, analysers are still affected by the flexibility-efficiency trade-off and can never be fully efficient or effective (Miles et al., 1978).

This thesis will apply the Miles et al. (1978) typology presented above, the reasons for which has been derived from Bedford's et al., (2016) discussion. First, the strategic classifications described in their framework are closely associated with MC practices (Chenhall, 2007; Dent, 1990). Second, the defender-prospector-analyser framework is the most widely used typology (Bedford et al., 2016; Hambrick, 2003). In relation to the previous point, the typology, therefore, has extensive research related to it (Chenhall, 2007; Langfield-Smith, 2006). Third, the typology is argued to be very agile and comparable as it can be related to the other existing typologies (Langfield-Smith, 2006) and to wide range of industries (Hambrick, 2003), with researchers having an overall consensus on the MC practices related to each choice. One limitation to the Miles et al., (1978) typology is the lack of research relating to analyser strategies. The existing literature on strategies mostly focus on dichotomous variables, with very few examining a joint possibilities (Bedford et al., 2016). Thus, following Bedford's et al. (2016) approach, this study limits its strategic context concepts to only defender and prospector.

2.2.2. Organizational Technology

Like strategy, technology is one of the most widely researched external (i.e. contextual) factors in the field of contingency theory (Otley, 2016). It first emerged as a relevant concept in contingency theory as an attempt to explain contradictory results and was later on recognized as "the simplest and longest established contingent variable in management accounting" (Otley, 1980).

Technology is defined as the method of which the organization's work processes operate (Chenhall, 2007), that is, how inputs are transformed into outputs. These processes includes both hardware, materials, software, knowledge and people (Chenhall, 2007). Three generic types of technology are identified in the literature – complexity, interdependence and task uncertainty. Complexity refers to the standardization of the working process. Scenarios of high complexity usually involve job-orders or overall small batches, whereas low complexity processes involve highly automated, large batch or mass production processes (Chenhall, 2007). Intuitively, interdependence is related to the level of linkage between departments and units within the organization. The higher the level of interdependence in an organization is, the more investment in coordination mechanism is required, which has implications on the control design. Finally, the most commonly used type of technology construct is task uncertainty, with some even using technology and task uncertainty interchangeably. Task uncertainty refers to two task characteristics, namely outcome measurability

and task programmability[5] . Outcome measurability is concerned with the degree to which employee's activities can be reliably captured in standards of performance (Ouchi, 1979). This is due to the high variability and low analysability in the methods of performing the task. Task programmability is related to the extent to which "subordinate actions required to achieve an objective are known and visible to top management" (Bedford & Malmi, 2015).

The concept of task uncertainty will be used in this thesis, with outcome measurability and task programmability as it's sub-dimensions. As with the strategic typology, after review of the existing literature, this choice was mainly guided by the wide-spread use of task uncertainty within the MC. Also, there is a strong and generally agreed upon association between task uncertainty and MC practices (Chenhall, 2007; Otley, 1980).

Brownell & Dunk (1991) noted that virtually all conceptualizations of task uncertainty can be boiled down to Perrow's (1967) framework. Perrow (1967) is concerned with the degree to which a task can be reduced to a set of "well-defined set of rules" (Birnberg et al., 1983, p. 114). It is argued that in relation to the two constructs of task uncertainty that have been discussed above, the organization adjusts its planning and control setup. Therefore, a company that produced a very standard, stable product would have a different control system than one that is associated with uncertain, unstable development of goods (for example R&D activities). Related to Perrow's (1967) framework is the Ouchi (1979) model, which is concerned with types of controls used under Perrow's (1967) task uncertainty conditions. Ouchi (1979) argues that depending on the technological setup organizations can use output measurements, clan controls and behavioural measurement. The contingent controls will be examined further in the hypothesis development section.

Finally, there is ambiguity in the separation of task uncertainty and environmental uncertainty in the existing literature (Chenhall, 2007). As both constructs measure levels of uncertainty, some researchers have aggregated them, though claiming to examine only one construct. Gul & Chia (1994), for example, claim to examine the interaction between management accounting, PEU and

[5] Despite the consistent definitions of those two characteristic, they have been labeled differently across papers (e.g. Brownell & Dunk (1991) discuss task analyzability and number of exceptions)

decentralization, yet they include constructs from both task uncertainty and environmental uncertainty. Hirst (1983) argued that the concepts measure the same thing, while examining the misfit between accounting measures and PUE. Finally, Ross (1995) examine task uncertainty and performance measures, but measures of uncertainty include PEU as well (Chenhall, 2007)

2.3. Dimensions Company Effectiveness

As discussed above, the idea of fit in contingency theory boils down to the increase of some dimensions of performance when an appropriate match between MC and context is achieved. Unless a study is taking a congruence approach to fit (Gerdin & Greve, 2004), a dimension of performance or effectiveness is required to estimate the fit between constructs. A contingency approach therefore does not need to assume that all companies are in equilibrium or that all organization are optimal, due to their survival. As such, the dimension of performance is central to the contingency approach chosen in this study.

There is not a single best performance dimension in the MC literature and naturally, there is disagreement on which independent variable to choose for contingency-based analyses. Some of the dimensions examined relate to the extent to which the system provides proper information, the degree of use, the usefulness of the information, helpfulness, financial results and other (Chenhall, 2007). Qualitative and quantitative dimensions of performance are discussed below.

Chenhall (2007) argues that research that utilizes “use” and “usefulness” as their effectiveness measures should be interpreted with care. MC practice could be used universally and extensively in an organization, yet this might be due to regulations, rule, procedures or other lack of choice (Grabner & Moers, 2013). Also, linking “benefits”, “satisfaction” or “usefulness” to organizational performance might be challenging, as a MC practice could be rated as unsatisfactory or useless, yet still have a positive effect on the organization.

In his paper, Otley (2016) gives two main reasons for why financial measures of performance might be problematic. Firstly, the relationship between MC and financial performance is not straightforward. That is, financial performance is affected by many factors, which are not related to the MC system. Therefore “a great deal of random noise can be expected” (Otley, 2016). Second,

financial performance has been considered as contingent by itself, which affects the MC practices used.

Return on Assets (RoA) will be used as the performance dimensions (independent variable) in this thesis. RoA provides information on the profitability of invested capital and how effective the company is in converting investments into profit. The argument made is that organizations with effective MC configurations that are both internally and externally consistent will create an environment where the more effective or efficient use of assets will be possible.

2.4. Summary

In summary, this thesis will use the following typologies and concepts. Firstly, as MC practices with the "Measurement" category, diagnostic use, interactive use, tightness, diversity of measurement and cost control will be used. In the "Structure" category, decentralization and communication will be used. For the "Strategy" contextual factor, the framework by Miles et al. (1978) will be used who differentiate between Prospectors, Defenders and Analysers. However, analysers will be excluded from the analysis. Finally, in regards to "Technology" the dimensions of task uncertainty will be examined based on the framework by Perrow (1967, 1970).

3. Hypotheses Development

In the next section the hypotheses of the thesis will be developed. The association between MC practices and contextual factors will be examined one at a time, by summarizing the existing conceptual and empirical research on the topic. Based on the review, one hypothesis per context factor will be developed for each MC practice. As recommended by Grabner & Moers (2013), to employ and support a systems approach to fit, a theoretical base will be developed to back the claim that structure and performance measurement form a system, after which hypotheses for their internal fit will be developed. Similar to Van Der Stede (2000), a certain degree of isomorphism and comparability is assumed in relation to the different strategic typologies in the literature (Segev, 1989). Similarly, despite technology being characterized by three distinct constructs (complexity, task uncertainty and difficulty), commonalities exist between the three and comparability will be assumed as well (Chenhall, 2007). Additionally, the existing contingency theory around strategy and technology is mainly centred around the impact of uncertainty associated with the two contexts. As such, despite the constructs reflecting different contextual aspects, the hypothesized

relationships between them and MC converge mainly in relation to the underlying uncertainty. More precisely, high technological uncertainty and high strategic uncertainty (prospectors) seem to be associated with similar set of MC practices, while low technological uncertainty and low strategic uncertainty – with another set. Yet, care is taken to not generalize evidence across contextual factors.

In Figure 4 below, a summary of the journals used in the hypothesis development is shown[6].

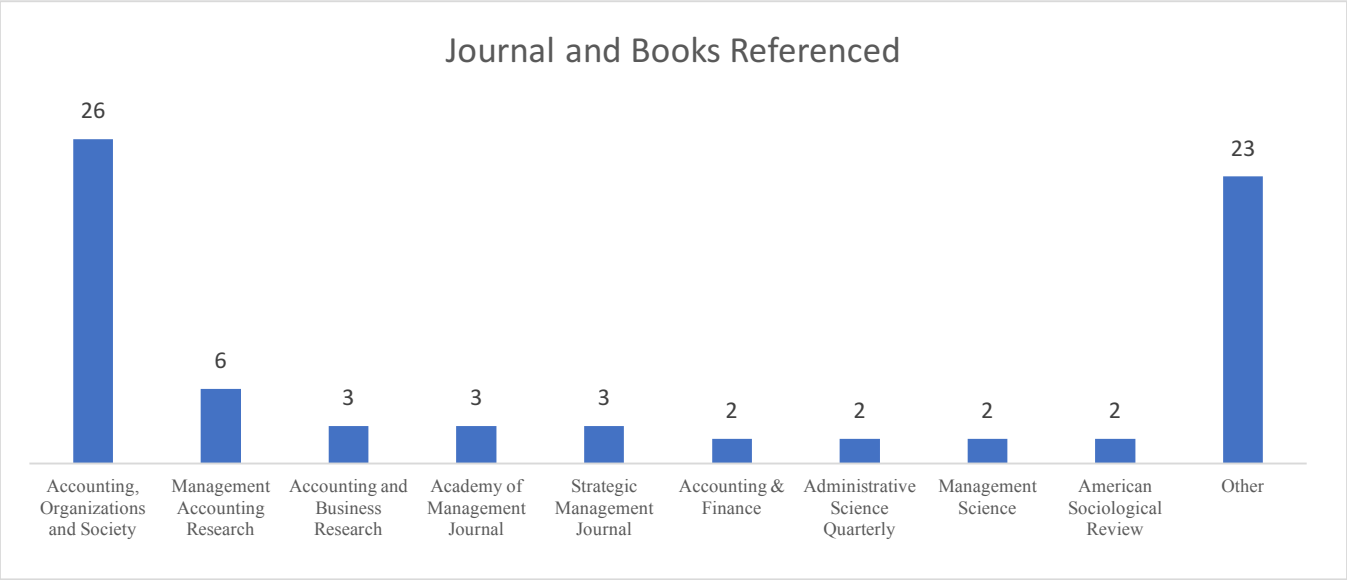

Figure 4 – Summary of Journals and Books used in the Hypotheses Development

3.1. Association of Diagnostic Use with Contextual Factors

Prior research has consistently linked diagnostic control use to companies with defender strategies (Abernethy & Brownell, 1997; Bedford, 2015; Bedford, Malmi, & Sandelin, 2016; Henri, 2006), which are characterized by more formal and rigid controls (Miles et al., 1978). Diagnostic control draws top-management's attention toward unfavourable variances (Bedford, 2015; Martyn et al., 2016) and is related with mechanistic structures, tight control and highly structured communication (Henri, 2006), which overlaps with Miles's et al. (1978) classification of defenders. Companies pursing a defender strategy are characterized by incremental and minor innovations that thrive in stable environments (Miles et al., 1978). Closely relating to that, diagnostic use is focused on creating boundaries and restricting risk-tasking (Henri, 2006) and is said to "constrain innovation

[6]In Appendix A, the full list of journals and books used can be found

and opportunity-seeking to ensure predictable goal achievement needed for intended strategies" (Simons, 1995, p. 95).

Supporting the above, while examining a survey sample of 400 companies, Bedford (2015) finds that diagnostic controls only fosters incremental, exploitative innovation and promotes continuous improvements in efficiency for companies that want to focus on existing markets and capabilities. Similarly, by approximating levels of strategic change based on the defender-prospector continuum of hospitals, Abernethy & Brownell (1999) conclude that diagnostic use of control is more appropriate for organizations that identify themselves as defenders and undergo low strategic change. Diagnostic use has also been found to have negative association with capabilities relating to entrepreneurship, innovation and organizational learning, which are considered central for prospector companies (Henri, 2006). Finally, after employing a package approach to examining MC practices, Bedford et al. (2016) find that despite defenders having several effective configuration of control, diagnostic control use occurs in all of them as a core MC practice.

Despite the large amount of research done on Simons' levers of control and their association with strategic uncertainty, no focus has been put on the task uncertainty of organizations (i.e. technology). Notwithstanding, this thesis argues that a significant association between the two concepts does exists. The fact that task uncertainty influences the use of performance measurement systems is one of the most established arguments in contingency theory and MC (Hopwood, 1972; Otley, 2016; Ouchi, 1979; Perrow, 1967; Waterhouse & Tjessen, 1978). Using measures diagnostically is related to "traditional" MC (Martyn et al., 2016) and is used to "monitor organizational outcomes and correct deviations from pre-set standards of performance" (Simons, 1994, p. 172). Key design variables of the diagnostic use are profit plans, budgets, goals and benchmarks. Correspondingly, low task uncertainty is linked to a high use of well-defined, standardized procedures and rules with few exceptions and a clear understanding of the cause-and-effect relationship between action and results. (Macintosh, 1981; Waterhouse & Tjessen, 1978). As such, the diagnostic use of traditional, quantitative measures can provide a useful tool for top management to identify variances and evaluate performance. In contrast, in situations of high task uncertainty, the key design variables of diagnostic use (mentioned above) are argued to be inappropriate (Chapman, 1997; Hopwood, 1972; Perrow, 1967). "The research is premised largely on the quite reasonable assumption that in complex settings, the abstraction of physical processes

into numerical form will result in an incomplete picture of these underlying processes" (Chapman, 1997, p. 193). Similarly, the use of diagnostic control to correct deviations from pre-set standards is inappropriate (Chapman, 1997), because the environment is characterized by low outcome measurability (the correlation between effort and good results might not always be correlated) and the outcomes of employee's activity cannot be captured in the quantitative standard (Bedford & Malmi, 2015) central for diagnostic control.

Taking the above into consideration the hypothesis is formulated as follows:
Hypothesis 1A: For companies employing a defender strategy, greater use of diagnostic control is associated with a positively higher effect on performance, than for companies employing a prospector strategy.

Hypothesis 1B: For companies with low task uncertainty, greater use of diagnostic control is associated with a positively higher effect on performance, than for companies with high task uncertainty.

3.2. Association of Interactive Use with Contextual Factors

Interactive control use supports development, creativity and inspirational environments (Henri, 2006), as well as fostering curiosity and experimentation (Dent, 1990). As such, it can be seen as contrasting to the constraining, negatively perceived effect diagnostic use has, which aims to create a stable and low-risk system. Top-management uses interactive control to "build internal pressure to break out of narrow search routines, stimulate opportunity-seeking, and encourage the emergence of new strategic initiatives" (Simons, 1995, p. 93). A consensus exists in the existing literature linking interactive control to prospector strategies, which are focused on change, flexibility and innovation. As prospectors operate in an uncertain environment with high level of strategic change, increased collaboration and communication is required between management and employees, as new targets or directions need to be agreed upon. These interactional needs could be satisfied by interactional use of control systems (Henri, 2006).

Much of the existing research examines both diagnostic and interactive use in tandem. As mentioned above, Abernethy & Brownell (1999) examine interactive control use in hospitals and their results show a positive association with performance when companies with prospector

strategies (or companies with high strategic change) adopt an interactive method of using controls. Bisbe & Otley (2004) argue that Simon's levers of control framework was vague in explaining the actual interaction effect of interactive control and find that interactive control provides a "significant" increase in performance by moderating the effect of innovation. Bedford (2015) provides further elaboration on the effects of interactive control and that effectiveness of companies has positive association with interactive control, but only in setting of explorative innovation (in line with prospector strategy) and not exploitative (in line with defender strategy). In their recent study on MC packages, Bedford et al., (2016) find three equally effective MC configurations of companies with a prospector strategy – all three of which had interactive control as core parts of their control package. Finally, in his study of 383 manufacturing companies, Henri (2006) found that interactive controls foster entrepreneurial spirit, innovativeness and organizational learning.

Similar to the diagnostic use above, no existing research examines the effect of organizational technology on Simons' (1995) interactive control. As such, all the existing literature focuses on the effects of strategic uncertainty, whereas task uncertainty has not been evaluated as a possible moderator. According to Simons (1995), any type of system can be transformed into an interactive one, if manager involve themselves personally and regularly. This involves face-to-face meeting and debates, challenging data, assumptions and plans (Simons, 1994). As task uncertainty becomes higher and quantitative performance measures become more inappropriate (Chapman, 1997; Hopwood, 1972), the use of non-accounting information, facilitated through communication or informal channels is expected to be more effective (Ditillo, 2004). That is because targets and standards are more difficult to create and quantify (Bedford & Malmi, 2015). Interactive use can bridge the information gap between management and employees by breaking down the hierarchical barriers within the organization (Henri, 2006) and enable a more qualitative, non-accounting approach to performance measurement. It thus facilitates more personal, informal, behavioural controls, which are more appropriate for high task uncertainty according to Chenhall (2007). In contrast, because interactive use is a tool to deal with uncertainty (Simons, 1994), it is expected to be unnecessary in low-uncertainty environments. Quantitative, accounting measure would be appropriate and provide complete information (Chapman, 1997), while discussions and meeting can be replaced by more efficient standards and procedures (Waterhouse & Tjessen, 1978).

Taking the above into consideration the hypothesis is formulated as follows:
Hypothesis 2A: For companies employing a prospector strategy, greater use of interactive control is associated with a positively higher effect on performance, than for companies employing a defender strategy.

Hypothesis 2B: For companies with high task uncertainty, greater use of interactive control is associated with a positively higher effect on performance, than for companies with low task uncertainty.

3.3. Association of Tightness with Contextual Factors

As defenders are focused on cost, it is proposed that their MC would be more rigid (Chenhall, 2007) and focused on stability and efficiency (Miles et al., 1978). However, the empirical results regarding the association between tightness and strategy have not been entirely consistent. For example, Simons (1987) examines tightness' effects on both small and large companies and finds evidence that large defenders do not benefit from tight control, which conflicts with the broadly held view that defenders require tighter and more rigid controls than prospectors (Chenhall, 2007; Govindarajan, 1988; Van Der Stede, 2000). However, he does find that small defender companies seem to benefit positively from tighter controls. In contrast, prospectors are faced with more uncertainty, because of their focus on innovation, development and wide range of products or services (Miles et al., 1978). This makes their operations harder to quantify and thus makes relying on strict controls more unsuitable (Merchant, 1985; Van Der Stede, 2000). Van Der Stede, (2000) also argues that loose controls might create a buffer, that can create the opportunity for experimentation and innovation. Therefore, prospectors that focus on entrepreneurial capabilities might be effected positively by loose control measures. Finally, Merchant (1985) argued that in a prospector strategy, top-management does not have the ability to effectively enforce tight controls, due to the interrelated high task uncertainty and complexity.

Unlike the literature on strategy, there seems to be a consensus on the effects of task uncertainty on tightness of control. Tasks which are measureable and programmable will usually be well-understood by top-management. Therefore, clear criteria for performance can be established with precise input and output requirements (Dunk, 1995). Merchant (1985) also argued that top-management is incentivised to set tight and accurate standards, when they are understood, as this

prevents the opportunity of slack. In relation to ambiguity, when arguing for the different task environments, Perrow (1970) proposed that organizations with low task uncertainty would be able to rely on rigid and tight reporting standard and high accountability, due to the high task measurability. In contrast, when the task uncertainty is high, there is lack of understanding of the cause-and-effect relationship between input and output. Attempts to specify tight performance targets have been argued to impair performance rather than improve it (Dunk, 1995; Gresov et al., 1989).

Merchant (1984) finds that higher level of automation in production departments, related to greater importance placed on meeting the budget targets. Abernethy & Brownell (1997) analysed the control processes of 138 R&D companies and by applying Perrow's (1970) framework concluded that "programmed" targets and evaluations were not suitable for companies with high task uncertainty. Instead they focused on personnel controls, which are focused on self- or social-controls (Abernethy & Brownell, 1997). Abernethy & Stoelwinder (1991) study the interaction between task uncertainty, budgeting and system goal orientation. The operationalization of budgeting, however, is defined in accordance to its tightness. They find that high tightness, high system-goal orientation and low task uncertainty achieve fit and therefore higher performance.

Based on the above, the hypotheses are formulated as follows:
Hypothesis 3A: For companies employing a defender strategy, greater use of tightness is associated with a positively higher effect on performance, than for companies employing a prospector strategy.

Hypothesis 3B: For companies with low task uncertainty, greater use of tightness is associated with a positively higher effect on performance, than for companies with high task uncertainty.

3.4. Association of Diversity of Measurements with Contextual Factors

As companies following a prospector strategy are characterized by a more dynamic environment with wide ranges of products – a broader information need is required, which targets specific elements of the operations (Chong & Chong, 1997; Gordon & Narayanan, 1984; Mia & Chenhall, 1994). Thus companies with a less routinized production benefit more from broad measures than ones focused only on financial data (Chenhall & Morris, 1995; Mia & Chenhall, 1994). Conversely, defender-type companies have been linked to narrow measurement types (Chenhall & Langfield-

Smith, 1998; Mia & Chenhall, 1994), because their stable environment requires narrow focus and low information needs (Chong & Chong, 1997).

Guilding (1999) finds that the usefulness of broader scope of information was more useful for prospector companies. He concludes that prospectors and companies that follow a build strategy will include extra measures focused around competitors. By examining 49 business units, found that broad-scope measures had a positive impact on performance for prospectors. Chong & Chong (1997) confirmed that by finding that both SBU's prospector strategy and its high perceived environmental uncertainty relate to diverse measurement scope. Bouwens & Abernethy (2000) found that companies that have a wide range of products (focused on customization) are using more aggregated and timely measures, but did not find evidence that these companies focus on broad performance measurements. However, the study focused only on operational aspects of the organization, thus might have excluded the organizational areas that are more likely to be associated with broad control (Chenhall, 2007). For example, Mia & Chenhall (1994) found that broad measures are related to more entrepreneurial and innovation oriented departments, whereas narrow measures were associated with production.

The empirical studies in regards to diversity of measurement and task uncertainty are broadly consistent. When individuals are faced with higher task uncertainty, they require greater amounts of information to execute the task at a given level of performance (Galbraith, 1977). "When the degree of task uncertainty is high, managers will require more diverse measurement information to cope with the complexity of the task environment" (Chong & Eggleton, 2003, p. 168)(Mia & Chenhall, 1994). In contrast, when low task uncertainty is present in the organization, managers require a narrow range of information, as they can interpret situations easily (Chong, 1996). If there is a mismatch between broadness (diversity) of the performance measurements and the task uncertainty, managers can experience information overload (Gaeth & Shanteau, 1984) or lack of information, both of which can be detrimental performance (Chong & Eggleton, 2003)

Mia & Chenhall (1994) studied the level of task uncertainty in 12 companies' production and marketing departments. They found that marketing departments, which were characterized by much higher product uncertainty were using much broader scope of measurement that production department. The broad scope of measurement was also positively associated with performance in

high level of task uncertainty and negatively associated for low task uncertainty levels. Gul (1991) studies the effects of perceived environmental uncertainty and scope of management accounting systems on performance of small companies. Although labelled as PEU, he conceptualizes uncertainty as task uncertainty (Gul, 1991, p. 58). His results confirm the findings in existing literature and links higher performance to a fit between high task uncertainty and broad measurement scope. Additionally, he concludes there's a misfit between broad scope and low-task uncertainty, due to decreased performance in those configurations. Abernethy & Brownell (1997) conclude that uncertain task environment should warrant the use of more qualitative measures like personnel controls. Finally, Chong & Eggleton, (2003) further confirm the theoretical expectations, but add an extra dimension by considered the personality traits of managers. They conclude that internally motivated managers are more negatively affected by broad scope measures under low task uncertainty.

Based on the above, the hypothesis is formulated as follows:
Hypothesis 4A: For companies employing a prospector strategy, greater use of measurement diversity is associated with a positively higher effect on performance, than for companies employing a defender strategy.

Hypothesis 4B: For companies with high task uncertainty, greater use of measurement diversity is associated with a positively higher effect on performance, than for companies with low task uncertainty.

3.5. Association of Cost Control with Contextual Factors

Miles et al. (1978) define defenders as companies that are highly focused on cost-efficiency, with a core engineering question of how to produce and distribute goods and services as efficiently as possible. Intuitively, defenders and cost-leaders have been found to focus on cost-control (Chenhall, 2007; Dent, 1990), whereas prospectors are expected to focus their attention on other aspects such as flexibility or forecasting (Simons, 1987). Additionally, Prospectors are assumed to place more emphasis on controls that will foster innovation and creativity (Simons, 1987).

In confirmation of the above, Davila (2000) found a positive effect on performance when cost-control was used in strategies emphasizing low costs. Simons (1987) found that cost controls are negatively correlated to prospector strategies and suggested that prospectors focus on other aspects of control such as planning. Finally, Dent (1990) argues that cost controls might be inappropriate for prospectors, which supposedly have products in early stages of their lifecycle and cost might not be an appropriate measure.

Very few studies discuss cost control directly in regards to task uncertainty. The majority of research has followed the framework set by Hopwood (1972), where he identified three types of evaluation – budget constrained, profit-conscious and non-accounting. In these three types of evaluation, the involvement in costs is high in budget-constrained and profit-conscious types and low in the non-accounting one (Hopwood, 1976). Budget-constrained and profit-conscious types have been labelled as "accounting" types of control / measures and high reliance on them is deemed incompatible to high uncertainty, contrasting to reliance on non-accounting controls (Chapman, 1997). Since organizations that have high ambiguity in their task environment cannot rely on a specified relationship between employee actions and financial controls, Widener, (2004) argues that traditional financial controls are not fitting. She also find that when cause-and-effect relationship between actions and results are not well understood, companies focus on non-accounting forms of control like personnel controls. Speklé (2001) utilizes a transaction-cost economics perspective and argues that companies within uncertain task environments should put low emphasis on budgets and financial controls. Hirst (1983) concludes that accounting measures in uncertain environments leads to high workplace tensions. This can be related to the inability of cost controls to capture the relationship between effort and cost measures in these environments (Widener, 2004). Similarly, Abernethy & Brownell (1997) determine that reliance on accounting measures in R&D departments is unsuitable and incomplete. Finally, in regards to companies with low task uncertainty, when comparing emphasis on accounting vs non-accounting controls, (Dunk, 1992) finds that automated manufacturing processes positively moderate the associated between accounting, traditional control and performance.

Based on the above, the hypothesis is formulated as follows:
Hypothesis 5A: For companies employing a defender strategy, greater use of cost control is associated with a positively higher effect on performance, than for companies employing a prospector strategy.

Hypothesis 5B: For companies with low task uncertainty, greater use of cost control is associated with a positively higher effect on performance, than for companies employing a high task uncertainty strategy.

3.6. Association of Decentralization with Contextual Factors

One of the reason decentralization occurs is because information becomes too expensive to transfer between hierarchies in a timely matter (Jensen & Meckling, 1992). Accordingly, the different levels of uncertainty and stability in prospectors and defenders plays a major role in the decision to decentralize (Govindarajan, 1988). Centralization is viable for the stable environment defenders aim to operate in, because "information processed does not overburden an organization's hierarchy" (Govindarajan, 1988, p. 833). However, as the environment becomes more dynamic and uncertain, with wide range of products and services involved, the information referred upward overloads the higher hierarchies (Govindarajan, 1988), which causes delays and inefficiencies (Jensen & Meckling, 1992). Therefore, authority is delegated where the information already resides. In contrast, delegation of authority when it is not required can cause inefficiencies (Waterhouse & Tjessen, 1978). While decentralization does provide basis for fast decision making and flexibility, it also incurs agency costs (Jensen & Meckling, 1992) that has been argued to outweigh the benefits if implemented in inadequate situations (Lazear & Gibbs, 2015).

The existing literature indicates that one way of managing innovation is through the organization structure (Chenhall, 2007; Nielsen et al., 1985; Russel & Russel, 1992). As such, a decentralized organizational structure has been found to provide basis for generating more ideas in comparison to a centralized one (Burns & Stalker, 1961; Russel & Russel, 1992). As decentralization allows for more autonomy and control over more resources, creative new ideas will be generated, which will presumably lead to more company innovation (Khandwalla, 1973). Finally, organization with a wide range of products and services have been consistently argued to require decentralization

(Chenhall, 2007), which could be attributed to the higher level of complexity and thus information needs.

The decentralization levels in an organization in relation to task uncertainty is mostly driven by the same factors as in strategy factors. Waterhouse & Tjessen (1978)'s framework is one of the main contributors to the association between decentralization and task uncertainty. The central ideas in their framework is that organizations balance rules and procedures and decentralization based on task technology. When tasks are repetitious and the cause-and-effect relationship between action and results are well understood by top-management, decision making and control authority can be kept at higher levels of hierarchy (Macintosh, 1981; Perrow, 1967; Waterhouse & Tjessen, 1978). This is because employees can follow well-defined and unambiguous procedures and rules (Fry & Slocum, 1984; Perrow, 1967; Waterhouse & Tjessen, 1978) and will thus be more effective and efficient, since their time is not spent on "obvious solutions" (Kim, 1990). Therefore, when task uncertainty is low, centralized structures will perform more efficiently (Fry & Slocum, 1984). However, when uncertainty rises, centralization becomes less effective due to the large number of exceptions – that is, cases that do not fall under the specified, standard rules and procedures (Argote, 1982). This leads to top-management becoming overburdened with information, which leads to delays and inefficiencies (Kim, 1990; Waterhouse & Tjessen, 1978). The response to this is the increased delegation of authority (Fry & Slocum, 1984; Galbraith, 1977; Macintosh, 1981; Perrow, 1967), which has been found to have a positive effect on performance (Kim & Burton, 2002).

Based on the above, the hypothesis is formulated as follows:
Hypothesis 6A: *For companies employing a prospector strategy, greater degree of decentralization is associated with a positively higher effect on performance, than for companies employing a defender strategy.*

Hypothesis 6B: *For companies with high task uncertainty, greater degree of decentralization is associated with a positively higher effect on performance, than for companies with low task uncertainty.*

3.7. Association of Communication with Contextual Factors

Organic, informal communication processes are required to facilitate the motivation of employees to participate in free flow of ideas (Chenhall & Morris, 1995, p. 487) that transcend functional or hierarchical barriers. Related to that, innovation is a process that requires collaboration and input from many functions within the organization and from people with diverse skills, interests and resources (Slack, 2015; Van de Ven, 1986). Furthermore, several papers have argued that developing ideas within the organization, as well as enabling flexibility is enhanced through open and free-flowing communication (Buijs, 1979; Chenhall & Morris, 1995). As such, organic communication has been associated with prospectors and entrepreneurial companies (Burns & Stalker, 1961; Chenhall & Morris, 1995; Van de Ven, 1986).

The empirical evidence for the above is scarce. Auzair & Langfield-Smith (2005) tested the interaction of organic structure with differentiators and cost leaders and found that companies pursuing a conservative strategy put greater emphasis on bureaucratic, mechanistic configuration. Additionally, Chenhall & Morris (1995) found a positive association between organic communication processes and performance for more entrepreneurial entities. Finally, Bedford et al. (2016) tested a sample of 400 companies and found three equally effective control configurations for prospector companies, where all three had organic communication as core parts of their package.

The existing conceptual and empirical evidence on task uncertainty and communication patterns is also very vague. The majority of research discusses organic versus mechanistic organizational structures, yet does not examine communication independently. High level of uncertainty has been said to require mutual judgement, frequent changes is time allocation, scheduling and priorities by employees (Van De Ven et al., 1976). A structured communication process would therefore hinder this process and reduce flexibility. In such situations, explicit directions and knowledge is expected to fail (Ditillo, 2004) and task related information is communicated between individuals “by means of common history, shared experiences and collective social and organizational frames” (Ditillo, 2004, p. 410), or more specifically informal, oral and face-to-face communication. In contrast, similar to the decentralization argument above, in a routine task setup, informal communication would be inefficient compared to standardized rules and procedure that capture all the necessary information needs and variance solutions (Argote, 1982; Perrow, 1967).

In relation to the formality of communication, (Van De Ven et al., 1976) finds that unscheduled meetings within organization increase drastically with the increase of uncertainty, as well as an overall increase in communication, which has been supported by several other studies (Gresov et al., 1989; Van De Ven & Drazin, 1985a). Merchant, (1984) examines the use of budgeting and finds that organizations with more routine production processes were related to formal budget-related communication.

Based on the above, the hypothesis is formulated as follows:
Hypothesis 7A: *For companies employing a prospector strategy, greater degree of organic communication is associated with a positively higher effect on performance, than for companies employing a defender strategy.*

Hypothesis 7B: *For companies with high task uncertainty, greater degree of organic communication is associated with a positively higher effect on performance, than companies with low task uncertainty.*

3.8. Systems Approach to fit of Theoretically Derived Optimal Configuration

The 14 hypotheses above examine the interactive effect on performance of one MC practice at a time. However, when undertaking a system approach to contingency theory, the combined effect of all practices must be examined simultaneously. Following Grabner & Moers (2013) guidelines, a theoretical proposition on the interdependence of performance measurements and structure will be developed. As discussed previously, the concept of packages relates to the notion that different MC practices or systems are introduced independently – focusing on different control problems, different interest groups or different times. However, similar to Abernethy et al., (2004) and Moers (2006), this thesis argues for the coordinated and intentional coupled design of organizational structure and performance measurement. As such, it's assumed that the two form a tightly coupled system and are interrelated (Malmi & Brown, 2008).

The majority of existing research that examines the interaction between performance measurement and structure refers to agency theory (Abernethy et al., 2004; Gong & Ferreira, 2014; Moers, 2006). When lack of specific knowledge, which is hard to transfer between the organizational hierarchies,

limits management's ability to make decisions, decision rights are delegated downwards, where the specific knowledge already resides (Jensen & Meckling, 1992). This leads to a reconfiguration of control as organizations are interested in aligning the behaviour of decision-makers with that of the company. To do that, different aspects need to be in aligned and in balance – allocating decision rights to employees, measuring and evaluating performance of those employees and rewards/punishment based on the evaluated performance (Zimmerman, 2011), also known as the "three-legged stool". As the analogy suggests, all the three aspects of the stool need to be consistently designed and balanced in order for the system to operate effectively and efficiently (Zimmerman, 2011). Gong & Ferreira (2014) summarize the issue accordingly - "it is key to coordinate and align each choice with other choices to maintain the functionality and efficiency of the MCS and enable the firm to attain the desired outcomes. When alignment is achieved, MCS design choices result in mutually enhancing elements that contribute to greater cost-efficiency, competitive advantage, and firm performance" (2014, p. 499).

Based on the notion that the correct fit between structure and performance measurement increases performance, it is hypothesized that the correct matching between the components of the two will lead to a higher performance, in relation to situations when they are not matched.

Hypothesis 8: *An appropriate match between all control practices with the organizational context of defender strategy or low task uncertainty will be associated with a higher company performance, in relation to companies with a mismatch between control practices.*

Hypothesis 8: *An appropriate match between all control practices with the organizational context of prospector strategy or high task uncertainty will be associated with a higher company performance, in relation to companies with a mismatch between control practices.*

4. Research Methodology and Data

The methodology of this thesis consists of four major parts: epistemology, data collection, construct measurement and preliminary analysis and pre-processing of data.

4.1. Epistemology

In order to create new knowledge, a variety of assumptions are taken by researchers. Therefore, these assumptions need to be made explicit, as the results of the analyses or the hypotheses proposed might be influenced by the choices researchers have made or their views of reality. Kuhn (1969) claims researchers "whose research is based on shared paradigms are committed to the same rules and standards for scientific practice. That commitment and the apparent consensus it produces are prerequisites for normal sciences, i.e., for the genesis and continuation of a particular research tradition".

This thesis will draw upon Arbnor & Bjerke's (2009) discussion, which frames three methodological approaches – analytical, systems and actor approach. They argue that a researcher "can never empirically or logically determine the best view. This can only be done reflectively by considering a situation to be studied and your own opinion of life" (p. 7). Figure 5 below summarizes the three approaches and their characteristics.

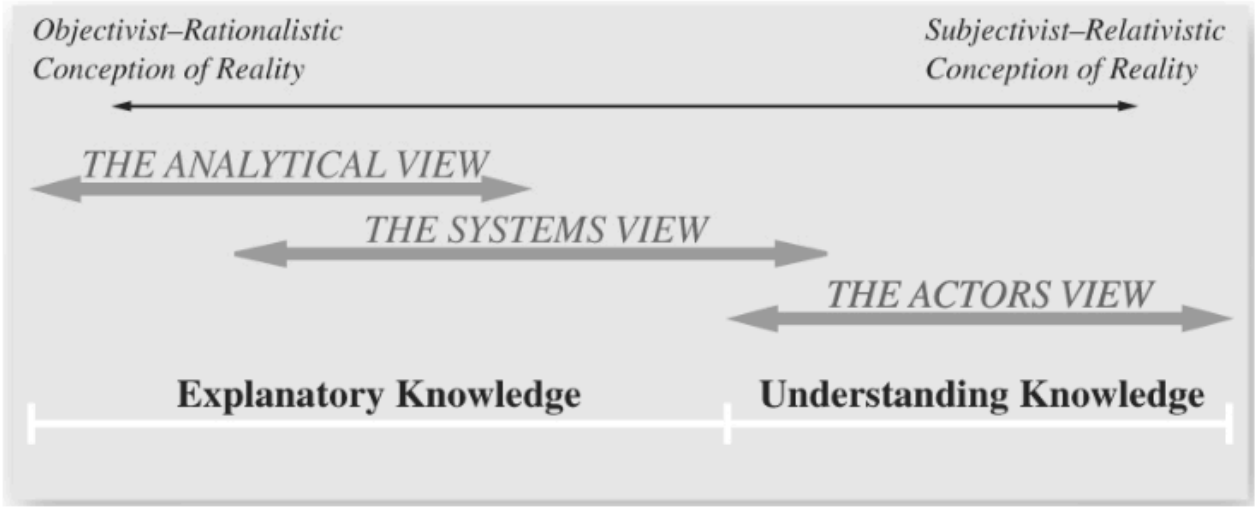

Figure 5 - The Boundary between Explanatory and Understanding Knowledge (Arbnor & Bjerke, 2009, p. 51)

The analytical approach's main purpose is to explain reality in a fact-based manner. The underlying assumption behind it is that all components of reality can be considered and examined in isolation. Correspondingly, the sum of these components is equal to the sum of all individual parts. Quantitative data is usually used in this approach with objectivity being one of the central focuses. Subjective data can also be employed thought, yet emphasis is put on proving its objectivity. To

assess whether a finding is “true” or not, the invariance of findings is often assessed. The more unrelated to changes in environment, perception or framing a finding is, the more “true” it is (Arbnor & Bjerke, 2009).

Similar to the analytical approach, the systems approach can also provide explanatory knowledge, however it can also focus on understanding knowledge as well. In both cases, reality is assumed to be full of facts, however adding individual components does not amount to the whole. Instead, synergies and interactions between elements of reality are assumed (Arbnor & Bjerke, 2009). Similarly, all systems are linked to other systems, which form an interrelated “web” of interactions.

An actor approach provides a substantially different view of reality than the other two, as reality is perceived as a social construct. Metaphors, images, narrative are seen as part of reality, rather than just representing it. It is assumed that researchers undertaking this approach need to be part of the “knowledge creation” in order to understand reality. Arbnor & Bjerke (2009, p. 131) argue that every kind of statistical measurement taken as explanation of human aspects/behaviour in social contexts (micro-cosmoses) leads to a gradual decreased understanding of ourselves as “authentic totalities”. And the opposite: the better we understand ourselves as authentic totalities, the more uncertain the quantitative aspects become” (p. 131). Therefore, generating objective quantifications of the above mentioned social constructs would be inappropriate under the actor’s approach. These studies usually rely on subjective data that cannot be generalized.

The approach chosen for this thesis is the systems approach, as it fits the conceptualization of MCS and organizations of this thesis. More specifically, the interdependencies within organizations and the complex nets of interactions are acknowledged. It allows for subjective and objective data and allows for deeper and more comprehensive elaborations. Additionally, the mix of quantitative and subjective survey data is fitting for the systems method. The three principles of the systems approach should thus be made explicit, based on Arbnor & Bjerke's (2009) discussion. First, external and internal delimitations must be accepted for the sake of practicality. As an intricate web of interactions is assumed, a certain framing must be taken to allow for realistic analysis. However, the existence of the excluded interactions must be acknowledged. Second, it must be acknowledged that each picture of reality is a limited one. Correspondingly, each frame can therefore be questioned and critiqued, as it can never encompass the totality of interactions. Finally, each frame

or “picture” of reality has an element of subjectivity to it, as it is reflective of the creator of the frame. Arbnor & Bjerke (2009) argue that “all systems models are “deceptive,” even “untruthful,” in the sense that it is not possible to present the whole truth in such models” (Arbnor & Bjerke, 2009, p. 113).

4.2. Survey Administration

The project’s dataset was acquired by administering a survey[7]. The survey questions were designed based on Bedford & Malmi's (2015) survey questions with minor adjustments to accommodate the different target group. Additionally, the approach to the survey was devised in accordance to Dillman's et al. (2014) web-survey guidelines. In an attempt to increase the response rate, a lottery gift of 250 € was included. Additionally, a summary of the results was promised to respondents that indicated interest. To ensure the quality of the data and that respondents understood questions correctly, phone and e-mail correspondence with participants was actively undertaken. This was also done to ensure a trustful environment (Dillman et al., 2014), which has a large positive impact on response rate. The items in the survey were not made mandatory, providing the opportunity for respondents to skip questions they did not want to disclose information on. Finally, the questions and writing was evaluated by peers and edited correspondingly. As Dillman et al. (2014) argues that the ordering of survey questions has a high impact on the response rate, the evaluators were also asked to rate the difficulty of each question, which later related to its ordering.

4.3. Sample Description

The database “ORBIS”[8] was used to select the company sample. Several criteria were considered when extracting the company sample. General requirements were: companies within the Nordics (Denmark, Finland, Iceland, Norway and Sweden), small and medium-sized, e-mail address and year of incorporation available. In this thesis, SMEs are defined based on the number of employees employed in the company. According to the official European definition, the upper bound of medium-sized companies is a staff headcount of 250. The lower bound is set at 5 employees, similar to Armitage et al., (2016). In regards to financials, available information on total assets and net profit before tax was filtered for. After manually checking each company’s data, the final

[7] See Appendix B for the survey questions.

[8] https://www.bvdinfo.com/

sample size amounted to 26,999. After the response period was over, a total of 533 completed and 362 partially completed answers were collected. Additionally, approximately 6,000 e-mails could not be delivered. Filtering for respondents that did not provide a satisfactory amount of responses, as well as companies that did not fit this thesis' SME definition left the final net number of respondents at 502. Table 2 below provides further details of the final sample size.

Panel A: Country	
Category	N
Denmark	137
Finland	137
Iceland	35
Norway	187
Sweden	6
Total	502
Panel B: Industry	
Category	N
Manufacturing	162
Service	235
Trade	105
Total	502

Table 2 – Descriptive Information on Sample Data

4.4. Variable Measurement

Bisbe et al. (2007) state that "in social research, conceptual specification is the process whereby fuzzy and imprecise notions of constructs are made more specific and precise" (p. 790). This thesis uses Bedford & Malmi's (2015) exploratory study of control configurations to operationalize its constructs. In the construct below, Likert-type scales from 1 to 7 are used unless otherwise indicated.

4.4.1. Performance Measurement

Diagnostic use construct relates to top-management's use of performance measurement systems and budgets. The items related to diagnostic use are based on Henri (2006) and Widener (2007). Five items are used to capture diagnostic use.

Interactive use items employed in this thesis have also been applied in Henri (2006), Widener (2007) and (Bisbe & Otley, 2004). As the above, it examines top-management's use of the measures. Based on (Bisbe et al., 2007), five properties were identified – intensive use by top management, intensive use of operations management, face-to-face challenge and debate and focus on strategic uncertainties (Bedford & Malmi, 2015). Five items are used to capture Interactive use.

Tightness is conceptualized in a continuum between strict (tight) and loose control. Its items relate to constructs developed by Kober et al. (2007), Simons (1987) and (Van der Stede, 2001). A tight control system is argued to have complete and specific targets, frequent and timely communication of targets, closer and more frequent monitoring of results, and a transparent and strict relationship between performance and compensation (Bedford & Malmi, 2015). Four items are used to capture tightness.

A Balanced Scorecard approach is used to capture *measurement diversity* (customer, financial, process, development perspectives) with additional Social Responsibility and Quality dimension added. Items are based on Henri (2006) and (Ittner et al. 2003). Measure diversity is captured through six items.

Cost control is measured through Simons' (1987) Widener's (2004) and Kober's et al. (2007) operationalisations. The construct is assessed in relation to the use of financial performance measures in companies. It is mainly associated with cost efficiency and effectiveness and is capture through three items.

4.4.2. Organizational Structure

Decentralization items used by Bedford & Malmi, (2015) are developed from Khandwalla (1973) and Gordon and Narayanan (1984) . Five items are used to operationalize decentralization relating to whether decisions on development, recruiting, investments, resource allocation and pricing are influenced more by top-management or subordinates.

Communication is measured on a scale ranging from mechanistic to organic. The construct was developed by Bedford & Malmi, (2015) based on (Chenhall & Morris, 1995; Covin et al. 2001). The construct consists of 4 items.

4.4.3. Organizational Technology

Technology as a context variable captures two distinct aspects; Outcome measurability and Task Programmability according to Bedford & Malmi (2015). Bedford & Malmi (2015) operationalizes technology as the level of internal technology capabilities. It is thus focused on the individual company and not on the technology of the market like Farrell (2000) suggests.

Outcome measurability is defined by Bedford & Malmi (2015) as "the extent to which outcomes of subordinate activity can be validly and reliably captures in quantitative standards of performance" (p. 9). The item thus relates to how well-defined an optimal performance and performance standards are and how accurately they can be measured. In order to validate and substantiate the outcomes of subordinates actions, the availability of data to support such insights is also an item to consider (Bedford & Malmi, 2015; Ouchi, 1978; Scott, 1992).

Task programmability relates to the extent of cause/effect relationship presence in an organization. The actions taken by employees must be visible to managers as must the relationship between actions taken by employees and the result they accomplish. Bedford & Malmi (2015) present three items to operationalize task programmability.

4.4.4. Organizational Strategy

Strategy is operationalized by Bedford & Malmi, (2015) through 11 items in level of pricing, innovation and customer focus in a company. Based on Bedford & Malmi's (2015) strategy measurement, a second-order model is used based on Miles et al. (1978) conceptualization of defenders and prospectors to combine the constructs into a single variable.

Pricing or low cost as Bedford & Malmi, (2015) denotes it, relates to whether a company has adopted a low price/discount strategy. Two items determine the company's price strategy.

The level of innovation is operationalized by four items, each devoted to uncovering the level of commitment to first-to-market strategy, product portfolio, product volume and experimental initiatives present in a company.

Bedford & Malmi, (2015) utilizes four items to determine a company's level of customer focus. Through five items related to product and process quality, support and customer service, the level of customer focus is uncovered.

4.4.5. Control Variables

Five control variables were included and found relevant when examining MC literature in SMEs – age, size, country, industry and hierarchy.

Age is measured based on the year of incorporation of the company. The variable has been commonly included as a control variable in existing SME studies (Armitage et al., 2016; Bryant & Bryant, 2014; Robson & Bennett, 2001). As their growth and profitability is associated with a S-curve, age can have large impacts on this thesis' analyses.

Similarly, size is a commonly used control variable, which has been found to have high influence on control variables. Khandwalla (1973) was one of the first to touch upon the relationship between size and control systems and stated that large companies undertake more complex, formalized and bureaucratic activities. Later, size has become one of the most commonly examined contingency factors (Chenhall, 2007), which can also be attributed to its straight-forwardness in regards to measuring it. In this study, size is measured based on employee headcount. Though some researchers use financial measures like revenue, in the context of MC and its conceptualization in this thesis (controlling employee behaviour), it is believed that employee number is more appropriate.

Country of origin is also included as a variable in order to control for differences in regional specific factors like government policies, small-company funding, or other country-specific uncertainties. Country of origin was available in the ORBIS database used. It also allowed for the cross-country comparison of MC use.

Hierarchical flatness can have an effect on both PMS (Scott & Tiessen, 1999) and is a natural part of organizational structure (Bedford & Malmi, 2015). It is hence also included in the thesis as a control variable. It is conceptualized based on Bedford & Malmi (2015). To measure hierarchy, the number of hierarchical levels was divided by the natural logarithm of employees.

Finally, companies were asked to classify their company in one of three industry categories (service, manufacturing or trade), which enabled the control for industry-wide differences in the SME sector and further allow the comparison between industries.

4.5. Preliminary Analyses

Before the main analyses of the project was conducted, several preliminary analyses and pre-processing activities were undertaken that should be made explicit. These procedures will be outlined below in the chronological order they were conducted.

First, the industry control enquiry chosen for the survey included an open-answer option. Depending on the answers of respondents, companies were moved in their according industry. If it was unclear which industry a company should be moved in, a manual search of the company was conducted to determine its type. Additionally, several items were reversed coded in order to align all construct items towards the same direction. The items that needed to be reversed relate to the first and fourth question of "Tightness" (See Appendix B for the full survey used in thesis). Also, as Table 2 shows, the responses received from Sweden amounted to only 6 out of 502. Therefore, due to the low sample size, the country's responses were merged with Norway's based on the highest similarities between the countries relating to Hofstede's country indices[9]. This provided an objective basis to merge the two samples.

As discussed, the answering of all questions was not mandatory. As such, there were instances of missing data points within the final dataset, which can adversely affect the thesis' sample size. In this situation, Hair (2014) argues that the researchers' task is to familiarize themselves with existing patterns and relationships of missing data and confirm that data is missing completely at random (MCAR). Hair (2014) argues that respondents that pass a 30% mark of missing values should be considered for exclusion. Following his methodology, cases with 25% missing values or above were excluded as the first step of the sample processing. To diagnose the level of randomness of data, a "Missing Value Analysis" was done in SPSS (Hair, 2014). The test analyses the patterns of missing values and compares it to the expected patterns of missing at random data. To classify the

[9] https://geert-hofstede.com/countries.html

data as MCAR, no significance should be found, which was the case for this dataset with a significance level of 0.613. The high level of randomness in the missing data allows for broad range of remedies that can be applied (Hair, 2014). An expectation-maximization (EM) method was used, to replace the data, as it provides the best representation of the original distribution of the data, with a minimum amount of bias (Hair, 2014).

After the missing values were removed by the EM method, factor analysis on the survey items was conducted in order to argue for the reliability and validity of the constructs used. Although previously validated constructs were used (Bedford et al., 2016; Bedford & Malmi, 2015), common factor analysis and principle component analysis were done in line with Bedford & Malmi (2015) approach. Two types of constructs are generally differentiated in the literature – reflective and formative models. A reflective model is used when the construct is reflected by a number of indicators. The direction of causality in this model is from the latent variable (the construct) to the indicators (the items) (Bisbe et al., 2007; Hair, 2014). Therefore, the items are considered as a "manifestation" of the underlying construct (Bisbe et al., 2007). Correspondingly, when changes in the construct level occur, changes in the items are expected to occur - as such the items are expected to covary. The practical implication of this relationship is that when reflective models are used, its underlying indicators are interchangeable (Bisbe et al., 2007; Hair, 2014; Jarvis et al., 2003). Otherwise, if a "construct is formed or induced by indicators that describe its inherent constitutive facets, a formative model applies" (Bisbe et al., 2007, p. 800). Contrasting to the relationship between indicators and construct within the reflective model, the direction of causality flows from indicator to construct. As such, the items within formative models are considered to be crucial in its validity and reliability. Finally, indicators of the formative models are not expected to covary.

This thesis follows the methodological approach of Bedford & Malmi (2015) in examining construct reliability and validity. In regards to reflective models used, common factor analysis is used to show the factor loadings of each item to its corresponding factor. According to Bedford & Malmi (2015), factors are required to load stronger than 0.35. Internal consistency is assessed through Cronbach alpha, which is a measure of reliability of a scale that ranges from 0 to 1. Hair (2014) argues that a lower limit of 0.6-0.7 is deemed acceptable. Formative models are examined based on principle component analysis, with items expected to load positively and above 0.3 to have satisfactory results. Additionally, variance inflation factors are examined to test for

multicollinearity, yet none of the output reached the threshold of 10 (Hair, 2014). Cronbach alpha was not conducted on formative models, as their items do not need to covary. Finally, despite not being report by Bedford & Malmi (2015), average variance extracted was included in the analysis to provide extra depth. The minimum requirement of this statistic is 0.5. Table 3 below summarizes the results.

Construct Name	Construct Type	Loadings	Alpha	AVE
Diagnostic Use	Reflective		0.866	0.57
Diagnostic 1		0.765		
Diagnostic 2		0.815		
Diagnostic 3		0.801		
Diagnostic 4		0.700		
Diagnostic 5		0.671		
Interactive Use	Formative		n/a	0.81
Interactive 1		0.875		
Interactive 2		0.916		
Interactive 3		0.925		
Interactive 4		0.908		
Interactive 5		0.880		
Tightness of Control	Formative		n/a	0.27
Tightness 1		-0.288		
Tightness 2		0.683		
Tightness 3		0.795		
Tightness 4		0.661		
Diversity of Measurements	Formative		n/a	0.48
Diversity 1		0.695		
Diversity 2		0.741		
Diversity 3		0.721		
Diversity 4		0.605		
Diversity 5		0.741		
Diversity 6		0.622		
Cost Control	Reflective		0.798	0.57
Cost Control 1		0.758		
Cost Control 2		0.745		
Cost Control 3		0.762		

Table 3 - Factor Analysis Summary

Construct Name	Construct Type	Loadings	Alpha	AVE
Decentralization	Formative		n/a	0.44
Decentralization 1		0.637		
Decentralization 2		0.598		
Decentralization 3		0.679		
Decentralization 4		0.705		
Decentralization 5		0.693		
Communication	Reflective		0.704	0.39
Communication 1		0.681		
Communication 2		0.765		
Communication 3		0.556		
Communication 4		0.468		
Low cost	Reflective		0.858	0.75
Low cost strategy 1		0.858		
Low cost strategy 2		0.876		
Innovation	Reflective		0.743	0.43
Innovation strategy 1		0.712		
Innovation strategy 2		0.507		
Innovation strategy 3		0.622		
Innovation strategy 4		0.754		
Strategy	Formative		n/a	0.52
Low cost		0.723		
Innovation		0.723		
Technology	Reflective		0.811	0.42
Technology 1		0.720		
Technology 2		0.789		
Technology 3		0.751		
Technology 4		0.573		
Technology 5		0.447		
Technology 6		0.540		

Table 3 (Continued) - Factor Analysis Summary

Several limitations emerge from the validity and reliability analysis of this thesis' constructs. Firstly, the construct of tightness and more specifically, "Tightness1" does not load accordingly and has shown the opposite association with what is expected. Despite that, the construct of tightness is a formative one and even though excluding the item improves the constructs statistics, the underlying assumptions behind it would become impaired. To keep the validity of the construct and according to discussions of previous literature, the item is kept in the data (Bisbe et al., 2007; Hair, 2014), yet the future interpretations of the construct are handled with care. Also, the strategy constructs provided did not load into a single factor, due to items relating to customer focus. These were excluded, which then led to a second order aggregation of constructs, based on Miles's et al. (1978) conceptualizations and fit appropriately with high loadings and high AVE. Despite that, the factor analyses yielded satisfactory results with items loadings strongly on single factors and therefore yielding the desired "simple structures" (Hair, 2014). Cronbach alpha statistics ranged between 0.704 to 0.866, which is also satisfactory. Average variance explained however, was below the 0.5 in most constructs, with tightness reporting as low as 0.27 (thought this is expected considering its unfitting loadings). Factor scores were used to assign values to construct, more specifically – regression based factor scores (Distefano et al., 2009). Despite simple means also being used in literature, this method is seen as a more sophisticated as it maximizes the validity of the item aggregations (Distefano et al., 2009). Additionally, the bivariate correlation matrix below (Table 4) shows plausible association between constructs. This is similar to Bedford et al. (2016), who find one correlation is above 0.6 – between diagnostic and interactive use. This has been reported by previous research as well (Henri, 2006; Widener, 2007).

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Diagnostic												
Interactive	0.667***											
Tightness	0.458***	0.354***										
Diversity	0.400***	0.336***	0.409***									
Cost Control	0.425***	0.446***	0.382***	0.229***								
Decentralization	0.194***	0.096**	0.079	0.141***	0.058							
Communication	0.212***	0.117***	-0.021	0.207***	0.001	0.119***						
Strategy	-0.127***	-0.089**	-.088**	-0.200***	-0.051	-0.123***	-0.234***					
Technology	0.442***	0.416***	0.432***	0.430***	0.271***	-0.004	0.140***	-0.089**				
RoA	-0.035	-0.041	-0.022	-0.015	-0.054	0.05	0.104**	-0.038	0.03			
Age	-0.016	-0.054	-0.001	-0.088**	0.081	-0.002	-0.135***	-0.047	-0.086	-0.125***		
Hierarchy	-0.034	-0.047	-0.003	-0.015	0.058	0.027	-0.139***	0.009	-0.055	-0.088	0.034	
Employees	0.109**	0.146***	0.059	-0.014	0.153***	0.072	-0.125***	-0.004	-0.002	0.002	0.027	-0.411***

Table 4 – Correlation Matrix
****. Correlation is significant at the 0.01 level (2-tailed)*
***. Correlation is significant at the 0.05 level (2-tailed)*
**. Correlation is significant at the 0.1 level (2-tailed).*

Finally, based on Hair's (2014) discussion, data is standardized based on a z-score standardization procedure, which mean-centres the data and sets the standard deviation of variables to 1. Additionally, outliers are highlighted based on the "outlier labelling rule", which was empirically derived after research conducted by Hoaglin et al., (1986). Similarly, Q-Q plots and histograms are used to visually examine the dataset and locate additional outliers in the data. Finally, outliers are transformed within the "normal" variations, based on the limits provided by the outlier rule mentioned above. The histograms and Q-Q plot of the dataset, which can provide additional information on the processing of the data, can be seen in Appendix C and Appendix D. The appendices show the variables before and after the normalization and standardization procedures were done. Additionally, Table 5 below provides information on the descriptive statistics of the non-processed data, which will be used as a basis for the following exploratory analysis, while the descriptive data on the processed variables can be found in Appendix E.

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Diagnostic	502	1.00	7.00	4.54	1.07
Interactive	502	1.00	7.00	4.79	1.16
Tightness	502	1.00	5.75	3.70	0.80
Diversity	502	1.00	7.00	4.68	0.89
Cost Control	502	1.00	7.00	4.12	1.47
Decentralization	502	1.00	5.00	2.23	0.69
Communication	502	1.50	7.00	5.64	0.89
Strategy	502	1.25	7.00	3.29	0.88
Technology	502	1.00	7.00	5.00	0.92
RoA	502	-0.47	1.78	0.18	0.19
Age	502	1.25	80.44	18.53	12.47
Hierarchy	502	0.28	2.49	0.90	0.28
Employees	502	5.00	250.00	34.11	37.92

Table 5 - Descriptive Statistics on Non-Processed Variables

5. Main Analyses and Results

This section will provide the main analyses and its results and is split into three parts. First, exploratory analyses are done using ANOVA and descriptive statistics. Second, regression analyses are conducted based on the 14 bivariate hypotheses developed. Finally, profile deviation analysis examines the fit between MC and context by taking a systems approach.

5.1. Exploratory Analyses

As it has been argued in this thesis' literature review, the existing SME research is predominantly conceptual or based on very small sample sizes, Meijaard et al. (2005) being a notable exception with a sample size of 1411. Therefore, the way MC is configured and used in SMEs is not clear. In the following, this gap in the literature will be addressed, which also relates to the thesis' first research question. A comparison of MC practices and context is also made both on a country level and on an industry level to uncover existing significant differences. Additionally, the exploratory analyses will aid in understanding the underlying data used in the following bivariate and multivariate analyses. Unlike the regression and profile deviation analysis, for the exploratory analysis, a mean-based method is used to examine MC constructs. This method is employed, because the mean-based approach has been argued to be appropriate for exploratory research situations (Tabachnick & Fidell, 2006; Distefano et al., 2009; Hair, 2014) and because it provides valuable information on the examined values relative to the 1-7 Likert scale used. More specifically, it is maintained that as the 1 to 7 scale is retained, information on the actual survey answers is more easily interpretable.

The following section is structured as follows: First, an ANOVA test is conducted to compare country and industry means; afterwards, each variable is examined individually with its frequencies and items taken into consideration to explore existing MC practices with added depth.

5.1.1. Analysis of Variance on a Country and Industry Level

The ANOVA output in Table 6 provides a comparison of the country means in the sample. As it has been mentioned in the analysis, Swedish responses have been merged with the Norwegian ones due to the low sample size (N = 6), based on highest similarities on Hofstede's country index. The results show that there are no significant differences in the MCS of SMEs based on country differences. However, significant differences are found in relation to contextual variables, age and employees.

						ANOVA	
Variable	DK	FI	IS	NO	Total	F	Sig.
Diagnostic	4.71	4.48	4.34	4.49	4.54	1.85	0.14
Interactive	4.94	4.85	4.74	4.64	4.79	1.96	0.12
Tightness	3.72	3.62	3.54	3.78	3.70	1.70	0.17
Diversity	4.69	4.75	4.75	4.62	4.68	0.67	0.57
Cost Control	4.30	4.07	4.16	4.03	4.12	0.96	0.41
Decentralization	2.23	2.31	2.07	2.20	2.23	1.35	0.26
Communication	5.61	5.71	5.47	5.63	5.64	0.72	0.54
Strategy	3.29	3.09	3.23	3.45	3.29	4.70	0.00
Technology	4.85	5.00	4.99	5.10	5.00	2.12	0.10
RoA	0.18	0.19	0.12	0.19	0.18	1.34	0.26
Age	20.77	18.08	26.41	15.82	18.53	9.70	0.00
Hierarchy	0.85	0.92	0.93	0.92	0.90	1.97	0.12
Employees	52.22	29.21	28.29	25.79	34.11	15.84	0.00
N	137	137	35	193	502	-	-

Table 6 - Analysis of Variance on Country-based Means

	Manufacturing	Service	Trade	Total	ANOVA	
					F	Sig.
Diagnostic	4.44	4.49	4.78	4.54	3.51	0.03
Interactive	4.64	4.81	4.97	4.79	2.63	0.07
Tightness	3.58	3.73	3.84	3.70	3.65	0.03
Diversity	4.67	4.68	4.73	4.68	0.19	0.83
Cost Control	4.08	4.03	4.39	4.12	2.28	0.10
Decentralization	2.10	2.26	2.37	2.23	5.37	0.00
Communication	5.54	5.72	5.60	5.64	2.08	0.13
Strategy	3.32	3.39	3.03	3.29	6.31	0.00
Technology	4.84	5.06	5.09	5.00	3.48	0.03
RoA	0.16	0.21	0.16	0.18	4.84	0.01
Age	20.93	15.64	21.28	18.53	12.41	0.00
Hierarchy	0.91	0.85	1.00	0.90	11.78	0.00
Employees	35.88	37.96	22.77	34.11	6.21	0.00
N	162	235	105	502	-	-

Table 7 – Analysis of Variance on Industry-based Means

Unlike the output for country differences, the industry-based ANOVA output shows high amount of significant differences. This provides indications that SMEs are configured differently based on the industry in which they operate. All variables examined apart from "Communication" and "Measurement Diversity" seem to have statistically significant variation across industries.

5.1.2. Examination of Variables

In the following, MC, context and control variables will be examined. The sections refer to ANOVA tables 6 and 7 and the frequency distributions, which can be seen in Table 8 below. Additionally, when examining the variables, their sub-items are also considered to add supplemental information. The descriptive statistics on the construct items can be found in Appendix F.

	N	Percentiles		
		25	50	75
Diagnostic	502	4.00	4.60	5.20
Interactive	502	4.20	4.98	5.60
Tightness	502	3.25	3.75	4.25
Diversity	502	4.17	4.83	5.33
Cost Control	502	3.00	4.30	5.33
Decentralization	502	1.80	2.20	2.60
Communication	502	5.25	5.75	6.25
Strategy	502	2.75	3.25	3.88
Technology	502	4.50	5.17	5.67
RoA	502	0.06	0.14	0.26
Age	502	9.92	15.31	26.02
Employees	502	11.00	20.00	40.00
Hierarchy	502	0.71	0.87	1.07

Table 8 – Percentile Distribution of Variables

Diagnostic

The mean of diagnostic measurement is 4.54, making it higher than the scale median, indicating that Nordic SME's in general are utilizing accounting as a cybernetic control to a great extent (Bedford & Malmi, 2015). The frequencies of the variable similarly report that 75% of the respondents have labelled their use of diagnostic control at 4.00 or higher, meaning that 75% have an above "moderate" use of diagnostic controls. The means of the items composing diagnostic control are evenly distributed, ranging between 4.27-4.92. Thus, indicating an overall focus on use of diagnostic control rather than a fragmented one. Furthermore, no significant difference between countries has been reported. On the contrary, significant difference across industries is found within a 0.05 confidence level. Here, manufacturing companies have the lowest focus on employing a diagnostic use of MCS with a reported mean score of 4.44, while companies in the trade industry have a much higher emphasis on diagnostic use of MCS by a mean of 4.78.

Interactive control

Interactive use is the highest indicated focus in regards to performance measurement reported by the respondents. The mean of interactive control is 4.79, placing it significantly above the scale median. Likewise, the quartiles distribution demonstrations that 75% of respondent have answered above 4.20 and 50% above 4.98. The item means of the construct are between 4.70 and 4.93, which demonstrates that the distribution is evenly spread over the items. The survey does not find any significant differences between countries. Between industries, the respondents report a significant difference at a 0.10 significance level. Like diagnostic measurement, companies in the manufacturing industry report lowest mean of interactive control (4.64) while companies within the trade industry report the highest mean (4.97).

Tightness

In contrast to interactive control, the survey respondents placed the level of tightness as the lowest of all the performance measurement variables at a mean of 3.70, suggesting a relatively loose control in Nordic SME's. However, from the individual items the data shows significant difference in the emphasis on tight controls. The item means of the item reveal that the respondents report a low emphasis on written explanations for performance target deviation (3.33), but a high emphasis on evaluating employees by achievement of performance targets (4.22). The survey does not report any significant difference between countries, but a significant difference between industries at a 0.05 confidence level. Here, companies in the manufacturing industry indicate that they have the least tight control practises, while companies within the trade industry report the highest emphasis on tight controls.

Measure diversity

The measure diversity is reported with a mean of 4.68 by the respondents. Being the 2nd highest measurement variable it is thus arguably a noticeable characteristic of the Nordic SME's use of MCS. Scrutinizing each item within the variable furthermore provides the insight that two of the items stand out from the rest. Thus, the respondents report very little emphasis on evaluating employees on social responsibility while having a huge emphasis on quality as a dimension of evaluation. Similarly, the respondent state lower emphasis innovation as a performance measure used for evaluations. The remaining item levels are evenly levelled. The survey does not find significant difference between countries or industries.

Cost Control

The use of cost control is reported at 4.12 by the respondents in the Nordic SME's, thus being close the neutral (moderate) on the scale. However, the respondent provide divergent answers as can be seen from the standard deviation and the distance between the quartiles (distance of 2.33 between the 25% and 75% quartile). Thus, despite being close to the median, the companies seem to have opposing uses of cost control. Yet, only in industries significant difference between categories can be found at a 0.01 confidence level. Here, companies in the trade industry reports significantly higher levels of cost control (mean at 4.39) utilization compared to companies within the manufacturing and service industries. The two latter both averaging close to 4 – 4.07 and 4.03 for manufacturing and service companies respectively. The item means further indicate the overall use of cost control is primarily driven by a focus on controlling operations through analysing deviations between expected and realised costs. Conversely, the respondents report low utilization of cost centres.

Decentralization

Respondents placed decentralization at the lowest levels of any MC variable examined in this study with a mean of 2.23. Frequency of the distribution further indicated that 75% of all respondents had a decentralization level below 2.6. This therefore indicates that SMEs are highly centralized with very little decision rights being delegated to employees outside of the top-management team. No differences in decentralization were found between countries, yet one exists in different industries. The survey finds that SMEs in the trade industry are associated with relatively higher decentralization, while manufacturing companies with the lowest levels. In regards to the specific decision rights that relate to decentralization in this survey, respondents indicated that the relatively highest influence employees have is on development of new products and service at a coefficient of 2.86 and allocation of resources at 2.63. In contrast, decisions related to personnel hiring and firing and decisions on investments are the areas where employees have the least say in.

Communication

Highly contrasting to the previous structure variable, communication is marked at the highest level of any MC variable in the survey with a mean of 5.64, with 75% of respondents answering above 5.25. As such, the survey indicates that information is perceived to be communicated very freely, informally and openly across the organization. Also, no differences are found by the ANOVA in

regards to industry and country. Additionally, all items within the construct have a mean above 5.1 further indicating a very organic communication style in Nordic SMEs.

Strategy

Relating to strategy, Nordic SMEs are leaning towards prospector strategies with a mean of 3.29. As such, the distribution of answers shows that 75% of all respondents answered below 3.87. Also, the ANOVA table finds significant difference on both country and industry level. For countries, Finland seems to be leaning the most towards prospector oriented strategy with higher than average focus on innovation and development (3.09). On the opposite side of the spectrum, Norway SMEs seem to be slightly more oriented towards defender strategies with (relatively) higher focus on cost reduction and stability (3.45). Denmark and Iceland have values of 3.29 and 3.23 respectively. The ANOVA relating to industry also finds a significant difference between categories at a >0.01 significance level. From its output, it can be seen that trade companies are the ones leaning the most towards defender strategies (3.03) while manufacturing and service companies have relatively the same level – 3.32 and 3.39 respectively.

Technology

Distinctly different values are shown when comparing task uncertainty (technology) to strategic uncertainty. Overall, the task uncertainty of SMEs seems to be low with average Nordic value of 5.00. The distribution of answers shows that 75% of companies answered above 4.5 and 50% answered over 5. This is thus indication that cause-and-effect relationships are perceived as visible and understood by managers and that tasks can by analysed and quantified. Technology shows a statistical difference between means in both industry and country at levels of 0.03 and 0.1 respectively. Manufacturing SMEs seem to have highest task uncertainty than all other industries, while service and trade have a generally similar mean of 5.06 and 5.09 respectively. In regards to country, Denmark is associated with the highest task-uncertainty (4.85), while Norway with the lowest (5.10). The specific items of the construct seem to reflect that on a Nordic level, outcome measurability is more problematic for managers than task programmability (i.e. analysability).

Control Variables

Regarding hierarchy, respondents indicated that the hierarchical structure of Nordic SMEs were relatively flat with a mean of 0.9[10]. Only 25% of the respondents report a hierarchy of more than 1.07. No difference between countries exist, while for industry – manufacturing companies seem to have the tallest structures, while service seem to have the flattest.

The average overall age of the SMEs sample is 18.5 years. The frequency distribution additionally shows that the youngest 25% are less than 9.92 years old while oldest 25% are more than 26 years. In regards to country differences, Icelandic companies seem to be the oldest with a mean of 26.4, while Norwegian ones are the youngest at 15.8 years. In regards to industry, companies that identify as working within the trade industry are the oldest with a mean of 21.3 years, contrasting to service companies, which are the overall youngest at 15.6 years on average.

On average respondents indicated that they employ 34.1 people in their companies. The frequencies show that only 25% of the SME's have more than 40 employees, while only 25% have less than 9.92 employees. The frequencies thus indicate that the vast majority of the companies have similar sizes. Danish SMEs employed a higher average number of people with an average of 52.2 people, while Norwegian companies employing the lowest; averaging 25.8 employees. In regards to industry, service companies had an average of 39 employees, while trading companies had the lowest average amount of 22.8.

RoA was on average 18%. From here, bottom 25% performers reported RoA at 5.6% or less, while the top 25% performers reported 26.4% or higher. Companies within the service industry seemed to have a higher on average RoA (20.0), while manufacturing and trade companies had the same average of 16.[11]

[10] For comparison, Bedford & Malmi (2015) find a mean of 3.81 for large companies using the same measurement method.

[11] The results of these findings have to be taken with caution, as service companies have generally lower levels of assets, which can result in a higher RoA. This thus provides good basis for why industry was added as a control variable.

5.2. Regression Analyses

In the following, empirical results from the regression analyses will be analysed followed by a presentation of robustness considerations. Below, Table 9 displays the results of the regression analyses. The first 14 regression models contain one interaction term each, while model 15 contains all interactions. As is apparent, model 15 provides the best R-squared value, thus offering most explanation power of the dependent variable of all the models. Hence, this regression has been chosen for further considerations and analyses. The regression provides six statistically significant variables – one MC variable, four interaction terms and one control variable; "Communication", "Strategy*Cost Control", "Strategy*Decentralization", "Technology*Communication", "Technology*Diversity" and "Age". However, the MC variable, Communication, and two of the interaction terms, "Strategy*Decentralization and" "Technology*Communication", are at a weak level of statistical significance (p-values between 0.05-0.10). Even so, following the previous literature, these levels are generally accepted and considered satisfactory in Management Accounting and Control research (Chenhall, 2005; Bedford et al., 2016).

	Dependent variable: RoA Pre-tax									
	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coefficients	t-value	Coefficients	t-value	Coefficients	t-value	Coefficients	t-value	Coefficients	t-value
MC practices										
Diagnostic	-0.040	-0.588	-0.041	-0.604	-0.039	-0.586	-0.049	-0.728	-0.045	-0.667
Interactive	-0.052	-0.826	-0.050	-0.793	-0.054	-0.859	-0.058	-0.917	-0.046	-0.725
Tightness	-0.013	-0.225	-0.015	-0.270	-0.015	-0.269	-0.014	-0.243	-0.017	-0.312
Diversity	-0.053	-0.974	-0.048	-0.891	-0.049	-0.897	-0.051	-0.934	-0.049	-0.909
Cost Control	-0.033	-0.615	-0.037	-0.700	-0.033	-0.630	-0.027	-0.507	-0.037	-0.691
Decentralization	0.052	1.116	0.048	1.027	0.051	1.086	0.054	1.143	0.044	0.930
Communication	0.066	1.327	0.065	1.294	0.066	1.313	0.074	1.476	0.063	1.251
Contextual factors										
Strategy	-0.046	-0.969	-0.043	-0.890	-0.046	-0.957	-0.036	-0.746	-0.038	-0.788
Technology	0.083	1.501	0.085	1.529	0.084	1.522	0.091	1.642*	0.086	1.554
Interactions										
Strategy*Diagnostic	-0.063	-1.400								
Strategy*Interactive			-0.011	-0.238						
Strategy*Tightness					-0.041	-0.915				
Strategy*Diversity							-0.068	-1.492		
Strategy*Cost Control									0.051	1.138
Strategy*Decentralization										
Strategy*Communication										
Technology*Diagnostic										
Technology*Interactive										
Technology*Tightness										
Technology*Diversity										
Technology*Cost Control										
Technology*Decentralization										
Technology*Communication										
Control variables										
Age	-0.097	-2.038**	-0.099	-2.097**	-0.099	-2.083**	-0.097	-2.057**	-0.100	-2.109**
Hierarchy	-0.050	-0.976	-0.050	-0.985	-0.050	-0.984	-0.053	-1.042	-0.049	-0.956
Employees	0.004	0.069	0.004	0.076	0.005	0.082	0.010	0.176	0.005	0.092
Norway										
Denmark	0.088	1.609	0.084	1.533	0.084	1.525	0.046	0.792	0.084	1.531
Finland	0.044	0.860	0.042	0.831	0.042	0.826	-0.067	-1.350	0.042	0.816
Iceland	-0.040	-0.816	-0.042	-0.866	-0.044	-0.898	-0.045	-0.805	-0.046	-0.954
Manufacturing	-0.074	-1.453	-0.072	-1.424	-0.070	-1.379	-0.069	-1.362	-0.073	-1.436
Service										
Trade	-0.023	-0.431	-0.018	-0.340	-0.019	-0.362	-0.013	-0.252	-0.016	-0.300
R-square	0.055		0.051		0.053		0.055		0.053	
Adj. R-square	0.019		0.016		0.017		0.020		0.018	
F-value	1.550		1.438		1.484		1.565		1.511	
Sig.	0.069		0.108		0.090		0.065		0.081	

Table 9 – Regression Analysis. Standardized coefficients reported.
**p < 0.10, **p < 0.05, ***p < 0.01*

	Dependent variable: RoA Pre-tax									
	Model 6		Model 7		Model 8		Model 9		Model 10	
	Coefficients	t-value	Coefficients	t-value	Coefficients	t-value	Coefficients	t-value	Coefficients	t-value
MC practices										
Diagnostic	-0.042	-0.621	-0.046	-0.677	-0.037	-0.547	-0.039	-0.578	-0.040	-0.591
Interactive	-0.053	-0.839	-0.050	-0.783	-0.049	-0.776	-0.047	-0.725	-0.053	-0.829
Tightness	-0.006	-0.114	-0.013	-0.237	-0.016	-0.277	-0.017	-0.305	-0.014	-0.252
Diversity	-0.049	-0.900	-0.047	-0.864	-0.048	-0.887	-0.048	-0.878	-0.047	-0.858
Cost Control	-0.031	-0.585	-0.035	-0.650	-0.037	-0.690	-0.036	-0.676	-0.035	-0.665
Decentralization	0.049	1.057	0.052	1.099	0.049	1.040	0.049	1.037	0.048	1.024
Communication	0.076	1.515	0.071	1.405	0.065	1.297	0.063	1.267	0.065	1.294
Contextual factors										
Strategy	-0.048	-1.007	-0.039	-0.824	-0.040	-0.841	-0.040	-0.847	-0.041	-0.857
Technology	0.085	1.544	0.088	1.588	0.089	1.596	0.089	1.592	0.087	1.566
Interactions										
Strategy*Diagnostic										
Strategy*Interactive										
Strategy*Tightness										
Strategy*Diversity										
Strategy*Cost Control										
Strategy*Decentralization	-0.099	-2.181**								
Strategy*Communication			-0.038	-0.820						
Technology*Diagnostic					0.023	0.497				
Technology*Interactive							0.022	0.453		
Technology*Tightness									0.015	0.318
Technology*Diversity										
Technology*Cost Control										
Technology*Decentralization										
Technology*Communication										
Control variables										
Age	-0.096	-2.044**	-0.098	-2.071**	-0.100	-2.102**	-0.099	-2.082**	-0.100	-2.106**
Hierarchy	-0.036	-0.700	-0.049	-0.963	-0.051	-0.987	-0.051	-0.993	-0.050	-0.975
Employees	0.006	0.114	0.005	0.089	0.003	0.054	0.001	0.025	0.004	0.067
Norway							-0.048	-0.857		
Denmark	0.097	1.756*	0.085	1.554	0.041	0.707	0.040	0.690	0.085	1.541
Finland	0.045	0.895	0.043	0.841	-0.067	-1.338			0.043	0.852
Iceland	-0.044	-0.900	-0.041	-0.839	-0.048	-0.854	-0.066	-1.324	-0.042	-0.856
Manufacturing	-0.070	-1.378	-0.068	-1.337	-0.072	-1.420	-0.072	-1.413	-0.072	-1.417
Service										
Trade	-0.021	-0.407	-0.017	-0.328	-0.019	-0.370	-0.018	-0.343	-0.019	-0.353
R-square	0.060		0.052		0.051		0.051		0.051	
Adj. R-square	0.025		0.017		0.016		0.016		0.016	
F-value	1.714		1.474		1.450		1.447		1.441	
Sig.	0.034		0.094		0.104		0.105		0.107	

Table 9 (continued) – Regression Analysis. Standardized coefficients reported.
**p < 0.10, **p < 0.05, ***p < 0.01*

	Dependent variable: RoA Pre-tax									
	Model 11		Model 12		Model 13		Model 14		Model 15	
	Coefficients	t-value	Coefficients	t-value	Coefficients	t-value	Coefficients	t-value	Coefficients	t-value
MC practices										
Diagnostic	-0.035	-0.525	-0.041	-0.603	-0.040	-0.600	-0.041	-0.614	-0.041	-0.602
Interactive	-0.053	-0.831	-0.055	-0.861	-0.052	-0.828	-0.056	-0.882	-0.039	-0.592
Tightness	-0.014	-0.249	-0.017	-0.307	-0.015	-0.277	-0.012	-0.210	-0.010	-0.172
Diversity	-0.063	-1.127	-0.046	-0.850	-0.047	-0.874	-0.051	-0.937	-0.088	-1.565
Cost Control	-0.034	-0.644	-0.039	-0.731	-0.038	-0.709	-0.037	-0.689	-0.010	-0.188
Decentralization	0.046	0.981	0.047	0.995	0.044	0.929	0.055	1.175	0.054	1.135
Communication	0.064	1.274	0.064	1.287	0.060	1.181	0.083	1.604	0.094	1.795*
Contextual factors										
Strategy	-0.045	-0.942	-0.042	-0.882	-0.043	-0.896	-0.041	-0.862	-0.040	-0.822
Technology	0.070	1.224	0.083	1.488	0.085	1.528	0.092	1.654*	0.081	1.411
Interactions										
Strategy*Diagnostic									-0.090	-1.320
Strategy*Interactive									-0.003	-0.051
Strategy*Tightness									-0.025	-0.436
Strategy*Diversity									-0.034	-0.661
Strategy*Cost Control									0.141	2.382**
Strategy*Decentralization									-0.090	-1.848*
Strategy*Communication									-0.014	-0.286
Technology*Diagnostic									0.012	0.153
Technology*Interactive									0.069	0.915
Technology*Tightness									0.052	0.872
Technology*Diversity	-0.057	-1.184							-0.110	-1.978**
Technology*Cost Control			-0.029	-0.620					-0.044	-0.772
Technology*Decentralization					-0.032	-0.693			-0.050	-1.066
Technology*Communication							1.464	0.14	0.083	1.677*
Control variables										
Age	-0.103	-2.164**	-0.101	-2.122**	-0.101	-2.137**	-0.102	-2.152**	-0.094	-1.988**
Hierarchy	-0.053	-1.030	-0.049	-0.968	-0.050	-0.980	-0.053	-1.046	-0.050	-0.977
Employees	0.002	0.032	0.005	0.090	0.006	0.101	0.008	0.144	0.011	0.186
Norway									-0.045	-0.799
Denmark	0.080	1.447	0.086	1.559	0.045	0.771	0.088	1.601	0.058	0.994
Finland	0.044	0.867	0.040	0.779	-0.066	-1.316	0.045	0.888		
Iceland	-0.042	-0.865	-0.045	-0.919	-0.046	-0.819	-0.044	-0.908	-0.066	-1.311
Manufacturing	-0.069	-1.367	-0.071	-1.401	-0.074	-1.450	-0.072	-1.416	-0.076	-1.480
Service										
Trade	-0.017	-0.333	-0.015	-0.293	-0.017	-0.329	-0.017	-0.327	-0.034	-0.641
R-square	0.054		0.052		0.052		0.055		0.091	
Adj. R-square	0.018		0.016		0.016		0.020		0.031	
F-value	1.517		1.458		1.463		1.561		1.508	
Sig.	0.079		0.100		0.098		0.066		0.041	

Table 9 (continued) – Regression Analysis. Standardized coefficients reported.
**p < 0.10, **p < 0.05, ***p < 0.01*

The beta coefficient for "Communication" (0.094, $p < 0.1$) suggest that higher levels of communication has a positive effect on the companies RoA, but falls outside the scope of this thesis' research questions. On the contrary, the interaction terms provide valuable insights towards the objectives of this study. Hypothesis 5A postulates that companies that employ a defender strategy will benefit from greater use of cost control. The coefficient of the interaction term "Strategy*Cost Control" (0.141, $p < 0.05$) confirms this relationship in that high levels of strategy, which in our survey is characterizes by a defender strategy, and high levels of cost control is associated with positive effect on company performance. Hypothesis 6A stipulates that companies employing a prospector strategy are associated with a more positive effect on performance when applying more decentralization, than for companies employing a defender strategy. The coefficient for the interaction term "Strategy*Decentralization" (-0.090, $p < 0.1$) provides support for this relationship; companies with high levels of strategy (defenders) are experiencing a negative effect on performance relative to prospector companies. Hypothesis 7B hypothesizes that companies with high task uncertainty are associated with a more positive effect on performance than companies with low task uncertainty when adopting a more organic form of communication. High values in the "Technology" variable relates to low task uncertainty levels, while the high values in the "Communication" variable relate to organic communication. As such, a negative coefficient was predicted by this thesis' hypotheses. However, the regression results report the opposite relationship, with the interaction term "Technology*Communication" shows a positive coefficient of 0.083 ($p < 0.1$). Finally, hypothesis 4B claims that companies with high task uncertainty are expected to experience a more positive effect on performance relative to companies with low task uncertainty when adopting a more diverse measurement practice. The coefficient from the regression confirms this hypothesis with a negative coefficient (-0.110, $p < 0.05$), meaning that a greater use of measure diversity is negatively associated with low levels of task uncertainty.

The control variable "Age" reports statistically significant values. In all instances the coefficient is negative, varying slightly around –0.1. Thus, this thesis finds that age is negatively correlated with RoA as expected (Mata, 1994), meaning that as a company ages, it will be associated with demising returns. Additionally, although the exploratory ANOVA analysis found many differences regarding the configuration of MC practices regarding industry, no significant effect was found by the regression regarding performance.

Additionally, in Table 10 below, further models are carried out to examine the regression models' robustness. Overall, despite changing the specifications of the models, the results remain relatively consistent throughout the checks. As such, the robustness of the regression results is demonstrated, which indicates that the findings are not highly sensitive to the exact specifications used. Model 16 only contains MC and context variables, while control variables are added in model 17. A heavy increase when moving from model 16 to model 17 in adjusted R-squared can be observed, indicating that the control variables ensures a better fitted model when added. Thus, supporting the relevance of the control variables. In model 18, all interaction terms are added, so that it reminisces the main model 15, except that countries are removed as control variable. Here, we see that adding the interaction terms improve the model compared to model 17, but still provides lower explanation power compared to model 15. Models 19 and 20 removes strategy and technology interaction terms respectively. Neither models provide better adjusted R-squared values. However, it is noticeable that strategy interactions provide more explanation power than technology's interactions. Further models were carried out for checks of robustness (See appendices G, H, I and J) with a different dependent variable Return on Equity (RoE) and with means instead of factor scores construct values. All models provide largely similar results regarding both significance levels and coefficients. Similar to the regression in Table 9, increasing significance can be observed when adding variables.

The general level of the adjusted R-squared value in all models calls for concern. Thus, the final model 15 with RoA as dependent variable have an adjusted R-squared value of 0.031, explaining only 3.1% of the variance in RoA. Similarly, a model with a dependent variable of RoE, returns an adjusted R-squared value of 0.062, which is significantly lower than what is commonly reported by scholars (Chenhall, 2005; Chenhall et al., 2011; Bedford et al., 2016). The reasons for the low adjusted R-squared values might stem from RoA not being predicted very accurately by MC practises.

	Dependent variable: RoA Pre-tax									
	Model 16		Model 17		Model 18		Model 19		Model 20	
	Coefficients	t-value	Coefficients	t-value	Coefficients	t-value	Coefficients	t-value	Coefficients	t-value
MC practices										
Diagnostic	-0.047	-0.709	-0.040	-0.601	-0.032	-0.470	-0.058	-0.862	-0.024	-0.358
Interactive	-0.026	-0.415	-0.052	-0.817	-0.028	-0.422	-0.042	-0.655	-0.058	-0.890
Tightness	0.001	0.021	-0.015	-0.270	-0.010	-0.169	-0.009	-0.167	-0.014	-0.246
Diversity	-0.050	-0.939	-0.048	-0.880	-0.091	-1.615	-0.061	-1.126	-0.071	-1.272
Cost Control	-0.058	-1.114	-0.037	-0.692	-0.011	-0.205	-0.018	-0.343	-0.031	-0.575
Decentralization	0.058	1.247	0.048	1.019	0.059	1.236	0.052	1.106	0.050	1.048
Communication	0.091	1.887*	0.064	1.286	0.098	1.865*	0.082	1.609	0.079	1.528
Contextual factors										
Strategy	-0.032	-0.684	-0.042	-0.877	-0.045	-0.927	-0.041	-0.843	-0.041	-0.867
Technology	0.087	1.584	0.085	1.542	0.063	1.115	0.087	1.575	0.075	1.318
Interactions										
Strategy*Diagnostic					-0.083	-1.215	-0.075	-1.111		
Strategy*Interactive					-0.015	-0.236	-0.007	-0.120		
Strategy*Tightness					-0.029	-0.499	-0.032	-0.567		
Strategy*Diversity					-0.030	-0.570	-0.036	-0.700		
Strategy*Cost Control					0.141	2.369**	0.133	2.291**		
Strategy*Decentralization					-0.080	-1.657*	-0.084	-1.735*		
Strategy*Communication					-0.019	-0.388	-0.017	-0.361		
Technology*Diagnostic					0.008	0.102			0.020	0.264
Technology*Interactive					0.079	1.045			0.036	0.487
Technology*Tightness					0.056	0.936			0.060	0.993
Technology*Diversity					-0.121	-2.193**			-0.106	-1.907*
Technology*Cost Control					-0.042	-0.745			-0.060	-1.074
Technology*Decentralization					-0.045	-0.963			-0.042	-0.890
Technology*Communication					0.077	1.564			0.081	1.645*
Control variables										
Age			-0.100	-2.111**	-0.097	-2.081**	-0.089	-1.883*	-0.107	-2.249**
Hierarchy			-0.050	-0.975	-0.053	-1.034	-0.038	-0.738	-0.062	-1.203
Employees			0.004	0.069	0.032	0.589	0.014	0.245	0.004	0.077
Norway							-0.043	-0.772	-0.046	-0.818
Denmark			0.084	1.539			0.060	1.033	0.043	0.725
Finland			0.043	0.846						
Iceland			-0.043	-0.881			-0.071	-1.425	-0.063	-1.248
Manufacturing			-0.071	-1.409	-0.053	-1.052	-0.073	-1.425	-0.073	-1.434
Service										
Trade			-0.017	-0.325	-0.031	-0.591	-0.024	-0.461	-0.025	-0.475
R-square	0.024		0.051		0.080		0.074		0.066	
Adj. R-square	0.006		0.017		0.026		0.027		0.018	
F-value	1.332		1.523		1.473		1.589		1.392	
Sig.	0.217		0.082		0.058		0.039		0.103	

Table 10 - Regression Analysis, Robustness Check
**p < 0.10, **p < 0.05, ***p < 0.*

5.3. Profile Deviation Analysis

The analyses above have so far examined the bivariate interactions between MC practices and context. However, to address the third research question of this thesis, as well as the existing interrelationship between MC variables, a systems approach to fit needs to be taken. As such, the analysis will assess the applicability of the theoretical propositions made as a whole, in the context of smaller companies, while also taking existing interdependence of MC variables into account. The method to apply a systems approach has been labelled as profile deviation analysis (Van De Ven & Drazin, 1985; Gerdin & Greve, 2004). Misfit in this approach is measured based on the Euclidean distance from an ideal configuration, where high misfit should relate to low performance (Selto et al., 1995). The methodology proposed by Van De Ven & Drazin (1985) will be followed, similar to previous literature (Govindarajan, 1988; Selto et al., 1995; Kristensen & Israelsen, 2014). The section below will detail the step taken and the results of the analysis.

First, contextual factors are dichotomised into two parts, based on their median. This is done as profile deviation analysis is not conducted based on continuous variables, but rather "system states" (Gerdin & Greve, 2004). Thus, strategy is categorized as either prospector or defender and technology as either high or low.

Second, the ideal configuration state needs to be determined. Van De Ven & Drazin (1985) proposes two approaches to doing this. An empirical approach, where top performers' configuration is aggregated based on a mean and a conceptual approach, where the ideal state is derived based on theory. For this thesis, the conceptual approach is chosen for several reasons. First, choosing the top performers in the empirical approach has been argued to be arbitrary (Kristensen & Israelsen, 2014). Second, Govindarajan (1988) also discusses that in order to not bias the results, the top performers, which are used for the benchmark need to be excluded, as well as an equal number of low-performers in order to not bias the sample. Third, the use of empirically-derived optimal performance configurations might lead to a logical contradiction (Govindarajan, 1988). This could occur if the empirically derived means are not different across contexts, which relates to the assumption that no contingency relation exists. "To make such an assumption before a contingency hypothesis has even been tested introduces an analytical contradiction in the internal logic of empirically derived ideal profiles" (Govindarajan, 1988).

Third, the factor scores of the MC practices are brought to an equal scale ranging from -1 to 1. Based on the positive or negative association between MC and context, end points of the scale are used as ideal values (Govindarajan, 1988; Kristensen & Israelsen, 2014). As such, the ideal profile deviations are created based on the hypothesized association in the Hypothesis Development section and in accordance to Hypotheses 8A and 8B. Table 11 below provides an overview of the two configurations, based on the previously developed theoretical propositions.

MC Practice	Defender Strategy / Low Tech Uncertainty	Prospector Strategy / High Tech Uncertainty
Diagnostic	+1	-1
Interactive	-1	+1
Tightness	+1	-1
Diversity	-1	+1
Cost Control	+1	-1
Decentralization	-1	+1
Communication	+1	+1

Table 11 - Theoretically Derived Optimal MC Configurations

Finally, the Euclidean distance is computed between ideal profiles and each case. A high degree of misfit is expected to be associated with low levels of performance. As such, the distance of each case from the ideals is correlated to performance. A negative correlation indicates that moving away from the hypothesized fit relates to a negative effect on performance.

Context Type	N	Defender / Low Tech Uncertainty Configuration	Prospector / High Tech Uncertainty Configuration
Prospector	252	-	-0.110*
Defender	250	0.035	-
High Technology	251	-	-0.113*
Low Technology	251	0.078	-
Total	502	0.108**	-0.076*

Table 12 - Correlation of Distance Measure with Company Performance

Table 12 above reports the system approach's finding. As hypothesis 8A predicts, moving away from the theoretical ideal profiles for prospectors and high uncertainty companies is negatively correlated to performance. Company effectiveness negatively correlated with both prospector strategy and high technological uncertainty at -0.11 ($p < 0.1$). Hypothesis 8A is therefore confirmed.

However, no support was found for hypothesis 8B, with defender strategies having a correlation value of 0.035 (not significant) and low technological uncertainty – 0.078 (not significant). As such, moving away from the ideal profiles in those settings does not significantly relate to performance. Finally, as an additional analysis, the two ideal configurations used are correlated to the entire SME sample (regardless of contextual settings) in order to provide further clarity of the results. Findings indicate that SMEs' performance is generally negatively affected by moving away from Prospector strategies (correlation = 0.076, $p < 0.1$), and positively affected by moving away from defender strategies (correlation = 0.108, $p < 0.05$).

6. Discussion of Results

After the theoretical propositions of this thesis have been analysed and tested, this section will discuss the results on a conceptual level. Theoretical and practical contributions are made explicit, while also comparing the findings to existing literature. Also, possible explanations for the results are provided. Finally, limitations and possible future research are discussed.

6.1. Theoretical Contributions

One of the aims of this thesis is to provide clarity in regards to the actual MC practices used in SMEs. Based on the sample of 502 Nordic SMEs, this thesis has examined the existing MC configurations, the results of which can be found in tables 6, 7 and 8. As such, this study contributes to one of the largest quantitative studies in the field and answer calls made by previous researchers for empirical studies on actual use of MC practices (Armitage et al., 2016; Garengo & Bititci, 2007). The specific findings of the exploratory analyses and their comparison to previous SME literature is discussed below. Additionally, parallels are drawn to large company research with similar constructs.

In regards to performance measurement systems of SMEs, the results indicate an overall balanced system with none of its components at the extremes of the scale. The use of PMS in SMEs shows that interactive use of measures is more common than diagnostic. This contrasts the exploratory study done by Bedford & Malmi (2015), which examined a sample of 400 large companies and found that diagnostic controls was actually the more predominant. This is not surprising, as interactive control includes more informal, face-to-face control, as well as high involvement of top-management which is characteristic to smaller companies (Garengo et al., 2005; Ghobadian &

Gallear, 1997). In regards to tightness, companies also reported a level below that of larger companies (Bedford & Malmi, 2015) with focus on variance similar to that found by Armitage et al., (2016, p. 34). Interestingly, diversity of measurement seemed to be very divergent from existing SME research. It has been predominantly reported that smaller companies focus only on financial controls (Garengo & Bititci, 2007) due to their limited resources and capabilities, yet the exploratory results indicated a very balanced focus on almost all measurement dimensions. Furthermore, the results of this study shows that the SMEs in the sample have a higher measurement diversity than the larger companies reported by Bedford & Malmi (2015). However, the analyses do find support for Hudson's et al., (2001, p. 1105) statement that "dimensions of quality and time are critical to ensure that waste levels are kept low", as SMEs are capacity and resource constrained. As such, quality seems to receive the highest measurement focus. Finally, cost control seems to be at a relatively moderate level. As mentioned, most literature assumes that SMEs focus almost exclusively on financial information, which the results of the thesis' survey challenge. Although Hudson et al., (2001, p. 1105) argue that the financial dimension is "paramount" to SMEs, no support is found to exceptional focus put on cost controls.

The organizational structure of SMEs seems to be highly aligned with expectations. The findings suggest a very centralized, flat organization where communication is informal and free-flowing very similar to previous assertions (Garengo & Bititci, 2007; Ghobadian & Gallear, 1997). No support is found for Meijaard's et al., (2005, p. 89) claim that SMEs being centralized and informal is a "myth". Likewise, compared to similar studies that focus on larger companies, SMEs are more centralized and informal (Bedford & Malmi, 2015; Willert, 2016).

The exploratory analysis of contextual factors found that companies are leaning towards more prospector strategies. This is generally expected results as most small companies would not be able to efficiently compete with a defender strategy against large companies that utilize higher economies of scale, though their small size and overall structure allows them to be more innovative and less resistant to change (Ghobadian & Gallear, 1997). The results regarding the technological uncertainty of SMEs indicated a low uncertainty of tasks. Examining the individual items of the construct reveals that managers indicate that the cause-and effect of tasks is well understood. One reason for the low task uncertainty could be attributed to the combination of flat organizational structures (Table 5) and the high involvement of SME managers within the daily production

(Garengo et al., 2005). As such, similar to the Thompson-Tuden's (1959) model, what the survey could be measuring is what managers believe they know, not whether their beliefs are true. This is not necessarily wrong as Otley (2016) argues that this is the most relevant aspect for MC studies, yet it could be one possibility for why the thesis' results show low technological uncertainty.

Finally, the ANOVA analyses (Table 6 and 7) provided information on existing differences between country and industries. Overall no differences were found in MC practices between countries. However, contextual factors were different between each country. Industry differences in the sample also showed very significant differences in mostly all aspects examined. As such these differences hint towards the relevance of the two dimensions on SME's MC.

A second theoretical contribution of this thesis was examining the contingent association between contextual and MC practices in an SME context based on established MC frameworks. Thus calls made by Chenhall (2007) regarding the many opportunities in small-company MC research are answered, while also considering Otley's (2016) discussion on the need for comparability between results. Accordingly, this thesis contributes to existing literature with one of the most comprehensive analyses carried out on SMEs in contingency-based MC literature.

The findings of the thesis' regression analysis was generally consistent with existing studies. In regards to strategy, a positive interaction was found between defender strategies and cost control, which aligns with previous literature (Davila, 2000; Dent, 1990; Simons, 1987). This supports the intuitive proposition that SMEs that are more oriented towards cost reductions and efficiencies will be more positively associated with higher cost control. Additionally, a defender strategy is found to negatively moderate the effect of decentralization and performance which is also in line with existing findings (Govindarajan, 1988). This, therefore, provides evidence that even within an SME context, where decentralization levels are found to be especially low (see Table 5), defenders benefit from higher levels of centralization in organizations. Concerning task uncertainty, only one hypothesis could be confirmed from a total of 7. The regression confirms that broad measurement diversity is negatively moderated by low technological uncertainty, thus providing support for the relevance of existing MC theory on the topic (Abernethy & Brownell, 1997; Gul, 1991; Mia & Chenhall, 1994) for SMEs (though in bivariate, reductionist terms). Finally, the fourth significant result in the regression did not fit the hypothesis proposition of this thesis and it related to

communication levels and technological uncertainty. Previous literature argues that more task uncertainty requires more informal contact and free-flow of communication (Ditillo, 2004), yet the opposite was found. This contradicting result will be discussed further by examining the joint analyses output.

In regards to the controls used, this thesis confirms age as a relevant control dimension in line with existing researchers (Audretsch, 2001). The results show that older companies are negatively associated with high performance. This has been relatively well established in SME literature and results are in line with these proposed expectations. For example, Mata (1994) finds that very few companies pass their infancy stages, but the ones that do have a significantly higher performance than their older counterparts. Similarly, (Almus & Nerlinger, 1999) finds that mature and older companies have a relatively smaller growth rates in comparison to their younger peers. Thus, confirming age as a relevant aspect also adds support for the existing theory relating to young companies.

Third, this study adds to the emerging body of literature examining interdependence between MC practices and thus looks at fit at both an internal and external level. Additionally, while using a conceptual approach to profile deviation, the relevance of MC theory is assessed on a systems level (i.e. taking existing interrelations into account). On the holistic level, the system analysis additionally provided several interesting findings. Companies regarded as prospectors and companies with high task uncertainty seems to be associated with a negative performance effect when distancing from the theoretically proposed profiles of MC. This therefore provides evidence that for SME prospectors the overall pattern of MC practices in high performances is consistent with this thesis' hypothesized associations (Van De Ven & Drazin, 1985a). Unfortunately, it is "not possible to assign weights to individual variables, because the impact that variables have on performance is a function of all relations between contingency and structure variables *in the particular situation*" (Gerdin & Greve, 2004, p. 320). However, this does provide support that for the configuration of companies with prospector strategy and high-task uncertainty, the existing MC theory is fitting and relevant, while also taking interdependence of MC practices into account.

In contrast, no support was found for the fit between defender strategies / low-task uncertainty SMEs and their proposed optimal profile. As such, these results suggest that aligning MC to the theoretically suggested profile has no positive effects on company performance, for defenders or companies that operate in low technological uncertainty. Moreover, the results showed that moving away from defender / low-task uncertainty profile actually had a positive influence on SMEs, although statistically insignificant.

Going further in depth with these results, when the profile deviation analysis was applied to the whole sample, it was found that the defender / low task uncertainty configuration had an overall significantly negative effect for all SMEs. As such, these results could warrant a discussion of the relevance of "pure" defender / low-task uncertainty configurations in SMEs. Smaller companies are inherently exposed to higher risk than larger ones (Armitage et al., 2016; Hudson et al., 1999), with great amounts of smaller companies not being able to pass their early stages of development (Mata, 1994). Although not only limited to smaller companies, SMEs have predominantly more issues with resource availability (Hudson et al., 1999), which leads to a "lack of a monetary safety net to absorb the impact of short term fluctuations" (Hudson et al., 2001, p. 1105). Similarly, literature finds that SMEs generally rely on relatively limited number of markets, while also servicing a small amount of customers (Hudson et al., 2001) with a restricted access to human capital and competences (Ghobadian & Gallear, 1997). All these factors can therefore contribute to an inherent, underlying high uncertainty in SMEs, regardless of technology or strategy. This is not an entirely new perspective, as size has a long tradition of being treated as a contingency factors in MC literature (Chenhall, 2007). However, the results of this study could suggest that the environment related to small size could warrant control configurations equipped for handling high uncertainty, regardless of outcome measurability, task programmability or strategic directions. The defender / low task uncertainty profiles that were derived based on theory (predominantly based on large-company research), could be too rigid or inflexible for the Nordic SME context. As such, this study supports the conclusion of previous literature and suggests that a discrepancy could exists between theory and practice in an small company context (Sérgio et al., 2006). Naturally, more research is needed to verify these propositions as the configuration approach used provides a very general view with low specificity, though it paves the way for more detailed examinations.

Finally, this study contributes to existing research by being one of the few to combine both bivariate and multivariate analysis. By combining the two analyses, it is argued that the results of this study provide complementary information, which would not have been clear if reliance on only one approach was chosen and does as such provide support for Van De Ven & Drazin (1985) and Govindarajan's (1988) claims.

The methodological approach to examining contingency relations in this thesis follows Van De Ven & Drazin's (1985) calls to combine both systems and Cartesian approach. They compare the results of systems and Cartesian approach to predict more salient predictors of performance by transferring the more detailed results of regressions to the more general results of the profile deviation. However, in this thesis, a choice is made to take a more conservative stance when interpreting the combined results of the two analyses. Despite the notion that an "interaction approach can therefore supplement and further specify the findings of the more general systems approach" (Van De Ven & Drazin, 1985a, p. 523) is considered suitable, several reservations must be examined and made explicit before continuing with the discussions. More specifically, the claim that weights based on the regression analysis can be compared to the profile deviation analysis is not supported in this thesis. The results of a moderated regression provide information on the relationship between constructs, while the profile deviation – on their optimal values (Gerdin & Greve, 2004). As such, a regression coefficient cannot be used to predict that the highest level of a particular MC practice would lead to the highest performance (Moers & Hartmann, 1999), but rather that for higher values of Z, X has a more positive effect on Y. Therefore the statement that "limited resources should be allocated to the most critical […] relationships" (Van De Ven & Drazin, 1985a, p. 523) of the regression results, when both Cartesian and Configuration approach find fit, might be misdealing[12]. Similarly, Govindarajan (1988) states that companies should focus on matching the constructs predicted by the regression first, yet this implies a reductions approach. Hence, some companies might be negatively affected by aligning a MC value at a specific level even if it is matched appropriately with Z, because in the particular situation, that specific MC level might be simultaneously inappropriately matched with other MC practices. As such it becomes impossible to take a systems approach to fit and assign weights to individual elements, as MC practices differ in each situation (Gerdin & Greve, 2004, p. 320).

[12] Given that this implies the increase of the level of the MC practice.

Despite the discussion above, as previously mentioned, this thesis does provide support for the complementary information of the two analysis. As discussed, the regression analysis found that high communication is positively moderated by a low technological uncertainty. One possible explanation of this, hinted by the systems analysis, is that SMEs might be inherently uncertain and require more flexible MC practices. As such, although companies are characterized by low technological uncertainty, they still might require informal and organic communication to achieve high performance. More explicitly, the system approach results could be interpreted as indication of the omission of relevant contextual factors that lead to the top-performing "high uncertainty" configuration found in SMEs. Additionally, the systems results do provide some general information on the optimal level of MC. As discussed, no individual weight can be assigned to any MC practice. However, the output could caution practitioners towards assigning "low-uncertainty" levels to their MC. For example, despite defender strategy positively moderating the effect of cost control, the system approach provides a signal of caution against that, although on a very holistic, unspecific level.

6.2. Practical Contributions

The outcomes of this study have practical implications regarding the design of effective MC. Based on the profile deviation analysis, results suggest that managers should be cautious with designing their control systems in a very low (strategic and task) uncertainty oriented manner, although the general MC literature, which is focused on larger companies might recommend it. As such, SMEs could benefit from investigating the use of MC systems that are geared for more uncertain environments that might align with their inherent uncertainty. A further contribution is the finding that SMEs with high strategic and task uncertainty benefit from aligning with MC contingency theory, even when interdependencies within MC is considered. Additionally, the bivariate analysis found alignment between defender strategy and higher levels of cost control and centralization, as well as low technological uncertainty and narrow measures, which might guide MC design. Finally, despite not being the focus of the study, organic communication in SMEs was found to be overall positively associated with performance, which could indicate managers should focus on free flow of information, and informal and open interactions.

6.3. Limitations

Survey

During the thesis, several choices have been made, causing some limitations to the results derived. Thus, when deriving results from surveys, one must recognize the inherent implication that cross-sectional data cannot be applied for test of causation as they present a snapshot of reality. Hence, the results must only be interpreted as associations and can therefore not necessarily be applied to other companies. To examine such causation relationships, further case studies need to be applied to test possible cause/effect relationship from this thesis. Furthermore, the nature of surveys imply that self-reported measures are used. As these are subjective evaluations and were only answered by managers, they might be subject to bias. Comparable research containing the answers of employees on different hierarchical levels would assist improving the understanding of these issues. Additionally, another limitation to this study is that the SME sample was not chosen at random and all available companies were contacted, which could lead to a selection bias.

Theoretical

An inherent issue of contingency theory is how to combine contingencies with conflicting recommendations (Otley, 2016). As such, different contextual factors might advocate opposite applications of MC. Hence, the thesis examines each context construct's effect on MC individually to study each effect, yet a more sophisticated approach would be to study the combined interactions. Additionally, arguments can always be made to include more variables which are relevant to investigate (Arbnor & Bjerke, 2009). A limitation of this thesis is hence that contextual factors such as PEU, regulatory/economic differences, etc. have not been included, yet might have significant effects on MC. Similarly, not all MC practises in the MC package were included, such as compensation, procedures, rules and organizational culture. Finally, this thesis has focused on only examining prospectors and defenders as possible strategies, similar to Bedford et al., (2016). However, (Miles et al., 1978) propose a third option – analysers, that are in the middle of the continuum, yet because of lack of research on hybrid strategies, they were omitted from the analysis.

Methodological

As mentioned in the analyses section, the regression models' adjusted R-squared indicates a bad fit of the model. Hence, as the explanation power of the of dependent variable by the independent variables is low, the interpreted results might be inaccurate. Likewise, the multivariate analysis carried out, has certain limitation. First, altering continuous variables as strategy and technology to dichotomous diminishes the level of detail in them as every value above or below the mean is now considered equal. Second, the optimal model is set at the extreme values of -1 and 1, which might not be precise, yet no alternative is available (Kristensen & Israelsen, 2014). Consequently, the approach provides a very general indication of whether the theoretical propositions are correct, but no information is gathered on the actual SME configurations. Additionally, by taking this statistical approach, a cross-over interaction assumption is inherently assumed. Finally, two constructs had unsatisfactory loadings in their chosen items, which could have adverse effect on their reliability. In particular, while the thesis choses to follow Bedford & Malmi's (2015) operationalization of strategy, a dichotomous strategy construct might be more suited as issues with loadings would have been avoided.

6.4. Future Research

Following the non-significance results within defenders presented in this thesis, a need for further investigation of defenders' MC configurations is noted. As the systems approach to configuration is of very general nature and only claiming correlation, this thesis calls for further research with higher levels of specificity. Furthermore, as mentioned in the limitations, simultaneous examination of strategy and technology is needed to investigate the cumulative effects of the two contextual factors. Additionally, research in this thesis examined a small portion of the MC package. The future inclusion of more MC variable will provide a clearer picture of the MC configurations of SMEs. Finally, the research on MC from a contingency perspective in SMEs lacks systematic approach. As such, future research should focus on the comparability of results and attempt a more systematic way of examining constructs and contextual factors by utilizing the MC frameworks available (for example, Ferreira & Otley, (2009); Malmi & Brown (2008); Simons (1995)).

7. Conclusion

The aim of this thesis has been focused on enriching our understanding of SMEs. Despite the many arguments supporting smaller companies' relevance from both an economic and social perspective, a clear gap was identified in relation to the existing empirical research of how SMEs control employee behaviour and decision making and make sure those are aligned with the organization's objectives and goals. This thus motivated the first research question of the thesis – "How are management control practices configured in SMEs?". Second, most research that examined SME's control practices are focused on the applicability of MC only in relation to size. As such, contingency factors with long tradition in MC like strategy and technology (Chenhall, 2007; Otley, 2016) are usually omitted, which could lead to erroneous findings (Grabner & Moers, 2013). Therefore the second and third research question of the paper was formulated – "how do the MC practices that we've identified interact with the organisational strategy and technology to affect performance?", which focused on standard bivariate analysis with high specificity and "do SMEs that are aligned with a theoretically derived optimal MC configuration achieve higher performance than others?", which focused on multivariate analysis and configuration approach to fit, which takes into account interdependencies of MC practices and provides a more holistic approach. To answer these questions a survey was administered in 5 Nordic countries – Denmark, Finland, Iceland, Norway and Sweden, which resulted in a sample amounting to 502 companies. Afterwards, a total of 16 hypotheses were tested using regression analyses and profile deviation analysis.

The results of this thesis contribute to existing literature in several ways. First, and relating to the first research question, this study provides one of the largest exploratory analyses in the field. MC practices, contextual factors and general characteristics of the company are detailed and examined on a Nordic, country and industry level. As such, this study is one of the few to present actual MC practices used in regards to performance measures and organizational structure in SMEs. Second, though with a very low explanatory power, three bivariate hypotheses are confirmed. Namely, this paper finds that defenders are positively associated with high emphasis on cost control and low decentralization levels, while companies with low technology uncertainty are positively associated with narrow measurement diversity. Third, the systems approach analysis yielded one approved hypothesis. Specifically, it was found that companies that are following a prospector strategy or have high technological uncertainty are negatively affected from moving away from a theoretically derived optimal MC configurations, as such confirming the relevance and applicability of MC

theory in a high-uncertainty context (both strategic and technological) and within a systems context. The rejected hypothesis in the system approach also yielded noteworthy findings. Namely, it was found that companies aren't affected negatively by moving away from the optimal low-uncertainty configuration. This therefore has both theoretical and practical contributions in relation to MC theory relevance in SMEs and for design considerations by practitioners. Fourth, this thesis contributes to the discussion of whether combining bivariate and multivariate analysis yields useful information. It is believed that the two provide complementary information on both broad and specific level and could supplement each other. Finally, this paper contributes to literature by being the first to frame its analysis and discussion around Malmi & Brown's (2008) framework, which could help facilitate a more systematic and comparable literature in the SME field.

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10. Appendix A – Summary of Journals Used for Hypothesis Development

Journal / Book Name	N
Accounting, Organizations and Society	26
Management Accounting Research	6
Accounting and Business Research	3
Academy of Management Journal	3
Strategic Management Journal	3
Accounting & Finance	2
Administrative Science Quarterly	2
Management Science	2
American Sociological Review	2
Issues in Accounting Education	1
Accounting Review	1
Long Range Planning	1
The management of innovation	1
Handbooks of Management Accounting Research	1
Advances in Accounting	1
Organizational Behaviour and Human Performance	1
Organization design	1
Organization Studies	1
Journal of Accounting Research	1
Accounting and human behaviour	1
Contract Economics	1
Computational & Mathematical Organization Theory	1
Information and Management	1
Personnel Economics in Practice	1
Journal of Accounting & Organizational Change	1
Academy of Management Review	1
The Accounting Review	1
Organizational analysis: A sociological view	1
Journal of Management	1
Levers of Control	1
Operations and Process Management: principles and practice for strategic impact	1
Accounting for Decision Making and Control	1

11. Appendix B – Survey[13]

Company Characteristics

Please indicate the category that best describes the type of industry in which your company operates:

(1) ❑ Manufacturing

(2) ❑ Service

(3) ❑ Wholesale / Retail Trade

(4) ❑ Other (Please specify) _____

Please indicate the number of people employed in your company:

____

Organizational Structure

The following questions relate to distribution of decision rights within your company.

Please indicate the number of hierarchical levels in your company:

____

To what extent has authority been delegated for each of the following classes of decisions? (Please rate actual, rather than stated, authority)

	Top Management has all influence	Top Management has most influence	Top Management has more influence	About the same	Employees have more influence	Employees have most influence	Employees have all influence
Development of new products and services	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
The hiring and firing of managerial personnel	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Selection of large investments	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Resource allocations	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

[13] The survey below represents a "Print" format of the actual web-based survey. As such, the actual formatting differs.

	Top Management has all influence	Top Management has most influence	Top Management has more influence	About the same	Employees have more influence	Employees have most influence	Employees have all influence
Pricing decisions	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

Ways of communication in your company
The following questions relate to the characteristics of work-related communication.

Please indicate the extent to which you agree or disagree with the following statements:

	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
Control communication is typically communicated in a very open, informal manner	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
There is free flow of important operational information throughout the company	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
In general, the operating management philosophy in the company favours giving the most say to experts even if this means bypassing formal line	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

The content of work-related communication between top management and employees involves sharing of information and ideas, consultation

(1) ❑ Strongly disagree
(2) ❑ Disagree
(3) ❑ Somewhat disagree
(4) ❑ Neutral
(5) ❑ Somewhat agree
(6) ❑ Agree
(7) ❑ Strongly Agree

Operations and Processes
The following questions relate to the characteristics of your company's operations and processes.

Please indicate the extent to which you agree or disagree with the following statements:

	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
Standards of desirable performance for employees are well defined	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Result measures accurately show how well employees have performed	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Top management has several sources of objective data available that show how well employees are performing	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

Please indicate the extent to which you agree or disagree with the following statements:

	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
The actions employees take to achieve results are visible to top management	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Effective and ineffective employees can be distinguished by observing the actions they take	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
The relationship between the actions that employees take and the eventual outcomes are well known by top management	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

Organizational Strategy
The following questions are related to the strategic direction of your company.

Indicate the emphasis your company places on the following strategic priorities relative to your competitors:

	Very low	Low	Somewhat low	Moderate	Somewhat high	High	Very high
Low cost products/services	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Low Price	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Being first to market with new products/services	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Extensive range of products/services	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Rapid volume or product/service mix changes	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Experimenting with new products/services	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Providing high quality products/services	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Accurately meeting delivery agreements	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Providing effective after-sales services and support	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Providing fast delivery of products/services	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Superior customer services	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

Strictness of Performance Targets
The following questions relate to pre-established targets, which are set for employees of the top management team. These targets or goals may be financial (e.g., budget targets) or non-financial (e.g., customer-satisfaction).

To what extent are ...

	Very low	Low	Somewhat low	Neutral	Somewhat high	High	Very high
...employees' performance targets flexible once they have been set?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
...written explanations due to target variances required from employees?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
...employees' evaluations predominantly based on achievement of performance targets?	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

How frequently are employees consulted about performance target achievement?

(1) ❑ Very Frequently (Daily)
(2) ❑ Frequently
(3) ❑ Somewhat Frequently
(4) ❑ Moderately (Monthly)
(5) ❑ Somewhat Infrequently
(6) ❑ Infrequently
(7) ❑ Very Infrequently (Quarterly or longer)

Variety of Measures
The following questions are related to the extent to which different aspects of performance are being measured in your company.

To what extent does the top management team use cost control?

	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
Cost control systems monitor virtually all tasks in the company	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Company operations are controlled by analysing and reporting to top management variances between actual costs and expected costs	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Cost centres are used to a great extent in our company	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

To what extent are measures related to the following dimensions used to evaluate employee performance?

	Very low	Low	Somewhat low	Neutral	Somewhat high	High	Very high
Customer (e.g., market share, satisfaction, retention)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Employee (e.g., satisfaction, turnover, workforce development)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Operational Process (e.g., productivity, safety, cycle time)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Innovation (e.g., R&D, new product/service success)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

	Very low	Low	Somewhat low	Neutral	Somewhat high	High	Very high
Quality (e.g., product/service quality, defects, awards)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Social Responsibility (e.g., environmental compliance, community impact, public image)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

Use of Performance Measures

The following questions relate to the way performance measures are being used in your company.

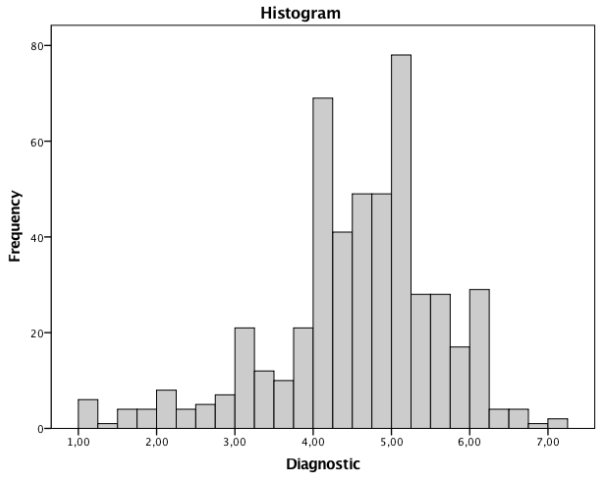
To what extent does the top management team use budgets or performance measures for the following:

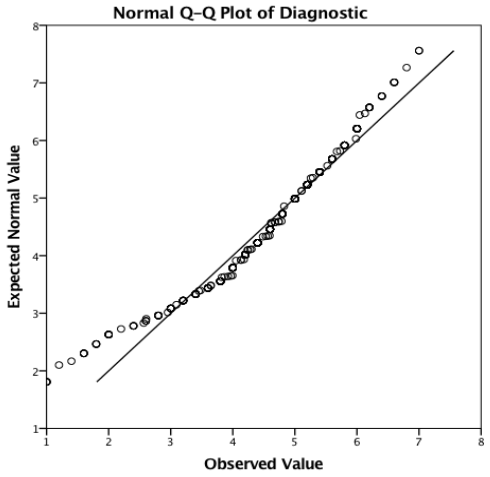
	Very low	Low	Somewhat low	Neutral	Somewhat high	High	Very high
Provide periodic agenda for top management activities	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Provide periodic agenda for employees' activities	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Enable continual challenge and debate of data, assumptions and plans with employees and peers	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Focus attention on strategic uncertainties (that is, factors that may invalidate current strategy or provide opportunities for new strategic initiatives)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Encourage and facilitate dialogue and information sharing with employees	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

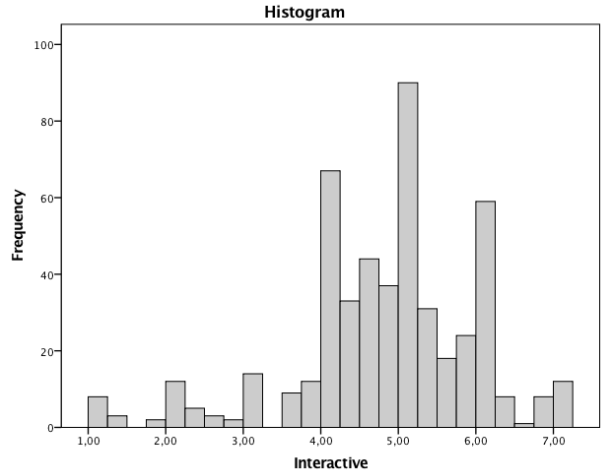
To what extent does the top management team use budgets or performance measures for the following:

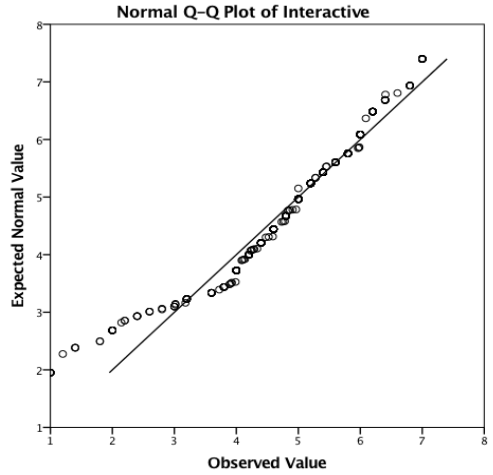
	Very low	Low	Somewhat low	Neutral	Somewhat high	High	Very high
Identify critical performance variables (that is, factors that indicate achievement of current strategy)	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Set targets for critical performance variables	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Monitor progress towards critical performance targets	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Provide information to correct performance target variance	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑
Review key areas of performance	(1) ❑	(2) ❑	(3) ❑	(4) ❑	(5) ❑	(6) ❑	(7) ❑

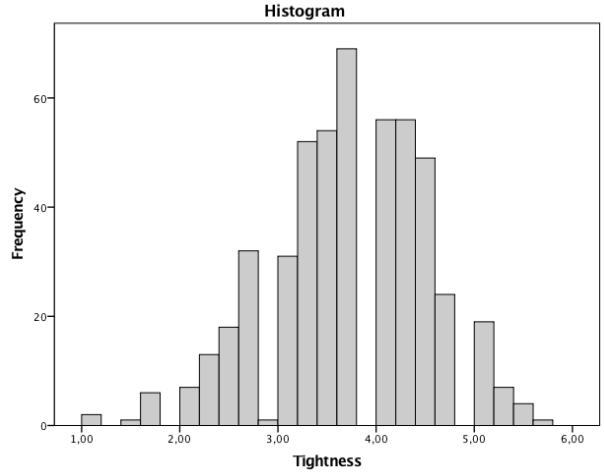
12. Appendix C – Histograms and Q-Q Plots, Non-Processed Data

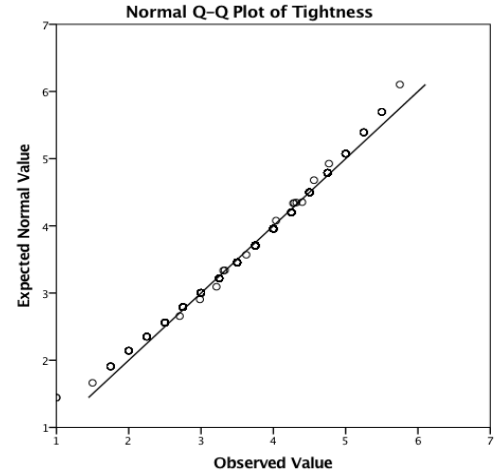


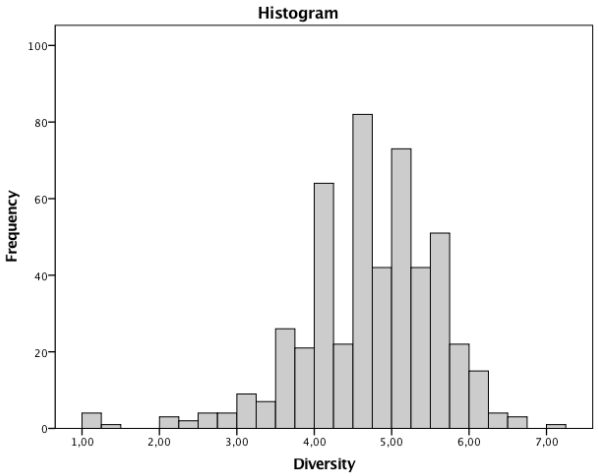


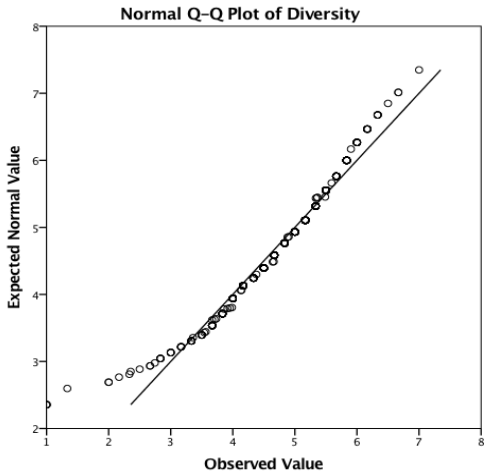


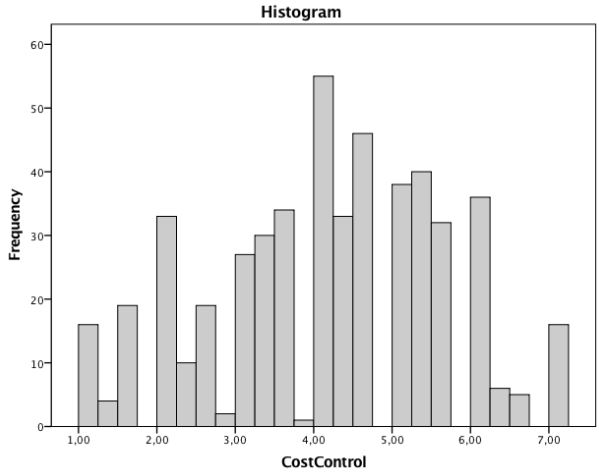


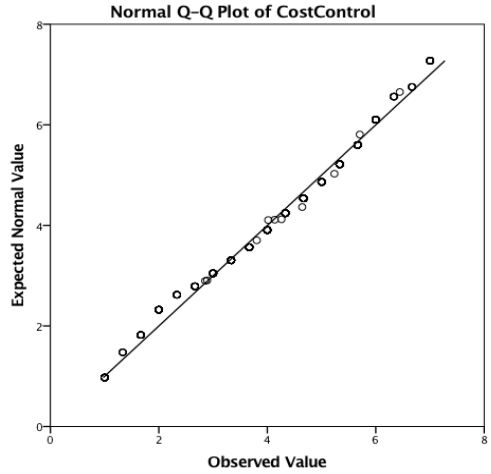


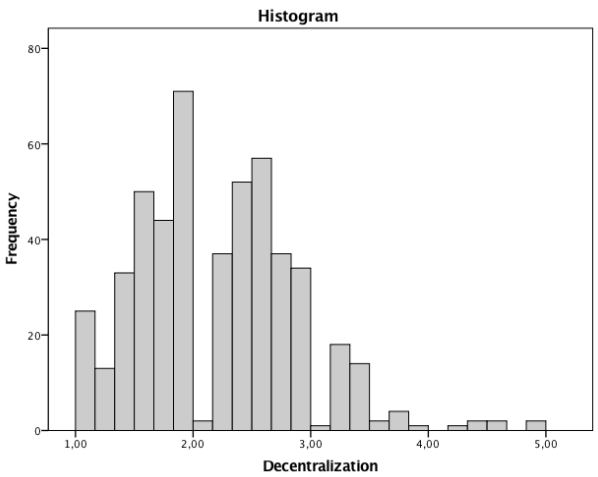


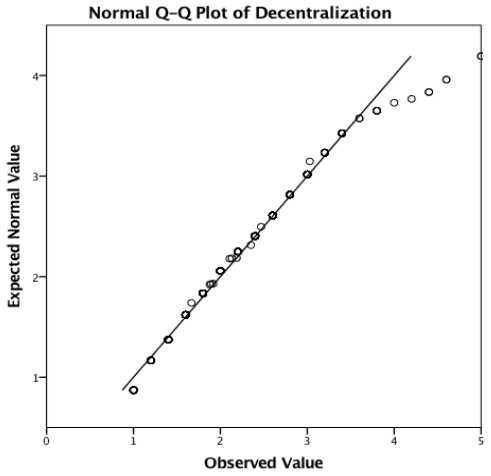

Histogram
Frequency
Diversity
100
80
60
40
20
0
1,00
2,00
3,00
4,00
5,00
6,00
7,00

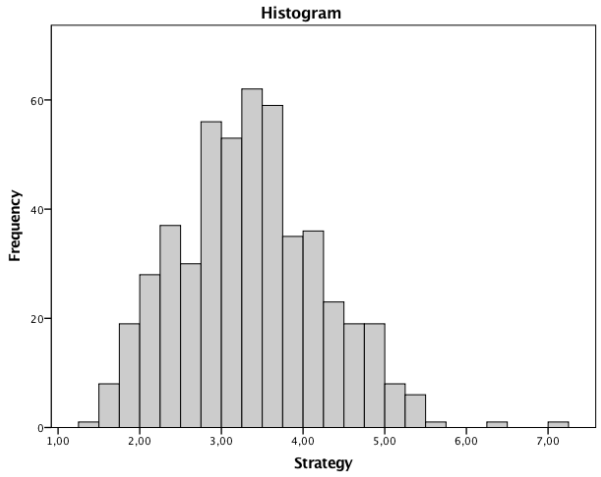

Normal Q-Q Plot of Diversity
Expected Normal Value
Observed Value
8
7
6
5
4
3
2
1
2
3
4
5
6
7
8

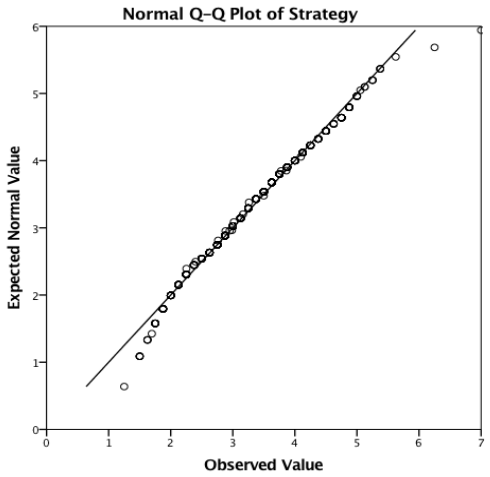

Histogram
Frequency
CostControl
60
50
40
30
20
10
0
1,00
2,00
3,00
4,00
5,00
6,00
7,00

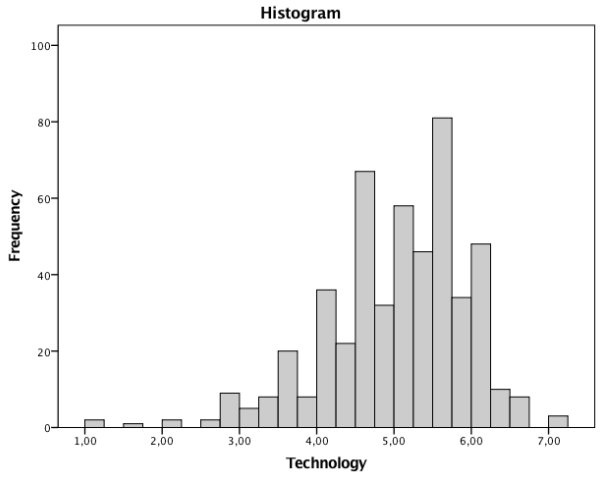

Normal Q-Q Plot of CostControl
Expected Normal Value
Observed Value
8
6
4
2
0
2
4
6
8

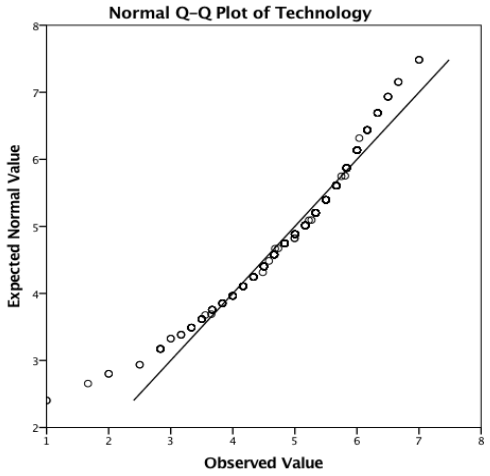

Histogram
Frequency
Decentralization
80
60
40
20
0
1,00
2,00
3,00
4,00
5,00

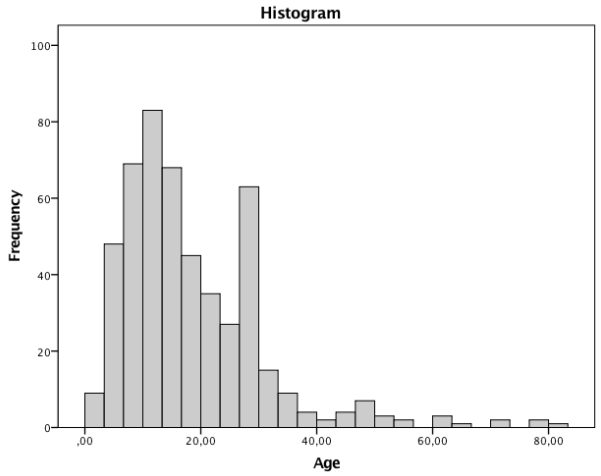

Normal Q-Q Plot of Decentralization
Expected Normal Value
Observed Value
4
3
2
1
0
1
2
3
4
5

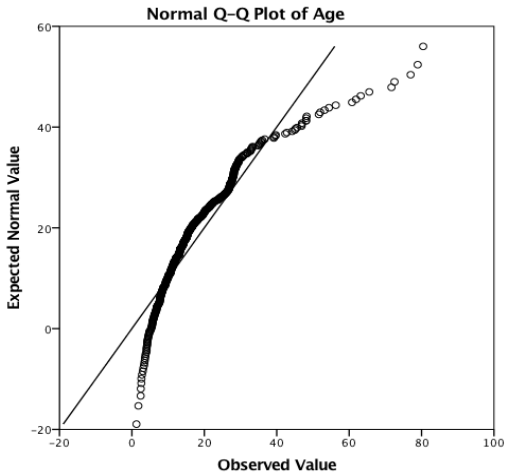

Histogram
Frequency
Strategy
1,00
2,00
3,00
4,00
5,00
6,00
7,00
0
20
40
60

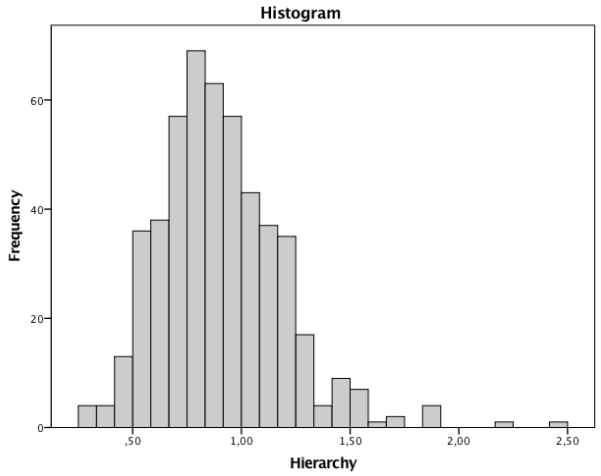

Normal Q-Q Plot of Strategy
Expected Normal Value
Observed Value
0
1
2
3
4
5
6
7

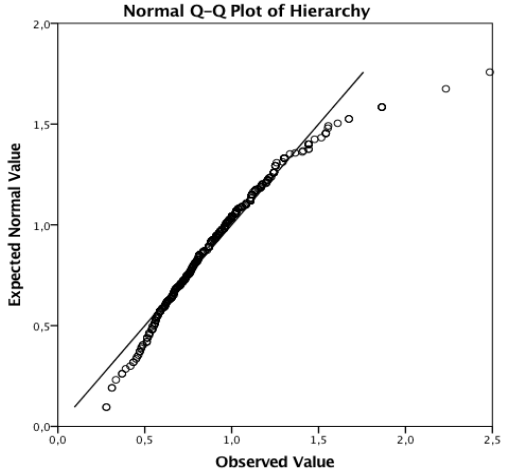

Histogram
Frequency
Technology
1,00
2,00
3,00
4,00
5,00
6,00
7,00
0
20
40
60
80
100

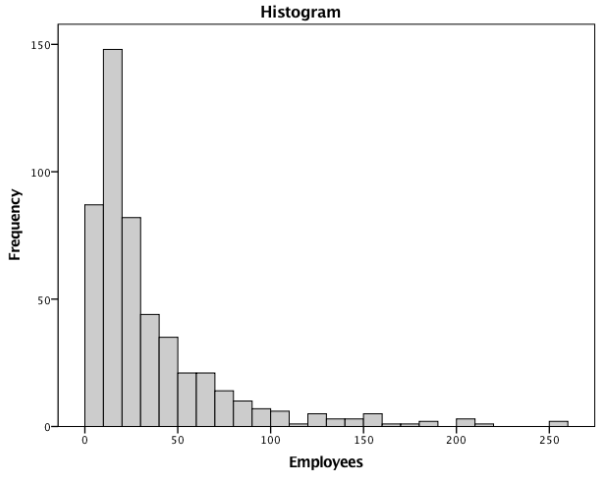

Normal Q-Q Plot of Technology
Expected Normal Value
Observed Value
1
2
3
4
5
6
7
8

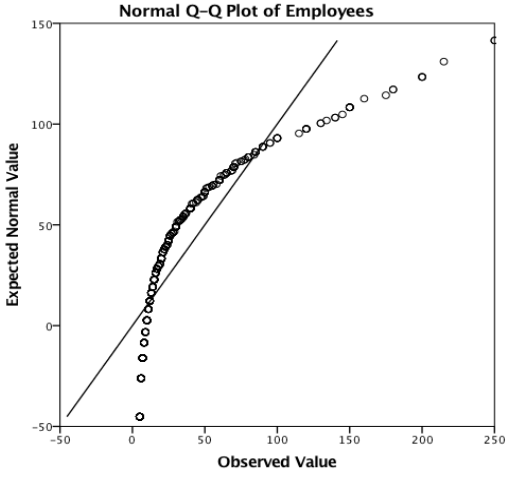

Histogram
Frequency
Age
,00
20,00
40,00
60,00
80,00

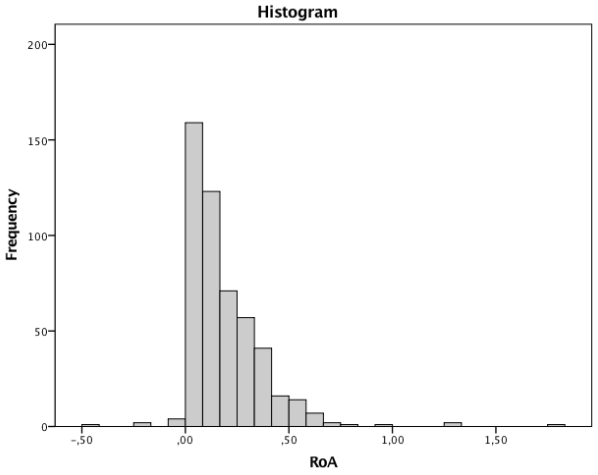

Normal Q-Q Plot of Age
Expected Normal Value
Observed Value

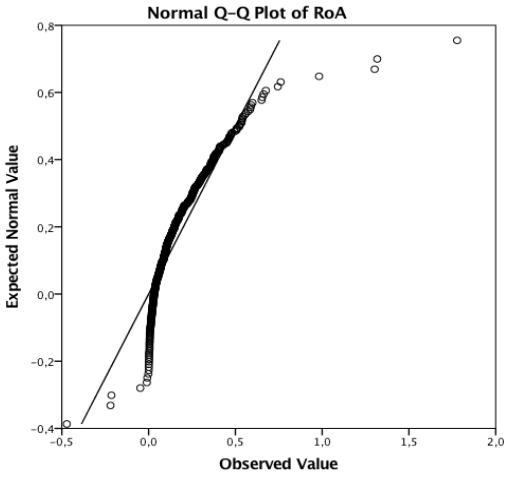

Histogram
Frequency
Hierarchy
,50
1,00
1,50
2,00
2,50


Normal Q-Q Plot of Hierarchy
Expected Normal Value
Observed Value

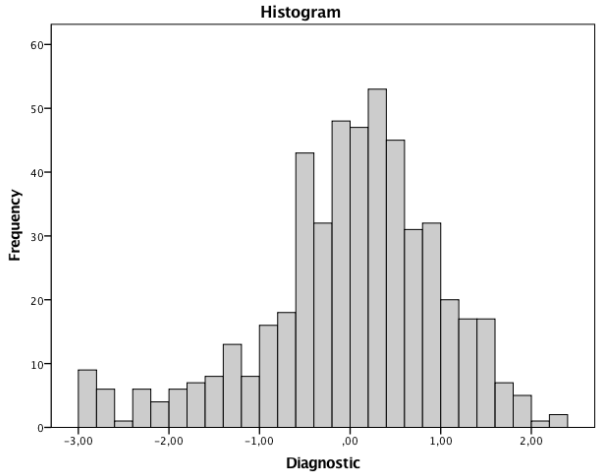

Histogram
Frequency
Employees

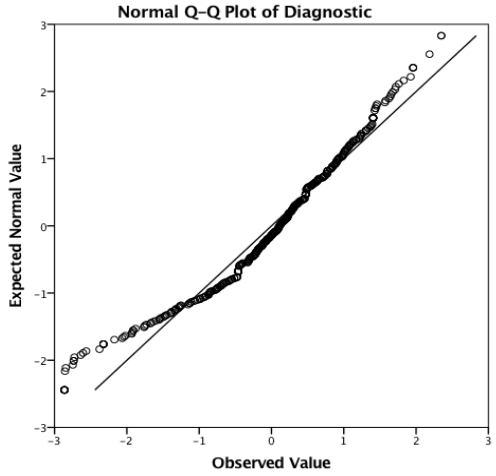

Normal Q-Q Plot of Employees
Expected Normal Value
Observed Value

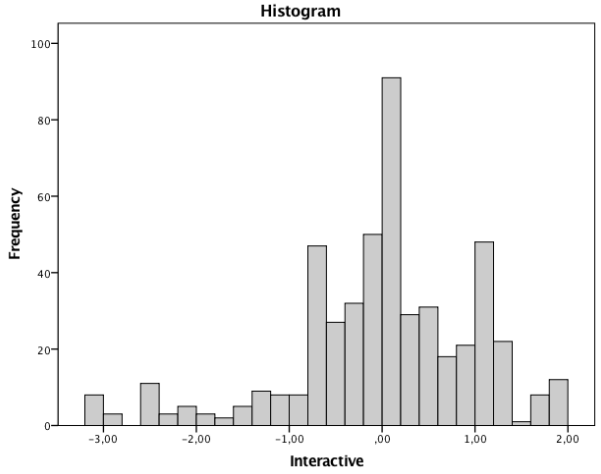

Histogram
Frequency
RoA
200
150
100
50
0
-,50
,00
,50
1,00
1,50

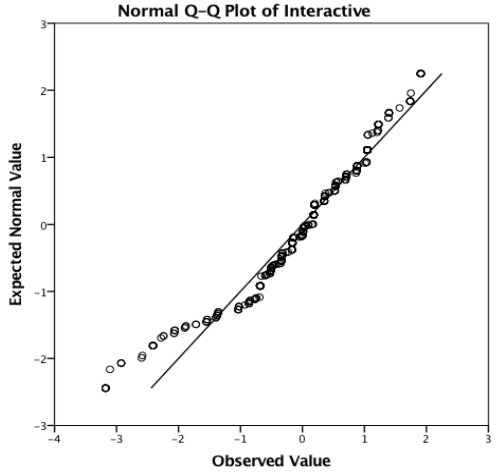

Normal Q-Q Plot of RoA
Expected Normal Value
Observed Value
0,8
0,6
0,4
0,2
0,0
-0,2
-0,4
-0,5
0,0
0,5
1,0
1,5
2,0

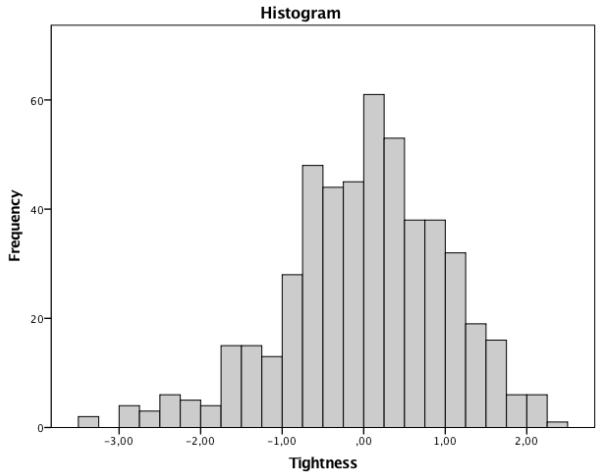
13. Appendix D – Histograms and Q-Q Plots, Processed Data

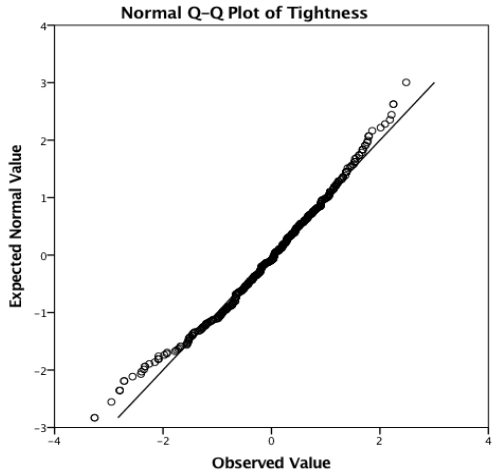


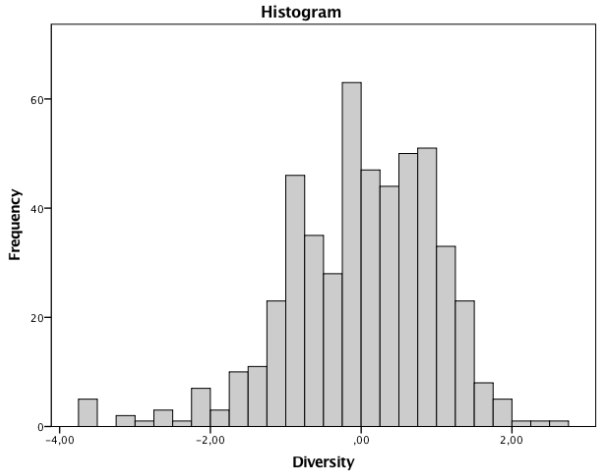


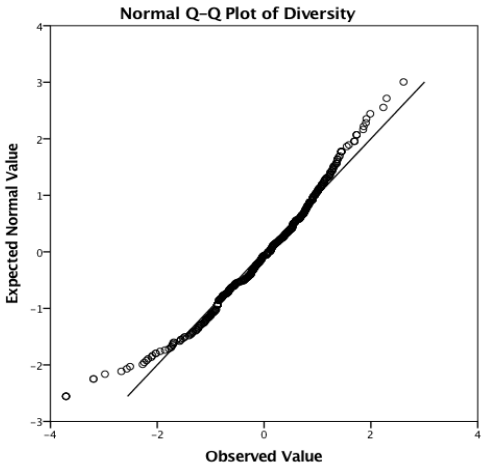


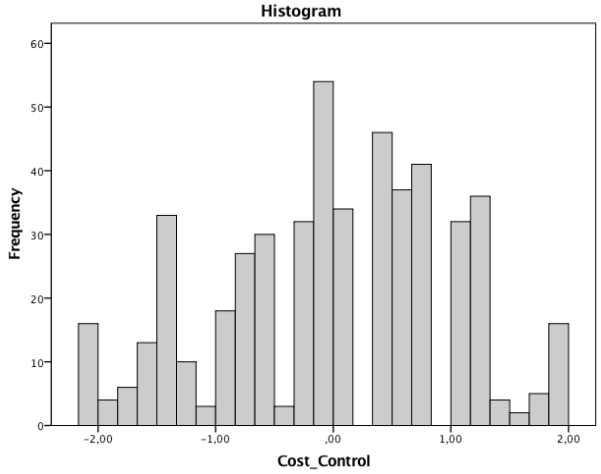


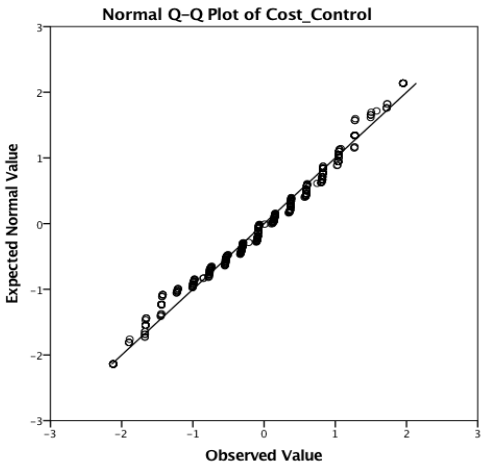


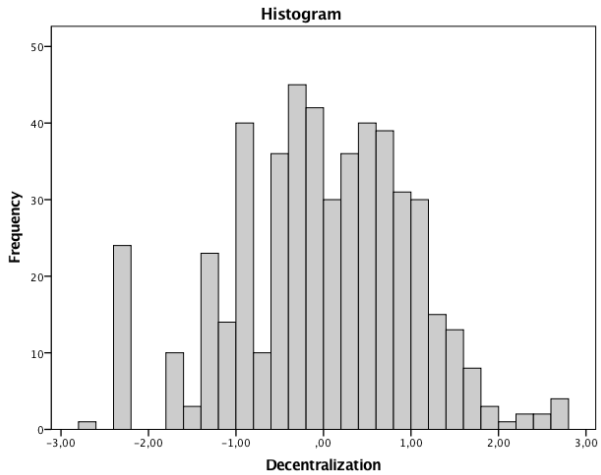


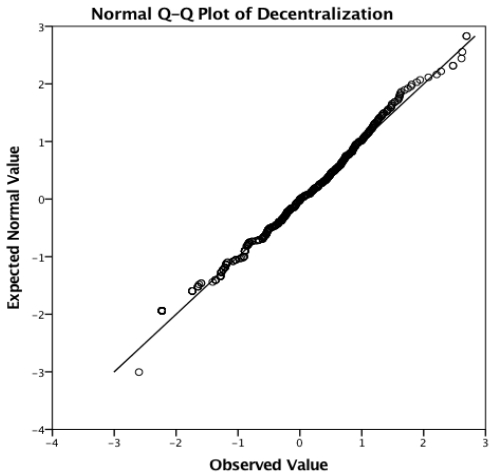

Histogram
Frequency
Diversity

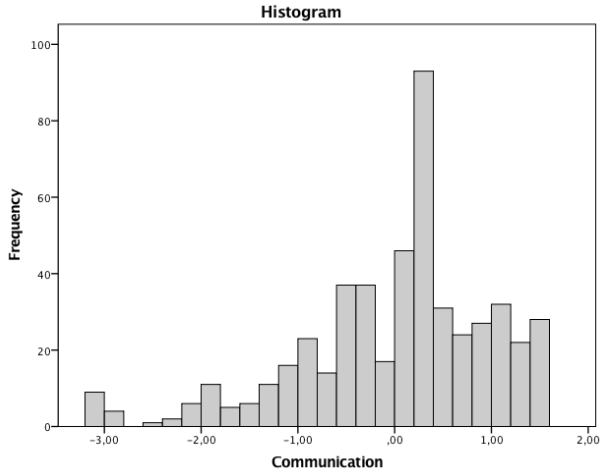

Normal Q-Q Plot of Diversity
Expected Normal Value
Observed Value

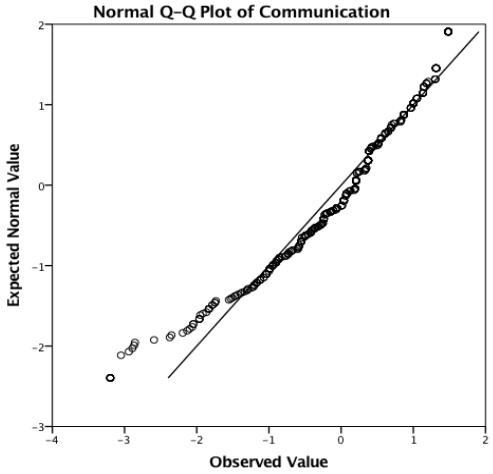

Histogram
Frequency
Cost_Control

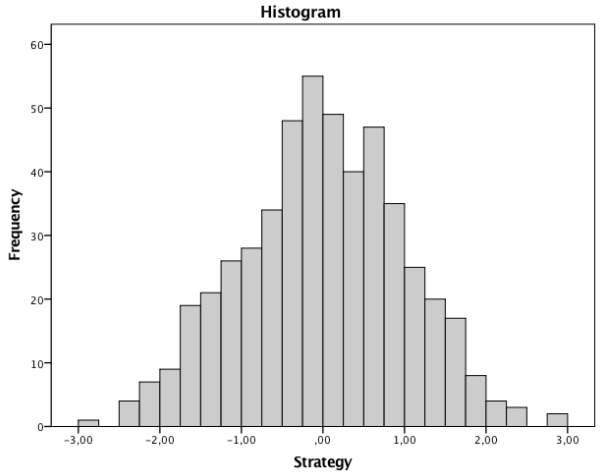

Normal Q-Q Plot of Cost_Control
Expected Normal Value
Observed Value

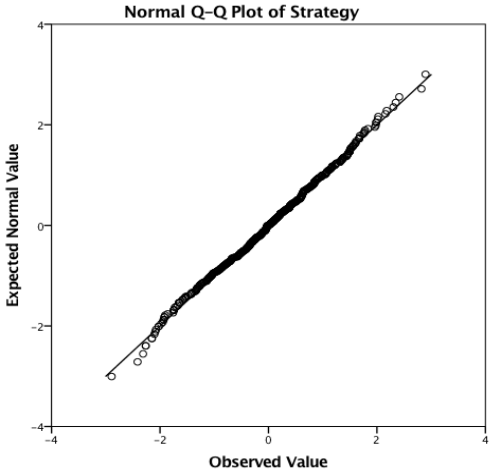

Histogram
Frequency
Decentralization

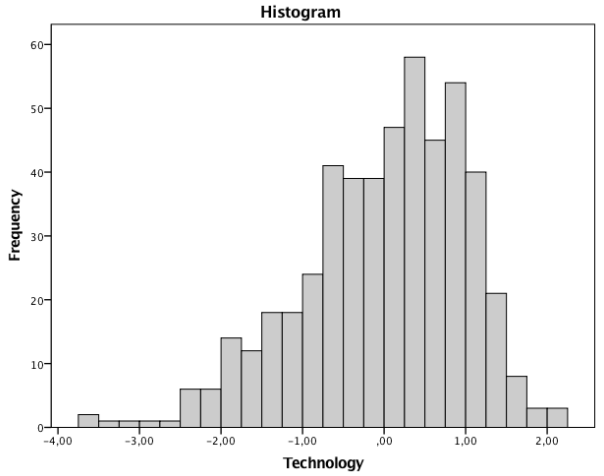

Normal Q-Q Plot of Decentralization
Expected Normal Value
Observed Value

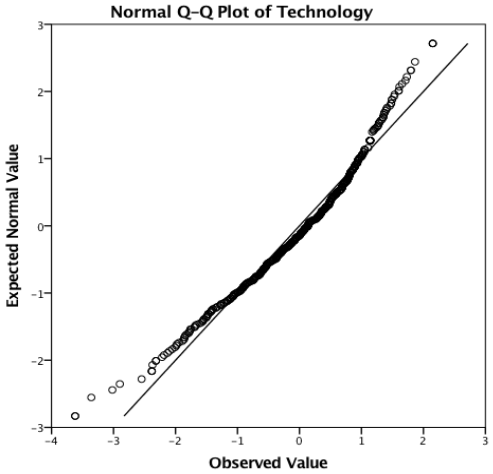

Histogram
Frequency
Communication

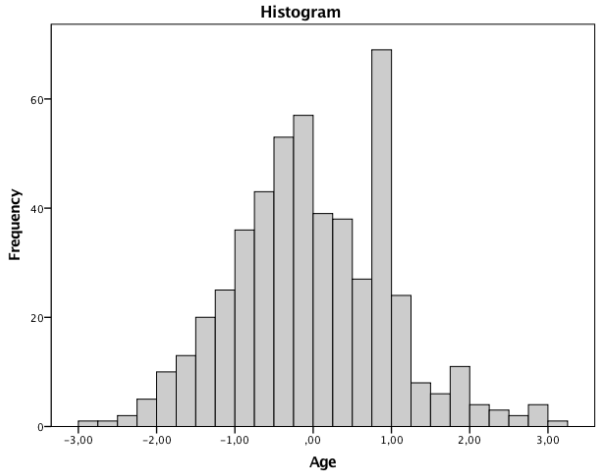

Normal Q-Q Plot of Communication
Expected Normal Value
Observed Value

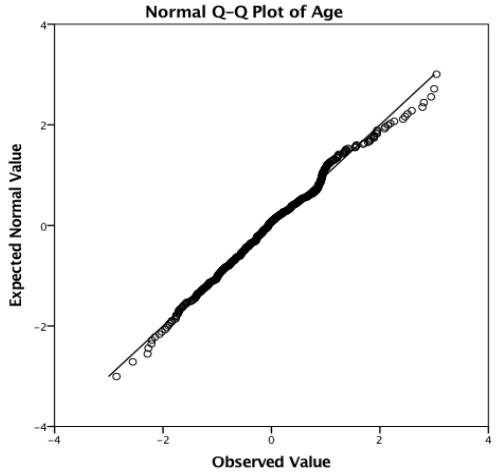

Histogram
Frequency
Strategy

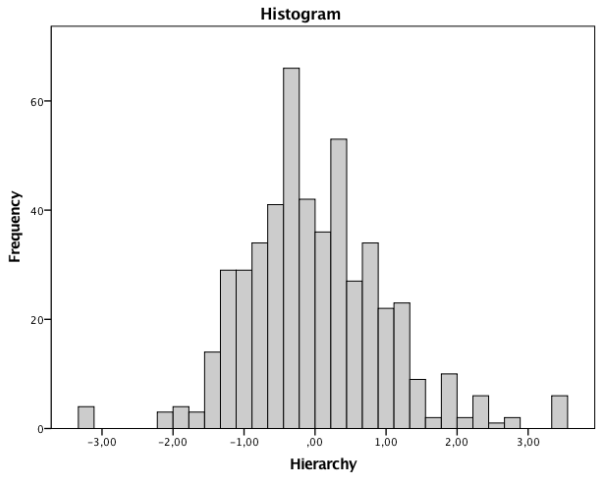

Normal Q-Q Plot of Strategy
Expected Normal Value
Observed Value

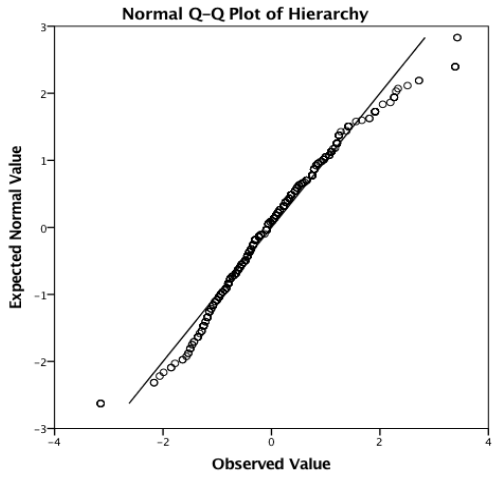

Histogram
Frequency
Technology

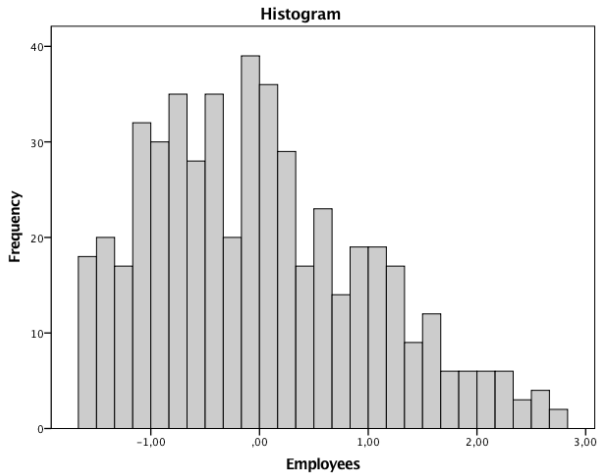

Normal Q-Q Plot of Technology
Expected Normal Value
Observed Value

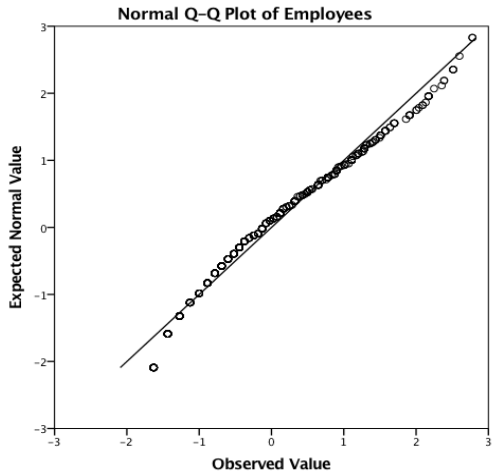

Histogram
Frequency
Age
-3,00
-2,00
-1,00
,00
1,00
2,00
3,00
0
20
40
60

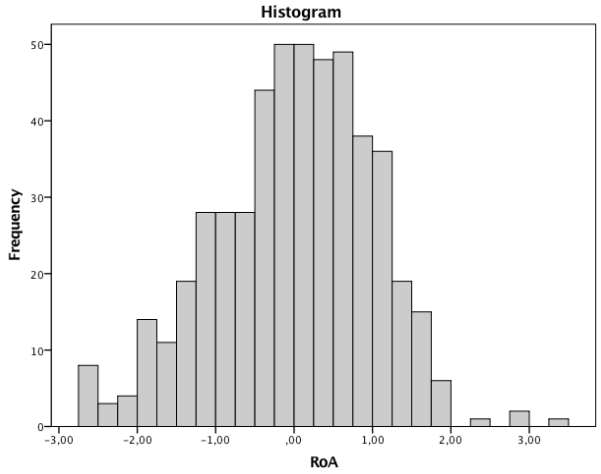

Normal Q-Q Plot of Age
Expected Normal Value
Observed Value
-4
-2
0
2
4

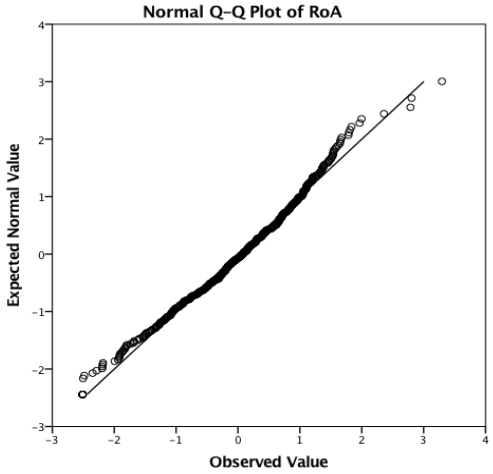

Histogram
Frequency
Hierarchy
-3,00
-2,00
-1,00
,00
1,00
2,00
3,00
0
20
40
60


Normal Q-Q Plot of Hierarchy
Expected Normal Value
Observed Value
-4
-2
0
2
4
-3
-2
-1
0
1
2
3


Histogram
Frequency
Employees
-1,00
,00
1,00
2,00
3,00
0
10
20
30
40


Normal Q-Q Plot of Employees
Expected Normal Value
Observed Value
-3
-2
-1
0
1
2
3


Histogram
Frequency
RoA
50
40
30
20
10
0
-3,00
-2,00
-1,00
,00
1,00
2,00
3,00


Normal Q-Q Plot of RoA
Expected Normal Value
Observed Value
4
3
2
1
0
-1
-2
-3
-3
-2
-1
0
1
2
3
4

14. Appendix E – Descriptive Statistics of Processed Data

						Skewness		Kurtosis	
	N	Min.	Max.	Mean	Std. Dev.	Statistic	Std. Error	Statistic	Std. Error
Diagnostic	502	-2,86	2,35	0,00	1,00	-0,736	0,109	0,741	0,218
Interactive	502	-3,18	1,91	0,00	1,00	-0,837	0,109	1,242	0,218
Tightness	502	-3,26	2,48	0,00	1,00	-0,424	0,109	0,345	0,218
Diversity	502	-3,71	2,61	0,00	1,00	-0,756	0,109	1,338	0,218
Cost Control	502	-2,12	1,95	0,00	1,00	-0,225	0,109	-0,632	0,218
Decentralization	502	-2,60	2,69	0,00	1,00	-0,199	0,109	-0,034	0,218
Communication	502	-3,20	1,48	0,00	1,00	-0,934	0,109	1,012	0,218
Strategy	502	-2,89	2,90	0,00	1,00	-0,050	0,109	-0,234	0,218
Technology	502	-3,62	2,15	0,00	1,00	-0,670	0,109	0,351	0,218
Age	502	-2,86	3,04	0,00	1,00	0,177	0,109	0,104	0,218
Hierarchy	502	-3,15	3,43	0,00	1,00	0,460	0,109	1,268	0,218
Employees	502	-1,63	2,78	0,00	1,00	0,475	0,109	-0,418	0,218

15. Appendix F – Descriptive Statistics of Items

Item	N	Minimum	Maximum	Mean	Std. Deviation	Percentiles		
						25	50	75
decent1	502	1,00	7,00	2,86	1,29	2,00	3,00	4,00
decent2	502	1,00	6,00	1,67	0,89	1,00	1,00	2,00
decent3	502	1,00	5,00	1,51	0,75	1,00	1,00	2,00
decent4	502	0,52	7,00	2,63	1,17	2,00	3,00	3,00
decent5	502	1,00	7,00	2,46	1,11	2,00	2,00	3,00
commun1	502	1,00	7,00	5,77	1,23	5,00	6,00	7,00
commun2	502	1,00	7,00	5,60	1,25	5,00	6,00	6,00
commun3	502	1,00	7,00	5,09	1,39	4,00	5,00	6,00
commun4	502	1,00	7,00	6,07	1,00	6,00	6,00	7,00
tech1	502	1,00	7,00	4,91	1,34	4,00	5,00	6,00
tech2	502	1,00	7,00	4,37	1,49	3,00	5,00	5,00
tech3	502	1,00	7,00	4,53	1,48	3,00	5,00	6,00
tech4	502	1,00	7,00	5,43	1,07	5,00	6,00	6,00
tech5	502	1,00	7,00	5,36	1,15	5,00	6,00	6,00
tech6	502	1,00	7,00	5,38	1,06	5,00	6,00	6,00
strat1	502	1,00	7,00	3,22	1,45	2,00	3,00	4,00
strat2	502	1,00	7,00	3,19	1,40	2,00	3,00	4,00
strat3	502	1,00	7,00	3,21	1,47	2,00	3,00	4,00
strat4	502	1,00	7,00	3,29	1,45	2,00	3,00	4,00
strat5	502	1,00	7,00	3,80	1,55	3,00	4,00	5,00
strat6	502	1,00	7,00	3,20	1,40	2,00	3,00	4,00
tight1	502	1,00	7,00	3,39	1,15	3,00	3,00	4,00
tight2	502	1,00	7,00	3,33	1,41	2,00	4,00	4,00
tight3	502	1,00	7,00	4,22	1,20	4,00	4,00	5,00
tight4	502	1,00	7,00	3,87	1,73	3,00	4,00	5,00
cost1	502	1,00	7,00	4,12	1,72	3,00	4,00	6,00
cost2	502	1,00	7,00	4,51	1,69	3,00	5,00	6,00
cost3	502	1,00	7,00	3,74	1,83	2,00	4,00	5,00
diverse1	502	1,00	7,00	4,73	1,44	4,00	5,00	6,00
diverse2	502	1,00	7,00	4,71	1,26	4,00	5,00	6,00
diverse3	502	1,00	7,00	4,72	1,21	4,00	5,00	6,00
diverse4	502	1,00	7,00	4,28	1,36	4,00	4,00	5,00
diverse5	502	1,00	7,00	5,47	1,08	5,00	6,00	6,00
diverse6	502	1,00	7,00	4,19	1,41	3,00	4,00	5,00
diag1	502	1,00	7,00	4,66	1,47	4,00	5,00	6,00
diag2	502	1,00	7,00	4,33	1,34	4,00	4,75	5,00
diag3	502	1,00	7,00	4,27	1,31	4,00	4,00	5,00
diag4	502	1,00	7,00	4,51	1,21	4,00	5,00	5,00
diag5	502	1,00	7,00	4,92	1,27	4,00	5,00	6,00
interac1	502	1,00	7,00	4,78	1,28	4,00	5,00	6,00
interac2	502	1,00	7,00	4,70	1,33	4,00	5,00	6,00
interac3	502	1,00	7,00	4,84	1,31	4,00	5,00	6,00
interac4	502	1,00	7,00	4,68	1,27	4,00	5,00	6,00
interac5	502	1,00	7,00	4,93	1,25	4,00	5,00	6,00

16. Appendix G – Regression on factor scores (RoA), Robustness Check

	Dependent variable: RoA Pre-tax											
	Model 21			Model 22			Model 23			Model 24		
	Coefficients	t-value	sig.	Coefficients	t-value	sig.	Coefficients	t-value	sig.	Coefficients	t-value	sig.
MC practices												
Diagnostic	-0,028	-0,406	0,69	-0,041	-0,607	0,54	-0,030	-0,439	0,66	-0,039	-0,571	0,57
Interactive	-0,038	-0,567	0,57	-0,033	-0,507	0,61	-0,030	-0,451	0,65	-0,028	-0,421	0,67
Tightness	-0,006	-0,113	0,91	-0,009	-0,158	0,88	-0,009	-0,162	0,87	-0,013	-0,226	0,82
Diversity	-0,096	-1,699	0,09	-0,090	-1,616	0,11	-0,091	-1,625	0,11	-0,084	-1,495	0,14
Cost Control	-0,010	-0,181	0,86	-0,010	-0,186	0,85	-0,011	-0,203	0,84	-0,012	-0,220	0,83
Decentralization	0,058	1,232	0,22	0,060	1,273	0,20	0,057	1,210	0,23	0,053	1,115	0,27
Communication	0,097	1,841	0,07	0,094	1,784	0,08	0,098	1,869	0,06	0,098	1,867	0,06
Contextual factors												
Strategy	-0,040	-0,820	0,41	-0,047	-0,971	0,33	-0,043	-0,875	0,38	-0,043	-0,885	0,38
Technology	0,071	1,240	0,22	0,079	1,381	0,17	0,063	1,113	0,27	0,065	1,145	0,25
Interactions												
Strategy*Diagnostic	-0,089	-1,298	0,20	-0,088	-1,284	0,20	-0,084	-1,227	0,22	-0,083	-1,209	0,23
Strategy*Interactive	-0,009	-0,145	0,89	-0,011	-0,174	0,86	-0,013	-0,208	0,84	-0,010	-0,162	0,87
Strategy*Tightness	-0,024	-0,416	0,68	-0,025	-0,434	0,66	-0,028	-0,491	0,62	-0,031	-0,546	0,59
Strategy*Diversity	-0,030	-0,569	0,57	-0,034	-0,650	0,52	-0,029	-0,561	0,58	-0,032	-0,612	0,54
Strategy*Cost Control	0,138	2,324	0,02	0,141	2,386	0,02	0,140	2,356	0,02	0,143	2,411	0,02
Strategy*Decentralization	-0,083	-1,709	0,09	-0,088	-1,821	0,07	-0,080	-1,650	0,10	-0,083	-1,705	0,09
Strategy*Communication	-0,018	-0,367	0,71	-0,018	-0,369	0,71	-0,018	-0,375	0,71	-0,015	-0,315	0,75
Technology*Diagnostic	0,007	0,087	0,93	0,012	0,155	0,88	0,007	0,093	0,93	0,010	0,133	0,89
Technology*Interactive	0,078	1,040	0,30	0,072	0,961	0,34	0,079	1,047	0,30	0,073	0,971	0,33
Technology*Tightness	0,057	0,951	0,34	0,057	0,950	0,34	0,056	0,926	0,36	0,051	0,850	0,40
Technology*Diversity	-0,121	-2,184	0,03	-0,111	-2,003	0,05	-0,122	-2,205	0,03	-0,116	-2,106	0,04
Technology*Cost Control	-0,039	-0,686	0,49	-0,049	-0,868	0,39	-0,040	-0,702	0,48	-0,042	-0,747	0,46
Technology*Decentralization	-0,047	-0,990	0,32	-0,053	-1,112	0,27	-0,045	-0,943	0,35	-0,045	-0,952	0,34
Technology*Communication	0,080	1,613	0,11	0,080	1,618	0,11	0,078	1,574	0,12	0,079	1,606	0,11
Control variables												
Age	-0,104	-2,218	0,03	-0,102	-2,181	0,03	-0,097	-2,078	0,04	-0,085	-1,806	0,07
Hierarchy	-0,053	-1,018	0,31	-0,054	-1,042	0,30	-0,053	-1,020	0,31	-0,051	-0,985	0,33
Employees	0,023	0,415	0,68	0,002	0,032	0,97	0,034	0,633	0,53	0,037	0,685	0,49
Norway	-0,055	-1,156	0,25									
Denmark				0,093	1,856	0,06						
Finland							0,015	0,326	0,75			
Iceland										-0,067	-1,442	0,15
Manufacturing	-0,061	-1,207	0,23	-0,071	-1,389	0,17	-0,053	-1,055	0,29	-0,058	-1,148	0,25
Service												
Trade	-0,036	-0,700	0,48	-0,044	-0,847	0,40	-0,029	-0,553	0,58	-0,020	-0,391	0,70
R-square	0,083			0,087			0,081			0,084		
Adj. R-square	0,027			0,031			0,024			0,028		
F-value	1,470			1,549			1,423			1,497		
Sig.	0,057			0,036			0,073			0,048		

17. Appendix H – Regression on means (RoA), Robustness Check

	Dependent variable: RoA Pre-tax														
	Model 1			Model 2			Model 3			Model 4			Model 5		
	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig
MC practices															
Diagnostic	-0,045	-0,693	0,49	-0,045	-0,691	0,49	-0,040	-0,623	0,53	-0,049	-0,764	0,45	-0,044	-0,681	0,50
Interactive	-0,045	-0,720	0,47	-0,042	-0,675	0,50	-0,048	-0,773	0,44	-0,050	-0,804	0,42	-0,041	-0,662	0,51
Tightness	0,023	0,431	0,67	0,021	0,401	0,69	0,018	0,334	0,74	0,022	0,412	0,68	0,021	0,395	0,69
Diversity	-0,069	-1,279	0,20	-0,067	-1,249	0,21	-0,066	-1,233	0,22	-0,073	-1,358	0,18	-0,068	-1,266	0,21
Cost Control	-0,047	-0,887	0,38	-0,049	-0,920	0,36	-0,047	-0,894	0,37	-0,039	-0,731	0,47	-0,050	-0,947	0,34
Decentralization	0,058	1,230	0,22	0,055	1,183	0,24	0,056	1,190	0,23	0,061	1,299	0,20	0,052	1,101	0,27
Communication	0,074	1,474	0,14	0,073	1,461	0,15	0,071	1,418	0,16	0,079	1,577	0,12	0,070	1,403	0,16
Context															
Strategy	-0,045	-0,918	0,36	-0,042	-0,870	0,39	-0,048	-0,979	0,33	-0,039	-0,804	0,42	-0,041	-0,835	0,40
Technology	0,092	1,671	0,10	0,092	1,662	0,10	0,092	1,659	0,10	0,099	1,792	0,07	0,092	1,669	0,10
Interactions															
Strategy*Diagnostic	-0,033	-0,741	0,46												
Strategy*Interactive				-0,014	-0,301	0,76									
Strategy*Tightness							-0,067	-1,505	0,13						
Strategy*Diversity										-0,064	-1,390	0,17			
Strategy*Cost Control													0,035	0,778	0,44
Strategy*Decentralization															
Strategy*Communication															
Technology*Diagnostic															
Technology*Interactive															
Technology*Tightness															
Technology*Diversity															
Technology*Cost Control															
Technology*Decentralization															
Technology*Communication															
Control variables															
Age	-0,096	-2,022	0,04	-0,098	-2,053	0,04	-0,094	-1,992	0,05	-0,097	-2,046	0,04	-0,100	-2,103	0,04
Hierarchy	-0,050	-0,976	0,33	-0,051	-0,983	0,33	-0,053	-1,029	0,30	-0,055	-1,058	0,29	-0,049	-0,958	0,34
Employees	0,006	0,100	0,92	0,006	0,103	0,92	0,008	0,137	0,89	0,010	0,172	0,86	0,006	0,105	0,92
Norway				-0,045	-0,799	0,43									
Denmark	0,088	1,600	0,11	0,044	0,763	0,45	0,082	1,503	0,13	0,087	1,594	0,11	0,084	1,545	0,12
Finland	0,042	0,817	0,42				0,040	0,777	0,44	0,041	0,795	0,43	0,040	0,784	0,43
Iceland	-0,040	-0,815	0,42	-0,064	-1,276	0,20	-0,045	-0,927	0,35	-0,043	-0,877	0,38	-0,044	-0,906	0,37
Manufacturing	-0,058	-1,145	0,25	-0,058	-1,148	0,25	-0,054	-1,067	0,29				-0,058	-1,149	0,25
Service										0,059	1,086	0,28			
Trade	-0,019	-0,350	0,73	-0,016	-0,309	0,76	-0,014	-0,272	0,79	0,036	0,649	0,52	-0,015	-0,280	0,78
Adj. R-squared	0,018			0,017			0,021			0,021			0,018		
F-value	1,503			1,476			1,604			1,584			1,506		
Sig. F	0,084			0,093			0,055			0,060			0,083		

	Dependent variable: RoA Pre-tax																	
	Model 5			Model 6			Model 7			Model 8			Model 9			Model 10		
	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig
MC practices																		
Diagnostic	-0,044	-0,681	0,50	-0,043	-0,662	0,51	-0,049	-0,761	0,45	-0,045	-0,701	0,48	-0,044	-0,687	0,49	-0,042	-0,646	0,52
Interactive	-0,041	-0,662	0,51	-0,047	-0,764	0,45	-0,041	-0,669	0,50	-0,043	-0,693	0,49	-0,042	-0,674	0,50	-0,047	-0,763	0,45
Tightness	0,021	0,395	0,69	0,021	0,393	0,70	0,021	0,384	0,70	0,021	0,388	0,70	0,018	0,342	0,73	0,017	0,316	0,75
Diversity	-0,068	-1,266	0,21	-0,067	-1,246	0,21	-0,066	-1,224	0,22	-0,066	-1,233	0,22	-0,066	-1,226	0,22	-0,062	-1,152	0,25
Cost Control	-0,050	-0,947	0,34	-0,042	-0,787	0,43	-0,043	-0,812	0,42	-0,045	-0,851	0,40	-0,045	-0,838	0,40	-0,044	-0,820	0,41
Decentralization	0,052	1,101	0,27	0,057	1,213	0,23	0,062	1,313	0,19	0,057	1,215	0,23	0,056	1,202	0,23	0,052	1,119	0,26
Communication	0,070	1,403	0,16	0,078	1,558	0,12	0,078	1,553	0,12	0,072	1,445	0,15	0,071	1,424	0,16	0,074	1,471	0,14
Context																		
Strategy	-0,041	-0,835	0,40	-0,052	-1,063	0,29	-0,042	-0,864	0,39	-0,042	-0,870	0,39	-0,042	-0,863	0,39	-0,041	-0,851	0,40
Technology	0,092	1,669	0,10	0,094	1,707	0,09	0,096	1,737	0,08	0,096	1,728	0,09	0,096	1,719	0,09	0,094	1,690	0,09
Interactions																		
Strategy*Diagnostic																		
Strategy*Interactive																		
Strategy*Tightness																		
Strategy*Diversity																		
Strategy*Cost Control	0,035	0,778	0,44															
Strategy*Decentralization				-0,065	-1,422	0,16												
Strategy*Communication							-0,057	-1,259	0,21									
Technology*Diagnostic										0,032	0,697	0,49						
Technology*Interactive													0,029	0,645	0,52			
Technology*Tightness																0,030	0,645	0,52
Technology*Diversity																		
Technology*Cost Control																		
Technology*Decentralization																		
Technology*Communication																		
Control variables																		
Age	-0,100	-2,103	0,04	-0,096	-2,038	0,04	-0,096	-2,037	0,04	-0,099	-2,081	0,04	-0,097	-2,056	0,04	-0,100	-2,113	0,04
Hierarchy	-0,049	-0,958	0,34	-0,044	-0,852	0,40	-0,052	-1,001	0,32	-0,051	-0,995	0,32	-0,051	-0,993	0,32	-0,050	-0,971	0,33
Employees	0,006	0,105	0,92	0,006	0,109	0,91	0,005	0,094	0,93	0,005	0,084	0,93	0,003	0,059	0,95	0,006	0,097	0,92
Norway													-0,045	-0,807	0,42			
Denmark	0,084	1,545	0,12	0,092	1,670	0,10	0,086	1,567	0,12	0,085	1,560	0,12	0,043	0,741	0,46	0,086	1,564	0,12
Finland	0,040	0,784	0,43	0,043	0,838	0,40	0,040	0,788	0,43	0,040	0,790	0,43				0,042	0,832	0,41
Iceland	-0,044	-0,906	0,37	-0,043	-0,878	0,38	-0,038	-0,781	0,44	-0,041	-0,841	0,40	-0,063	-1,265	0,21	-0,040	-0,811	0,42
Manufacturing	-0,058	-1,149	0,25				-0,052	-1,028	0,30	-0,058	-1,149	0,25	-0,058	-1,145	0,25	-0,059	-1,164	0,25
Service				0,062	1,142	0,25												
Trade	-0,015	-0,280	0,78	0,030	0,543	0,59	-0,016	-0,305	0,76	-0,020	-0,370	0,71	-0,017	-0,329	0,74	-0,019	-0,357	0,72
Adj. R-squared	0,018			0,021			0,020			0,018			0,018			0,018		
F-value	1,506			1,589			1,564			1,499			1,495			1,495		
Sig. F	0,083			0,058			0,065			0,085			0,086			0,086		

	Dependent variable: RoA Pre-tax														
	Model 11			Model 12			Model 13			Model 14			Model 15		
	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig
MC practices															
Diagnostic	-0,040	-0,620	0,54	-0,044	-0,680	0,50	-0,043	-0,672	0,50	-0,048	-0,748	0,46	-0,046	-0,709	0,48
Interactive	-0,043	-0,696	0,49	-0,045	-0,722	0,47	-0,044	-0,717	0,47	-0,045	-0,734	0,46	-0,051	-0,808	0,42
Tightness	0,020	0,378	0,71	0,021	0,393	0,70	0,023	0,428	0,67	0,031	0,567	0,57	0,007	0,134	0,89
Diversity	-0,071	-1,318	0,19	-0,066	-1,230	0,22	-0,066	-1,230	0,22	-0,068	-1,274	0,20	-0,078	-1,424	0,16
Cost Control	-0,048	-0,914	0,36	-0,050	-0,945	0,35	-0,050	-0,936	0,35	-0,048	-0,905	0,37	-0,025	-0,453	0,65
Decentralization	0,054	1,154	0,25	0,054	1,157	0,25	0,052	1,095	0,27	0,063	1,335	0,18	0,060	1,246	0,21
Communication	0,071	1,417	0,16	0,072	1,443	0,15	0,070	1,390	0,17	0,083	1,637	0,10	0,084	1,639	0,10
Context													0,093	1,646	0,10
Strategy	-0,044	-0,903	0,37	-0,043	-0,888	0,38	-0,043	-0,880	0,38	-0,044	-0,912	0,36			
Technology	0,084	1,498	0,14	0,091	1,636	0,10	0,092	1,653	0,10	0,092	1,674	0,10	-0,047	-0,939	0,35
Interactions															
Strategy*Diagnostic													-0,011	-0,168	0,87
Strategy*Interactive													-0,035	-0,561	0,58
Strategy*Tightness													-0,095	-1,827	0,07
Strategy*Diversity													-0,030	-0,588	0,56
Strategy*Cost Control													0,121	1,999	0,05
Strategy*Decentralization													-0,056	-1,139	0,26
Strategy*Communication													-0,061	-1,244	0,21
Technology*Diagnostic													0,039	0,578	0,56
Technology*Interactive													0,035	0,536	0,59
Technology*Tightness													0,051	0,989	0,32
Technology*Diversity	-0,041	-0,901	0,37										-0,102	-1,929	0,05
Technology*Cost Control				-0,020	-0,437	0,66							-0,032	-0,584	0,56
Technology*Decentralization							-0,022	-0,489	0,63				-0,043	-0,910	0,36
Technology*Communication										0,067	1,458	0,15	0,076	1,539	0,12
Control variables															
Age	-0,100	-2,109	0,04	-0,099	-2,088	0,04	-0,100	-2,105	0,04	-0,100	-2,107	0,04	-0,095	-1,991	0,05
Hierarchy	-0,052	-1,014	0,31	-0,050	-0,974	0,33	-0,050	-0,973	0,33	-0,054	-1,054	0,29	-0,066	-1,275	0,20
Employees	0,002	0,043	0,97	0,006	0,105	0,92	0,007	0,123	0,90	0,009	0,152	0,88	0,010	0,182	0,86
Norway							-0,095	-1,580	0,12				-0,094	-1,554	0,12
Denmark	0,081	1,486	0,14	0,086	1,568	0,12				0,088	1,603	0,11			
Finland	0,043	0,839	0,40	0,039	0,768	0,44	-0,045	-0,781	0,44	0,042	0,815	0,42	-0,055	-0,944	0,35
Iceland	-0,041	-0,836	0,40	-0,043	-0,877	0,38	-0,090	-1,804	0,07	-0,045	-0,917	0,36	-0,098	-1,930	0,05
Manufacturing	-0,056	-1,099	0,27	-0,057	-1,121	0,26	-0,059	-1,160	0,25						
Service										0,060	1,112	0,27			
Trade	-0,016	-0,304	0,76	-0,014	-0,272	0,79	-0,016	-0,300	0,76	0,034	0,621	0,54			
Adj. R-squared	0,018			0,017			0,017			0,021			0,025		
F-value	1,518			1,482			1,485			1,596			1,414		
Sig. F	0,079			0,091			0,090			0,057			0,072		

18. Appendix G – Regression with factor scores (RoE), Robustness Check

Dependent variable: RoE

	Model 1			Model 2			Model 3			Model 4			Model 5		
	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig
MC practices															
Diagnostic	-0,039	-0,595	0,55	-0,041	-0,621	0,54	-0,039	-0,591	0,56	-0,046	-0,689	0,49	-0,040	-0,607	0,54
Interactive	-0,036	-0,580	0,56	-0,031	-0,503	0,62	-0,039	-0,623	0,53	-0,040	-0,633	0,53	-0,036	-0,569	0,57
Tightness	0,036	0,654	0,51	0,033	0,603	0,55	0,033	0,606	0,55	0,034	0,622	0,53	0,033	0,604	0,55
Diversity	-0,025	-0,464	0,64	-0,022	-0,403	0,69	-0,020	-0,383	0,70	-0,021	-0,395	0,69	-0,019	-0,361	0,72
Cost Control	-0,072	-1,377	0,17	-0,078	-1,485	0,14	-0,072	-1,383	0,17	-0,070	-1,335	0,18	-0,076	-1,459	0,15
Decentralization	0,010	0,223	0,82	0,007	0,150	0,88	0,009	0,203	0,84	0,009	0,197	0,84	0,005	0,116	0,91
Communication	0,060	1,223	0,22	0,060	1,210	0,23	0,060	1,212	0,23	0,064	1,295	0,20	0,058	1,177	0,24
Context	0,058	1,058	0,29	0,058	1,070	0,29	0,059	1,079	0,28	0,064	1,164	0,25	0,060	1,100	0,27
Strategy															
Technology	-0,032	-0,683	0,50	-0,030	-0,630	0,53	-0,032	-0,683	0,50	-0,023	-0,499	0,62	-0,027	-0,581	0,56
Interactions															
Strategy*Diagnostic	-0,067	-1,511	0,13												
Strategy*Interactive				-0,033	-0,744	0,46									
Strategy*Tightness							-0,050	-1,119	0,26						
Strategy*Diversity										-0,043	-0,946	0,35			
Strategy*Cost Control													0,000	-0,003	1,00
Strategy*Decentralization															
Strategy*Communication															
Technology*Diagnostic															
Technology*Interactive															
Technology*Tightness															
Technology*Diversity															
Technology*Cost Control															
Technology*Decentralization															
Technology*Communication															
Control variables															
Age	-0,195	-4,184	0,00	-0,197	-4,225	0,00	-0,197	-4,229	0,00	-0,197	-4,224	0,00	-0,198	-4,258	0,00
Hierarchy	-0,011	-0,222	0,83	-0,013	-0,259	0,80	-0,012	-0,232	0,82	-0,013	-0,264	0,79	-0,011	-0,221	0,83
Employees	0,092	1,668	0,10	0,093	1,687	0,09	0,093	1,682	0,09	0,095	1,730	0,08	0,092	1,665	0,10
Norway															
Denmark	0,036	0,673	0,50	0,032	0,584	0,56	0,031	0,581	0,56	0,058	1,024	0,31	0,032	0,596	0,55
Finland	-0,023	-0,451	0,65	-0,025	-0,505	0,61	-0,025	-0,490	0,63	-0,079	-1,599	0,11	-0,023	-0,464	0,64
Iceland	-0,088	-1,845	0,07	-0,090	-1,870	0,06	-0,093	-1,937	0,05	0,027	0,491	0,62	-0,092	-1,910	0,06
Manufacturing	-0,016	-0,331	0,74	-0,018	-0,351	0,73	-0,012	-0,248	0,80	-0,013	-0,254	0,80	-0,014	-0,284	0,78
Service															
Trade	-0,003	-0,053	0,96	0,001	0,011	0,99	0,001	0,016	0,99	0,006	0,108	0,91	0,003	0,062	0,95
R-square	0,087			0,083			0,085			0,084			0,082		
Adj. R-square	0,053			0,049			0,051			0,050			0,048		
F-value	2,540			2,435			2,478			2,456			2,402		
Sig.	0,001			0,001			0,001			0,001			0,001		

	Dependent variable: RoE														
	Model 6			Model 7			Model 8			Model 9			Model 10		
	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig
MC practices															
Diagnostic	-0,041	-0,625	0,53	-0,048	-0,716	0,47	-0,032	-0,482	0,63	-0,038	-0,566	0,57	-0,041	-0,614	0,54
Interactive	-0,036	-0,587	0,56	-0,033	-0,525	0,60	-0,030	-0,476	0,63	-0,026	-0,409	0,68	-0,035	-0,562	0,57
Tightness	0,040	0,731	0,47	0,036	0,649	0,52	0,032	0,587	0,56	0,029	0,533	0,59	0,033	0,593	0,55
Diversity	-0,020	-0,376	0,71	-0,018	-0,341	0,73	-0,020	-0,382	0,70	-0,019	-0,359	0,72	-0,020	-0,372	0,71
Cost Control	-0,072	-1,373	0,17	-0,073	-1,403	0,16	-0,076	-1,457	0,15	-0,075	-1,430	0,15	-0,077	-1,470	0,14
Decentralization	0,007	0,145	0,89	0,011	0,235	0,81	0,008	0,173	0,86	0,007	0,154	0,88	0,005	0,113	0,91
Communication	0,067	1,361	0,17	0,067	1,353	0,18	0,059	1,208	0,23	0,056	1,144	0,25	0,058	1,171	0,24
Context	0,060	1,101	0,27	0,064	1,168	0,24	0,070	1,265	0,21	0,067	1,222	0,22	0,059	1,072	0,28
Strategy															
Technology	-0,032	-0,686	0,49	-0,024	-0,512	0,61	-0,023	-0,500	0,62	-0,025	-0,528	0,60	-0,028	-0,592	0,55
Interactions															
Strategy*Diagnostic															
Strategy*Interactive															
Strategy*Tightness															
Strategy*Diversity															
Strategy*Cost Control															
Strategy*Decentralization	-0,079	-1,762	0,08												
Strategy*Communication				-0,051	-1,133	0,26									
Technology*Diagnostic							0,057	1,220	0,22						
Technology*Interactive										0,041	0,871	0,38			
Technology*Tightness													-0,009	-0,192	0,85
Technology*Diversity															
Technology*Cost Control															
Technology*Decentralization															
Technology*Communication															
Control variables															
Age	-0,196	-4,210	0,00	-0,196	-4,208	0,00	-0,198	-4,245	0,00	-0,196	-4,208	0,00	-0,199	-4,260	0,00
Hierarchy	0,000	-0,001	1,00	-0,010	-0,206	0,84	-0,013	-0,255	0,80	-0,013	-0,259	0,80	-0,011	-0,220	0,83
Employees	0,094	1,706	0,09	0,093	1,694	0,09	0,090	1,630	0,10	0,087	1,575	0,12	0,092	1,666	0,10
Norway										0,024	0,441	0,66			
Denmark	0,042	0,772	0,44	0,033	0,619	0,54	0,054	0,959	0,34	0,053	0,930	0,35	0,032	0,593	0,55
Finland	-0,021	-0,429	0,67	-0,024	-0,471	0,64	-0,078	-1,582	0,11				-0,024	-0,468	0,64
Iceland	-0,092	-1,932	0,05	-0,089	-1,857	0,06	0,024	0,444	0,66	-0,077	-1,558	0,12	-0,092	-1,923	0,06
Manufacturing	-0,013	-0,255	0,80	-0,010	-0,191	0,85	-0,016	-0,314	0,75	-0,015	-0,294	0,77	-0,014	-0,278	0,78
Service															
Trade	0,000	-0,003	1,00	0,003	0,057	0,95	-0,003	-0,052	0,96	0,001	0,026	0,98	0,004	0,081	0,94
R-square	0,088			0,085			0,085			0,084			0,082		
Adj. R-square	0,054			0,051			0,051			0,050			0,048		
F-value	2,590			2,480			2,492			2,448			2,404		
Sig.	0,000			0,001			0,001			0,001			0,001		

Dependent variable: RoE

	Model 11			Model 12			Model 13			Model 14			Model 15		
	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig
MC practices															
Diagnostic	-0,034	-0,518	0,61	-0,041	-0,612	0,54	-0,040	-0,608	0,54	-0,041	-0,627	0,53	-0,025	-0,367	0,71
Interactive	-0,036	-0,587	0,56	-0,040	-0,643	0,52	-0,036	-0,582	0,56	-0,041	-0,654	0,51	-0,017	-0,267	0,79
Tightness	0,035	0,631	0,53	0,030	0,544	0,59	0,033	0,597	0,55	0,037	0,681	0,50	0,033	0,586	0,56
Diversity	-0,037	-0,679	0,50	-0,017	-0,316	0,75	-0,019	-0,356	0,72	-0,023	-0,434	0,66	-0,060	-1,089	0,28
Cost Control	-0,073	-1,402	0,16	-0,080	-1,521	0,13	-0,077	-1,477	0,14	-0,076	-1,459	0,15	-0,063	-1,185	0,24
Decentralization	0,003	0,071	0,94	0,004	0,082	0,94	0,002	0,034	0,97	0,015	0,321	0,75	0,016	0,343	0,73
Communication	0,057	1,164	0,25	0,058	1,181	0,24	0,053	1,075	0,28	0,081	1,595	0,11	0,087	1,692	0,09
Context	0,041	0,739	0,46	0,056	1,022	0,31	0,059	1,089	0,28	0,068	1,247	0,21	0,052	0,926	0,36
Strategy															
Technology	-0,031	-0,662	0,51	-0,028	-0,591	0,56	-0,028	-0,602	0,55	-0,026	-0,564	0,57	-0,031	-0,640	0,52
Interactions															
Strategy*Diagnostic													-0,059	-0,877	0,38
Strategy*Interactive													-0,023	-0,371	0,71
Strategy*Tightness													-0,036	-0,639	0,52
Strategy*Diversity													0,005	0,098	0,92
Strategy*Cost Control													0,072	1,242	0,22
Strategy*Decentralization													-0,068	-1,429	0,15
Strategy*Communication													-0,041	-0,841	0,40
Technology*Diagnostic													0,081	1,098	0,27
Technology*Interactive													0,071	0,952	0,34
Technology*Tightness													0,009	0,154	0,88
Technology*Diversity	-0,068	-1,430	0,15										-0,124	-2,268	0,02
Technology*Cost Control				-0,045	-0,980	0,33							-0,079	-1,431	0,15
Technology*Decentralization							-0,031	-0,690	0,49				-0,053	-1,135	0,26
Technology*Communication										0,085	1,852	0,07	0,084	1,729	0,09
Control variables															
Age	-0,201	-4,328	0,00	-0,199	-4,281	0,00	-0,200	-4,285	0,00	-0,201	-4,321	0,00	-0,195	-4,184	0,00
Hierarchy	-0,015	-0,289	0,77	-0,011	-0,212	0,83	-0,011	-0,227	0,82	-0,016	-0,312	0,76	-0,017	-0,339	0,74
Employees	0,089	1,622	0,11	0,093	1,699	0,09	0,093	1,696	0,09	0,097	1,763	0,08	0,093	1,680	0,09
Norway							0,027	0,490	0,62				-0,046	-0,766	0,44
Denmark	0,026	0,489	0,63	0,034	0,632	0,53	0,059	1,031	0,30	0,036	0,676	0,50			
Finland	-0,022	-0,441	0,66	-0,028	-0,561	0,58				-0,021	-0,413	0,68	-0,070	-1,209	0,23
Iceland	-0,091	-1,897	0,06	-0,095	-1,975	0,05	-0,077	-1,568	0,12	-0,093	-1,952	0,05	-0,112	-2,260	0,02
Manufacturing	-0,012	-0,233	0,82	-0,014	-0,273	0,79	-0,016	-0,327	0,74	-0,014	-0,291	0,77	-0,016	-0,321	0,75
Service															
Trade	0,003	0,053	0,96	0,006	0,111	0,91	0,003	0,058	0,95	0,003	0,061	0,95	-0,017	-0,324	0,75
R-square	0,086			0,084			0,083			0,089			0,120		
Adj. R-square	0,052			0,050			0,049			0,055			0,062		
F-value	2,526			2,460			2,431			2,610			2,064		
Sig.	0,001			0,001			0,001			0,000			0,001		

19. Appendix J – Regression on means (RoE), Robustness Check

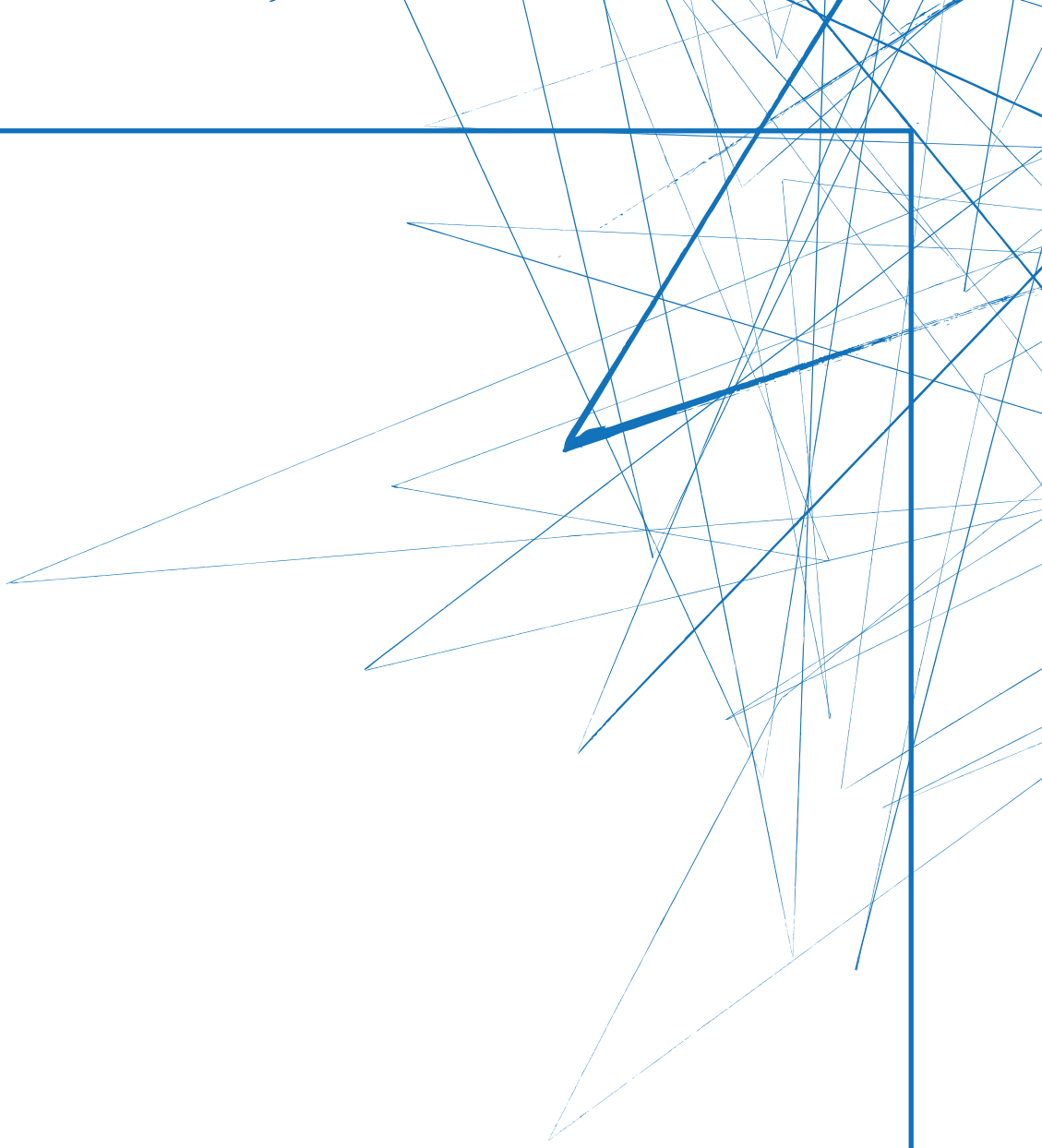
	Dependent variable: RoE														
	Model 1			Model 2			Model 3			Model 4			Model 5		
	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig
MC practices															
Cost Control	-0,022	-0,412	0,68	-0,014	-0,270	0,79	-0,014	-0,273	0,79	-0,020	-0,386	0,70	-0,015	-0,289	0,77
Decentralization	0,021	0,460	0,65	0,024	0,513	0,61	0,031	0,665	0,51	0,022	0,488	0,63	0,026	0,553	0,58
Communication	0,077	1,553	0,12	0,083	1,683	0,09	0,085	1,707	0,09	0,076	1,532	0,13	0,082	1,643	0,10
Tightness	0,073	1,370	0,17	0,072	1,361	0,17	0,071	1,346	0,18	0,069	1,298	0,20	0,073	1,377	0,17
Diversity	-0,050	-0,942	0,35	-0,050	-0,946	0,35	-0,049	-0,920	0,36	-0,049	-0,932	0,35	-0,054	-1,016	0,31
Diagnostic	-0,046	-0,712	0,48	-0,044	-0,696	0,49	-0,053	-0,826	0,41	-0,042	-0,656	0,51	-0,049	-0,768	0,44
Interactive	-0,044	-0,716	0,47	-0,048	-0,790	0,43	-0,041	-0,678	0,50	-0,049	-0,797	0,43	-0,048	-0,787	0,43
Context															
Technology	0,049	0,904	0,37	0,052	0,951	0,34	0,055	1,005	0,32	0,049	0,899	0,37	0,054	0,988	0,32
Strategy	-0,023	-0,468	0,64	-0,033	-0,676	0,50	-0,022	-0,449	0,65	-0,028	-0,577	0,56	-0,020	-0,423	0,67
Interactions															
Strategy*Cost Control	0,004	0,085	0,93												
Strategy*Decentralization				-0,070	-1,557	0,12									
Strategy*Communication							-0,075	-1,685	0,09						
Strategy*Tightness										-0,070	-1,593	0,11			
Strategy*Diversity													-0,041	-0,913	0,36
Strategy*Diagnostic															
Strategy*Interactive															
Technology*Cost Control															
Technology*Decentralization															
Technology*Communication															
Technology*Tightness															
Technology*Diversity															
Technology*Diagnostic															
Technology*Interactive															
Control variables															
Age	-0,176	-3,765	0,00	-0,174	-3,720	0,00	-0,173	-3,710	0,00	-0,172	-3,671	0,00	-0,175	-3,740	0,00
Hierarchy	-0,031	-0,600	0,55	-0,024	-0,473	0,64	-0,033	-0,643	0,52	-0,034	-0,663	0,51	-0,034	-0,658	0,51
Employees	0,065	1,164	0,25	0,066	1,179	0,24	0,065	1,162	0,25	0,068	1,208	0,23	0,068	1,212	0,23
Norway															
Denmark	0,002	0,031	0,98	0,009	0,162	0,87	0,003	0,047	0,96	-0,001	-0,023	0,98	0,003	0,057	0,95
Finland	-0,002	-0,046	0,96	-0,001	-0,018	0,99	-0,004	-0,078	0,94	-0,004	-0,082	0,93	-0,003	-0,056	0,96
Iceland	-0,097	-2,015	0,04	-0,098	-2,047	0,04	-0,093	-1,923	0,06	-0,101	-2,097	0,04	-0,098	-2,032	0,04
Manufacturing	-0,043	-0,851	0,40				-0,036	-0,713	0,48	-0,039	-0,781	0,44			
Service				0,046	0,860	0,39							0,044	0,818	0,41
Trade	-0,010	-0,196	0,85	0,022	0,403	0,69	-0,011	-0,209	0,83	-0,009	-0,172	0,86	0,028	0,509	0,61
Adj. R-squared	0,041			0,046			0,046			0,046			0,042		
F-value	2,183			2,328			2,353			2,335			2,233		
Sig. F	0,003			0,002			0,001			0,002			0,003		

Dependent variable: RoE

	Model 6			Model 7			Model 8			Model 9			Model 10		
	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig
MC practices															
Cost Control	-0,020	-0,378	0,71	-0,022	-0,413	0,68	-0,021	-0,409	0,68	-0,023	-0,445	0,66	-0,021	-0,401	0,69
Decentralization	0,025	0,538	0,59	0,022	0,479	0,63	0,022	0,468	0,64	0,017	0,354	0,72	0,027	0,580	0,56
Communication	0,079	1,592	0,11	0,078	1,573	0,12	0,077	1,560	0,12	0,073	1,470	0,14	0,084	1,682	0,09
Tightness	0,074	1,401	0,16	0,072	1,368	0,17	0,073	1,370	0,17	0,075	1,411	0,16	0,078	1,474	0,14
Diversity	-0,052	-0,985	0,33	-0,050	-0,948	0,34	-0,050	-0,939	0,35	-0,049	-0,925	0,36	-0,051	-0,962	0,34
Diagnostic	-0,047	-0,731	0,47	-0,046	-0,724	0,47	-0,045	-0,712	0,48	-0,045	-0,704	0,48	-0,049	-0,759	0,45
Interactive	-0,045	-0,742	0,46	-0,043	-0,698	0,49	-0,044	-0,721	0,47	-0,046	-0,748	0,46	-0,045	-0,742	0,46
Context															
Technology	0,050	0,914	0,36	0,049	0,904	0,37	0,049	0,901	0,37	0,049	0,890	0,37	0,050	0,910	0,36
Strategy	-0,025	-0,516	0,61	-0,022	-0,464	0,64	-0,023	-0,474	0,64	-0,023	-0,472	0,64	-0,024	-0,494	0,62
Interactions															
Strategy*Cost Control															
Strategy*Decentralization															
Strategy*Communication															
Strategy*Tightness															
Strategy*Diversity															
Strategy*Diagnostic	-0,037	-0,834	0,41												
Strategy*Interactive				-0,012	-0,265	0,79									
Technology*Cost Control							-0,001	-0,023	0,98						
Technology*Decentralization										-0,037	-0,828	0,41			
Technology*Communication													0,044	0,977	0,33
Technology*Tightness															
Technology*Diversity															
Technology*Diagnostic															
Technology*Interactive															
Control variables															
Age	-0,173	-3,694	0,00	-0,175	-3,733	0,00	-0,176	-3,764	0,00	-0,178	-3,804	0,00	-0,177	-3,781	0,00
Hierarchy	-0,031	-0,608	0,54	-0,031	-0,613	0,54	-0,031	-0,602	0,55	-0,031	-0,606	0,55	-0,034	-0,657	0,51
Employees	0,065	1,168	0,24	0,065	1,168	0,24	0,065	1,163	0,25	0,068	1,206	0,23	0,067	1,200	0,23
Norway				0,003	0,055	0,96				0,002	0,045	0,96			
Denmark	0,005	0,088	0,93	0,004	0,077	0,94	0,002	0,033	0,97	0,007	0,118	0,91	0,003	0,064	0,95
Finland	-0,002	-0,039	0,97				-0,002	-0,045	0,96				-0,002	-0,043	0,97
Iceland	-0,095	-1,974	0,05	-0,095	-1,919	0,06	-0,097	-2,012	0,05	-0,095	-1,927	0,06	-0,099	-2,058	0,04
Manufacturing	-0,043	-0,865	0,39	-0,043	-0,865	0,39	-0,043	-0,849	0,40	-0,045	-0,899	0,37			
Service													0,045	0,836	0,40
Trade	-0,014	-0,259	0,80	-0,011	-0,209	0,84	-0,010	-0,196	0,85	-0,011	-0,204	0,84	0,027	0,490	0,63
Adj. R-squared	0,042			0,041			0,041			0,042			0,043		
F-value	2,224			2,187			2,182			2,224			2,240		
Sig. F	0,003			0,003			0,003			0,003			0,003		

Dependent variable: RoE

	Model 11			Model 12			Model 13			Model 14			Model 15		
	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig	Coefficients	t-value	sig
MC practices															
Cost Control	-0,017	-0,319	0,75	-0,021	-0,407	0,68	-0,016	-0,304	0,76	-0,013	-0,244	0,81	0,007	0,135	0,89
Decentralization	0,019	0,419	0,68	0,021	0,447	0,66	0,025	0,546	0,59	0,025	0,543	0,59	0,028	0,596	0,55
Communication	0,079	1,585	0,11	0,075	1,524	0,13	0,077	1,559	0,12	0,075	1,514	0,13	0,082	1,622	0,11
Tightness	0,068	1,276	0,20	0,071	1,338	0,18	0,071	1,344	0,18	0,065	1,228	0,22	0,052	0,958	0,34
Diversity	-0,046	-0,855	0,39	-0,055	-1,043	0,30	-0,049	-0,929	0,35	-0,048	-0,911	0,36	-0,056	-1,044	0,30
Diagnostic	-0,044	-0,682	0,50	-0,041	-0,640	0,52	-0,048	-0,755	0,45	-0,047	-0,738	0,46	-0,045	-0,697	0,49
Interactive	-0,048	-0,781	0,44	-0,044	-0,714	0,48	-0,043	-0,707	0,48	-0,040	-0,659	0,51	-0,050	-0,797	0,43
Context															
Technology	0,051	0,931	0,35	0,039	0,709	0,48	0,056	1,029	0,30	0,058	1,050	0,29	0,050	0,901	0,37
Strategy	-0,021	-0,444	0,66	-0,024	-0,501	0,62	-0,022	-0,454	0,65	-0,021	-0,432	0,67	-0,031	-0,640	0,52
Interactions															
Strategy*Cost Control													0,076	1,278	0,20
Strategy*Decentralization													-0,064	-1,326	0,19
Strategy*Communication													-0,085	-1,753	0,08
Strategy*Tightness													-0,090	-1,764	0,08
Strategy*Diversity													0,000	-0,007	0,99
Strategy*Diagnostic													-0,013	-0,193	0,85
Strategy*Interactive													-0,016	-0,255	0,80
Technology*Cost Control													-0,038	-0,703	0,48
Technology*Decentralization													-0,058	-1,246	0,21
Technology*Communication													0,051	1,041	0,30
Technology*Tightness	0,029	0,635	0,53										0,042	0,814	0,42
Technology*Diversity				-0,052	-1,155	0,25							-0,120	-2,305	0,02
Technology*Diagnostic							0,054	1,197	0,23				0,052	0,795	0,43
Technology*Interactive										0,066	1,480	0,14	0,075	1,158	0,25
Control variables															
Age	-0,178	-3,793	0,00	-0,178	-3,802	0,00	-0,176	-3,766	0,00	-0,174	-3,712	0,00	-0,172	-3,647	0,00
Hierarchy	-0,031	-0,602	0,55	-0,034	-0,658	0,51	-0,033	-0,646	0,52	-0,033	-0,656	0,51	-0,046	-0,899	0,37
Employees	0,065	1,164	0,25	0,061	1,095	0,27	0,064	1,144	0,25	0,060	1,078	0,28	0,062	1,107	0,27
Norway										0,003	0,058	0,95	-0,001	-0,024	0,98
Denmark	0,002	0,042	0,97	-0,003	-0,050	0,96	0,002	0,042	0,97	0,002	0,039	0,97			
Finland	-0,001	-0,025	0,98	0,000	-0,010	0,99	-0,004	-0,082	0,93				-0,013	-0,220	0,83
Iceland	-0,095	-1,973	0,05	-0,096	-1,997	0,05	-0,096	-1,999	0,05	-0,092	-1,867	0,06	-0,098	-1,957	0,05
Manufacturing	-0,044	-0,882	0,38	-0,040	-0,808	0,42	-0,044	-0,880	0,38	-0,044	-0,881	0,38	-0,037	-0,727	0,47
Service															
Trade	-0,014	-0,258	0,80	-0,011	-0,208	0,84	-0,017	-0,327	0,74	-0,014	-0,274	0,78	-0,029	-0,545	0,59
Adj. R-squared	0,042			0,043			0,044			0,045			0,053		
F-value	2,207			2,263			2,268			2,314			1,896		
Sig. F	0,003			0,002			0,002			0,002			0,003		



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