



LUND UNIVERSITY  
School of Economics and Management

Department of Business Administration  
BUSN79 Master thesis in Accounting and Finance  
Spring 2017

# Is performance measurement and management fit for the future?

Sibel Hatipoglu\*

---

\* I would like to acknowledge my appreciation to my supervisor Johan Dergård for his support and particularly time spent and flexibility provided during the writing process. I wish to also thank the executives at the case study companies for the interviews and permission to access internal documents.

# Abstract

Title	Is performance measurement and management fit for the future?
Seminar date	May 31st, 2017
Course	BUSN79 Degree Project in Accounting and Finance, 15 ECTS
Author	Sibel Hatipoglu
Supervisor	Johan Dergård
Key words	Dynamism; Performance measurement; Performance management; Strategic fit; Multiply-case study
Purpose	The aim of this paper is to find out how the PMM system can be used to remain resilient to a change in the environment and so continue to provide appropriate guidance to managers in real time.
Methodology	The paper is based on a qualitative research method with primarily an abductive approach to derive insight about a PMM system's use to remain resilient to a change in the environment.
Theoretical perspectives	The main approach is on Performance measurement and management with a particular focus on its use. Also assumptions from the dynamic environment theory are applied.
Empirical foundation	A seven-point scale questionnaire has been used to identify companies with high- or very high environmental dynamics index by considering a 5 years' time period. From the total replied sample of 26 firms, eight were chosen for additional data collection. This subsample represents seven highly differentiated industries, more exactly IT- and chemical industry, paper- and metal powder manufacturing, infrastructure, construction and, logistics. The intense of competition (price, product/services, technology, distribution) were perceived as high- or very high within five of these firms. Three of the firms were highly- or very highly affected by diverse factors, all from many environmental changes (competition, technology/innovation, economics, regulations) to difficulties to obtain input to the business in form of raw material or unfavourable demographic trends.
Conclusions	In summary, three major types of uses of PMM are found that have relevance for the possibility of organizational alignment. First, organizations should decide whether their PMM is strategic or operational. This choice will determine whether there is a fixed or unfixed link between strategy and measures. Second, the balance between alignment and empowerment will have a relevant consequence for the diagnostic or interactive use of PMM. Third,

depending on the use assigned to the PMM, information will generate either single or double-loop learning, which will have an immediate impact on the firms' possibilities for change. Case study findings demonstrate that for PMM system to remain resilient and continue to provide appropriate guidance, all six features should be present and managed in such a way that an appropriate balance of the tensions can be sustained.

# Table of contents

<b>1. INTRODUCTION.....</b>	<b>5</b>
<b>2. THEORETICAL CONTEXT.....</b>	<b>7</b>
<b>2.1 PREVIOUS RESEARCH ABOUT STRATEGY – PMM – ENVIRONMENT.....</b>	<b>7</b>
2.1.1 THE RELATIONSHIP OF STRATEGY & PMM.....	7
2.1.2 THE RELATIONSHIP OF STRATEGY & PMM - CRITIQUE.....	11
2.1.3 THE RELATIONSHIP OF PMM & ENVIRONMENT.....	14
<b>2.2 THEORIES.....</b>	<b>16</b>
2.2.1 DYNAMIC ENVIRONMENT.....	16
2.2.2 PERFORMANCE MEASUREMENT AND MANAGEMENT.....	19
2.2.3 THE PERFORMANCE ALIGNMENT MATRIX.....	21
2.2.4 SIMONS' LOC FRAMEWORK.....	23
2.2.5 SINGLE AND DOUBLE-LOOP LEARNING.....	25
<b>3. METHODOLOGY.....</b>	<b>28</b>
<b>3.1 RESEARCH STRATEGY.....</b>	<b>28</b>
<b>3.2 RESEARCH DESIGN.....</b>	<b>29</b>
3.2.1 CASE STUDY DESIGN.....	29
<b>3.3 RESEARCH METHODS.....</b>	<b>29</b>
3.3.1 GATHERING EMPIRICAL DATA.....	29
3.3.2 PRIMARY DATA.....	30
3.3.3 SECONDARY DATA.....	32
<b>3.4 DATA ANALYSIS.....</b>	<b>32</b>
<b>3.5 VALIDITY AND RELIABILITY.....</b>	<b>33</b>
<b>4. CASE EMPIRICS AND ANALYSIS.....</b>	<b>35</b>
<b>4.1 EMPIRICAL FINDINGS.....</b>	<b>35</b>
<b>4.2 RECATEGORIZED SUMMARY OF EMPIRICAL FINDINGS.....</b>	<b>42</b>
4.2.1 CORPORATE LEVEL.....	42
4.2.2 BUSINESS-UNIT LEVEL.....	44
<b>4.3 ANALYSIS.....</b>	<b>48</b>
4.3.1 MEASUREMENT-DRIVEN MANAGEMENT.....	48
4.3.2 ASSESSMENT-DRIVEN MANAGEMENT.....	51
<b>5. CONCLUSION.....</b>	<b>55</b>
<b>5.1 SUMMARY FINDINGS.....</b>	<b>55</b>
<b>5.2 CONCLUDING REMARKS.....</b>	<b>58</b>
<b>5.3 FURTHER RESEARCH.....</b>	<b>58</b>
<b>6. REFERENCES.....</b>	<b>59</b>
<b>7. APPENDIX.....</b>	<b>66</b>

# 1. Introduction

Performance measurement and management (PMM) is critical for the effective and efficient management of any business. The PMM system provides managers with a potentially effective mechanism for enhancing strategic alignment by enabling the translation of strategy into a set of financial and non-financial measures to report the current level of performance (e.g. Kaplan & Norton, 2001). It also allows the organization to compare actual performance to desired performance, and to act upon variances (Melnyk et al., 2014).

By enhancing strategic alignment, however, PMM may also introduce organizational rigidity and slow down the organization's ability to adapt to changing circumstances (Bititci et al., 2000).

Academic research has long held that PMM must be aligned with firm strategy in order to maintain appropriate focus in the environment and to enhance the final performance (e.g. Kaplan & Norton, 1993;1996; Neely et al. 2002; Epstein & Manzoni, 1998; Lynch & Cross, 1991). If PMM succeeds to be aligned with the firm's strategy, researchers have argued that the PMM system is an effective mechanism for enabling the strategy to be implemented as it facilitates the translation of strategy into operational terms, improving strategy alignment, i.e. helping organizations align their actions in pursuit of their strategic objectives and thus delivering an enhanced performance (Franco-Santos et al., 2012). PMM has thus been defined and framed within the "specific" where measures have supported the need to relate directly to the organization's mission and strategy and to make the need for strategies, action and measures to be consistent. However, such a cause-and-effect based PMM, derived from the idea that a cause must precede its effect in time, has in later research been debated among a host of researchers (e.g. Bisbe & Malagueno, 2012; Kasperska & Tayles, 2013; Smith, 1995; Micheli & Manzoni, 2010; Toumela, 2005; Kennerley & Neely, 2002; Bourgeois & Eisenhardt, 1988; Neely et al., 2002; Bourne et al., 2000).

Kasperska and Tayles (2013) have argued that, with respect to causal links, an emphasized usage of "hard" data and quantification may undermine the informal and spontaneous emergence of strategy and risks to be missing important "soft" information such as intuition. Such "soft" data may be especially important in organizations with no major strategic intends or with no pre-established understanding of what problems or bottlenecks are to be solved (Kennerley & Neely, 2002), which is a highly relevant issue for organizations operating in dynamic environments.

The last few decades changing and complex global business environment and growing competition have stimulated growing attention to PMM. Practitioners have expressed how emerging processes, complex situations and managing opportunities when the environment changed have created anxieties within the organizations (Melnyk et al., 2014). Such obstacles have created challenges because of the time and number of iterations needed to get the metrics aligned with the new strategy have been problematic, in parallel with, creating a holistic view and making the correct decisions early with incomplete data until concrete evidence from their PMM system for a need to change have been available. (Melnyk et al., 2014)

More recent research has started to question the assumption that performance measures, derived from strategy, has one main purpose for why they are put in use. The initial suggestion that measurements should measure the success of the implementation of strategy appear in new research to be inappropriate. Researchers such as Bourne et al. (2000) and Melnyk et al. (2014) have argued that information and feedback derived from the measures are used to rather challenge the assumptions and to test the validity of the strategy. The previously made premise that for PMM to be functioning, it has to be incorporated in a three-step approach, where a change in the environment stimulates a change in the strategy and a change in the strategy

stimulate a change in the PMM (Melnyk et al., 2014), appears to be not appropriate in more recent research. In addition, such principle undermines PMM's possibility to remain resilient in a dynamic environment, where local creativity and sense making combined with interpretation of reasonable strategic directions are translated into executable plans, would be more appropriate in order to quickly identify new threats and opportunities. Melnyk et al. (2014) have shed light on the emerging issue that for PMM to be efficient, a need to recast the relationship between strategy and PMM, is compulsory. Their contribution has provided evidence that strategy and PMM system need to be co-created to better reflect the business environment and the business strategy being developed. However, no contribution has been made how this conceptualization can be adopted in practice for PMM system to remain resilient. Yet such a capability is likely to be vital in industries facing a dynamic environment and is also from a theoretical point of view highly timely. Questions have evolved around whether an environmental change, impacting the firm, can be effectively communicated throughout the firm through the PMM. Does the PMM system provide appropriate guidance after a significant change in the environment, or does the communication of an updated direction of what to be achieved have to go through the firm strategy?

Through a multiple-case study of eight Swedish companies, demonstrating a high- or very high dynamic environment, this paper aims to contribute with an empirical research on the topic of co-creation of strategy and PMM system, where the research field not has been exhausted.

The research question will be:

How can the PMM system be used to remain resilient to a change in the environment and so continue to provide appropriate guidance to managers in real time?

The remainder of this thesis is structured as follows. In Section 2, the theoretical context is provided, and a full description of the relationship between strategy, PMM and dynamic environment is presented. In Section 3, the methodology of literature review and data collection is discussed, explaining in detail the process adopted and the research selection criteria. In Section 4, the conclusion is presented, comprising the findings of the case study. In Section 5, findings of the study are discussed, along with the suggestions for further research.

## 2. Theoretical context

### 2.1 Previous research about Strategy - PMM - Environment

Researchers have examined the relationship between strategy, PMM and dynamic environment in several ways. Two main approaches have been applied widely. First, researchers have been predicated on the belief that influences of external variables as environmental dynamism is moderating the relationship between strategy and PMM. This approach assumes that a change in the environment stimulates a change in the strategy and a change in the strategy stimulates a change in PMM system (phase 2.1.1). Second, studies have attempted to justify this first assumption by providing arguments of why an alignment between strategy and PMM is not a desired target in a dynamic environment. This more recent attention has focused on ensuring that the PMM system keeps abreast of the changes in the strategy (phase 2.1.2 and 2.1.3).

#### 2.1.1 The relationship of Strategy & PMM

Traditionally, performance measurement system (PMS) has been based on management accounting systems. This has resulted in measures primarily focusing on financial data which has been claimed to be too historical and backward-looking, reward short term or incorrect behaviour and provide little information on root causes or solutions to problems (Ghalayini & Noble, 1996). Traditional performance measures have also not incorporated strategy. Rather the objectives have been to quantify performances as in a led to minimize costs, increase labour efficiency and machine utilization. (Ghalayini & Noble, 1996)

In late 1980/early 1990, a general dissatisfaction with the shortcomings of traditional performance measures led to development of “balanced” or “multi-dimensional” performance measurement systems to overcome the previous limitations (Neely et al., 2002).

These new performance measures have been developed in order to give an overall view of companies’ performance. Their primarily characteristics are identified to be non-financial, future-looking, changing over time as the need change, helping in achieve continuous improvement, and to function as a tool for effective strategy implementation (Gimbert et al., 2010).

In recent years, a special interest has been placed on strategic performance measurement systems (SPMSs), an approach that emphasizes the implementation of PMS that are more closely linked to a firm’s specific strategy (Ittner et al., 2003). This idea is however not new. In a similar vein to SPMSs, the contingency theory has long held that control systems must be aligned with the organizational characteristics such as firm strategy (eg. Fisher, 1995). Also, in economics theory it has been argued that the optimal design of a firm’s information and reward system is a function of the firm’s business strategy (Milgrom & Roberts, 1992).

SPMSs is a subset of the multidimensional causal-oriented PMSs, which include models such as the SMART pyramid (Lynch & Cross, 1991), the Performance Measurement Questionnaire (Dixon et al., 1990), the Performance Prism (Neely et al., 2002), Tableaux-de-bord (Epstein & Manzoni, 1998) and the Balanced Scorecard (Kaplan & Norton, 1993). A study by the Conference Board defines SPM as a system that “translates business strategies into deliverable results. SPM systems combine financial, strategic, and operating business measures to gauge how well a company meets its targets” (Gates, 1999, p. 4). If SPMSs succeed to be aligned with the firm’s strategy, researcher find that SPMSs are an effective mechanisms for a) engaging

managers in the strategy formulation and review processes, b) enabling the strategy to be implemented as it facilitates the translation of strategy into operational terms, c) encouraging managers to embrace the organization's strategy as a continuous process rather than an one-off exercise, and d) improving strategic alignment, i.e. helping organizations align their actions in pursuit of their strategic objectives (Franco-Santos et al., 2012). Under this approach, advocates argue that SPMSs help companies improve alignment between their PMS and their organizational objectives, thus enhance the final performance (Ittner et al., 2003).

The definition of SPMSs also assume that external triggers in the firm's environment are considered in formulation of the strategy, thus supporting an appropriate design of the measurement systems aligned with the environment (Kennerley & Neely, 2003). Several authors that strongly support this approach are Mintzberg, 1982; Globerson, 1985; Sink, 1986; Fortuin, 1988; Keegan et al., 1989; Bitton, 1990; Maskell, 1989; Azzone et al., 1991, Wisner and Fawcett, 1991 and Goold, 1991.

The phrase SPMSs has in the literature often been used interchangeably with phrases such as "comprehensive performance measurement" (Hall, 2008) and "contemporary performance measurement" (Franco-Santos et al., 2012).

Several authors have presented their definition of the SPMSs concept.

Hall (2008) argue that a comprehensive PMSs include a diverse set of performance measures and that these measures are linked to the strategy of the firm. Such system aim to provide information about parts of the processes. Hall (2008) defines CPM as a system that "translates business strategies into deliverable results [...] combining financial, strategic and operating business measures to gauge how well a company meets its targets" (p. 43).

Similarly, Ittner et al. (2003) suggest that SPMSs "provides information that allows the firm to identify the strategic offering with the highest potential for achieving the firm's objectives, and aligns management processes, such as target setting, decision-making, and performance evaluation, with the achievement of the chosen strategic objectives" (p. 715)

Ittner & Larcker (2001) further state that a key element in managing the links between strategy and performance is to identify and measure the specific critical factors that drive performance - the "value drivers" which lead to strategic success or firm value. By linking strategies to their underlying value drivers and tying information systems, goals and objectives, resource allocation, and performance evaluation to these drivers, SPMSs are expected to improve communication of these specific actions required to achieve the chosen strategy and provide more rapid feedback on whether the strategy is achieving its objectives.

Some researchers add to the SPMSs literature that the value drivers should not only influence the design and use of measurement systems, but should also affect external requirements put on the organization (Gates, 1999; Black et al., 1998).

Franco-Santos et al. (2012) define contemporary PMSs as financial and non-financial performance measures with aim of operationalize strategic objectives. This definition is based on a number of assumptions: a) the role of CPM system is to evaluate performance for either information or motivational purposes, b) the CPM system comprise a supporting infrastructure which can vary from being a simple method of data collection and analysis to a sophisticated information system or a business intelligence solution, c) the CPM system involve specific processes or information provisions measuring design and data. The definition of CPM by Franco-Santos et al. (2012) is that the KPIs are linked to the organization's strategy.

Light (1998) is supporting a broader perspective of performance measures. To achieve alignment between strategy and PMM he states that intangibles such as "management



performance, quality of strategy, customer satisfaction and employee retention” must be addressed. He argues that measurement, monitoring and control of these aspects helps to “pinpoint problems, improve processes and achieve company goals” (p. 17).

Beyond the various definitions of SMPSs provided by different authors, also a wide range of SMPSs frameworks have been developed to help organizations define a set of measures that reflects their objectives and to evaluate their performances appropriately. The frameworks support the need for measures to relate directly to the organization’s mission and strategy and to make the need for strategies, action and measures to be consistent. Advocates argue that these models can contribute to the alignment of both strategic decision making and action by acting as a part of an implementation framework for performance measures (Kaplan & Norton, 1993).

#### *The SMART Performance Pyramid*

The Strategic Measurement Analysis and Reporting Technique (SMART) represent a four-level pyramid of objectives and measures. The main strength is its attempt to integrate corporate objectives with operational performance indicators. At the top is the corporate vision and strategy. At this level, top management assign and allocate resources to each business unit. At the second level, objectives for each business unit are defined in market and financial terms. At the third level, more tangible operating objectives and priorities can be defined for each business operating system in terms of customer satisfaction, flexibility and productivity. At the fourth level, the department level, customer satisfaction, flexibility and productivity are specified to specific operational criteria: quality, delivery, process time and cost. The SMART pyramid aims, with the use of the operational measures, achieve higher-level results and implementation of the corporate strategy. (Lynch & Cross, 1991)

#### *The performance measurement questionnaire*

Dixon et al. (1990) developed the PMQ questionnaire with attempt to audit whether a firm’s performance measures are aligned with its strategy. Its aim is to help managers identify improvement needs of their organization by determine the extent to which existing performance measures support improvements and to establish an agenda for performance measure improvements. The results of the questionnaire are evaluated in four categories: alignment, congruence, consensus and confusion. Alignment analysis is conducted to investigate in general terms how well a company’s actions and measures complement its strategy. Congruence analysis is conducted to provide a detailed understanding of how well the measurement system supports an organization’s actions and strategy. Consensus analysis is carried out by grouping the data by management level or by functional group. This analysis shows the effect of communication. The goal of the confusion analysis is to determine the extent of consensus (standard deviation) regarding each improvement area and performance measure. The PMQ is said to has the advantage of providing a mechanism to identify the improvement areas of the company and their associated performance measures. In addition, it tries to determine the extent to which the existing measurement system support such improvement area. (Dixon et al., 1990)

#### *The Performance Prism*

The Performance Prism aims to manage the performance of an organization from five interrelated ‘facets’; 1) Stakeholder satisfaction – who are our stakeholders and what do they want?; 2) Stakeholder contribution – what do we want and need from our stakeholders?; 3) Strategies – what strategies do we need to put in place to satisfy the wants and needs of our stakeholders while satisfying our own requirements too?; 4) Processes – what processes do we need to put in place to enable us to execute our strategies?; 5) Capabilities – what capabilities do we need to put in place to allow us to operate our processes? By answering these five

questions, Neely et al. (2002) argue that organizations can build a structured business performance model. (Neely et al., 2002)

#### *Tableaux-de-bord*

The Tableaux-de-Bord is a dashboard, such as the one in an aircraft, with purpose to give managers a brief overview of key parameters to support decision making. The Tableaux should be developed in the context of each unit's mission and objectives. This involves translating the unit's vision and mission into a set of objectives from which the unit identifies its key success factors (KSF). These KSF are then translated into a series of quantifiable KPIs. In order to give managers information for decision making, the Tableaux should primarily contain performance indicators that are largely controllable. (Epstein & Manzoni, 1998)

#### *The Balanced Scorecard*

The Balanced Scorecard (BSC) promotes the idea of a top-down approach in which senior managers develop their strategic vision and the strategies needed to achieve it. Whereas most companies use a bottom-up approach with measures derived from local activities or ad hoc processes, the BSC presumes that by building strategy maps and identifying appropriate leading and lagging indicators, four specific perspectives of the scorecard should communicate the strategy down the organization. These four perspectives, in which firms should supplement financial measures with non-financial measures are the perspectives: customers, internal business processes and, learning and growth. This large set of measures is designed to capture the firm's desired business strategy and to include drivers of performance in all areas important to the firm. The use of the BSC is said to improve managerial decision making by aligning critical performance measures with the goal and strategies of the firm. (Kaplan & Norton, 1993)

Bukh and Malmi (2005) promote Kaplan and Norton's (2001) idea of strategy mapping and argue that it is a beneficial tool to develop appropriate organizational strategies which aids strategies to be formulated in detail and also cover process- and learning and growth topics. Furthermore, Bukh and Malmi (2005) argues that precision and detail in strategy may also help to build commitment among people and make strategies more actionable since people understand concrete and detailed targets better than broadly stated ones. People therefore commit to these plans and take actions to make the plans to reality. The strategy mapping may also work as a tool for people to better understand how their actions are related to more broad objectives of the firm. (Bukh & Malmi, 2005)

Also Micheli and Manzoni (2010) supports the idea of causal links by argue that a comprehensive strategic map can make people believe their jobs are more meaningful by helping them to understand how their work fits in the broader scope, thus affecting intrinsic motivation and empowerment. The authors states further that causal links facilitates for a greater understanding and helps management to focus on key priorities and increase managers goal clarity. Especially the issue of focus is claimed to be an important factor, where a causal link may function as a reference point, which in turn facilitate for shared values and beliefs, provides inspiration for managers and acts as a platform for discussion of strategic uncertainties and cause-and-effect assumptions. (Micheli & Manzoni, 2010)

Bukh and Malmi (2005) conclude that the way strategy is formulated will have an impact on how the cause-and-effect relationship among different measures are modeled in practice. If some aspects of strategy are left outside the strategy map, the BSC will simplify the mapping. However, being precise about cause-and-effect relationships require targets to be pre-defined but would make the mapping of activities easier. (Bukh & Malmi, 2005)

To sum up the first approach, a general dissatisfaction of traditional PMS systems, based on outdated management accounting systems, have led to the development of SPMSs. A wide range of research have been done within this stream of research where a strong consensus of alignment between strategy and measures has been identified. Some of the main contributors in this debate are Lynch and Cross (1991), Dixon et al. (1990), Neely et al. (2002), Epstein and Manzoni (1998) and Kaplan and Norton (1993) who have argued that measures should be derived or aligned with strategy in order to maintain appropriate focus in the environment. Here, the idea of a traditional top-down view of strategy is assumed where a strategic control essentially means ensure that behavior of people and processes are consistent with the predetermined strategy (Merchant, 1985). The objective of such assumptions is to help organizations define a set of measures that reflects their strategic objectives and assess their performances appropriately (McAdam & Bailie, 2002).

## 2.1.2 The relationship of Strategy & PMM - critique

The SPMSs comprise the use of financial as well as non-financial performance measures linked to the organization's business strategy. The adoption of SPMSs, such as the SMART Performance Pyramid (Lynch & Cross, 1991) and the BSC (Kaplan & Norton, 1993), has steadily increased during the last two decades (Franco-Santos et al., 2012), where a believe that firms under great pressure might enhance the value to both stakeholders and shareholders by using SPMSs. However, the adoption and its actual consequences are critical for determining the benefits of these systems. Following phase provide a literature review of the cause-and-effect principle from a dynamic environment point of view.

Kaplan and Norton (1996) define strategy as “a set of hypotheses about cause and effect” which highlight the existence of a cause-and-effect relationship in a properly constructed BSC. A BSC should contain outcome measures and the performance drivers should be linked together in a cause-and-effect relationship (Kaplan & Norton, 1993). Although, the BSC concept have been highly praised since its introduction, confusions both in practice and among academics, with respect of how this cause-and-effect principle should be implemented and used, have raised questions about its validity.

As a matter of fact, Granger (1969) explain that causality is a standard step when analyzing linear systems of time series. Causality, with existence in forecasting principles, derive from the idea that a cause must precede its effect in time. In practical applications of cause-and-effect, relationships that have a causality lag is predefined objectives with outcomes of “hard” data, for e.g. when the percentage growth in revenue and revenue from a certain customer segment is measured (Bukh & Malmi, 2005).

A danger of such causal and “hard” data concepts is that they often represent only a simplification of the reality (Kasperska & Tayles, 2013). An emphasized usage of “hard” data and quantification may undermine the informal and spontaneous emergence of strategy and risks to be missing important “soft” information such as intuition (Kasperska & Tayles, 2013). Such “soft” data may be especially important in organizations with no major strategic intents or with no pre-established understanding of what problems or bottlenecks are to be solved (Kennerley & Neely, 2002), which is a highly relevant issue for organizations operating in dynamic environments.

Ewusi-Mensah (1981) investigate the external organizational environment and its impact on management information systems. She concludes that majority of the discussion within the literature deal with information systems from an internal organizational perspective without

considering the external environment surrounding the organization. She claims that a trend of “closed” systems have emerged, a logic that refers to a deterministic system with complete knowledge about cause-and-effect relationships in the structure, and which consider an enterprise as independent from its external environment. This view is a similar vein to Feibleman and Friend’s (1969) “static” description of an organization as being outside of its organizational boundaries and isolated from problems of interaction.

In a try to understand why a trend such as cause-and-effect relationship, characterized by “hard” data, “closed” and “static approach has gained great popularity, Smith (1995) propose that organizations often reduce their performances in its meaning and scope to what is technically easier to measure, thus following an operational point of view. Also Bourgeois (1985) provide evidence that people tend to search for order and simplicity. Such clarity seeking can however lead to an inappropriate situation which doesn’t exist (Bourgeois, 1985). An implication of this is that performance indicators often is formulated to its simplest and most easily measurable aspect of the activity or process being performed (Smith, 1995).

In a similar vein, Kasperska and Tayles (2013) argue that causal links and its elaboration is subject to human cognitive limitations. The management’s ability to select the right area to focus on and to specify appropriate measures to be included in the cause-and-effect pre-requisites an understanding of what actions produce what outcomes. Most managers do not see clear-cut relationships inherent in the nature of business processes and the bigger and more diverse the organization, the more causal relationships may be needed to capture its real potential. (Kasperska & Tayles, 2013)

Given the continuously changing and complex business environment, a complete knowledge about cause-and-effect in such context increase the difficulty furthermore. According to Kasperska and Tayles (2013), tracing a comprehensive cause-and-effect model would become very costly and resource-hungry to construct. To keep in touch with reality, the strategy and measurement system will require constant revisions and refinements which may prove to be unrealistic. Micheli and Manzoni (2010) have emphasized that SPMSs and causal relationship concepts may act as an obstacle to change. Certainly, this happens when the SPMSs are too pervasive, rarely reviewed or not subdivided in levels and when responsibilities are not delegated in the organization.

Toumela (2005) has raised an important issue from a measurement continuity point of view about how and when PMM system should be adjusted in order to adapt to the environment. Lack of proper mechanisms for improving and updating the measurement system and to align the strategy with proper measures are further identified problems (Toumela, 2005). With lack of measurement history and poor understanding of environmental trends, setting appropriate targets and altering rewards systems can be difficult that may lead to too low or high performance targets are set with decreased motivation as a result (Toumela, 2005). Toumela (2005) claims that given the difficulty in defining and implementing goals for a successful strategy in a dynamic environment, objectives behind the strategy is far from clear-cut. Among others, he states that different coalitions or stakeholder groups may dominate in the goal setting process. The ultimate objective of a company can be set in order to satisfy shareholders but an other opinion can be to satisfy the needs of all relevant stakeholders (Toumela, 2005). Toumela (2005) even question if strategy formulation has more to do with randomness and traditional sense making rather than with rational decision making. The garbage-can model developed by March (1971) support such a questioning by illustrating that action and decision-making in organizations is a mixture of problems, solutions and choice opportunities that often come together by chance. March (1971) states that decisions are often based on imitation and coercion

and that goals may be unclear during the decision-making process.

From a dynamic environment point of view, Bourgeois and Eisenhardt (1988) argue that strategic decision making is problematic not only because changes are so dramatic, but also because it is difficult to predict the significance of a change's occurring. As a result, the authors claim that it is easy to make inappropriate strategic judgements. A traditional way to avoid strategic errors is to simply wait to see how events unfold, or to imitate others (Bourgeois & Eisenhardt, 1988). However, in this environment, the "wait and see" and "me too" decision strategies may also result in failure, as competitive positions change and windows of opportunities closes. The dilemma of strategic decision making in this environment is that it is easy to make a mistake by acting too soon, but equally ineffective to delay decision making or to copy others. (Bourgeois & Eisenhardt, 1988)

Micheli and Manzoni (2010) and Kennerley and Neely (2002) investigate the relevance of different strategic models and find that in organizations where success is believed to emerge from incremental improvement in a number of areas, a deliberate strategy, followed exactly as intended, can harm the business as it picks some areas to be in focus thereby leaving others in the background. On the other hand, several researchers have raised the problem of a rigid adherence to a large number of indicators. Such SPMSs have been criticized to promote organizational inertia and create "ossification" (Bisbe & Malagueno, 2012). According to Micheli and Manzoni (2010), this may not be a problem in stable environments, but could be dysfunctional for firms operating in very dynamic environments, where only a few indicators and rules should be set, and those mostly to define boundaries.

Effects of strategy formulation and strategic agendas have been identified to be correlated to the degree of environmental dynamism in an organizations' environment. In a study by Bisbe and Malagueno (2012) the authors investigate implications of the relationship between PMM system and strategy formulation on performance. The researchers question the extent to which PMM system influence organizational performance through reformulation of intended strategies. They also examine whether the strength of the influence of PMM systems on performance acting through strategy reformulation depends on the level of environmental dynamism. The findings provide evidence that both strategic formulations derived from strategic agendas and decisions and PMM system affect the final performance. However, if a dynamic environment factor is included in the research question, the findings show that such element significantly influences the strength of the effect of PMM system on performance. This positive effect is salient in stable environment but diminishes as environmental dynamism grows. The authors conclude that environmental dynamism negatively affects the relationship between PMM system and organizational performance that is mediated by intended strategies. The positive consequences of strategic decisions arrays only in the context of low dynamic environments. Companies in stable environments are therefore more likely to capitalize the beneficial effects of PMM system that originates from strategy formulation whereas companies in very dynamic environments will find it harder to exploit such effects, this even if PMM system are positively associated with strategic agendas. (Bisbe & Malagueno, 2012)

In an investigation of the use of management control systems (MSC) among Finnish firms, Malmi (2001) provides evidence that the relationship between strategy and measures, based on a cause-and-effect relationship, appear weak in most of the companies, even if interviewees states that their measures have originated from the strategy. Also, it appeared that the idea of linking measures was not well understood among the practitioners, where scorecards often was composed in a collection of indicators sorted in four dimensions without any attempt to map the relationships between the indicators, resemble the measures more in kind of key

performance indicators rather than scorecards. (Malmi, 2001) Aslo, Lipe and Salterio (2002) argue that companies find capturing the essence of strategy to a PMM system as a challenging task. Malmi (2001) make a conclusion and claim that the use of indicators of strategically important issues is fairly limited among practitioners leaving the cause-and-effect principle flawed.

According to Micheli and Mari (2014) this issue is highly relevant and problematic, where difficulties in- and the impossibility of defining the measurement of tasks of complex activities and processes, remains as a considerable gap. Micheli and Mari (2014) states that it is not the assignment of numbers, but the adequacy of the measurement systems that makes sense and evaluates a certain task. According to Bourgeois (1985) the direction of simplicity might not be too dangerous in stable environments, but for firms in constantly changing environments, an attempt to avoid uncertainty and to gather complete agreement on perceptions and goals may be harmful for the organizational performance.

To sum up, an assumption that measures should be derived or aligned with strategy in order to maintain appropriate focus in the environment, is in this second phase challenged by providing a more recent literature review of strategy and PMM systems. The use of cause-and-effect principle within the SPMSs may not necessarily prove beneficial since a) a cause must not precede its effect in time since the nature of organizational environment is unpredictable, b) causal links is a simplification of the reality and emphasize usage of “hard” data, c) it is a “closed” system considering an enterprise as independent from its external environment, d) there is no understanding or agreement on the underlying causalities, i.e. what actions will produce desired outcomes among practitioners, d) in conditions of environmental dynamism, an intended strategy will negatively affect the relationship between PMM system and performance and, e) tracing a comprehensive cause-and-effect model will become very costly and resource-hungry with constant revisions as a result.

### 2.1.3 The relationship of PMM & Environment

A lot have been written about the importance of fit between business strategy and environment. By authors as Beer (1981) and Miles and Snow (1978), alternative approaches have been proposed of how to achieve proper interaction between strategy development and environment. The use of PMM systems is frequently recommended in this literature to facilitate strategy implementation and enhance organizational performance, a view that corresponds with much of the BSC rhetoric (Davis & Albright, 2004). This type of fit between business strategy and environment has often been portrayed as the process of ensuring that the PMM system reflects the strategy (Kaplan & Norton, 1993). This fit assumes that a change in the environment stimulates a change in strategy, and a change in strategy stimulate a change in the PMM system. This process illustrates an assumption that external influences are reflected in the business strategy. When the influences have been incorporated in the strategy, the PMM system is adjusted. (Bourne et al., 2000; Neely et al., 2002)

After the introduction of SPMSs and related approaches such as BSC and causal links, a discussion of the implications of the relationship between strategy formulation and PMM systems has intensified. Even if frameworks like these have been well-promoted, related limitations have rapidly increased where numerous hints of potential problems and challenges have been pointed out. Traditional top-down view of strategy implies that strategic control means ensuring that behavior of people and operational processes are consistent with the predetermined strategy (Merchant, 1985). Challenges related to this were reviewed in the

previous phase (2.1.2) where several authors have claimed that maintaining alignment between PMM system and strategy is not simple. Additionally, external structural changes as innovation and globalization accelerate in a higher speed and environmental trends are not predictable as before. One of the latest contributions in this debate is related to the paper by Melnyk et al. (2014) who have raised the issue that it takes time to restate strategic changes into reformulated measures and metrics. Also, it takes time for these changes to be communicated effectively through the organization. Additionally, it takes time for the participants to accept these changes and for them to change their behaviour. (Melnyk et al., 2014) Hence, Melnyk et al. (2014) claims that the previous research assumes a three-step approach which is not suitable for organizations surrounded by dynamic environments.

This assumption has meant that a PMM system detects changes in the environment, which in turn leads to changes in the strategy and then consequently to changes in the PMM system. They express their concern by questioning “[...] but what happens if the environment is so turbulent that this two- or three step approach takes too long to implement? Can the PMM system remain resilient to a change in the environment and so continue to provide appropriate guidance to managers in real time?” (p. 183). This direct fit between the environment and the PMM system has received far less attention in the research and is also the specific focus for this paper.

More recent research has started to question the assumption that performance measures, derived from strategy, has one main purpose for why they are put in use. The initial suggestion that measurements should measure the success of the implementation of strategy appear in new research to be an inappropriate definition. Researchers such as Bourne et al. (2000) argue that information and feedback derived from the measures are used to rather challenge the assumptions and to test the validity of the strategy. For instance, Waterhouse and Tiessen (1978) have demonstrated that planning, such as KPIs and targets, is one kind of ex ante control. Such control practices are incomplete with regard to measures which provide feedback and compare actual results with plans (Waterhouse & Tiessen, 1978). Implementation of KPIs and targets can thus be translated to a simplification of the control practice since variables in the environment, not incorporated in the KPIs or targets, will be excluded in the firms follow up. Bourgeois (1985) have argued that it is important that firms only reduce uncertainty under stable environmental conditions. Uncertainty should not be reduced if it is, in fact, representing an accurate picture of the objective situation. A reduction of uncertainty may in a dynamic environment result in dysfunctionality at strategic levels (Bourgeois, 1985).

It can be argued that the traditional definition of PMM have moved towards the trend of “specific”, where firms use metrics such as KPIs and targets that promote specific outcomes and focus on specific solutions. Melnyk et al. (2014) claim that such a static assumption is more appropriate for organizations in stable environments since such PMM system is not resilient to environmental changes.

In a survey made by Melnyk et al. (2014) the authors find that senior managers are struggling to manage in volatile environments. The interviewees expressed that they had real concerns about how to deal with an increasingly unpredictable fast moving business environment. They also described that the current PMM literature provided little guidance that addressed these issues and that the prescription was fairly limited. The guidance provided in the research was seen as static in nature whereas the managers had to deal with a dynamic, uncertain environment. Second, the guidance offered was overly simplistic and highly mechanistic - when the environment changes, the strategy must change, when strategy changes, the PMM must change. The managers felt that more of a conditional, contingent response was required, one that recognized that the strategic and PMM response was highly dependent on numerous factors

and issues. Such a contingent response was lacking in the PMM literature.

The senior managers expressed their anxieties by stating: “[...] the belief is that the business environment in which we are trying to run our businesses is changing. The speed of change in technology and increasing levels of connectivity are combining with shifts in economic patterns of activity to make markets extremely unpredictable and more complex to manage” (p. 179). Melnyk et al. (2014) explain that for business to survive, they need to quickly identify new threats and opportunities, make decisions about their responses and implement these decisions quickly. Furthermore, an especially concern was related to situations where the solution or approach has not been fully developed. Emerging processes, complex situations and managing opportunities are factors that illustrates the flux faced among practitioners when the environment changed. They stated that such obstacles created challenges because of the time and number of iterations needed to get the metrics aligned with the new strategy and the confusion caused during the change (Melnyk et al., 2014).

A second group of respondents had raised the issue of the limitations of metrics in managing the organization. They highlighted the challenges in forecasting in a turbulent environment together with the need for metrics to be dynamic and move synchronously with the changing environment and business. Obstacles stated was revolved around creating a holistic view and making the correct decisions early with incomplete data until they had concrete evidence from their measurement system for a need to change.

Melnyk et al. (2014) summarize that the main challenges for the practitioners were associated with enabling local creativity within strategic direction, enabling local teams to sense make and interpret the strategy and translate their understanding into executable plans.

To sum up, the three-step approach promoted by concepts as SPMSs, BSC and causal links is in this third phase claimed to be inappropriate for organizations in dynamic environments. In such context, strategic decision making is problematic since changes are dramatic and to predict the significance of the change is difficult. Senior managers feel concerns about how to deal with an increasingly unpredictable fast moving environment and the guidance offered in the literature have been overly simplistic and highly mechanistic in nature. Melnyk et al. (2014) shed light on the emerging issue by stating that there is a need to recast the relationship between strategy and PMM. They further question the feasibility of developing PMM from strategy in volatile environments and finally conclude that a more nuanced approach to the co-creation of strategy and PMM is required in turbulent environments.

## **2.2 Theories**

In this phase the theoretical perspectives of PMM and dynamic environment is presented to make the subjects clear.

### **2.2.1 Dynamic environment**

Since the 1970s, the dynamic environment has received a great attention in the literature. Specifically, researchers have examined the relationship between perceived environmental uncertainty (PEU) and a multitude of varied organizational settings including; strategy; design; effectiveness and individual variables such as motivation and well-being.



Tymon et al. (1998) makes a literature review within PEU and find two major streams of studies within the research. The first stream is based on the work provided by Duncan (1972) and the second one on Khandwalla (1972) and Miles and Snow (1978). Under these two main groups, a host of varied authors have examined different ways in which PEU may affect an organization. By conducting an additional literature review, works provided after Tymon et al. (1998) has been included in this paper. In total five papers have been found are based on Duncan's (1972) PEU research (Table 1) and nine papers who have adopted Khandwalla (1972) and Miles and Snow's (1978) dynamic environment study (Table 2).

Duncan (1972) was the first researcher who addressed the term perceived environmental uncertainty. Common for Duncan based definition of PEU is that both internal and external influences (mainly internal) can cause a decision-maker uncertainty. Duncan (1972) defined the environment to include the "totality of physical and social factors that are taken into consideration in the decision-making behavior of individuals" (p. 314). Some of these factors that have been addressed are role conflict; role ambiguity; job satisfaction; job performance and; salary-incentives. Also, specific for this stream of research is that all decision-makers are appropriate subject for the PEU perception within an organization, regardless whether they are members of top management.

After Duncan's (1972) contribution, several authors have used Duncan's definition of PEU as their theoretical foundation, e.g. Chenhall and Morris (1986); Rebele and Michaels (1990); Miller (1992); Umanath et al. (1993) and; Gregson et al. (1994).

Most of these adopters have related to internal factors with no reference to the external environment. (Tymon et al., 1998)

In the second set of studies, origin have been related to the work of Khandwalla (1972) and Miles and Snow (1978), whose findings have been identified as being equal.

Common for Khandwalla and Miles and Snow based definition of PEU is that these studies restrict the term to only consider factors in the external environment.

With regard of terminology, Khandwalla (1972) also expressed the term "competition" in his study rather than the phrase "perceived environmental uncertainty". However, these two definitions have later been claimed to be two equally similar terms. Further, he stated that competition is equally used to be referred as dynamism, complexity and change (Khandwalla, 1972).

In the Khandwalla (1972) study, the specific external factors mentioned are 1) price competition; 2) promotion and distribution competition and; 3) product quality and variety competition. Authors that have adopted this stream of research have identified some additional external factors such as 4) competition; 5) technology; 6) raw materials and; 7) regulation. E.g. of works adopting this second stream of research are Miller and Friesen (1983); Gordon and Narayanan (1984); Govindarajan (1984); Gul (1991); Chenhall and Morris (1993); Kren and Kerr (1993); Gul and Chia (1994) and; Newkirk and Lederer (2006). Common for each of these studies is also the measurement of top managers' perception rather than the whole organization as in Duncan (1972) based research.

With regard of the particular focus of the external environment in this paper and the long proven scientific track record of the study by Khandwalla (1972)/Miles and Snow (1978), this paper will adopt the Khandwalla and Miles and Snow's theory. Consequently, also the terminology "dynamism" will be further used.

<b>Author/s (Year)</b>	<b>PEU Measure</b>	<b>Environment: external, internal or both</b>
Chenhall and Morris (1986)	Based on Duncan (1972)	Unclear
Rebele and Michaels (1990)	Based on Duncan (1972)	Both
Miller (1992)	Based on Duncan (1972)	Both
Umanath et al. (1993)	Based on Duncan (1972)	Both
Gregson et al. (1994)	Based on Ferris (1977, 1978)	Unclear

**Table 1**

Duncan based dynamic environment studies by Tymon et al. (1998). Miller (1992) added.

<b>Author/s (Year)</b>	<b>PEU Measure</b>	<b>Environment: external, internal or both</b>
Khandwalla (1972)	Intensity of competition in price, marketing, and product (variety and quality): importance of each to profitability.	External
Miller and Friesen (1983)	Based on Khandwalla (1972)	External
Gordon and Narayanan (1984)	Based on Khandwalla (1972). Predictability and stability of various aspects of industry, competition, customers, economy, and technology.	External
Govindarajan (1984)	Based on Miles and Snow (1978). Predictability of technology, competitors' actions, market demand, product attributes/design, raw material, government regulation, and labor union actions.	External
Gul (1991)	Adapted Govindarajan (1984)	External
Chenhall and Morris (1993)	Adapted Gordon and Narayanan (1984)	External
Kren and Kerr (1993)	Based on Govindarajan (1984)	External
Gul and China (1994)	Based on Govindarajan (1984)	External
Newkirk and Lederer (2006)	Based on Khandwalla (1972)	External

**Table 2**

Khandwalla based dynamic environment studies by Tymon et al. (1998). Miller and Friesen (1983); Newkirk and Lederer (2006) added.

Khandwalla (1972) have identified three environmental dimensions of an external environment which are referred to as 1) environmental dynamism; 2) hostility and; 3) heterogeneity. These are clarified in next.

### *Dynamism*

Khandwalla (1972) defines the first feature of environment as the degree of predictableness in an environment. A similar definition is also given by Miller and Friesen (1983) who defines the variable as the rate of change or innovation in the industry as well as the uncertainty or unpredictability of actions of competitors and customers.

Khandwalla (1977) have refined the definition of predictableness by dividing it into three levels 1) perceived uncertainty about forthcoming events; 2) its consequences and; 3) how to react to them.

Khandwalla (1972) argue that numerous of different types of factors can cause an environment to be perceived as uncertain. For example, technological changes, which can cause release of new products and make current ones quickly obsolete; market competitiveness, where competition on price or quality can eliminate weaker players; radical macro-economic and social changes, which both can challenge the possibilities in the markets within short time frames. Miller and Friesen (1983) add the unpredictability in customer tastes; production or service technologies and; the modes of competition in the firm's primary industries.

### *Hostility*

The second environmental dimension represents the degree of threat to the organizations' primary objectives, such as market share, liquidity or profitability (Khandwalla, 1972). Newkirk and Lederer (2006) have added that the definition of hostility capture the level of competition and the accessibility of resources, in terms of labour and raw materials. Yayla and Hu (2012) have argued that this dimension describes the degree of competition in terms of price; product and service quality and; product and service differentiation. Miller and Friesen (1983) definition is threats with regard of price; product; technological and distribution competition; severe regulatory restrictions; shortages of labour or raw materials and; unfavorable demographic trends, such as the drying up of markets.

### *Heterogeneity*

The final dimension, also commonly referred to as diversity or complexity, encompasses variations among the firm's markets that require diversity in production and market orientation. Such type of factors are for e.g. differences in buying habits; nature of competition; product lines; channels of distribution and geographic concentration of firms (Khandwalla, 1972). The wider diversity, the higher is the need for information to evaluate the environment appropriately. Miller and Friesen (1983) argue that this variable concerns the differences in competitive tactics; customer tastes; product lines and; channels of distribution across the firm's respective markets. However, Miller and Friesen (1983) makes it clear by arguing that these differences are only significant to the extent that they require very different marketing; production and; administration practices.

## 2.2.2 Performance Measurement and Management

During the last three decades, there have been a revolution in performance measurement and management and researchers have not yet fully reached any consensus regarding the definition and scope of the concept. Throughout this paper, the definition provided by Melnyk et al. (2014) will be adopted and their study is addressed in next.

The term performance measure is defined as “[...] the instrument used to quantify the efficiency and/or effectiveness of action” (Melnyk et al., 2014, p. 175). Therefore, a performance measure is both quantifiable and verifiable.

Performance measurement and management (PMM) consists of two main components; the performance measurement system and the performance management system.

The performance measurement system contains the process for; setting goals and collecting; analyzing and interpreting of performance data.

The objective of this subsystem is to convert data into information and to evaluate the effectiveness and efficiency of an action.

Although this component is essential for the effectively managing of an enterprise, there is a complementary need for a second system – the performance management system.

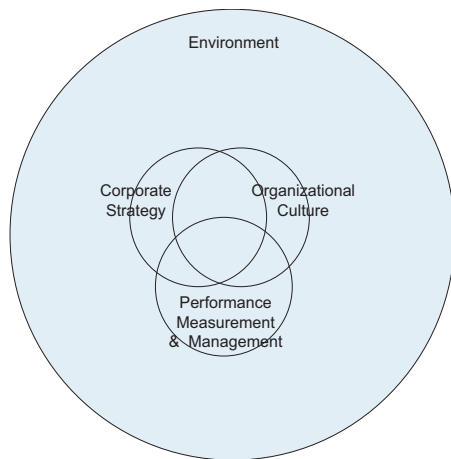
The performance management system contains the process for; evaluate the difference between actual and desired outcomes; identifying and highlighting those differences that are critical; understanding if and why the differences have occurred - and thereby signaling management for a closer involvement and; monitoring corrective actions aimed to closing the performance gaps.

To be able to manage the performance management system, a single and double-loop learning (Argyris, 1977) is essential to be included, since this subsystem should be able to both detect and correct errors, but also be able to questioning underlying standards, assumptions and strategies of the organization.

Furthermore Melnyk et al. (2014) argue that these two components forms one integrated system (the PMM system) which is part of a wider context where also corporate strategy and organizational culture are included. Each of the three systems PMM, culture and strategy are furthermore surrounded by the external environment. All four systems are integrated and affect each other. Thus a change in corporate strategy, organizational culture or environment has a direct consequence for the PMM system. However, Melnyk et al. (2014) argue that how the PMM reacts to a change in the environment depends heavily on the firm’s organizational strategy, structure and culture.

By incorporating organizational culture, the PMM system has furthermore been acknowledged as both a technological process as a social one.

Figure 1 represent the relationship between the systems of environment, corporate strategy, organizational culture and PMM.



**Figure 1**

Theoretical framework of the interfaces with the PMM system by Melnyk et al. (2014)

Six specific roles of PMM systems have in total been identified within the research and is argued to be critical for managing an organization. These are; 1) establishing position – current levels of performance; 2) communicating direction – what is to be achieved; 3) influencing behaviour – good and bad performance; 4) stimulating action – identifying when to intervene; 5) facilitating learning – both single and double-loop and finally; 6) implementation of strategy – ensuring change happens. (Melnyk et al., 2014; Franco-Santos et al., 2007)

Of these six roles, this study explicitly focus on the second – communicating direction. More closely this subrole encompass whether an environmental change impacting the firm, is being effectively communicated throughout the firm through the PMM system (Melnyk et al., 2014). That is, does the PMM system provide guidance after a significant change in the environment, or do the communication of an updated direction of what to be achieved has to go through the firm strategy?

### 2.2.3 The performance alignment matrix

Melnyk et al. (2014) propose the framework Performance alignment matrix to explain the relationship between strategy and PMM system. The framework is determined to be useful for guiding the use of measurement in different parts of the organization over different levels and different stages of strategy development. The performance alignment matrix consists of two dimensions: outcomes and solutions, which both can be positioned from a scale from general to specific.

General outcomes are desired results and is often reflected in an organization’s vision and strategy. This type of outcome is described as a situation where a broad understanding of what is required is stated. An example is “I want to do radical innovation”.

From another point of view, outcomes can be described in terms of certainty. Here, the more certain a management is of changes in the environment and its ability to identify an appropriate strategic response, the more tightly will the outcome be specified. Thus, the higher the confidence, the higher the specificity; the lower the confidence, the lower the specificity. In an environment with high fluctuations and turbulence, management may decide to preserve strategic flexibility by stating its strategic objective in general terms. By using this approach, the management identifies the general direction to conduct without committing the firm to a

specific set of response.

Contrary, specific outcomes are situations where the decision-maker has a good idea of what is desired, for e.g. “I need five new products launched by the end of the year”.

The second dimension solutions intend to explain the specific approaches the organization adopts to deliver the outcome. In general solution, multiple ways are available to achieve a given outcome. An example is “We want to be operationally excellent”. In this type of solution, the management has not identified a specific method of achieving its outcomes.

Specific solution, on the other hand, is when only one way of achieving the desired outcome is available, for example “We want to introduce a Kanban by the end of the financial year”.

By combining these two dimensions, Melnyk et al. (2014) provide the Performance alignment matrix consisting of the four quadrants: measurement-driven management, outcome-driven solutions, assessment-driven management and solution-driven outcomes.

Measurement-driven management is the most specific form of measurement and is regarded as the measurement “after the fact”. In this approach, the method is fixed and the outcome is pre-determined. A strong and immediate link between strategy and metrics is assumed where changes in strategy drives changes in metrics.

This method is applicable in a stable environment where the management is expected to know how to respond to the environment. The management is further expected to have high confidence in its strategic solutions and can in advance identify the specific solution to be used to achieve these outcomes. The main concern in a measurement-driven approach is to match actual performance with the targets set and identify whether objectives have been achieved or not.

Outcome-driven solutions are applied when the outcome is clearly specified but the solution is only expressed in general terms. Here, specific goals or outcomes of the organization are specified, but the method chosen to reach the goal is seen as less critical, as long as the specified outcome is achieved. Thus, a linkage between strategic goals and metrics are not built-in. Rather, once the best approach has been identified, chosen one is “locked” by specifying the exact metrics to be used.

Assessment-driven management comprises a broadly described outcome. This is a measurement where the management is open to any outcome and solution as long as the action is consistent with the general goal. Thus, it is not possible to measure against pre-determined goals, only to measure its progress. In the assessment-driven management focus is moved from measurement to assessment. Consequently, outcomes are assessed by controlling whether the tasks are being carried out or in line with the goal. In this quadrant, outcomes or solutions are not measured because there is a risk of shaping the outcome in ways not appropriate. Specification of metrics risks in turn to shape and change the resulting outcome.

Solution-driven outcomes encompass measurement that drives the outcome. Here, the management do not have a clear strategic goal. However, specific solutions are created by setting up measurement of activities with no clear link to outcomes. This quadrant is considered as dangerous. Management may be letting the execution shape and influence the corporate strategy which over time may formalize what the firm is doing and what it is measuring. As a result, strategy may focus on what the firm does well and what it measures, rather than what the market requires.

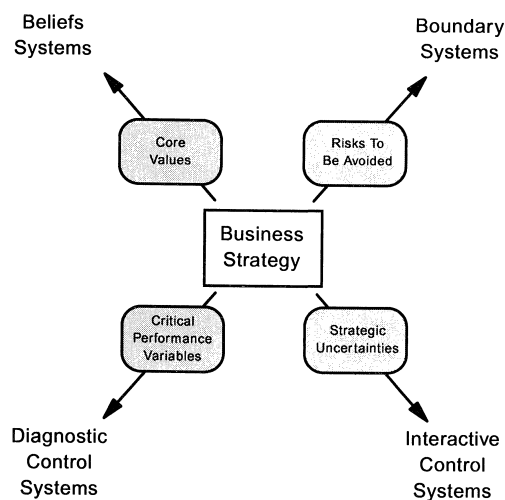
		Outcome	
		General	Specific
Solutions	General	Assessment-driven management	Outcome-driven solutions
	Specific	Solution-driven outcomes	Measurement-driven management

**Figure 2**  
The Performance Alignment Matrix by Melnyk et al. (2014)

### 2.2.4 Simons' LOC framework

The Levers of Control (LOC) framework provided by Simons (1995) consists of four control systems: belief (e.g. core values), boundary (e.g. behavioural constraints), diagnostic (e.g. monitoring), and interactive (e.g. forward-looking, management involvement). Collectively, these four categories comprise a tool for implementing and controlling the business strategy of a firm. Also, it gives a firm's management power to control the performance of the organization as well as empower the employees.

Figure 3 illustrate the four controlling systems of the framework.



**Figure 3**  
Controlling business strategy by Simons (1995)

Beliefs system which communicate core values of the company, are “the explicit set of organizational definitions that senior managers communicate formally and reinforce systematically to provide basic values, purpose, and direction for the organization (Simons, 1995, p. 34).

Belief systems are created and communicated through formal documents such as mission statements, vision statements and statement of purpose.

Belief systems serve as controls that inspire and motivate employees to search, explore, create and engage in opportunity-seeking behaviours. (Simons, 1995)

Belief systems have been suggested to be critical to high-performing organizations (Calfee, 1993). For e.g. a mission statement provides management with a unity of direction for all individuals within an organization, independent positions. It promotes a sense of shared expectations among all levels and generations of employees. It consolidates values over time and across individual and different interest groups. The more a firm emphasize the belief system to communicate intended strategy and inspire employees for opportunities, the more will the firm all together contribute to provide a successful outcome. (Widener, 2007)

Boundary system which communicate risks to be avoided, “delineate the acceptable domain of activity for organizational participants” (Simons, 1995, p. 34).

Boundary systems are created through codes of business conduct, strategic planning systems and, capital budgeting systems.

Boundary systems communicates and prescribe the limits and rules which must be respected and actions that employees should avoid. Its purpose is to allow employees freedom to innovate and achieve within certain predefined areas. (Simons, 1995)

Diagnostic system which communicate the critical performance variables, are “formal information systems that managers use to monitor organizational outcomes and correct deviations from preset standards of performance” (Simons, 1995, p. 59).

Diagnostic systems provide motivation, resources, and information to ensure important organizational strategies and goals will be achieved.

Diagnostic systems are exemplified by profit plans and budgets, goals and objectives systems and function as a feedback system to track variances from preset goals. It reports information on the critical success factors which allows managers to focus their attention on the underlying organizational drivers that must be monitored in order for the firm to realize its intended strategy. (Simons, 1995)

Diagnostic control has been criticized for its negative and weakening effect on innovation and its capacity to support transformation of organizations (Micheli & Manzoni, 2010). With its basic attention on outputs of processes that are measurable, diagnostic control aims to signal success in the most critical factors of the intended strategy (Simons, 1995).

Interactive control systems which focus on strategic uncertainties, are “formal information systems that managers use to involve themselves regularly and personally in the decision activities of subordinates” (Simons, 1995, p. 95).

The purpose of making a control system interactive is to focus attention, help stimulate search and learning and intensify dialogue throughout the organization.

This control system requires top management involvement to make the system interactive by for e.g. ensuring that system is an important and recurring agenda to discuss with subordinates; ensuring that system is a regular focus of attention by operating managers throughout the organization; participating in face to face meetings with subordinates and; continually challenging and debating data, assumptions, and action plans. (Simons, 1995)

Interactive control is argued to foster capabilities of entrepreneurship, organizational learning, innovativeness and market orientation. It helps focusing organization’s attention on strategic priorities and stimulate a continually dialogue throughout the organization’s all levels (Chenhall, 2005). By doing so, this control system assist in identifying emergent strategies and reformation of existing models and beliefs (Henri, 2006). When beliefs and boundaries becomes questioned, the organization’s strategy may also be reshaped (Widener, 2007). The



causal predetermined links at the strategic levels will thus be open for discussion and questioning.

The specific character of interactive control and its especially top management involvement and use, is by Widener (2007) argued to not only be used by higher level managers. The author argues that this system rather is used throughout the organization's all levels.

The interactive control is also argued to facilitate double-loop learning (Micheli & Manzoni, 2010).

A growing part of the research have reached an agreement about the importance of finding a balance between the different levers of control. It has been argued that the power of these levers in implementing strategy does not lie in how each is used alone, but rather in how the forces together create a dynamic tension.

Of the four levers, two are defined as positive; belief- and interactive control systems, and two as negative; boundary- and diagnostic control systems. (Simons, 1995)

The belief and interactive systems creates positive energy that inspire employees to seek, explore and create. Conversely, the boundary- and diagnostic controls are tended towards negative forces that constrain the space that employees have to explore, and to ensure compliance with organizational objectives. (Simons, 1995)

Interactive controls provide top managers with an opportunity to learn of new strategic opportunities. A strategy emerged from an interactive control system means that objectives and critical success factors have been refined and agreed about through interactive dialogues throughout the organization. (Chenhall & Morris, 1995).

Boundary and belief systems are similar type of controls which aim to motivate employees to search for new opportunities. However, the boundary system does this in a negative way through constrains of behaviour or as minimum standards while the belief system does so in a positive way through inspiration and guidance. (Simons, 1995)

## 2.2.5 Single and Double-loop learning

There are two main organizational learning levels in established literatures; single-loop learning and double-loop learning. The work of Chris Argyris (1977) has made a significant contribution to the development of organizational learning theory.

### *Theories-in-use and Espoused theory*

The starting point in Argyris (1977) contribution is that people have mental maps with regard to how to act in situations. This involves the way they plan, implement and review their actions. Furthermore, they assert that it is these maps that guide people's actions rather than the theories they explicitly espouse. People are seldom aware of the maps or theories they do use.

Theories-in-use are world-view and values implied by the behaviour, or the maps people use to take action. They are implicit in what we do as practitioners. They govern actual behaviour and tend to be tacit structures. Their relation to action is like to relation to grammar-in-use to speech; they contain assumptions about self, others and environment, and are applied naturally in our day-to-day life. (Argyris, 1977)

Espoused theory is defined as the world-view and values people believe their behaviour is based on. It is the words people use to convey what they do or what they would like others to think they do. When someone is asked how he or she would behave under certain circumstances, the

answer usually given is the espoused theory for that situation. This is the theory of action to which we give allegiance, and which, upon request, communicate to others. However, the theory that actually governs our actions is the theory-in-use.

Argyris assert that the theories-in-use are often not the same as their espoused theories, and that people often are unaware of their theories-in-use. (Argyris, 1977)

### *Single-loop learning*

Single-loop learning involves detection and correction of error. This type of learning is present when goals, values, frameworks and, to a significant extent, strategies are taken for granted. When an error or problem is detected and corrected, and organizations carry on with their present policies or achieve its present objectives, then the process is a single-loop learning. This learning is characterized as a problem-solving process where individuals examine the environment, compare data with the norm, and then initiate an appropriate action. Individuals look at what alternatives they have to correct the problem rather than questioning why the problem has arisen. The activities to correct error and solve the problems add to the knowledge-base or firm-specific competencies or routines without altering the fundamental nature of the organization's activities. (Argyris, 1977)

### *Double-loop learning*

The theory of double-loop learning was developed by Argyris (1977) as a way of creating more robust knowledge. Double-loop learning occurs when error is detected and corrected in ways that involve questioning and modification of an organization's underlying norms, procedures, policies and objectives. It involves the process of questioning the role of the framing and learning system which underlie actual goals and strategies. The basic assumptions behind ideas or policies are confronted, hypotheses are publicly tested and processes are disconfirmable not self-seeking.

At the highest level, double-loop learning leads to a paradigm shift, to a change in the fundamental governing values that define the institution.

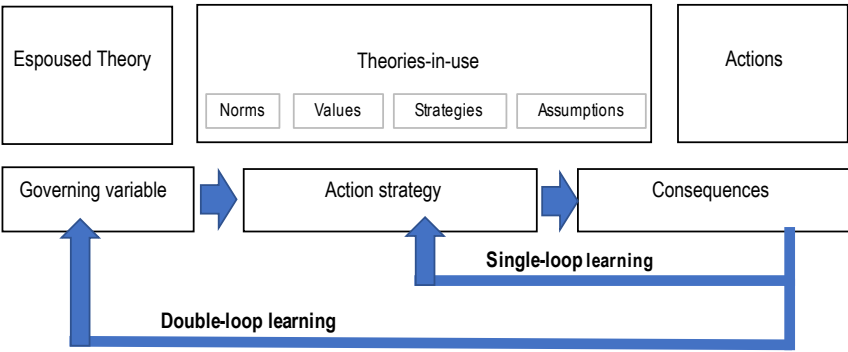
Such learning may lead to an alteration in the governing variables and, thus, to a shift in the way in which strategies and consequences are framed. As a result, the nature of the organizational learning becomes improved.

Argyris (1977) use a simple example of a thermostat to illustrate the difference between single and double-loop learning. A thermostat detects deviations from the prescribed temperature and turns the heat off. When the thermostat turns the heat on or off, it is keeping with the programme of orders given to it. The thermostat does not analyze the reasons for the variance, leaving the learning as a single-loop because the underlying programme is not questioned. Single-loop learning does not contribute to the stock of knowledge, since it only applies what is already known. It is not even necessary for the thermostat to know why or how its actions create change in the temperature. The response that is made is routinized one that is present.

If the thermostat could ask questions, and wondered why it was set for a particular temperature, or what the significance of temperature was in the wider scheme of things, it would be characterized as a double-loop learning, as it would begin to develop consciousness in its routines and thus is examining the problem.

Argyris (1977) appear to imply that double-loop learning is always superior to single-loop learning. Furthermore, Argyris (1990) argue that an overwhelming amount of learning today is single-loop because organizations are designed to identify and correct errors. Organizations are good at such learning, which is relatively straightforward, since errors are attributable to defective actions or strategies. He furthermore claims that accounting and management control

systems should be used in a manner that promotes learning in order to overcome adoption of defensive routines. (Argyris, 1990)



**Figure 4**  
Single and Double-loop learning by Argyris (1977)

## 3. Methodology

In the following section, the research approach of conducting a qualitative case study method is explained in order to explore the use of PMM systems in highly dynamic environments. The process of data collection and analysis is presented as well as the validity and reliability of made choices are tested.

### 3.1 Research strategy

Often the choice between qualitative and quantitative methods is given by looking at how the main question and purpose of the research are formulated (Trost & Hultåker, 2007). The specific research scope and purpose of this thesis validates the use of a qualitative methodology; the aim of this paper is to understand how PMM is used within companies demonstrating a high- or very high dynamic environment. In comparison to a quantitative strategy, the qualitative method aims to explore the diversity of some topics within a certain context (Bryman & Bell, 2011). Thus, the qualitative approach makes it possible to acquire a broad empirical dataset within the use and practices present within PMM across different industries for a meaningful comparison. Consequently, the analysis will be based on qualitative findings instead of a quantitative analysis.

Two distinct research approaches are available to apply within qualitative studies; inductive and deductive methods. With an inductive stance, relevant objects, dimensions and categories are based on raw data from a context, and theories are built with basis of that. The aim is to explore and build new theories drawn from the observations. (Jansen, 2010) On the other hand, a deductive stance starts with a pre-defined theory where dimensions and categories are set beforehand for which a hypothesis is tested against to conclude whether characteristics exist empirically (Jansen, 2010).

In this paper, a deductive approach has been applied in the sense that two interview question templates have been established by using existing theories. An initial questionnaire to identify companies subject for dynamic environments was established and based on theories provided by Khandwalla (1972). This process is explained in deep in phase 3.3.2. A second interview question template was based on a theoretical framework provided by Ferreira & Otley (2009 p. 268). This framework of the performance measurement management systems (PMSs) describes the design and operation of PMSs and has functioned as a guidance for the formation of the questions for the eight in-deep interviews. The rest of the research process has however primarily been abductive in nature. The abductive approach can be explained as a hybrid of the inductive and deductive approaches and a significant characteristic is the iterative process of weaving back and forth between data and theory to draw verifiable conclusions (Kärreman & Alvesson, 2011).

In this thesis, an in-depth literature review process was first initiated where a potential theoretical scope was detected. Questions for the questionnaire and in-depth interviews were in next prepared. After the data collection and analysis phase, insights from the empirical findings resulted in that generalizable inferences could be drawn from the data observed and hence, the existing theories could be developed. A contribution could thus be done to theories whilst taking into account existing ones.

## **3.2 Research design**

### **3.2.1 Case study design**

There are several ways to conduct qualitative research, among others experiments, history, surveys and archival analysis (Yin, 2009). This thesis will employ a case-study methodology which is suitable if “how” and “why” questions are to be addressed and answered in the observed phenomenon (Yin, 2009). The value of a case study is further asserted to help getting an in-depth understanding of the complexity and nature of the object (Bryman & Bell, 2011) and is therefore deemed to be suited for this thesis since focus will be to get a deep understanding of the subject organization’s use of PMM systems.

Furthermore, in order to connect the empirics from the case-company to an analysis, it is important to design a study that gives weight to the empirics and provides help towards understanding the research question (Bryman & Bell, 2011). There is a clear divide within qualitative research on the path of research design and that is the choice between single and multiple-case study, where the former allows for deep understanding of a particular social setting, while the latter leads to comparative insights and generalizable results (Eisenhardt & Graebner, 2007; Bryman & Bell, 2011). The more contexts a researcher investigates, the less contextual insight he or she can obtain and this is a critical trade-off which must be considered. The main focus of the analysis of this thesis will be to make a comparison of the theoretical findings and real life scenarios. By applying a multiple-case approach, a broad empirical dataset will be acquired. This makes it possible to explore the empirical diversity of the use PMM systems across each of the eight case study companies subject for highly dynamic environments and draw generalizable conclusions, rather than relying on a single in-depth case study. According to Bryman and Bell (2011) an additional divide of case study research can be done between multiple-case study and cross-sectional design, where the former emphasizes the unique characteristics of each studied context, whilst the latter focus on producing general findings with little regard for the unique contexts of each of the case. This thesis falls somewhere in between these approaches since an understanding of each of the eight PMM system’s use will require an approach where more than general findings is collected in order to understanding each of the eight systems complexity.

## **3.3 Research methods**

### **3.3.1 Gathering empirical data**

A central element of case study research is the data collection. The data collection process requires certain preparations to provide high quality input for the case study. According to Yin (2009), the preparation for data collection can be complex and challenging, and if not done with required attention, it can jeopardize the validity of the case study. Beside this, a careful selection of the case study objects is essential (Yin, 2009).

### 3.3.2 Primary data

#### **Sampling**

To be able to conduct a multiple-case study of companies subject for dynamic environments, it is important to make sure that the companies selected indeed are dynamic in order to collect accurate and valid empirical material. A pre-interview process was therefore carried out by first define the term of dynamic environment and its main characteristics by making a deep literature review of relevant research. Since the 1970s, the dynamic environment research field has received a great attention and a host of varied researchers have contributed with a multitude of varied terminologies and components comprising the organization's internal and external environment. After a careful analysis of these contributions, the decision to continue with the theory provided by Khandwalla (1972) and Miles and Snow (1978) fell naturally since their study restrict the term to only consider factors in the external environment, which also is the particular focus of this thesis. In addition, this study has been widely applied among a stream of researchers since its publication, which validates the theory choice additionally.

A questionnaire was next developed by considering three main dimensions of dynamic environment, namely; dynamism, hostility and heterogeneity, which all were found from the definition of dynamic environment. Each of these three features were subject to further under-categories.

Within the first factor; dynamism, which deals with predictability and amount of changes, categories like competition, technology/innovation, customer preferences, economics and regulations were considered. The second factor; hostility, deals with the difficulty to obtain input in the business in form of labour and raw material but also unfavourable demographic trends like drying up of markets and its effect on input acquirement. The third factor; heterogeneity/complexity, deals with the extent variations among the firms' markets require diversity in production, marketing and administration practices. Here competitive tactics, customer preferences, product lines and channels of distribution across respective markets were considered.

A seven-point scale (1=very predictable to 7=high unpredictable) were used throughout the questionnaire where the respondents were asked to rate their environment of his own choice from low to high on the scale by considering a 5 years' time period. The respondents' ratings on these three items were then averaged to arrive at a single environmental dynamics index for each firm. The higher the index, the more dynamics the firm's environment.

The initial list of companies was selected from Retriever Research; the register/database of corporations in the Nordic region. The structure of the sample firms is highly diverse and heterogeneous but subject for three constrains; 1) manufacturing or service firms 2) number of employees to be greater than 250 in order to exclude very simple operations and 3) sales to be greater than 500 000 SEK.

The researcher's chose of companies has been restricted to region Skåne, Sweden to collect the data because of two primary reasons. First, it is the researcher's home base, which facilitate possibility for a company visit to selected companies and consequently an enhanced validity of the results. Second, the developing nature of the region is remarkable with cities as Malmö ranked as 4th most inventive in the world and companies poised for rapid growth (Forbes, 2013), which provides an ideal setting for the research question.

In total 95 companies fulfilled the criterions of company selection. The target respondents were set to directors of business control, marketing or key account, CFO, general business managers or other senior level positioned personnel with a strategic understanding of the business. All companies were considered and a follow-up call was carried out to those individuals who either not was in office/busy or in other form not available during the first call. In total 26 firms replied the questionnaire which gives a response rate of 27,4 percent.

From the sample of 26 firms, eight were chosen for this study. These companies did all indicate for a high- or very high environmental dynamics index. This subsample represents seven highly differentiated industries, more closely: IT- and chemical industry, paper- and metal powder manufacturing, infrastructure, construction and, logistics (Table 3). The intense of competition (price, product/services, technology, distribution) were perceived as high- or very high within five of these firms. Three of the firms were highly- or very highly affected by diverse factors, all from many environmental changes (competition, technology/innovation, economics, regulations) to difficulties to obtain input to the business in form of raw material or unfavourable demographic trends (Appendix A2). Further, the average number of employees for these firms is 1163 and the average annual sales revenue is 4.275 MSEK. With basis of these characteristics, these firms were selected for additional data collection and analysis by conducting a semi-structured interview.

Company	Industry
1	Contractor for new construction, renovation and maintenance
2	Manufacturer and supplier of paper
3	Manufacturer and supplier of metal powder
4	Manufacturer and supplier of chemicals
5	Consultant in IT engineering
6	Manufacturer and supplier of chemicals
7	Logistics provider in land transport
8	Consultant in civil and structural engineering

**Table 3**  
Companies involved in the research and their industry

### **Semi-structured interviewing**

The second source of primary data for the thesis was collected using in-depth semi-structured interviews. This method allows for rational orientation through the pre-determined questions but also a flexible approach to uncover new aspects experienced by the respondent (Merriam, 1994).

After a thorough review of the literature, an interview guide was developed with five specific themes to collect the data from the semi-structured interviews. These themes consist of current PMS, contextual factors, change in PMS/dynamism, consequences of the change and, evaluation of consequences, which all are based on Ferreira and Otley's (2009) PMSs framework and Khandwalla (1972)/Miles and Snow's (1978) dynamic environment study. For the semi-structured interviews, questions were developed to these main themes but in order to avoid control the direction of the answers given, the order vary with the flow of each conversation. This structure also gives each respondent the opportunity to freely add information (Bryman & Bell, 2011).

The first part of the interview guide, the current PMS, is used to provide a general understanding of how the firm design and make use of their current PMS system. The second part of the template consists of questions about contextual factors and the respondent's perception of their impact on the PMS. The third part aim to identify how contextual factors foster changes in the PMS. Part four include questions about consequences and outputs of the PMS change and the last part, evaluation of consequences and output of the change, is used to identify if a double-

loop learning is established to evaluate why the changes of PMS lead to a positive or negative outcome. Appendix A3 shows the interview template that was the foundation for the interviews. The researcher's choice of respondents was based on two criteria: firstly, she wanted to meet someone with either a CFO, manager, group controlling/controller or performance measurement related title to ensure capturing a holistic view of the PMS and secondly, she wanted to talk with someone with minimum of three years' experiences within such a position since the nature of the question, especially those about the PMS change, require some years of experience within the firm.

The interviews were held in May 2017 and lasted between 50-120 minutes. All of the interviews except two, which was held over telephone, were conducted face-to-face at the offices of each case company individually. All interviews were tape recorded with help of a mobile phone. Moreover, respondents were assured total anonymity and informed that the recording would be deleted from the mobile phone as soon as it was transcribed to limit the risk of exposure in case of theft or similar (Yin, 2009). Interviews were held in Swedish, since the researcher and all interviews were native Swedes and the transcription was completed within one day.

Company	Date	Interviewee Position	Experience within the position (years)	Type of interview	Duration
1	2017-05-08	CFO	6	Face-to-face	80 min
2	2017-05-09	Senior Controller	7	Telephone	70 min
3	2017-05-09	Head of Performance Management	3	Face-to-face	65 min
4	2017-05-10	Senior Manager Group Business Control	6	Face-to-face	50 min
5	2017-05-11	CFO	8	Telephone	60 min
6	2017-05-11	Director Site Controlling	3	Face-to-face	100 min
7	2017-05-12	Senior Manager Controlling	5	Face-to-face	120 min
8	2017-05-12	Senior Manager Group Controlling	12	Face-to-face	70 min

**Table 4**  
Interviews conducted

### 3.3.3 Secondary data

The case study provides a vehicle through which several qualitative methods can be combined (Bryman & Bell, 2011). This approach has enabled to combine semi-structured interviews and documentary data for a more overarching understanding and a deepen result, following the triangulation principle (Bryman & Bell, 2011). In two cases the researcher was provided with documents detailing KPIs, company strategy and vision and mission statements. In another case, the researcher was provided with a corporate risk review document, which contributed with new insights.

## 3.4 Data analysis

To analyze and discuss obtained case study results, Miles and Huberman (1984) presents three analytical techniques which include data reduction (selecting, focusing, simplifying, abstracting, and transforming the relevant raw data); data display (assembly of information that



facilitates drawing conclusions) and lastly conclusion-drawing and verification (testing of conclusions for their validity and robustness). These steps have been followed in the process of data analysis.

After completion of transcription of each of the interviews, in total 120 pages of transcription was went through to be thoroughly down to 3-4 pages per interview. Then, an additional focusing process of the most interesting findings was carried out parallel as the analysis part was initiated as the focusing from sampling decision became more clear as the analyzing process continued. To be able to find patterns in the data, coding of the material was done where especially two main codes were dedicated. The first code was related to the hierarchical level of the company in question, whilst the second code was for comments relating to whether the use of PMM was stated in financial and/or non-financial terms. By organizing the data according to these codes, differences and similarities between the eight case study companies were facilitated. Furthermore, patterns in each case companies' PMM adoption, led to development of further emergent insight where it became clear the data could be analyzed using the Levers of Control (Simons, 1995), Performance measurement matrix (Melnik et al., 2014) and later also the Single and Double-loop learning theory by Argyris (1977). Consequently, final comparisons were made through theoretical lenses which enabled to draw final conclusions of each of the studied case companies. By applying theories, empirical findings could be positioned to previous research which enabled a more theoretically founded analysis of findings and potential contributions.

### **3.5 Validity and reliability**

Good research is defined in terms of validity and reliability. Reliability refers to the ability to replicate the same study and come to the same conclusion, keeping all factors constant. High reliability is achieved if the study not is affected by contingencies or coincidences. (Bryman & Bell, 2011) Thus, the reliability concept aims to minimize the different errors and biases that can occur when doing a study (Yin, 2009).

Since this thesis heavily is based on interviews, one considered factor has been to get an accurate and unbiased picture of each of the studied companies in order to get the same results if the study was replicated. To reach this, all interviews were tape recorded and the transcription was completed within one day in order to document the same information as it was received. Also, face-to-face meetings have been prioritized in order to avoid misunderstandings and noises that can appear for e.g. during phone meetings. However, due to time constraints in two of the companies, two interviews were carried out by phone. When misunderstandings appeared, the researcher asked for clarifications, and any limitations could thus be overcome. In rest of the interviews, the researcher visited the subject company's office to get a deep sense of how the certain company operated due to face-to-face communication.

Furthermore, to ensure the reliability of this study, the researcher has aimed to documenting the research procedure in a structured way so that other researchers would be able to follow the same procedure to arrive at the same results (Yin, 2009).

Validity refers to whether findings made in this study actually are related to the studied phenomenon. A study's validity is assessed by checking if the conclusions shown in the study is based on the collected material and related to the purpose of the study. Thus, a high validity is obtained if one succeeds to measure what one already from the beginning intended to measure. (Bryman & Bell, 2011) According to Yin (2009) there are particularly two types of validity that are relevant to consider in order to ensure that the case-study approach keeps a

high quality, these are the construct validity and external validity. These two components will be addressed in next.

Construct validity refers to data collection and finding an optimal composition of evidences to best answering the research question. According to Yin (2009) this concept can be increased if multiple sources of data are used.

To gather information, the multiple-case study methodology was selected. The aim of this was among all to ensure gaining an objective and truthful presentation of reality and to cross-analyze the interview material to confirm that the picture portrayed in the study replicates the reality in an honest way. In addition, when secondary information in type of internal documents were available, this was used to enrich the data additionally. According to Yin (2009) this concept is referred to as triangulation since the phenomenon is looked up from different perspectives.

External validity is concerned with the research design and is related to what extend the results of the study can be generalized (Yin, 2009). Case studies are based on analytical generalizability, i.e. in relation to theory, and not statistical generalizability, i.e. to a wider population (Yin, 2009). One shortcoming inherent of case study as a method is that generalizations are difficult to make due to firm-specific factors and the environment in which the company operates. Also, the information interviewees share can be invalid within just a few months due to changes in perception and understanding of a certain topic. It is hard to overcome these types of shortcomings. However, by having the possibility to interview eight companies, additionally at both corporate and business-unit levels, the generalization is aimed to be enriched, since findings are representing seven highly differentiated industries at both senior and mid- hierarchical levels.

Beyond these two type of validity, Yin (2009) also presents the internal validity, but this is not applicable for descriptive studies, and is therefore excluded from this thesis.

## 4. Case empirics and analysis

This section is based on eight case studies of companies that have considerable experience using PMM systems. The case studies sought to identify practices to acknowledge how PMM systems are used in environments characterized as highly dynamic. Data were collected from professionals with a number of years experience in using PMM systems. Interviews were undertaken with managers from a variety of functions to obtain a broad view.

Phase one presents the empirical findings from each of the companies. Phase two contains a summary of the same findings but where practices encountered from the companies are recategorized in corporate and business-unit phases in order to make comparable conclusions. The third and final phase analyze the key variables found in each of the case companies from a theoretical point of view.

### 4.1 Empirical findings

#### *Company 1*

In company 1, the main purpose of the organizational-level measures was to monitor the business areas in terms of key financial and strategic measures. Common measures, independent division, were related to growth, profitability and productivity. The CFO expressed an ‘extremely’ importance of especially four KPIs set at the corporate level; (1) occupancy (percentage of total employees engaged in revenue generating activities); (2) EBIT (earnings before interest and taxes); (3) price per hour and; (4) yield (revenue in relation to direct costs per hour). As the CFO addressed, these KPIs were selected predominantly by owners/shareholders in a close collaboration with the CFO. The CFO further described “[...] Our owners are highly experienced, cutting edge in their field and important for us”, which acknowledged the PMM system in company 1 as highly shaped and adapted to the owners’ perception and view.

With respect to keeping the selected KPIs up-to-date, the CFO demonstrated that “Many of these KPIs used at the corporate level are derived directly from our consolidated reporting system. Due to the nature of such accounting measures we cannot adjust or renew the KPIs that much”.

Follow up of the KPIs were arranged on a monthly basis at functional- and management levels which aimed to ensure that things were on track and the corporation as a whole was adding value for its shareholders.

The implemented PMM system in company 1’s organizational-level was designed to improve the overall profitability target. In addition, “there is a self-interest within each business area and by using proper metrics we try to signal that the overall profitability target is the most important one. The vital is that the whole group earns money, not the individual divisions” (the CFO).

A second important purpose of the organizational-level measures was to improve. Each division was monitored and compared against forecasts and target levels by the management team at the corporate-level. However, the CFO clearly demonstrated that an interactive dialogue between the corporate and business-unit levels was highly critical to maintain an appropriate and successful measurement system. Same KPIs, irrespective business area, were implemented at the organizational-level, but in order to catch up the different business areas correctly, a few KPIs were designed to be directly applicable to a certain business area. These measures were both financial- and non-financial. As the CFO expressed “it does not make sense if we

implement KPIs which not monitor the businesses in an appropriate way. We work on a continually basis between different hierarchical levels and reflect all together to find out what strategic issues to focus on and the best way to follow up our different business areas". By maintaining an interactive dialogue between corporate- and business unit level, strategic priorities and appropriate KPIs could better be adapted to the certain business area.

One clearly highlighted key success factor to reach the overall profitability target was associated with opportunities of entrepreneurship. The CFO described "We have a lot of owners in type of entrepreneurs at the different business-units. These employees own a number of shares. By using this strategy we aim to create engagement and participation within the organization." The CFO further explained "We want that our employees feel a drive for continuous improvement, are flexible and open to changes, and also curious." Further "The senior management use a very little top-down driven management style in this company. If you get here, you don't get a manual of one hundred pages of how to act. You should individually find out what to do and how to do it." With respect to this the CFO referred to norms, beliefs, and values which the company stand for and was expected by every employee to pay attention to. "Our slogan 'Expect a better tomorrow' is meant to reflect how everyone in this company should think and act. We take care of the environment by having this sustainability mindset reflected in everything we do. As an example, at the corporate level we supported start-up companies some months ago here in Malmö. This type of engagements is targeted to work as a signal for rest of our employees in the different divisions" (the CFO).

### *Company 2*

Although, both financial- and non-financial performance measures had been implemented in the strategy, failure to use both measures to manage the business was identified in company 2. As in company 1, financial measures as profitability and productivity were here the key measures to monitor the business at the organizational-level. A reason for this was explained by the Senior Controller due to an owner-dominated measurement system. Different owners had their own definition of necessary areas to be measured but all had been around financial ones. As of that, a continued emphasis was placed on financial KPIs which prevented subjectivity and the use of more balanced ones. Yet, the Senior Controller shared his overall reflection by stating "Implemented measures aims to give us a good overall picture of the current state of the company."

Central KPIs in company 2 were (1) profitability with a particular focus on revenue and highly cost-based posts such as salaries and fuel; (2) EBIT; (3) productivity; (4) other cost related factors such as overtime or undertime in terms of employees' working hours and administrative costs in relation to total driven miles.

Costs such as fuel and salaries were followed-up on a daily basis whereas the other financial measures were analyzed once a month.

To keep the critical fuel costs at lowest possible levels, the Senior Controller described the monitoring system in place. The management at the organizational-level had a direct insight in the driving costs of each chauffeur in terms of emissions. "We have tried different alternatives to lower the fuel costs. Detailed monitoring like this is helping us to identify when the costs are rising." Furthermore, the Senior Controller described that a monthly top 10 list had been set up which consisted of a monthly competition of the most cost-efficient driver. This tactic had helped the management to communicate the importance of keeping the costs low.

Company 2 described further the management's attention on current trends in the operating environment. "We attempt to identify trends which we believe is relevant and important for our

business. For example, last year the fuel prices increased very drastically. Then we added a measure to follow the fuel costs on a daily basis. The thing is to focus on what is the most critical for the moment” (the Senior Controller).

Furthermore, company 2 also addressed that an informal communication channel between the individual and senior management were maintained to monitor the environment. The Senior Controller described that the subordinates actively keep their “ears on the ground” in order to catch up trends in the market or customers in order to be up to date. This informal information functioned as an important input for the management at the corporate level. “It is important to be alert and adaptive here. In this sector the competition is intense. We monitor the environment and identify current and future possible trends. You must be attentive for e.g. when a customer is dissatisfied with a transport, if customers change their production place or other changes in their logistics, where it is important that we are flexible in our routines, in order to adapt quickly.” The Senior Controller also added “The transport sector is a quite small sector. You usually know each other here. It is of vital importance to be close to your customer in order to catch up changes in the environment. Also, even if the competition is tough, there is a cooperation among the actors in the market. No one can manage all transports by their selves. There is a lot of collaboration. So, customers, network and industry colleagues are all important informal ways of catching up trends and to be adaptive”. If features had been identified in the environment considered as important, the Senior Controller described that KPIs with more ad-hoc and shorter time horizon features could be implemented in order to manage the business in right direction.

### *Company 3*

An extensive performance measurement implementation had been undertaken in company 3. By combining stable financial measures as (1) profitability; (2) productivity and; (3) pipe (possible deals) with highly prioritized quality-defined measures as (3) employee and; (4) customer satisfaction, a balance in the measures had been maintained at the business-unit level of company 3.

Pipe was a monthly reported KPI to the management. Here, all types of ideas of potential future businesses were collected from the employees.

Satisfaction of employees was a yearly investigation between manager and subordinate which aimed to identify factors which the employees appreciated or not appreciated within the certain business-unit. Identified factors was directly reported to stab-manager who forwarded the same to the management of the business unit for their action.

Similarly, satisfaction of customers aimed to examine positive and negative factors perceived after a project was completed. This investigation was initiated directly after a project had been finalized and was mainly identified through a face-to-face dialogue between the customer and company representative.

The Head of Performance Management in company 3 described the company as young and still in an exploiting period. By providing its customer flexible and cost-efficient solutions, the company aimed to increase its market share. With such a vision, the substantial use of non-financial measures fell naturally. The Head expressed especially the importance of employees and described the company as with a low hierarchy.

Unique for the company was described with regard to the communication channel established between managers and subordinates. Each team was consisting of a manager with only a few numbers of directly reporting employees. This created a good opportunity to establish a dialogue and to build a relationship between the parties. The managers’ closeness to its subordinates was seen as highly important. Every manager should help their subordinates to develop their selves. “The communication and relationship between manager and subordinate

is our biggest strength. We take care of our individuals so they don't just disappear.” (the Head). Beyond the relationship building activity, personal development and feedback meetings were arranged twice a year. In the former, each employee was aimed to define own targets, both short- and long term, to strive for during the forthcoming period. In the latter, frequent feedback of the employees' performance was maintained by development meetings. A deep investigation was also done if employees left the company. A specific meeting between the manager and employer was then structured to identify the main reasons for leaving the company.

Regarding monitoring and especially on individual levels, the Head informed that this type of follow up was not performed at all within the company. “To set KPI on an individual level is dangerous. It is not appropriate to set such enforcement on our employees.”

One type of measurement system identified at company 3 was that each employee by themselves could report and follow up their percentage of occupancy. This system aimed to track how much each employee is put on work on a monthly basis. “Each employer report and follow up this by themselves. Similar to employment rate, we have sick-leaves and other types of absences” (the Head). Salaries of all employees were based on these rates and were only followed up by higher managers on an aggregated level. “Each employee knows very well here which measures he or she is responsible for. By using internal codes, everyone report their performances each month in our internal system.” The Head further described that on an aggregated business-unit level, departmental and regional employment rates we consolidated and analyzed.

#### *Company 4*

As in company 2, traditional financial performance measures were the main type of measures at the organizational-level in company 4. The primary reason for this was explained by an owner-dominated set-up, where KPIs was measuring (1) profitability; (2) efficiency (cost savings); (3) investments within production and (3) volume, all on a monthly basis. The Senior Manager Group Business Control expressed the importance of the KPIs “KPIs are managing everything within this company. They help us to decide towards which direction we should navigate the company. These ones are those we believe are most important”.

However, the Senior Manager also expressed the bad balance of the KPIs in use. Parallel with a newly entered president, new strategies had been put in place. However, the new strategies had not been reflected to a new set of measures. As the Senior Manager expressed “There is no balance for the moment in our KPIs. Most measures are to an advantage of our owners. Additionally, the measures have no linkage to our new strategy or philosophy. For e.g. beyond increasing shareholder-value, sustainability, customer- and employee satisfaction are our new strategic areas but we don't measure any of these at an aggregated level”. The Senior Manager demonstrated the urgency of having a more varied mix of KPIs in order to maintain a broad understanding of different parts of the organization.

With regard of implementing new measures, information from the Senior Manager revealed the ambition among top management to engage subordinates at business-unit and individual levels to take central responsibility for the relevance of the measures.

The Senior Manager in company 4 describes the process of new measures' implementation in the organization. “First of all, we aim to describe for people who will work with the new measure how it functions, how to work with it and its calculation. However, beyond just commanding, we have a, so called, “Learning process” six months after its implementation. Actually, in this process we from the management team goes out to the operation and ask people

who have worked with the measure for their evaluation of the measure itself. We focus on four questions; does the measure help us in the organization? Why does it help us, or why does it not help us? And, what can we do about it?”.

By having this set-up, the top management tried to increase engagement in the organization by incorporating employees at the individual levels to give input to central issues. “We want to listen to people and we want that people understand the importance of this kind of higher level issues. It is not something that we just have commanded them to do” (the Senior Manager). Here the employees were able to give their input and by themselves express what they felt about the implemented procedure. However most importantly, the evaluation process provided the management team with highly valuable input derived directly from the operation.

Values and beliefs in company 4 was further important factors expressed by the Senior Manager. A company slogan formulated as “To make more with less” was aimed to signal to employees to not waste. “The whole company is managed through this phrase. This is important. Waste is a term with a broad definition and incorporates all from waste of time and raw materials to right quality on our products” (the Senior Manager).

#### *Company 5*

Company 5 provided a good example of managing measurement system in a dynamic environment at a business-unit level. The primary factor incorporating dynamism in the management was the availability of the concept called Lean production. The CFO described the Lean concept as “Daily monitoring through Lean is a way to highlight the importance of continuous improvements. It is also a way to communicate the importance of engagement among our employees where every individual should feel responsibility for a certain part of the process”.

Through Lean the KPIs had been broken down in a way where every employee should be able to find their “identity” in the measures. Also, responsibility had been delegated lower down in the hierarchy. People were in a higher degree responsible for different processes and also for its follow up. “So, why is the KPIs broken down on an individual level? Of course it is to create engagement among the employees. Every employee should be able to feel involvement and inclusiveness. It is through that way Lean concept is being realized. Everyone participate to improve the business little bit every day of our operation” (the CFO).

By working with Lean, both financial targets such as decreasing costs in production and non-financial such as employee satisfaction was aimed to be improved.

Company 5 was however acting in a highly cost-sensitive business and there was an extremely high focus on financial measures such as (1) productivity; (2) profitability; (3) fixed costs and; (4) production-ton, a measure which reflected total produced ton in the manufacturing each day. Non-financial KPIs were related to (5) environment; (6) employee satisfaction; (7) sick absence and; (7) leadership.

Even if the measurement system in this company clearly demonstrated an importance of non-financial measures, the cost-sensitive business caused a detailed monitoring of the costs in production in order to not exceed predefined targets and budgets.

The KPI of productivity was one of the most highlighted measures in this company. One way to keep the costs at low levels had been by using a strategy where every employee was encouraged to provide ideas of how to improve the processes. When a “best practice” had been found among all ideas provided, as standardization of the process was done. This standardization meant that everyone from that point of time was targeted to execute a certain action in accordance to the presented idea. This set-up was said to lower the costs in production.

### *Company 6*

The use of performance measurement was heavily dominated by financial measures in company 6's business-unit level. Here, the tendency to report too many KPIs and produce too many follow ups to monitor the financial targets acted as a significant barrier to make subjectivity explicit. The Director Site Controlling stated "We have both financial- and non-financial measures. Security and environmental questions are our most important strategic areas. However, we only use financial measures on an aggregated level. KPIs of productivity and profitability are truly important. We have broken down these to monitor progresses of each product type and factory. Employee satisfaction is monitored once per year whilst productivity is followed up each hour" (the Director). This description clearly addressed the problem of continue to use financial measures to manage the business, despite the availability of a more balanced set of KPIs.

Examples of KPIs in company 6 were (1) efficiency improvement (percentage of raw material utilization); (2) fixed costs; (3) MOEE (quality of customer delivery) and; (4) production-ton (total ton produced in the manufacturing).

The Director described that KPIs were settled to monitor different products and plants. A careful analysis of discrepancies between cost of raw materials and its actual output was considered as highly important. Sometimes even a dig into costs at invoice-levels could be necessary in order to find explanations. In addition, the Director stated the importance of continuously improvements through monitoring "[...] If you not do that, you can't survive. That's simple. We need to identify where we can improve. Where is the business particularly sensitive? If we find discrepancies between target and actual, we undoubtedly need to investigate its reason." To communicate the importance of the KPIs, big boards at the office was hanged up to show current status of the KPIs. Red, yellow and green marks was updated each month for respective KPI.

### *Company 7*

The PMM system was well permeated in company 7. Use of strategic objectives was targeted to both financial performance measures and non-financial ones. Four strategic values functioned as a direction for the KPI settlement at the business-unit level; innovation, environment, customer and employees. However, the Senior Manager Controlling pointed out that non-financial measures followed a more flexible set-up and were dependent on current circumstances. This demonstrated that strategic and tactical targets and measures were varying dependent on the current situation within company 7.

In company 7 following non-financial measures were available; (1) improvement proposals per employee; (2) employee health and satisfaction; (3) leadership and; (4) customer satisfaction. Within financial measures, the Senior Manager specified; (5) site profit (profit at a specific facility); (6) fixed costs; (7) CAPEX (investments) and; (8) consumption of natural-gas, which constituted the biggest cost in production. Respective KPI were followed-up on a monthly basis.

In a way to improve the KPI of employee satisfaction, engagement and participation was highlighted. Each quarter, the management team of the business-unit invited individual employees to participate in strategic questions discussed and highlighted at the top level. This open management meeting aimed to increase motivation among employees, to help them to better understand background to predefined targets, but also, for management team to receive valuable inputs from the lower level employees which was unrecognized at the higher level.

An other feature of the measurement system at company 7 was related to subordinates opportunity to define own targets. Beyond personal development meetings, held between



manager and subordinates such as in company 3, also an additionally KPI to measure improvements per employee was implemented. “We have a specific KPI to follow up individual improvements among our employees. Each person is targeted to present two own improvements each year.”, described the Senior Manager.

Furthermore, the Senior Manager explained how common values and beliefs across the organization had been decided by using a collaborating approach “Values and beliefs are highly prioritized within our company. By having different workshops, every employee has been invited, all from senior management teams to employers at the plants, to contribute with their thoughts.”

#### *Company 8*

As in company 1, 2 and 4, the financial measures were dominating in company 8’s organizational-level PMM system. However the Senior Manager Group Controlling clarified that each business-levels were measured only one-third by KPIs set at the corporate level. Rest two-third were related to one-third targets set at the business-unit level and one-third at the function each employee was belonging. This measurement set-up enabled each business-units to be measured by KPIs set at different hierarchical levels, which in turn functioned as a way to adapt measures to each business-unit (the Senior Manager).

The share at the corporate level was consisting of only financial measures, such as (1) revenue; (2) return on equity; (3) operating margin. The Senior Manager expressed the difficulty with use of non-financial measures “I think we should have some few non-financial parameters included in the current measurement system. However, it is very difficult to be objective in such subjective measures. You must be able measure. The more you leave the objectivity, the more difficult it becomes to measure”.

Phase one in this section presented the empirical findings of the case studies undertaken and Table 5 summarizes the main characteristics with regard of hierarchical level and type of measures found within the companies studied.

Company	Hierarchical level	Type of measures
1	Corporate	Financial and Non-financial
2	Corporate	Financial and Non-financial
3	Business-unit	Financial and Non-financial
4	Corporate	Financial and Non-financial
5	Business-unit	Financial and Non-financial
6	Business-unit	Financial
7	Business-unit	Financial and Non-financial
8	Corporate	Financial

**Table 5**  
Main characteristics of case companies

## 4.2 Recategorized summary of empirical findings

### 4.2.1 Corporate level

#### **Financial measures**

Regarding measures common across all business entities, interviewees positioned at corporate level, company 1, 2, 4 and 8 described that monitoring of business areas were done mainly by using numbers of key financial measures. Commonly referred KPIs among these firms were the emphasis on traditional financial measures such as profitability, productivity, growth and efficiency. As could be identified by each of these interviewees, considerable attention was given to the owners view of how to monitor the business. As a result, measures were heavily influenced by the owners' reflection of how to create a proper measurement set-up.

Beyond these traditional financial measures presented, company 1 was also using KPIs such as occupancy (percentage of total employees engaged in revenue generating activities); EBIT (earnings before interest and taxes); price per hour and; yield (revenue in relation to direct costs per hour). By monthly management meetings, follow up of these could be maintained. The aim of financial monitoring was clearly described in this company as ensuring that things were on track and that the corporation was adding value to its shareholders. The CFO described "many of these KPIs used at the corporate level are derived directly from our consolidated reporting system. Due to the nature of such accounting measures, we cannot adjust or renew the KPIs that much".

Company 2 presented financial measures such as profitability, with a particular focus on revenue and highly cost-based expenditures such as salaries and fuel; EBIT and; productivity. Costs such as fuel and salaries were monitored on a daily basis whereas other financial measures were analyzed once a month. These measures aimed to give a good overall picture of the current status of the company. In order to keep the critical fuel costs at lowest possible levels, a system had been put in place where each chauffeur was monitored in terms of total emission usage. "We have tried different alternatives to lower the fuel costs. Detail monitoring like this is helping us to identify when the costs are rising." Furthermore, the Senior Controller described that a monthly top 10 list had been set up, where a competition of which driver had been performed most cost-efficient was carried out. This tactic had helped the management to communicate the importance of keeping the costs low.

Similarly, in company 4, financial measures were focusing on profitability; efficiency; investments within production and; volume, which all were reviewed on a monthly basis. The Senior Manager Group Business Control expressed the importance of the KPIs "KPIs are managing everything within this company. They help us to decide towards which direction we should navigate the company. These ones are those we believe are most important".

Also company 8 was managing the business through financial measures. The Senior Manager Group Controlling described that each business-level is measured one-third by KPIs set at the corporate level. The share from the corporate level was consisting of only financial measures, such as revenue; return on equity and; operating margin. The Senior Manager expressed the difficulty with use of non-financial measures "I think we should have some few non-financial parameters included in the current measurement system. However, it is very difficult to be objective in such subjective measures. You must be able measure. The more you leave the objectivity, the more difficult it becomes to measure".

### **Non-financial measures**

Beyond the diagnostic control in company 1, an other, more engaging and empowering type of control, had been set up in order to reach the financial targets defined at the corporate level. As the CFO described, one of the strategies to develop the company was explained through partnership. “We have a lot of owners in type of entrepreneurs at the different business-units. These employees own a number of shares. By using this strategy we aim to create engagement and participation through the business-units.” The CFO further explained “We want that our employees feel a drive for continuous improvement, are flexible and open to changes, and also curious”. Further “The senior management use a very little top-down driven management style in this company. If you get here, you don’t get a manual of one hundred pages of how to act. You should individually find out what to do and how to do it.” With respect to this the CFO referred to norms, beliefs, and values which the company stand for and was expected by every employee to pay attention to.

In company 1 also a learning perspective was considered as equally important to improve the business. As the CFO stated, the business areas were frequently monitored against predefined targets in order to improve. However, there was a vital importance of having an interactive dialogue between corporate and business-units. The corporate level used the same financial KPIs to monitor the business areas, irrespective business, but some local adaptation was necessary at the business-unit levels. As the CFO expressed “it does not make sense if we implement KPIs which not monitor the business in an appropriate way. We work on a continually basis between different hierarchical levels and reflect all together to find out what strategic issues to focus on and the best way to follow up the businesses within our different business areas”. By maintaining an interactive dialogue between corporate- and business unit level, defining strategic priorities and select appropriate KPIs could better be adapted to the certain business area.

Company 2 described the management’s attention on current trends in the operating environment. “We attempt to identify trends which we believe is relevant and important for our business. For example, last year the fuel prices increased very drastically. Then we added a measure to follow the fuel costs on a daily basis. The thing is to focus on what is the most critical for the moment” (the Senior Controller). Furthermore, “It is important to be alert and adaptive here. In this sector the competition is intense. We monitor the environment, identify current and future possible trends. You must be attentive for e.g. when a customer is dissatisfied with a transport, if customers change their production place or other changes in their logistics, where it is important that we are flexible in our routines, in order to adapt quickly. The Senior Controller also added “The transport sector is a quite small sector. You usually know each other here. It is of vital importance to be close to your customer in order to catch up changes in the environment. Also, even if the competition is tough, there is a cooperation among the actors in the market. No one can manage all transports by their selves. There is a lot of collaboration. So, customers, network and industry colleagues are all important informal ways of catching up trends and to be adaptive”. If features had been identified at the environment considered as important, the Senior Controller described that KPIs with more ad-hoc and shorter time horizon features could be implemented in order to manage the business in right direction.

Company 2 also addressed that an informal communication channel between the individual- and organizational-level were maintained to monitor the environment. The Senior Controller described that the subordinates actively keep their “ears on the ground” on trends in the market or customers in order to be up to date. This informal information worked as an important input for the corporate level.

The Senior Manager Group Business Control in company 4 describes the process of new measures' implementation in the organization "First of all, we aim to describe for people who will work with the new measure how it functions, how to work with it and its calculation. However, beyond just commanding, we have a "Learning process" six months after its implementation. Actually, in this process we from the management team goes out to the operation and ask people who have worked with the measure for their evaluation of the measure itself. We focus on four questions; does the measure help us in the organization? Why does it help us, or why does it not help us? And, what can we do about it?"

By having this set-up, the top management tried to increase engagement in the organization by incorporating employees at the individual levels to give input to such central issues. "We want to listen to people and we want that people understand the importance of this kind of higher level issues. It is not something that we just have commanded them to do" (the Senior Manager). Here the employees were able to give their input and by themselves express what they felt about the implemented procedure. However most importantly, the evaluation process provided the management team with highly valuable input derived directly from the operation.

Values and beliefs are expressed in company 1 as important factors which reflect how people work in their day-to-day business. "Our slogan "Expect a better tomorrow" is meant to reflect how everyone in this company should think and act. We take care of the environment by having this sustainability mindset reflected in everything we do. As an example, from the corporate level we supported start-up companies some months ago here in Malmö. This type of engagements is targeted to work as a signal for rest of our employees in our different divisions" (the CFO).

A similar set-up was found in company 4, where the philosophy "To make more with less" was aimed to signal to employees to not waste. "The whole company is managed through this slogan. This is important. Waste is a term with a broad definition and incorporates all from waste of time and raw materials to right quality on our products" (the Senior Manager Group Business Control).

## 4.2.2 Business-unit level

### **Financial measures**

Similar to the financial measures set at the corporate level, company 3, 5, 6 and 7 reported that financial measures constituted a major part of the measures set at the business-unit level. Company 5 described being operating in a highly cost-sensitive business, where a focus on financial performance measurement was undoubtedly obliged to include. Even if the measurement system in this company clearly demonstrated an importance of non-financial measures, the cost-sensitive business caused a detailed monitoring of the costs in production. This, in order to not exceed predefined targets and budgets. Examples of financial KPIs were productivity; profitability; fixed costs and; production-ton, a measure which reflected total produced ton in the manufacturing each day.

Company 6 followed a similar approach. Here, a selected set of financial KPIs was monitored on an hourly basis. The Director described that KPIs were settled to monitor different products and plants. A careful analysis of discrepancies between cost of raw materials and its actual output was considered as highly important. Sometimes even a dig into costs at invoice-levels could be necessary in order to find explanations. The Director stated the importance of continuously improvements through monitoring "[...] If you not do that, you can't survive. That's simple. We need to identify where we can improve. Where is the business particularly

sensitive? If we find discrepancies between target and actual, we undoubtedly need to investigate its reason.” This quote was indirectly in line with the strategy of the organizational-level where optimization of current business areas was prioritized.

To communicate the importance of the KPIs, big boards at the office was hung up to show current status of the KPIs. Red, yellow and green marks was updated each month for respective KPI. Examples of financial KPIs in this company were efficiency improvement (percentage of raw material utilization); fixed costs; MOEE (quality of customer delivery) and; production-ton (total ton produced in the manufacturing).

### **Non-financial measures**

Use of non-financial measures could be demonstrated within company 3, 5 and 7.

The Head in company 3 described the company as young and still in an exploiting period. By providing its customer flexible and cost-efficient solutions, the company aimed to increase its market share. With such vision, the substantial use of non-financial measures fell naturally.

The most prioritized non-financial measures in this company was referred to pipe (possible deals); employee and; customer satisfaction.

Pipe was a monthly reported KPI to the management. Here, all types of ideas of potential future businesses were collected from the employees.

Satisfaction of employees was a yearly investigation between manager and subordinate which aimed to identify factors which the employees appreciated or not appreciated within the certain business-unit. Identified factors was directly reported to stab-manager who forwarded the same to the management of the business unit for their action.

Similarly, satisfaction of customers aimed to examine positive and negative factors perceived after a project was completed. This investigation was initiated directly after a project had been finalized and was mainly identified through a face-to-face dialogue.

The Head demonstrated the importance of its employees. In order to reach the vision of developing an organically growing company, the employees were considered as a key factor. Unique for the company was described with respect to the communication channel established between managers and subordinates. Each group was consisting of a manager with only a few numbers of directly reporting employees. This created a good opportunity to establish a dialogue and to build a relationship between the parties. The managers’ closeness to its subordinates was seen as highly important. Every manager should help their subordinates to develop their selves. “The communication and relationship between manager and subordinate is our biggest strength. We take care of our individuals so they don’t just disappear” (the Head). Beyond the relationship building, personal development and feedback meetings were available twice a year. In the former, each employee was aimed to define own targets, both short- and long term, to strive for during the forthcoming period. In the latter, frequent feedback of the employees’ performance was maintained by frequent feed-back meetings. A deep investigation was also done if employees ended their employment. A specific meeting between the manager and employer was then structured to identify the main reasons for leaving the company.

Regarding monitoring progress on an individual level, the Head informed that this type of financial follow up is only defined at departmental levels. “To set KPI on an individual level is dangerous. It is not appropriate to set such enforcement on employees.” explained the Head.

In company 5, non-financial measures were related to environment; employee satisfaction; sick absence and; leadership.

With respect to Lean production, a high delegation of responsibility had been given to subordinates. By applying this concept, people were in a higher degree responsible for different processes and follow ups at the lower levels. The CFO described the concept “Daily monitoring

through Lean is a way to highlight the importance of continuous improvements. It is also a way to communicate the importance of engagement among our employees where every individual should feel responsibility for a certain part of the process”.

Lean functioned also as a way to break down KPIs so every employee could feel their “identity” in the measure. “So, why is the KPIs broken down on an individual level? Of course it is to create engagement among the employees. Every employee should be able to feel involvement and inclusiveness. It is through that way Lean concept is being realized. Everyone participate to improve the business little bit every day of our operation” (the CFO).

By working with Lean, both financial targets such as decreasing costs in production and non-financial such as employee satisfaction was aimed to be improved.

In company 7, improvement proposals per employee; employee health and satisfaction; leadership and; customer satisfaction could be found.

In a way to improve employee satisfaction, engagement and participation was highlighted. Each quarter, the management team of the business-unit invited individual employees to participate in strategic questions discussed and highlighted at the top level. This open management meeting aimed to increase motivation among employees, to help them to better understand background to predefined targets, but most importantly, for management team to receive valuable inputs from the lower level employees which was unrecognized at the higher level.

An other feature of the measurement system in company 7 was related to subordinates opportunity to define own targets. Beyond personal development meetings, held between manager and subordinates such as in company 3, also an additionally KPI to measure improvements per employee was implemented. Each employer was here targeted to present two own improvements each year.

In company 3, the Head described one type of measurement system where each employee by themselves report and follow up their percentage of occupancy. This system aimed to track how much each employee is put on work on a monthly basis. “Each employer report and follow up this by themselves. Similar to employment rate, we have sick-leaves and other types of absences” (the Head). Salaries of all employees were based on these rates and were only followed up by higher managers on an aggregated level. “Each employee knows very well here which measures he or she is responsible for. By using internal codes, everyone report their performances each month in our internal system”. The Head further describes that on an aggregated business-unit level, departmental and regional employment rates we consolidated and analyzed.

In company 5, productivity is highlighted due to the cost-sensitive business. One way to keep the costs on low levels have been by using a strategy where every employee is encouraged to provide ideas of how to improve the processes. When a “best practice” have been found among all ideas provided, a standardization of the process is done. This standardization means that everyone from that point of time is targeted to execute a certain action in accordance to the presented idea. This set-up was said to lower the costs in production.

The Senior Manager in company 7 describes how common values and beliefs across the organization have been decided by using a collaborating approach “Values and beliefs are highly prioritized within our company. By having different workshops, every employee has been invited, all from senior management teams to employers at the plants, to contribute with their thoughts.”

Table 6 and 7 summarize the key variables found in each of the studied companies categorized in either corporate or business-unit level and financial and/or non-financial terms.

Corporate level		Variables included
Company 1	Financial measures	Monitoring of the business through financial KPIs. 4 of them have extreme importance for the regular follow up. KPIs are selected predominantly by shareholders. Several KPIs also derived directly from the consolidated reporting system. Due to the nature of such system KPIs cannot be adjusted or renewed that often. KPIs are used to ensure that things are on track and that the corporation adds value
	Non-financial measures	Interactive dialogue maintained between corporate and business units to reflect and learn from each other and to find out what strategic areas to focus on and by using which KPIs. Opportunity of partnership provided to create engagement and participation in the organization. This aims to also increase possibility to reach the financial targets in the company. Flat organizational structure identified. "If you get here, you don't get a manual of one hundred pages of how to act. You should individually find out what to do and how to do it."
Company 2	Financial measures	Monitoring of the business through financial KPIs. These aims to give a good overall picture of the current state of the company. KPIs are selected predominantly by shareholders. Monitoring of drivers' fuel consumption is executed on an individual level to keep the costs low.
	Non-financial measures	An informal communication channel is set up between senior management team and individual employer. Subordinates keeps their "ears on the ground" to catch up trends in the market or customers in order to be up to date.
Company 4	Financial measures	Monitoring of the business through financial KPIs. "KPIs are managing everything within this company. They help us to decide towards which direction we should manage the company." KPIs are selected predominantly by shareholders.
	Non-financial measures	Implementation of new measures through a "Learning process" where management team involve evaluate the measure. Focus is on four questions; Does the measure help us? Why does it help us, or why does it not help us? What can we do about it? The Learning process aims also to increase engagement at individual levels by giving input on central issues.
Company 8	Financial measures	Monitoring of the business through financial KPIs. Non-financial measures are considered as difficult to be implemented. "I think we should have some few non-financial parameters included in the current measurement system. However, it is very difficult to be objective in such subjective measures. You must be able to measure. The more you leave the objectivity, the more difficult it becomes to measure."
Business-unit level		Variables included
Company 3	Financial measures	Monitoring of the business through financial and non-financial KPIs. Considerably high focus is placed on non-financial ones.
	Non-financial measures	High focus is placed on employees. A communication channel is established between managers and subordinates in order to build good relationships. Every manager is targeted to help their co-worker to develop their selves, give appropriate feedback and to maintain regular meetings where the employees are aimed to give their inputs of positive and negative thoughts.
Company 5	Financial measures	Monitoring of the business through financial and non-financial KPIs. Extremely high focus is on financial measures due to a cost-sensitive business. Financial KPIs are "[...] undoubtedly obliged to be included in the PMM system in order to not exceed price
	Non-financial measures	Implementation of "Best practice" methodology to keep costs on low levels and to improve current processes. The concept of "Lean production" is implemented to encourage continuous improvements. It is also a way to communicate the importance of engagement among employees where every individual should feel responsibility for a certain part of the process. KPIs are broken down so every employee can find their "identity" in the measure. This aims to create engagement among employees.
Company 6	Financial measures	Monitoring of the business through financial KPIs. Careful analysis of discrepancies between costs and actual output is important. Sometimes even dig into costs at invoice levels is done to find explanations. Continuous improvements through monitoring is highlighted. "[...] If you don't do that, you can't survive. That's simple. We need to identify where we can improve."
Company 7	Financial measures	Monitoring of the business through financial and non-financial KPIs.
	Non-financial measures	Engagement and participation of employees is focused. Each quarter the management team invites employees to participate in strategic meetings. Every employee is targeted to provide two improvements to the business per year.

## 4.3 Analysis

The third and final phase of the case empirics and analysis section analyze the key variables found in each of the case study companies from a theoretical point of view. Here, collected data is analyzed through Melnyk et al.'s (2014) Performance alignment matrix; Simons (1995) LOC framework and; Argyris (1977) Single and Double-loop learning theory. This phase aims to position collected data to the previous research but also to contribute with empirical evidences to existing theories.

### 4.3.1 Measurement-driven management

#### **Measurement-driven management**

Common across all case study companies at both corporate and business-unit level, the use of financial measures to monitor the businesses was highly remarkable. Numerous traditional measures could be identified to be reported on hourly, daily or monthly basis that made it possible to detect notable variances from the target. Sometimes this monitoring could even be executed on an individual level, such as in company 2, where monitoring of drivers' fuel-consumption on each driven mile was tracked per employee in order to keep the costs on lowest possible levels.

As explained by company 1, the aim of financial monitoring was to ensure that things were on track and that the company was adding value to its shareholders. As also could be identified among the companies, the selection of measures was heavily influenced by the owners' thought of which measures to implement. In company 1, the CFO also added that "[...] many of these KPIs used at the corporate level are derived directly from our consolidated reporting system".

To some degree, all companies, at both corporate and business-unit levels, demonstrated what Melnyk et al. (2014) is referring to a measurement-driven management or the measurement "after the fact". According to this approach, a strong and immediate link between strategy and measures is assumed, where changes in strategy drives changes in the measurements. Dominatingly among the interviewees, the use of financial measures was aimed to detect discrepancies from predefined standards and there was a believe that financial measures guaranteed that "things were on track" and the company was adding value to its shareholders. For example, company 2 stated that the measures helped to provide a good overall picture of the current state of the company. Similarly, company 4 expressed that "KPIs are managing everything within this company. They help us to decide towards which direction we should navigate the company. These ones are those we believe are most important". Company 5 demonstrated that in line with a cost-sensitive business, financial performance measures "was undoubtedly obliged to be included" in order to not exceed predefined targets. Company 6, with its strictly monitoring system, exemplified that a careful analysis of discrepancies between cost of raw materials and actual output was highly important in the regular follow up of the business. Sometimes even a dig into costs at invoice-levels could be necessary in order to find explanations, stated by the Director. He furthermore described that the monitoring was important in order to improve the business "[...] If you not do that, you can't survive. That's simple. We need to identify where we can improve. Where is the business particularly sensitive? If we find discrepancies between target and actual, we undoubtedly need to investigate its reason". Company 8 expressed the importance of objectivity "[...] You must be able to measure. The more you leave the objectivity, the more difficult it becomes to measure".



A common feature among all these citations and explanations done by the interviewees, is the executives assumption of their high confidence in knowing how to respond to the environment. These companies, by applying a measurement-driven management, is expected to have a high believe that applied strategic priority and related method, or financial measure to track its progress, is proper in certain organizational contexts. As explained by company 4, the KPIs helped to decide towards which direction to navigate the company. As also could be related to the findings, especially the owners' views were considered as the "right" way of how to manage the companies. Company 1 additionally stated that many of the measures was often directly taken from the consolidated reporting system, leaving the surrounding environment and other variables which must be considered in a dynamic environment, excluded.

Melnyk et al. (2014) made here a highly important contribution by arguing that a measurement-driven management only is suitable in an environment categorized as stable, where the management is able to foresee and predefine what to do and how to do it, thus leading to a high specificity in both outcome and solution. The main concern in such approach is to match actual performance with intended strategy.

The measurement-driven management follow a view that corresponds with much of the BSC and causal links rhetoric. With reference to the previous PMM literature review, the misalignment of causal links in a dynamic business environment is both significant and well known. The application of the measurement-driven management is thus argued to be risky, since respective company is operating in highly dynamic and unpredictable environment.

### **Diagnostic control systems and Single-loop learning**

From an other point of view, the detection of variances from goals is clearly in line with Simons (1995) diagnostic control where monitoring of organizational outcomes and correction of deviations from standards is prioritized in order to realize intended strategies. As clearly could be demonstrated among the interviewees, there was a high consensus that variances were important to be tracked in a detailed level in order to improve the entire business. Company 2 and 6 even demonstrated strictly detailed diagnostic controls where costs at individual or invoice levels were monitored in order to detect differences.

The diagnostic control has been criticized for its negative effect on innovation and opportunity seeking behavior since its focus have been limited to signal success of critical factors of a predefined strategy.

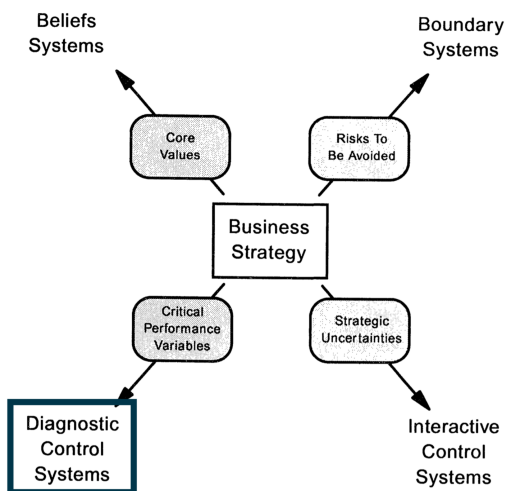
Argyris (1990) argue that an overwhelming amount of learning today is single-loop because organizations are designed to identify and correct errors. Organizations are quite good at such learning, which is relatively straightforward, since errors are attributable to defective actions or strategies. As in line with the measurement-driven management, Buckmaster (1999) argue that firms usually respond to traditional PMM systems by modifying the strategy within the current norms of the organization. One example of this is when resources of inputs to outputs are not being utilized efficiently and a solution of a cost efficiency program is to be implemented. Management may react by implementing cost control strategies such as activity based costing. However, this represents a single-loop learning since only a control mechanism to track costs, rather than questioning the underlying program, is implemented. (Buckmaster, 1999) Also findings from the case companies provide evidence that this kind of control mechanism is heavily dominating.

Company 2 argued that financial measures, such as EBIT and fuel costs per driven mile, aimed to give a good overall picture of the current state of the company. In company 4 it was even stated that KPIs were managing everything within the firm and the use of KPIs helped the management team to decide which direction the company should be navigated. This company

was fully confident that current financial KPIs were the most important ones to manage the company. Company 6 referred to a detailed monitoring. If deviations not were tracked, improvements could not be made. As the Director stated “If we find discrepancies between target and actual, we undoubtedly need to investigate its reason”.

This type of learning is all derived from internal data, it is short termed and it is based on repetition. Most importantly, it does only capture one single element of what the organization does and it does not analyze the reason for the variance. A question is thus arising how financial measures, which is able to address performance from only one perspective, can be able to provide a good overall picture of the current state of the company; can manage ‘everything’ within the firm; how they can help to decide which direction the company should be navigated or, function as a tool to improve the whole business. As CFO of company 1 stated, the KPIs is often taken directly from the consolidated reporting system and due to the nature of such accounting measures, it is not possible to adjust or renew the KPIs that often. This sheds additionally light on how measures derived directly from consolidated reporting system, which only identify one feature of the corporations’ whole performance, can be argued to be suitable in a company operating in a highly dynamic environment with continually complex and unpredictable dimensions. It may be that, as the CFO stated, due to the nature of the accounting based measures, it is not possible to adjust or renew the KPIs that often, leaving the measures in a circle of single-loop learning with no questioning of the underlying assumption of the measure itself.

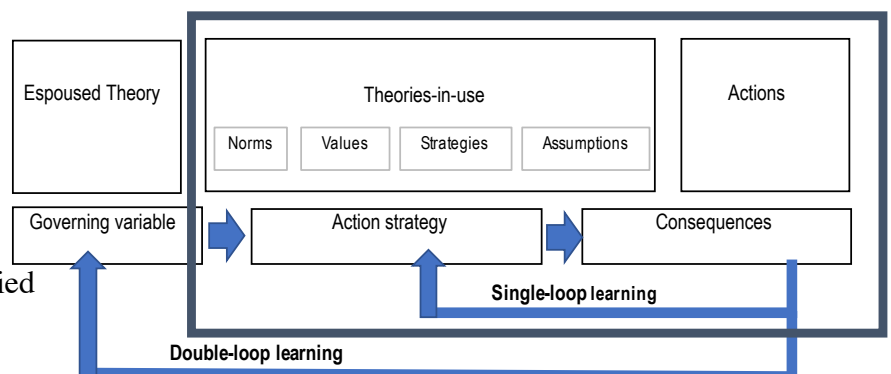
Figures 5-7 highlight the first part of the analysis phase which clearly demonstrated a measurement-driven management with a high confidence in knowing how to respond to the environment, and thus consequently with both a strong diagnostic control and a single-loop learning.



**Figure 6**  
Diagnostic control systems identified

		Outcome	
		General	Specific
Solutions	General	Assessment-driven management	Outcome-driven solutions
	Specific	Solution-driven outcomes	Measurement-driven management

**Figure 5**  
Measurement-driven management identified



**Figure 7**  
Single-loop learning identified

Beyond the fixed strategy and measures found within the case study companies, also an opposite approach could be found among the findings. Here, an unfixed approach to both strategy and measures could be demonstrated. Next part of the analysis phase examines these results.

### 4.3.2 Assessment-driven management

#### **Assessment-driven management**

Company 1 described that a high amount of partnership was provided down in the hierarchy of the organization. This aimed to support reaching the financial targets defined at the corporate level and to create engagement and participation among the employees. The CFO did also explain that a flexibility in the selection of what to do and how to do a certain task was available “[...] You don’t get a manual of one hundred pages of how to act in this company. You should individually find out what to do and how to do it”. This management approach at company 1 can be argued to be in-between the two quadrants of outcome-driven solution and assessment-driven management, provided by Melnyk et al. (2014).

In the first approach, the outcome-driven solution, the management have clearly specified specific goals or outcomes to be achieved, but the method chosen to reach the goal is less critical. Thus, a linkage between strategic goals and measures are not built in the management’s measurement system. Due to the predefined target to reach the financial targets defined at the corporate level, company 1 can be argued to be using an outcome-driven solution. However, the CFO’s later description of partners’ freedom to by themselves decide “what to do and how to do it” turns this management style towards Melnyk et al.’s (2014) assessment-driven management. In this box, only a broadly outcome and solution is predefined by the management team. The management is open to any outcome and solution as long as the action is consistent with the general goals. This method is in line with the CFO’s aim to create a drive of continuous improvements, where employees are flexible and curious to alternative ways. The CFO, which further referred to norms and beliefs which every employee should pay attention to, seem to, even if not being a strictly adherence of a commanding control, be using a belief system to provide one type of direction for the day-to-day work of the employees.

In company 7 a similar approach could be find. Here, the management team of the business-unit had a target that each employee should provide two new improvement proposals each year. As in company 1, the management can here be argued to be open to both alternative methods and solutions, thus categorizing the company as an assessment-driven management style.

Company 5 illustrated a pure outcome-driven solution. Within this cost-sensitive company, one way to keep the costs at low levels was to implement a “best practice” methodology. Here, each employee in the firm was encouraged to provide ideas of how to improve certain processes. Once a best practice had been found among all ideas provided, a standardization was done where all future actions to perform that specific process should be in line with the standardized method. As Melnyk et al. (2014) describes, linkage between strategy and metrics is not built-in in an outcome-driven solution, however, once a best approach has been identified, such as the “best approach” in company 5, chosen one is locked. Future actions to reach that target is then predefined by a certain best practice method which should be obeyed.

A second example of the outcome-driven solution in company 5 is illustrated by the Lean production concept where each employee in operation were given a high delegation of responsibility. As the CFO informed “Daily monitoring through Lean is a way to highlight the importance of continuous improvements. It is also a way to communicate the importance of

engagement among our employees where every individual should feel responsibility for a little part of our operation". By breaking down KPIs in the company to a level where every individual could find "their identity", the employees within company 5 was aimed to better understand how their actions were linked to improvements of the KPIs and thus easier could provide new methods of how to decrease the predefined strategy of decreasing costs in production.

An assessment-driven approach can be argued to be beneficial for companies operating in dynamic environments from several points of views. The assessment-driven management makes a move from measurement to assessment. Clearly, within this approach it is argued that if monitoring of progress would be done, both a method, or the process of how to achieve a target, and the predefined target itself, would be set. In a dynamic environment, such settlements would be dangerous since selection and specification of methods and outcomes would shape what type of outcome the firm would be directed towards. By applying an assessment-driven management approach, employees are welcome to provide ideas of how to tackle current challenges faced in the environmental context.

### **Belief control systems**

In order to be adaptive to a dynamic environment, company 2 had maintained one type of informal communication channel where individuals from the operation team were reporting current news they had caught up in the environment to the higher level management. The Senior Controller illustrated this system as employees "ears on the ground". This structure enabled the company to be attentive for issues such as reasons of why customers had been dissatisfied with product or services of the company, changes in the customers' set up, such as production places or changes in their logistics, which would cause an adaption requirement for the company, or other environmental trends critical to manage the company in right direction, such as changes in oil prices.

Through this informal communication, it seems that the management in company 2 has maintained what Simon's (1995) is referring to a belief system, where market trends and customer feedbacks have been motivated to be collected among the employees. Without a managements communication and signal of what is important within the company, the lower level employees may not had initiated the collection of environmental information on own initiative. It can thus be argued that by inspiring and motivating employees to search and explore in opportunity seeking behaviour, the management team seem to have succeeded to provide a proper direction for employees in the organization. Such management initiative is however not only subject to those employees who collect the environmental information, instead a shared expectation is communicated to the whole organization in order to create a common engagement in same direction among all employees independent levels.

### **Interactive control systems and Double-loop learning**

In company 1 a continually dialogue between different hierarchical levels could be demonstrated. The CFO described that in order to find out what areas are the most important at the business-unit levels, regular meetings were done between corporate and business-unit levels in order to decide strategic focus areas and appropriate KPIs to be used. The CFO expressed "It does not make sense if we implement KPIs which not monitor the business in an appropriate way".

Also company 7 emphasized the importance of a continuous dialogue between different hierarchical levels and the maintaining of an interactive system. By inviting individual employees to management meetings on a quarterly basis, the senior management tried to signal importance of certain topics, focus a regular attention and increase engagement and motivation among the employees. With help of these regular meetings, the management could especially

receive local input from the individual employees which may aim to continually challenge and debating data and previously done assumptions.

Simons (1995) stress the importance of top management's face to face meetings with its subordinates. The interactively used control system, which focus on strategic uncertainties, aims to stimulate search, learning, innovation and to intensify dialogues throughout an organization. By maintaining a frequent meeting between the different organizational levels in company 1 and 7, the top management can signal importance of certain strategic issues to lower levels, which in turn can foster a priority among the employees and a continually search for learning, challenging and debating of previously done assumptions.

Simons (1995) also states that when focus is on action and improvement rather than reporting and controlling, an effective system is arising for facilitating organizational learning that supports growth and development at all levels.

Argyris (1990) made a contribution to this by arguing that, especially, accounting and management control systems should be used in a manner that promotes learning in order to overcome adoption of defensive routines. The interactive control, which supports a double-loop learning, clearly questions and reform existing beliefs and boundaries and reshape the strategy in use. The strategically made assumptions by corporate level in company 1, will with help of the frequent meetings with the lower levels, be open for discussion and questioning. With operational and local input from the business-unit levels, the causal predetermined links at the strategic level may be challenged. This would also assist in identification of new emergent strategies.

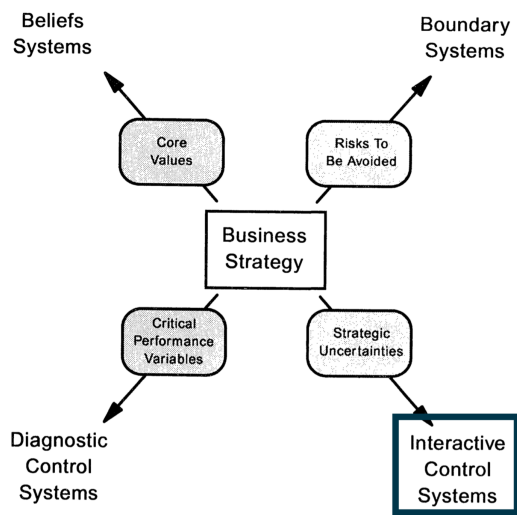
The Senior Manager in company 4 describes how strategically made assumptions and practices are put on challenge through a practice called "Learning process". Clearly, when a new strategic decision, such as implementation of a new KPI has been decided and tested for a few months, the management team goes out to the operation and ask people who have worked with the measure for their individual evaluation. Here, four questions of positive/negative experiences were asked, but which also incorporated why the experience was perceived as good or bad.

The learning process in place at company 4 demonstrates a clear double-loop learning where current assumptions made by the top management level are being questioned. In the learning process, smaller corrections of the measure are not seen as enough; rather the existence of the measure itself is in challenge by incorporating operational people to give their local input of the measure's effect in a wider context. Such evaluation process both enable a deeper questioning of current assumptions and both consider broad range of elements to decide its benefits and disadvantageous in practice.

In a similar vein, company 3, which vision is to provide flexible and cost-efficient solutions, have placed a big emphasis on its employees and customers. In order to meet the both's expectation and increase satisfaction, a deep regular investigation is inaugurated. In order to increase satisfaction among the employees, the company had highlighted the importance of a good relation between manager and its subordinate. By maintaining small groups, every manager was targeted to have a good dialogue with their subordinate, help them to develop their selves, give appropriate feedback and maintaining regular meetings where the employees were aimed to give their input of positive and negative thoughts. Beyond all frequent meetings, also a deep investigation was done if employees ended their employment. A specific meeting was then scheduled to identify the main reasons for leaving the company. This setup in company 3 follows a double-loop learning by implementing several actions in order to understand and make a proper evaluation of their employees' satisfaction. When comments had been collected, the same were forwarded to both stab-manager and management of the business-unit. With respect to the several actions in place to satisfy the employees, it can be suggested that the management team in company 3 also would investigate a questioning of the norms and practices

in place if a too high level of negative comments would be received from the employees, making the knowledge of employees' satisfaction increased.

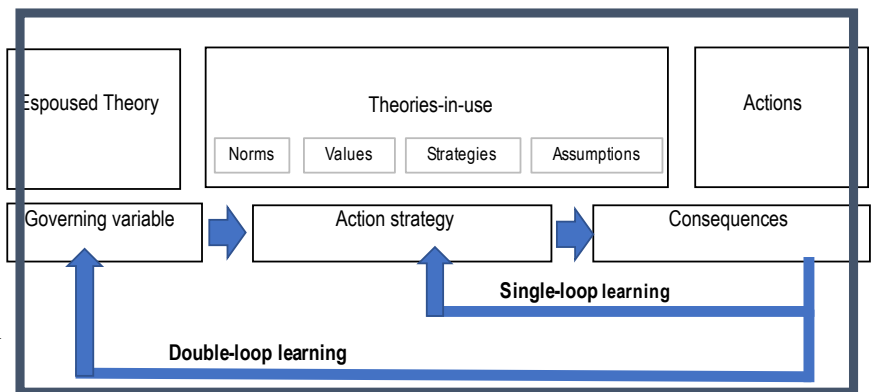
Figures 7-9 highlight the second part of the analysis phase which clearly demonstrated an assessment-driven management where a broadly outcome and/or solution is set up as a way to respond to the environment, and thus consequently with both an interactive and/or belief control system and a double-loop learning approach.



**Figure 8**  
Interactive control systems identified

		<b>Outcome</b>	
		General	Specific
<b>Solutions</b>	General	Assessment-driven management	Outcome-driven solutions
	Specific	Solution-driven outcomes	Measurement-driven management

**Figure 7**  
Assessment-driven management identified



**Figure 9**  
Double-loop learning identified

# 5. Conclusion

## 5.1 Summary findings

### **Strategic vs Operational**

Findings from the case study companies provided evidence that with an extensive use of financial measures a common feature among all companies were the execution of a measurement-driven management. Here, a high believe that applied strategic priority and related method to reach the strategic target is proper according to a certain organizational context. The executives were thus acting with a high confidence in knowing how to respond to the environment and consequently, there is a strong and immediate link between strategy and measures, making the measurement system *strategic*.

Findings from the questionnaire of environmental dynamism demonstrated that one of the highest scores identified among the companies were related to the question of predictability of actions caused by competitors, technology/innovation, customer preferences, economics and regulations.

Even if financial measures, to some degree always have to be included in the measurement systems, the high predictability of these five factors in the environment could be an explanation to the developed confidence of how to act in the dynamic environment among the firms.

From the other side of the coin, among same companies, partnerships and a lot of freedom for individuals to discover what and how to execute performances were provided. Here, engagement and participation were demanded in order to improve the businesses. The focus was thus shifted from the high specificity in solutions and methods and related confidence in the measurement-driven management to an assessment-driven management or outcome-driven solution, where targets and/or methods are left unfixed in order to provide freedom and adaption to the environment. In these two approaches there are no built-in linkages between strategic goals and measures and the measurement system is thus categorized as *operational*.

Findings from the questionnaire of environmental dynamism demonstrated that a high diversity was required in the market due to competitive tactics, customer preferences, product lines and channel of distribution variations was found as high in the environment. The management's low confidence and low specificity in targets and methods can be argued to be a consequence of the high scores perceived in these market variables.

### **Alignment vs Empowerment**

The use of financial measures among the case study companies aimed to strictly track deviations from standards in order to realize intended strategies. Findings from the case study companies provided evidence that outcomes were in detail monitored and correction of deviations were highly prioritized. With a consensus among executives that variances were important to be monitored, sometimes even on individual- and invoiced levels, the companies demonstrated a pure use of diagnostic control, thus requiring employees to be *aligned* with the predefined targets.

Findings from the questionnaire of environmental dynamism demonstrated that a high majority of the executives perceived an extremely intense competition with regard of prices, product and services, technology and, distribution in the markets. With respect to such high competition, in

addition within several areas, the extensive use of diagnostic control among the companies can be argued to fall naturally in order to ensure that actions are performed in line with predefined targets. This could work as a help to not lose market shares.

Despite the strictly use of diagnostic control system, practices from another point of view demonstrated that the case study companies in a high degree maintained an interactive dialogue between different hierarchical levels of the firm. Here, a continuous dialogue between different levels was kept in order to jointly decide strategic focus areas to be prioritized and measures to be used. This approach, which ensured regular face-to-face meetings among managers and subordinates, sometimes in informal setups, enabled managers to receive local input from the operation. In addition, interactive dialogues could help focus a regular attention and increase engagement and motivation for opportunity seeking behaviours among the employees. Thus, through a clear use of interactive control, the companies could stimulate search and foster *empowerment* throughout the organization.

Findings from the questionnaire of environmental dynamism, which demonstrated a high requirement of diversity due to competitive tactics, customer preferences, product lines and channel of distribution variations in the market, can also be an explanation for the use of interactive control among the case study companies. By fostering regular attention on strategic priorities and stimulate search and learning throughout the organization, dialogues may be intensified and possibilities to innovation may be enhanced.

Beside this high diversity requirement due to variations in the market, the questionnaire of environmental dynamism also demonstrated that some companies perceived a high difficulty in obtaining input in terms of labour. By maintaining an interactive dialogue, where employees in a higher degree are recognized and involved in strategic processes, a feeling of inclusion and recognition of employees' competence and skills may be improved. The intrinsic motivation would thus be boosted and a direction to take new actions would be motivated (Ryan & Deci, 2000). In the long run, the perceived difficulty of obtaining labour may be reduced.

### **Single-loop vs Double-loop**

Findings from the case study companies provided evidence that, an extensive use of traditional financial measures and related diagnostic control, was aimed to provide a good overall picture of the current state of the company and function as a tool to decide towards which direction the company should be navigated. Financial measures combined with diagnostic control can be argued to fall as a natural choice for companies with an environment characterized as extremely competitive to monitor that performances not exceeds predefined targets. However, some financial measures and type of control does in same time also only present a process of detection and correction of errors. Organizations involved in this kind of procedure, follow routines and carry on to achieve present objectives without altering the fundamental nature of the organization's activities. This type of *single-loop learning* can be the explanation for why empirical findings provided evidence that some companies used exclusively financial measures to improve the whole business of the company, where a questioning of such setup and consideration of a wider scheme of things, might have been excluded.

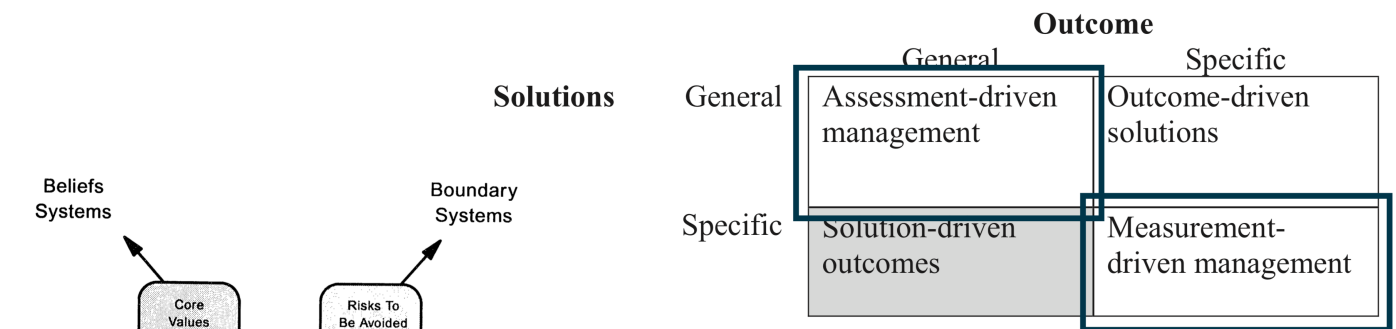
An environment characterized as highly dynamic and complex in its nature requires that organizations are managed in a way where consciousness is developed in routines in order to develop an understanding of why and how current processes are being performed in an optimal way. Without this, environmental variables affecting the company will be excluded from the



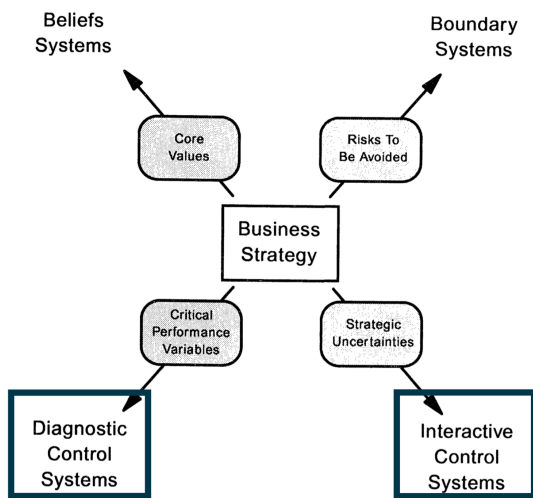
strategic priorities and improvements will be done in type of efficiency in current norms, policies and objectives. Beyond detection and correction of errors, present in single-loop learning, an understanding of why deviations have occurred is essential to understand in order to better adapt to the organizational environment. In some circumstances it can even be necessary to questioning the fundamental nature of the organization's activities in order to confirm whether proper strategic direction have been applied.

The empirical research provide evidence that a more advanced type of learning is available within the case companies. By maintaining an interactive control, where face-to-face meetings are held between managers and subordinates, fresh local inputs are integrated with strategically made assumptions into a "Learning process" where questioning of made hypotheses are publicly tested by co-workers from the operational levels. By receiving local input, a wider context is considered and both deviations and new opportunities can be developed through a more advanced *double-loop learning* system.

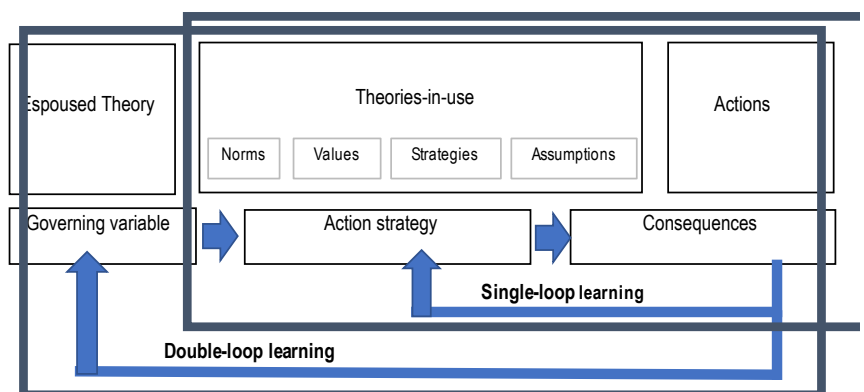
Figures 10-12 illustrates the three major types of uses of PMM found in the case study companies. It is the use of these practices and their maintaining in an appropriate balance that makes the PMM system remains resilient to a change in the environment and continue to provide appropriate guidance to managers in real time.



**Figure 10**  
Assessment and Measurement-driven management identified



**Figure 11**  
Diagnostic and Interactive control systems identified



**Figure 12**  
Single and Double-loop learning identified

## 5.2 Concluding remarks

Although the issue of performance measurement and management has received considerable attention from both academics and practitioners, neither has completely addressed the issue of how the PMM system can be used to remain resilient to a change in the environment and so continue to provide appropriate guidance to managers in real time.

While various practices have been identified and discussed, the case study provided in this paper revealed that three major types of uses of PMM are found within the practice that have relevance for the possibility of organizational alignment.

First, organizations should decide whether their PMM is strategic or operational. This choice will determine whether there is a fixed or unfixed link between strategy and measures. Second, the balance between alignment and empowerment will have a relevant consequence for the diagnostic or interactive use of PMM. Third, depending on the use assigned to PMM, information will generate either single or double-loop learning, which will have an immediate impact on the firms' possibilities for change.

However, case study findings show that no one company, excluding company 6 and 8, demonstrated a straight application of each of the three types of uses, irrespective of the hierarchical level to which they represent. Instead, in most of the organizations' corporate or business-unit level it was possible to identify a range of successful features which associated with both strategic and operational; alignment and empowerment; and single and double-loop learning practices of PMM. This observation concludes that for PMM system to remain resilient to a change in the environment and to continue provide appropriate guidance to managers in real time, all six features should be present and managed in such a way that an appropriate balance of the tensions can be sustained.

## 5.3 Further research

In terms of wider research agenda, there are two conclusions and recommendations for further research. First, the findings of this study are consistent with earlier results (Bisbe & Otley, 2004; Abernethy & Brownell, 1999) that it is not the specific tools or design of PMM but the way they are applied that should be taken into account. Further research could continue to develop a more fine-grained understanding of how companies seek a balance between the three major types of uses of PMM system. Preferably a single or multiple-case study should address how a balance between strategic vs operational; empowerment vs alignment and single vs double-loop learning is maintained in a highly dynamic setting. In addition, PMM systems may have implications for all levers of control and by conducting a pure in-depth multiple-case study, benefits and challenges of respective control systems could be addressed.

Second, although the three types of use of PMM have evolved through seven highly different industries, there is a need that PMM continue to be researched in different contexts. Specific attributes of the environment will be changing on a constant basis and the external environment will with reason of that continue to be a central element for the effectiveness of PMM systems.

## 6. References

- Argyris, C. (1977). Double loop learning in organizations. *Harvard Business Review*. Vol. 55. No. 5. pp. 115-125.
- Argyris, C. (1990). The dilemma of implementing controls: The case of managerial accounting. *Accounting, Organizations and Society*. Vol. 15. No. 6. pp. 503-511.
- Azzone, G., Masella, C., Bertelé, U. (1991). Design of Performance Measures for Time-based Companies. *International Journal of Operations & Production Management*. Vol. 11. No. 3. pp. 77-85.
- Beer, S. (1981). *Brain of the Firm*. Wiley: Chichester. England.
- Bisbe, J., Malagueño, R. (2012). Using strategic performance measurement systems for strategy formulation: Does it work in dynamic environments? *Management Accounting Research*. Vol. 23. No. 4. pp. 296-311.
- Bititci, U-S., Turner, T., Begemann, C. (2000). Dynamics of Performance Measurement Systems. *International Journal of Operations & Production Management*. Vol. 20. No. 6. pp. 692-704.
- Bitton, M. (1990). Methode de conception et d'implantation de systemes de mesure de performances pour organisations industrielles. These d' automatique Universite de Bordeaux I.
- Black, A., Wright, J., Backman, J., Makall, M., Wright, P. (1998). *In search of shareholder value: managing the drivers of performance*. London: Pitman Publishing.
- Bourgeois, L-T. (1985). Strategic Goals, Perceived Uncertainty, and Economic Performance in Volatile Environments. *The Academy of Management Journal*. Vol. 28. No. 3. pp. 548-573.
- Bourgeois, L-J., Eisenhardt, K-M. (1988). Politics of Strategic Decision Making in High-Velocity Environments: Towards a Midrange Theory. *Academy of Management Journal*. Vol. 31. No. 4. pp. 737-770.
- Bourgeois, L-J., Eisenhardt, K-M. (1988). Strategic Decision Processes in High Velocity Environments: Four Cases in the Microcomputer Industry. *Management Science*. Vol. 34. No. 7. pp. 816-835.
- Bourne, M., Mills, J., Wilcox, M., Neely, A., Platts, K. (2000). Designing, implementing and updating performance measurement systems. *International Journal of Operations & Production Management*. Vol. 20. No. 7. pp. 754-771.
- Bryman, A., Bell, E. (2011). *Business research methods. 3<sup>rd</sup> edition*. Oxford University Press: Oxford.

- Buckmaster, N. (1999). Associations between outcome measurement, accountability and learning for non-profit organisations. *International Journal of Public Sector Management*. Vol. 12. No. 12. pp. 186-197.
- Bukh, P-N., Malmi, T. (2005). Re-examining the cause-and-effect principle of the Balanced Scorecard. In: Mourtisen, J., Jönsson, S. (Eds.) *Accounting in Scandinavia: The Northern Lights*. Liber: Stockholm
- Calfee, D-L. (1993). Get Your Mission Statement Working! *Management Review*. Vol. 82. No. 1. pp. 54-57.
- Chenhall, R-H. (2005). Integrative strategic performance measurement systems, strategic alignment of manufacturing, learning and strategic outcomes: an exploratory study. *Accounting, Organizations and Society*. Vol. 30. No. 5. pp. 395-422.
- Chenhall, R-H., Morris, D. (1986). The Impact of Structure, Environment, and Interdependence on the Perceived Usefulness of Management Accounting Systems. *The Accounting Review*. Vol. 61. No. 1. pp. 16-35.
- Chenhall, R-H., Morris, D. (1993). The role of post completion audits, managerial learning, environmental uncertainty and performance. *Behavioural Research in Accounting*. Vol. 5. pp. 170-186.
- Chenhall, R-H., Morris, D. (1995). Organic decision and communication processes and management accounting systems in entrepreneurial and conservative business organizations. *International Journal of Management Science*. Vol 23. No. 5. pp. 485-497.
- Davis, S., Albright, T. (2004). An investigation of the effect of Balanced Scorecard implementation on financial performance. *Management Accounting Research*. Vol. 15. No. 2. pp. 135-153.
- Dixon, J-R., Nanni, A-J., Vollmann, T-E. (1990). *The New Performance Challenge: Measuring Operations for World-class Competition*. Business One Irwin: Homewood, IL.
- Duncan, R. (1972). Characteristics of Organizational Environments and Perceived Environmental Uncertainty. *Administrative Science Quarterly*. Vol. 17. No. 3. pp. 313-327.
- Eisenhardt, K-M., Graebner, M-E. (2007). Theory Building from Cases: Opportunities and Challenges. *The Academy of Management Journal*. Vol. 50. No. 1. pp. 25-32.
- Epstein, M., Manzoni, J-F. (1998). Implementing corporate strategy: From Tableaux de Bord to Balanced Scorecards. *European Management Journal*. Vol. 16. No. 2. pp. 190-191.
- Ewusi-Mensah, K. (1981). The External Organizational Environment and Its Impact on Management Information Systems. *Accounting, Organizations and Society*. Vol. 6. No. 4. pp. 301-316.
- Feibleman, J., Friend, J-W. (1969). *The Structure and Function of Organization in F.E. Emery. Systems Thinking*. Penguin: Harmondsworth, UK.

Ferreira, A., Otley, D. (2009). The design and use of performance management systems: An extended framework for analysis. *Management Accounting Research*. Vol. 20. No. 4. pp. 263-282.

Fisher, J. (1995). Contingency-based research on management control systems: categorization by level of complexity. *Journal of Accounting Literature*. Vol. 14. pp. 24-53.

Forbes Media LLC (2013). World's 15 Most Inventive Cities. Available Online: <https://www.forbes.com/sites/williampentland/2013/07/09/worlds-15-most-inventive-cities/#56a258b84ec5> [Accessed 15 April 2017]

Fortuin, L. (1988). Performance Indicators. Why, Where and How? *European Journal of Operational Research*. Vol. 34. No. 1. pp. 1-9.

Franco-Santos, M., Lucianetti, L., Bourne, M. (2012). Contemporary performance measurement systems: A review of their consequences and a framework for research. *Management Accounting Research*. Vol. 23. No. 2. pp. 79-119.

Gates, S. (1999). *Aligning strategic performance measures and results*. The Conference Board, New York: NY.

Ghalayini, A., Noble, J. (1996). The changing basis of performance measurement. *International Journal of Operations & Production Management*. Vol. 16. No. 8. pp. 63-80.

Gimbert, X., Bisbe, J., Mendoza, X. (2010). The Role of Performance Measurement Systems in Strategy Formulation Processes. *Strategic Performance Measurement, Long Range Planning*. Vol. 43. No. 4. pp. 477-497.

Globerson, S. (1985). Issues in developing a performance criteria system for an organization. *International Journal of Production Research*. Vol. 23. No. 4. pp. 639-646.

Goold, M. (1991). Strategic control in the decentralized firm. *Sloan Management Review*. Vol. 32. pp. 69-81.

Gordon, L., Narayanan, V-K. (1984). Management Accounting Systems, Perceived Environmental Uncertainty and Organization Structure: An Empirical Investigation. *Accounting, Organizations and Society*. Vol. 9. No. 1. pp. 33-47.

Govindarajan, V. (1984). Appropriateness of accounting data in performance evaluation: An empirical examination of environmental uncertainty as an intervening variable. *Accounting, Organizations and Society*. Vol. 9. No. 2. pp. 125-135.

Granger, C-W-J. (1969). Investigating causal relations by econometric models and cross spectral methods. *Econometrica*. Vol. 37. No. 4. pp. 424-438.

Gregson, T., Wendell, J., Aono, J. (1994). Role ambiguity, role conflict, and perceived environmental uncertainty: Are the scales measuring separate constructs for accountants? *Behavioral Research in Accounting*. Vol. 6. p. 144.

Gul, F. (1991). The Effects of Management Accounting Systems and Environmental

Uncertainty on Small Business Managers' Performance. *Accounting and Business Research*. Vol. 22. No. 85. pp. 57-61.

Gul, F., Chia, Y-M. (1994). The effects of management accounting systems, perceived environmental uncertainty and decentralization on managerial performance: A test of three-way interaction. *Accounting, Organizations and Society*. Vol. 19. No. 4. pp. 413-426.

Hall, M. (2008). The effect of comprehensive performance measurement systems on role clarity, psychological empowerment and managerial performance. *Accounting, Organizations and Society*. Vol. 33. No. 2/3. pp. 141-163.

Henri, J-F. (2006). Management control systems and strategy: A resource-based perspective. *Accounting, Organizations and Society*. Vol. 31. No. 6. pp. 529-558.

Ittner, C-D., Larcker, D-F. (2001). Assessing empirical research in managerial accounting: a value-based management perspective. *Journal of Accounting & Economics*. Vol. 32. No. 1/3. pp. 349-410.

Ittner, C-D., Larcker D-F., Randall, T. (2003). Performance implications of strategic performance measurement in financial services firms. *Accounting, Organizations and Society*. Vol. 28. No. 7/8. pp. 715-727.

Jansen, H. (2010). The Logic on Qualitative Survey Research and its Position in the Field of Social Research Methods. *Forum: Qualitative Social Research*. Vol. 11. No. 2. pp. 1-21.

Kaplan, R-S., Norton, D-P. (1993). Putting the Balanced Scorecard to Work. *Harvard Business Review*. Vol. 71. No. 5. pp. 134-147.

Kaplan, R-S., Norton, D-P. (1996). *The Balanced Scorecard. Translating strategy into action*. Harvard Business School Press: Cambridge, Mass.

Kaplan, R-S., Norton, D-P. (2001). *The Strategy Focused Organization: How Balanced Scorecard Companies Thrive in the New Business Environment*. Harvard Business School Press: Boston, MA, US.

Kasperska, Y., Tayles, M. (2013). The role of causal links in performance measurement models. *Managerial Auditing Journal*. Vol. 28. No. 5. pp. 426-443.

Keegan, D-P., Eiler, R-G., Jones, C-R. (1989). Are your performance measures obsolete? *Management Accounting*. pp. 45-50.

Kennerley, M., Neely, A. (2002). A framework of factors affecting the evolution of performance measurement systems. *International Journal of Operations & Production Management*. Vol. 22. No. 11. pp. 1222-1245.

Kennerley, M., Neely, A. (2003). Measuring performance in a changing business environment. *International Journal of Operations & Production Management*. Vol. 23. No. 2. pp. 213-229.

- Khandwalla, P-N. (1972). The Effect on Different Types of Competition on the Use of Management Controls. *Journal of Accounting Research*. Vol. 10. No. 2. pp. 275-285.
- Khandwalla, P-N. (1977). *The Design of Organizations*. Harcourt Brace Jovanovich: New York, NY.
- Kren, L., Kerr, J. (1993). The Effect of Behaviour Monitoring and Uncertainty on the Use of Performance-Contingent Compensation. *Accounting & Business Research*. Vol. 23. No. 90. pp. 159-167.
- Kärreman, D., Alvesson, M. (2011). *Qualitative Research and Theory Development: Mystery as Method*. Sage Publications: London, UK.
- Light, D. (1998). Performance Measurement: Investors' Balanced Scorecards. *Harvard Business Review*. Vol. 76. No. 4. pp. 17-20.
- Lipe, M-G., Salterio, S. (2002). A note on the judgemental effects of the balanced scorecard's information organization. *Accounting, Organizations and Society*. Vol. 27. No. 6. pp. 531-540.
- Lynch, L-R., Cross, K-F. (1991). *Measure Up! The Essential Guide to Measuring Business Performance*. Mandarin: London.
- Malmi, T. (2001). Balanced scorecards in Finnish companies. A research note. *Management Accounting Research*. Vol. 12. No. 2. pp. 207-220.
- March, J-G. (1971). *The Technology of Foolishness*. Blackwell: New York, NY.
- Maskell, B-H. (1989). Performance Measurement for World Class Manufacturing. Management Accounting. *Human Resource Management*. Vol. 30. No. 2. pp. 270-270.
- McAdam, R., Bailie, B. (2002). Business performance measures and alignment impact on strategy – The role of business improvement models. *International Journal of Operations & Production Management*. Vol. 22. No. 2. pp. 972-996.
- Melnyk, S-A., Bititci, U., Platts, K., Tobias, J., Andersen, B. (2014). Is performance measurement and management fit for the future? *Management Accounting Research*. Vol. 25. No. 2. pp. 173-186.
- Merchant, K-A. (1985). Organizational controls and discretionary program decision making: A field study. *Accounting, Organizations and Society*. Vol. 10. No. 1. pp. 67-85.
- Merriam, S. (1994). *Fallstudien som forskningsmetod*. Studentlitteratur: Lund.
- Micheli, P., Manzoni, J-F. (2010). Strategic Performance Measurement: Benefits, Limitations and Paradoxes. *Long Range Planning*. Vol. 43. No. 4. pp. 465-476.
- Micheli, P., Mari, L. (2014). The theory and practice of performance measurement. *Management Accounting Research*. Vol. 25. No. 2. pp. 147-156.

- Miles, M-B., Huberman, M-A. (1984). Drawing Valid Meaning from Qualitative Data: Toward a Shared Craft. *Educational Researcher*. Vol. 13. No. 5. pp. 20-30.
- Miles, R-E., Snow, C. (1978). *Organizational Strategy, Structure and Process*. McGraw Hill: New York, NY.
- Milgrom, P., Roberts, J. (1992). *Economics, organization & management*. Prentice Hall: Englewood Cliffs, NJ.
- Miller, K-D. (1992). Industry and Country Effects on Manager's Perceptions of Environmental Uncertainties. *Purdue CIBER Working Papers*. Paper 72.
- Miller, D., Friesen, P-H. (1983). Strategy-Making and Environment: The Third Link. *Strategic Management Journal*. Vol. 4. No. 3. pp. 221-235.
- Mintzberg, H. (1982). *Structure et Dynamiques des Organisations*. Editions d'organisation: Paris.
- Neely, A., Mills, J., Platts, K., Richards, H., Gregory, M., Bourne, M., Kennerley, M. (2000). Performance measurement system design: developing and testing a process-based approach. *International Journal of Operations & Production Management*. Vol. 20. No. 10. pp. 1119-1145.
- Neely, A., Adams, C., Kennerley, M. (2002). *The Performance Prism: The Scorecard for Measuring and Managing Business Success*. Prentice Hall: London
- Newkirk, H-E., Lederer, A-L. (2006). The effectiveness of strategic information systems planning under environmental uncertainty. *Information & Management*. Vol. 43. No. 4. pp. 481-501.
- Rebele, J-E., Michaels, R-E. (1990) Independent auditors' role stress: Antecedent, outcome and moderating variables. *Behavioral Research in Accounting*. Vol. 2. pp. 124-130.
- Simons, R. (1995). How New Top Managers Use Control Systems as Levers of Strategic Renewal. *Strategic Management Journal*. Vol. 15. No. 3. pp. 169-189.
- Sink, P-E. (1986). Performance and productivity measurement: The art of developing creative score boards. *Industrial Engineer*. Vol. 1. pp. 86-90.
- Smith, P. (1995). On the unintended consequences of publishing performance data in the public sector. *International Journal of Public Administration*. Vol. 18. No. 2/3. pp. 277-310.
- Toumela, T-S. (2005). The interplay of different levers of control: A case study of introducing a new performance measurement system. *Management Accounting Research*. Vol. 16. No. 3. pp. 293-320.
- Trost, J., Hultåker, O. (2007). *Enkätboken*. Studentlitteratur AB: Lund.
- Tymon, W-G., Shaw, K-N. (1998). Critical Analysis and Recommendations Regarding the Role of Perceived Environmental Uncertainty in Behavioral Accounting Research. *Behavioral*



*Research in Accounting*. Vol. 10. pp. 23-24.

Umanath, N-S., Ray, M-R., Campbell, T-L. (1993). The Impact of Perceived Environmental Uncertainty and Perceived Agent Effectiveness on the Composition of Compensation Contracts. *Management Science*. Vol. 39. No. 1. pp. 32-45.

Waterhouse, J-H., Tiessen, P. (1978). A contingency framework for management accounting systems research. *Accounting, Organizations and Society*. Vol. 3. No 1. pp. 65-76.

Widener, S-K. (2007). An empirical analysis of the levers of control framework. *Accounting, Organizations and Society*. Vol. 32. No. 7. pp. 757-788.

Wisner, J-D., Fawcett, S-E. (1991). Linking firm strategy to operating decisions through performance measurement. *Production and Inventory Management Journal*. Vol. 32. No. 3. pp. 5-11.

Yayla, A., Hu, Q. (2012). The impact of IT-business strategic alignment on firm performance in a developing country setting: exploring moderating roles of environmental uncertainty and strategic orientation. *European Journal of Information Systems*. Vol. 21. No. 4. pp. 373-387.

Yin, R-K. (2009). *Case study research: design and methods*. Sage: London, UK.

# 7. Appendix

## A1. Questionnaire Environmental dynamism

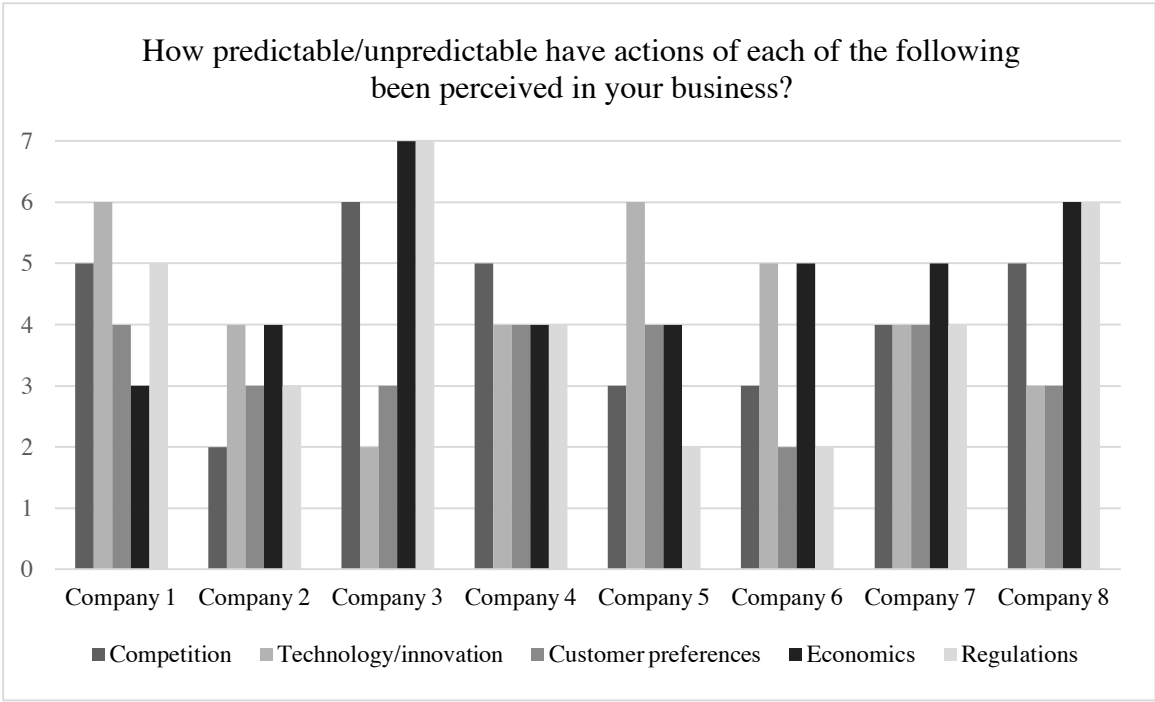
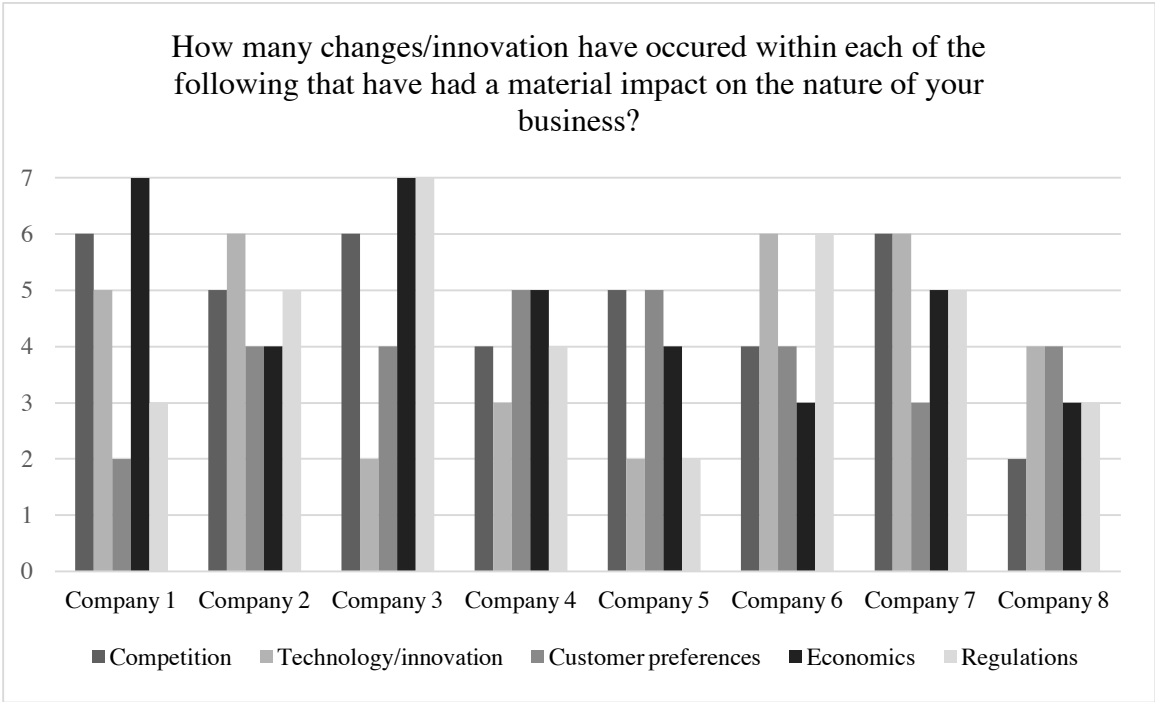
Table A Environmental dynamism\*

Please indicate how much you agree with the following statements regarding the business environment your organization is in:

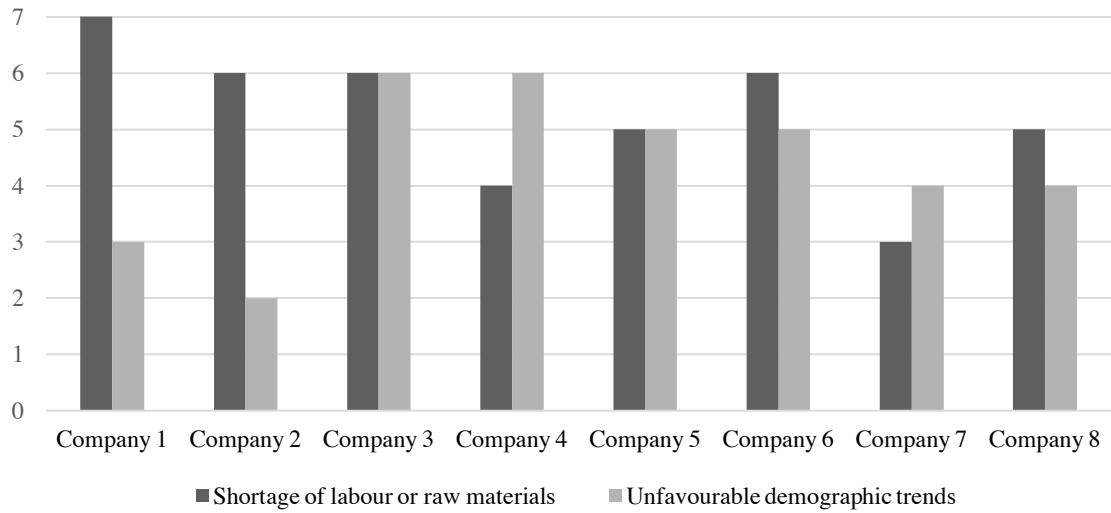
<i>Dynamism</i>							
How many changes/innovation have occurred within each of the following that have had a material impact on the nature of your business?	<i>Few changes</i>					<i>Many changes</i>	
Competition	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Technology/innovation	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Customer preferences	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Economics	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Regulations	(1)	(2)	(3)	(4)	(5)	(6)	(7)
How predictable/unpredictable have actions of each of the following been perceived in your business?	<i>Very predictable</i>					<i>Highly unpredictable</i>	
Competition	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Technology/innovation	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Customer preferences	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Economics	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Regulations	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Hostility</i>							
How difficult have it been to obtain input for environment characterized by down-/upswings of each of the following?	<i>Very easy</i>					<i>Very difficult</i>	
Shortage of labour or raw materials	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Unfavourable demographic trends (eg. drying up of markets)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
How intense has the competition of each of the following been perceived in your industry?	<i>Low intense</i>					<i>High intense</i>	
Price	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Product and services	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Technology	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Distribution	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Heterogeneity</i>							
To what extent have variations among the firms' markets required diversity within each of the following practices?	<i>Low diversity</i>					<i>High diversity</i>	
Competitive tactics	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Customer preferences	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Product lines	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Channels of distribution across respective markets	(1)	(2)	(3)	(4)	(5)	(6)	(7)

\* Survey based on experiences over the past 5 years

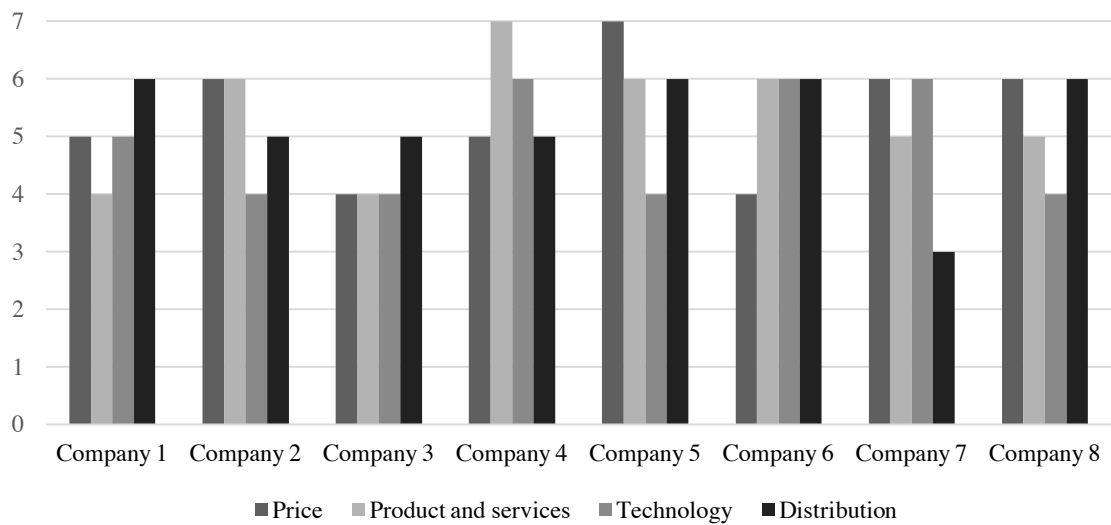
**A2. Results of Questionnaire Environmental dynamism**



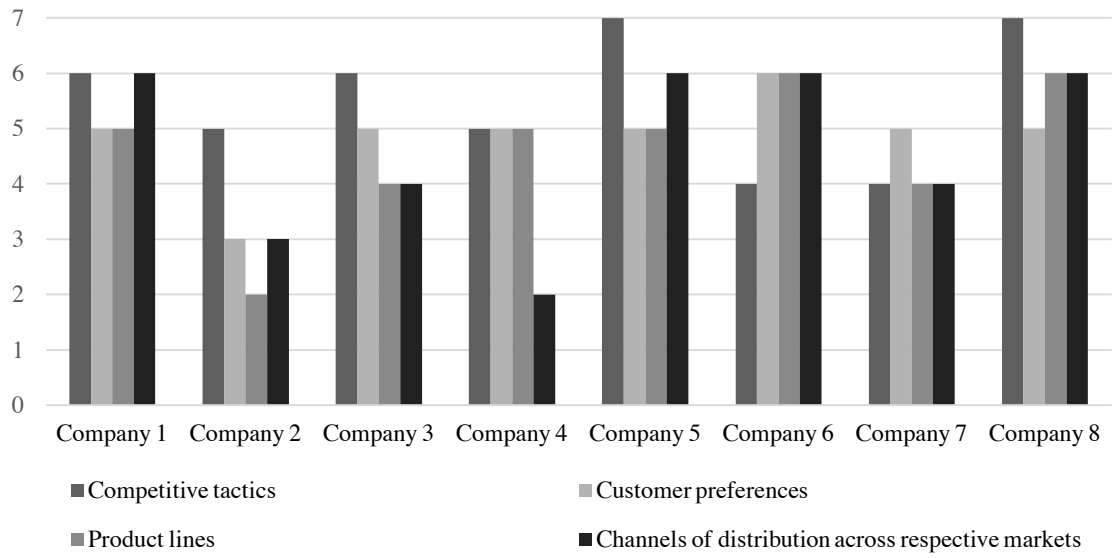
How difficult have it been to obtain input for your business in an environment characterized by down-/upswings of each of the following?



How intense has the competition of each of the following been perceived in your industry?



To what extent have variations among the firms' markets required diversity within each of the following practices?



## **A3. Interview guide**

### **Part I - Current PMS**

#### PMS och strategi

1. Hur ser företagets vision och strategi ut?
2. Vilka är företagets kritiska framgångsfaktorer (key success factors)?
3. Hur kommuniceras dessa ut i organisationen, till vilka och hur ofta?
4. Hur ser företagets PMS ut och varför?
5. Vad är syftet med företagets PMS?

#### Etablerade prestationsmått

1. Vilka prestationsmått används i erat PMS, varför och vad är deras syfte?
2. Hur definieras dessa prestationsmått?
3. Vilka mått är viktigast, varför?
4. Hur är dem anpassade utifrån företagets mål, strategi, kritiska framgångsfaktorer?
5. Vilka områden mäts framförallt, vilka är viktigast?
6. Vilka faktorer påverkar måtten, och hur?
7. Finns det några andra mått som inte är kopplade till företagets mål, strategi, kritiska framgångsfaktorer, hur ser dessa ut?
8. Finns det något annat sätt att mäta prestation på, hur ser dessa ut?
9. Hur uppfattar ni att de nuvarande måtten uppfyller sitt syfte? I det fall de inte uppfyller sitt syfte, varför?

#### Måttens användning

1. Vad används måtten till, och vad är dess syfte?
2. Var i organisationen används måtten, varför?
3. På vilket sätt utvärderas måtten? Varför?
4. Vilken betydelse har måtten i dess användningsområde? Varför?
5. Hur kommuniceras vikten av de olika måtten? Varför?

### **Part II - Contextual factors**

1. På vilket sätt uppfattar ni att omgivningen är dynamisk (oförutsägbar)?  
Vilka faktorer uppfattar ni kan leda till en dynamisk miljö?
2. På vilket sätt uppfattar ni att omgivningen är fientlig och hotfull?  
Vilka faktorer uppfattar ni kan leda till en fientlig och hotfull miljö?
3. Hur heterogent (diversifierat) är företaget utifrån miljön? Exempelvis genom diversifiering av produktutbud, marknader, produktion, distributionskanaler.

### **Part III - The process of change in PMS**

1. Vilka förändringar har företaget gjort i sin PMS?  
Varför gjordes dessa förändringar och vad var den bakomliggande orsaken?
2. Vilka förändringar planerar företaget att genomföra i sin PMS?  
Varför planeras dessa förändringar och vad var den bakomliggande orsaken?
3. Hur går ni tillväga för att identifiera faktorer i omgivningen?

- Hur säkerställer ni at förändringar i omgivningen identifieras?  
Hur ofta bevakas omgivningen?  
Vem ansvarar för bevakningen?  
Hur avgörs faktorernas relevans?
4. Hur reflekterar ni över användningen av måtten så att de överensstämmer med omgivningen?
  5. Hur går förändringar av måtten till?  
Uppdateras vissa mått mer ofta än andra?
  6. Hur implementeras nya mått?  
Uppstår några hinder på vägen vid implementeringen?  
Leder all ”modifieringar” till implementering eller finns det någon urvalsprocess?  
Hur lång tid tar en implementering av nya mått?

#### **Part IV - Consequences and output of the change**

1. Hur säkerställs det att företagets PMS är fullt funderande efter en förändring?
2. Har du exempel på fall då förändring i företagets PMS inte resulterade i önskvärt resultat?
3. Hur beaktas samverkan mellan de olika komponenterna i företagets PMS?

#### **Part V - Evaluation of consequences and output of the change**

1. Om en förändring i PMS inte nådde det önskvärda resultatet, vilken anledning är det mest troligt att det beror på?
2. Vilka faktorer kan hindra en förändring i PMS?
3. Vilka åtgärder vidtas när förändringen i PMS inte uppnår önskvärt resultat?