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# **Analysing the Role of Rolling Forecast from a Broad Perspective**

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## **Abstract**

The dynamic business environment requires the management control system (MCS) of an organization to be changed to be adaptable. Therefore, as a management control system, rolling forecasts are increasingly being adopted as a replacement for a static annual budget in more and more organizations under the current volatile economy conditions. However, rolling forecasts do not operate in isolation, and its efficiency depends upon what control systems it is combined with. In other words, rolling forecasts should be operated within the context of a management control system package. The lack of literature in this respect calls for more research on this topic. This thesis takes advantage of this opportunity to study the role of rolling forecasts on the basis of a previously described performance management system (PMS) framework. In this sense, we conduct a literature-based investigation of the topic. Based on the existing literature on rolling forecasts, we find that rolling forecasts interrelate significantly with other control systems, and that each relevant control system should be coherent with each other to serve the organizational objectives. This study contributes to the field of management accounting in three ways. This study provides a theoretical support for readers to understand the role of rolling forecasts in a holistic manner. It also provides practitioners with an overview of the interrelation between rolling forecasts and the various MCSs within an organization, and reminds them to have an MCS package thinking when designing and using rolling forecasts. Moreover, this study provides a foundation for future empirical and theoretical developments.

Key words: Rolling forecast; Budget; Management control system.

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# 1. Introduction

Today's business environment is dominated by changes which became more and more unpredictable (Pardey, 2007, Frow et al., 2010). Therefore, in order to maintain their competitive advantages, organizations have to be flexible and adaptive (Frow et al., 2010) to respond quickly to the increasingly unpredictable business environment in which they operate (Pardey, 2007). Likewise, management control systems (MCSs) also have to adapt to the evolving requirements in order to "sustain their relevance and usefulness" p.275 (Ferreira and Otley, 2009). As one of the MCSs, budgeting is "still regarded as an organizational imperative" p.445 (Frow et al., 2010) and has been widely adopted by organizations across the world (Hansen et al., 2003, Tanlu, 2008a). However, traditional annual budget is unable to fulfill many managerial requirements and have been criticized for their various weaknesses (Hansen et al., 2003; Hope and Fraser, 1999, 2003; Seechoonparsad, 2009). One of the weaknesses is that a traditional annual budget is static and only adaptable in the context of a stable environment (Seechoonparsad (2009), and it becomes less useful when an organization operates in turbulent business environments (Hansen et al., 2003). Thus, a traditional annual budget is no longer suitable for companies who want to respond quickly to changing business scenarios (Seechoonparsad, 2009, Hansen et al., 2003). In the context of goals and targets achievement, budgets are seen as irrelevant during times of uncertainty, high market volatility, and intense competition (Frow et al., 2010). In such circumstances, businesses that require more flexible and adaptive management are under enormous pressure (Hope and Fraser, 1999, Hope and Fraser, 2003b). Therefore, more and more organizations are shifting from annual budgets to rolling forecasts (Hope and Fraser, 2004, Banham, 2011, Lynn and Madison, 2004, Stretch, 2012a). Rolling forecasts take the dynamic changes into account and help organizations predict potential risks and opportunities and react more effectively to the volatile business environment (Seechoonparsad, 2009). Although, a rolling forecast is used as an alternative to overcome the limitations of the traditional annual budget, a rolling forecast itself does not provide a complete answer to such limitations. Hope and Fraser (1999, 2003a, 2011) claimed that only an adaptive organization can benefit from the new management model, e.g., rolling forecasts. In addition, focusing only on the changed components (new model) does not lead to success; all of the parts must operate in harmony to derive a well-functioning management model, which can minimize conflict and maximize potential (Ferreira

and Otley, 2009). Fisher (1998) also advocated that studying a specific MCS component without considering its links with the other components leads to improper conclusions. This notion is supported by many researchers who argue that it is rather important to study MCS as a package since they do not operate independently, and the efficiency of a single control system depends in fact on the additional systems with which it is combined (Malmi and Brown, 2008; Otley, 1980; Flamholtz et al., 1985; Cäker, 2012). As a management control system, rolling forecasts, too, do not operate in isolation and “should be studied as part of an organizational package” p.110 (Hansen et al., 2003). Many researchers advocate that to better understand rolling forecasts, they should be integrated with other control processes. This will also enable managers to respond more flexibly to today’s unpredictable business environment and intensive competition. (Frow et al., 2010, Hope et al., 2011, Lynn and Madison, 2004, Myers, 2001b, Hansen et al., 2003) Therefore, it is advisable to study rolling forecasts within a broader MCS context.

However, few theories and empirical evidence can be found on the role of rolling forecasts in a MCS package manner, mostly because integrating systems within a corporation is a complex and time-consuming process (de Waal et al., 2011, Stretch, 2012a, Clarke, 2007, Østergren and Stensaker, 2011). Moreover, the existing literature contains fragmentary suggestions on the role of rolling forecasts, which focuses on some perspectives and different concepts. Thus, no integrated framework can be found from the literature to guide the design and use of a rolling forecast. In other words, the features of rolling forecasts and how they interact with other control systems in an organization are not well-understood. This lack of theoretical integration and the relative inattention has limited our understanding of the nature of rolling forecasts as a control system in complex organizations. Consequently, a comprehensive framework is needed to help organizations and enhance their chance of success when they design and use rolling forecasts.

Therefore, this thesis aims to investigate the role of rolling forecasts among MCSs by using Ferreira and Otley’s (2009) performance management systems (PMS) framework. The PMS framework describes 12 questions on performance management process and also explains the interrelation between different questions. As Ferreira and Otley (2009) argues, the PMS framework presents a robust and systematic framework for researchers to describe the design and use of the package of controls as well as examine the structure, operation and use of PMS in a holistic manner. In this thesis, the PMS framework is used as the basis for literature selection and also for the systematic analysis of the role of rolling forecasts in MCSs.

Going further, we choose to use literature review as our research approach, because it provides us with a better and deeper understanding of rolling forecasts and helps us in increasing our knowledge and getting a comprehensive picture of the area we study.

By reviewing the existing set of literature, this study aims to explore what relevant MCSs are discussed and to what extent, as well as what role a rolling forecast plays among them. Therefore, the research question can be established as follows:

*To what extent and how is each of the 12 elements of the PMS framework covered in the extant literature on rolling forecasts?*

This study contributes to the field of management accounting in three ways. This study provides a theoretical support for academics to understand the role of rolling forecasts in a holistic manner. It also provides practitioners with an overview of the interrelation between rolling forecasts and the various MCSs within an organization, and reminds them to have an MCS package thinking when designing and using rolling forecasts. Moreover, this study provides a foundation for future empirical and theoretical developments.

The remainder of the thesis is structured as follows: the next section describes the research methodology; then the PMS framework is introduced; this is followed by an analysis on the role of rolling forecasts under the PMS framework. In the last section, concluding remarks, research limitations and future research opportunities are suggested.



## **2. Methodology**

### **2.1 Research paradigm: Interpretivism**

An understanding and choice of research paradigm, i.e. positivism or interpretivism, is important for researchers to identify adaptable research designs for their research. Interpretivism paradigm sees the world as socially complicated and open to interpretation. It concerns with subjective and shared meanings, and allows researchers focus on one particular subject in-depth. (Wilson, 2014) In this study, we choose interpretivism as our research paradigm, because it is the most helpful paradigm for answering our research questions. In this study, we aim to choose rolling forecasts as our focus. By introducing Ferreira and Otely's (2009) PMS framework as our theoretical foundation, we explain the important roles rolling forecasts play among different MCSs and how they interact with each other based on all the extant literature on rolling forecasts. Interpretation is vitally significant for the analysis of qualitative data under interpretivism paradigm(Eriksson, 2008). Therefore, through interpreting the role of rolling forecasts from a broad perspective, we can gain better knowledge and in-depth understanding of rolling forecasts, thereby produce new insights into the investigated phenomenon.

### **2.2 Research approach: literature review**

In this thesis study, we choose a literature review as our research approach, because the features of it satisfy our research purpose and help to answer our research question. Literature reviews present a kind of power and value beyond any single study by integrating results of various studies. Moreover, literature reviews allow researchers to address broad questions and draw broad conclusions. (Baumeister, 1st edition(2003), Baumeister, 2nd edition (2013)). This thesis study aims to interpret the role of rolling forecasts on the basis of a holistic PMS framework and involves integrating viewpoints of relevant literatures. Going further, instead of solving a specific problem, the conclusion of this study will explain the research status and possible questions on this topic and suggest potential future research directions. Baumeister (2003 and 2013) also suggests literature review as a research strategy if broad questions and conclusions are to be addressed.

Webster and Watson (2002) suggest two types concerning reviewing of literature, writing a mature topic with considerable published literature, and writing an emerging topic with few literature. While in the first case, the authors can synthesize and extend the existing research, for

the second case, the authors can introduce a framework as the basis for analysis. Since rolling forecast is an emerging topic<sup>1</sup> and a few literature can be accessed (Golyagina and Valuckas, 2012), we introduce Ferreira and Otely's (2009) PMS framework as our theoretical foundation. This framework served as the basis for not only literature selection but also for the systematic analysis of the role of rolling forecasts in MCSs.

Baumeister (2003 and 2013) suggests presenting the research findings of this kind of literature reviews on the basis of the theory introduced. Baumeister recommends to "organize the presentation of research findings into subsections, each of which has a single theoretical point to make, and provide a summary critique at the end of each subsection. This summary critique can evaluate the group of studies as a whole and the amount and methodological diversity (i.e. converging evidence) of the evidence." (p.66). This thesis follows the useful analysis format of Baumeister (2003 and 2013) and organizes the analysis under 12 sections. Every section discusses a single element of the 12 elements of PMS framework. It discusses how well each element is covered by literature by providing a summary strength and provides thereby a summary critique at the end of each element.

Going further, it is important to have a clear goal in mind when writing a literature review (Baumeister, 1997). It is also important in literature reviews to explain the contributions of the study to the field. The contributions should improve the theoretical understanding of some phenomena. (Baumeister 1997, 2003, 2013). Obviously, this thesis aims to test PMS framework on the area of rolling forecasts. It also has broad contributions to the management accounting field. The findings are helpful for researchers to have a theoretical support to understand the role of rolling forecasts in a holistic manner, and provide practitioners with an overview of the interrelation between rolling forecasts and the various MCSs within an organization, thereby increase the chance of successfully building effective rolling forecasts.

### **2.3 Literature search and study**

Typically, in a literature-based research process, following the identification of topic area, literature is searched to identify the limitations and new research opportunities. For emerging

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<sup>1</sup> From the table below in this section, we can see that the first wave of the studies on this topic appeared at the beginning of this century, but a new wave of research emerges more frequently in recent years.

topics, computerized searches are not so helpful, the most effective method is to identify “the most relevant journals and examine every article they published” p.121 (Baumeister, 2013) . In line with this idea, we refer to Golyagina and Valuckas’ (2012) thesis work and use the top 30 accounting journals chosen from Lowe and Locke (2005) to constitute our literature search. Selecting the right key words is the most important step to finding relevant literature. Therefore, several related key words, such as rolling forecast, roll, forecast, rolling budget, budget, continuous budget, were used for this study. With academic journals, we searched for keywords in the title, abstract, and full text. For practitioner journals, we searched for keywords in title and full text. The literature search was limited to English language texts published before June 2013. For searching results of each journal, we start with the latest publications with the thought that they will cite important previous references. We read the abstract of each article to identify the relevant ones. If the article is relevant, we will read the whole articles to confirm our choice. Apart from the articles directly accessed from the above databases, related articles recommended by the databases were also checked and selected.

Finally, five academic articles are chosen:

- Frow, N., Marginson, D., & Ogden, S. (2010). "Continuous" budgeting: reconciling budget flexibility with budgetary control. *Accounting, Organizations and Society*, 35 (4), 444-461.
- Ekholm, B.-G., & Wallin, J. (2000). Is the annual budget really dead? *European Accounting Review* , 9 (4), 519-539.
- De Leon, L., Rafferty, P. D., & Herschel, R. (2012). Replacing the annual budget with business intelligence driver-based forecasts. *Intelligent Information Management*, 4, 6-12.
- Hansen, S. C. (2011). A theoretical analysis of the impact of adopting rolling *budgets, activity-based budgeting and beyond budgeting*. *European Accounting Review*, 20 (2), 289-319.
- Sivabalan, P., Booth, P., Malmi, T., & Brown, D. A. (2009). An exploratory study of operational reasons to budget. *Accounting & Finance*, 49 (4), 849-871.

Based on the five academic articles accessed above, we examine all the references cited in each article and identify the relevant ones. We find that many cited articles on rolling forecasts are

from practitioner journals. If the references cited in the identified articles were not covered in the top 30 accounting journals mentioned above, we would identify the journal and apply the same search process as described above.

Steward (2004) claims that researches can build on literatures not only from formal journal publications but also from other sources such as internet publications, in-house reports, conferences, magazines. We used the search engines, such as Google, Google Scholar, with the same key words mentioned above to amplify our sources. We select three relevant articles after reading all the relevant searching results:

- Bunce, P. (2007). *Transforming financial planning in small and medium sized companies*. BBRT 2007.
- Player, Steve. (2009) *Managing through change: the power of rolling forecasts*
- *Replacing the annual budget with rolling forecasts*. May, 2011.

We traced the first online article to the beyond budgeting round table (BBRT) website, where we find a key author Hope, Jeremy, whose articles and books are also cited by Frow et al. (2010). We identified his three relevant books:

- Hope et al. (2011). *The leaders' dilemma: how to build an empowered and adaptive organization without losing control*.
- Hope & Player, (2012). *Beyond performance management*.
- Hope, J., & Fraser, R. (2003a). *Beyond Budgeting: How Managers Can Break Free from the Annual Performance Trap*.
- In summary, the literature used in this thesis study includes 5 articles from academic journals, 12 articles from practitioner journals, 6 literature with 3 e-books and 3 articles from online sources (see table below)

	<b>No.</b>	<b>Year</b>
<b>Academic journals</b>		
<i>Australian Accounting Review</i>	1	2005
<i>Accounting and Finance</i>	1	2009
<i>Intelligent Information Management</i>	1	2012
<i>Accounting, Organizations and Society</i>	1	2010
<i>European Accounting Review</i>	1	2000
<b>Subtotal</b>	<b>5</b>	
<b>Practitioner journals</b>		
<i>Accountancy</i>	2	1999;2000
<i>Journal of Accountancy</i>	1	2001
<i>Management Accounting Quarterly</i>	1	2004
<i>Strategic Finance</i>	1	2002
<i>Accounting &amp; Business</i>	1	2012
<i>Controlling &amp; Management</i>	1	2003
<i>Accountancy Ireland</i>	1	2007
<i>Entrepreneur</i>	1	2012
<i>Charter</i>	1	2011
<i>Financial Management</i>	1	2007
<i>Harvard Business Review</i>	1	2003
<b>Subtotal</b>	<b>12</b>	
Online articles	<b>3</b>	2007;2009;2011
Books	<b>3</b>	2010;2011;2012
<b>Total</b>	<b>23</b>	

## 2.4 Validity

According to Eriksson (2008), validity concerns to what extent findings of a research accurately describe the phenomenon investigated and how the findings are supported by evidence. In this thesis study, we refer to other published articles (e.g. Lowe and Locke, 2005; Baumeister, 2003, 2013) to make our study more academic and enhance the research validity. Regarding literature, there is not so much literature that is focused rolling forecasts. However, there is considerable

literature relating to budget and alternatives to the budget. We have chosen to use the literature that highlights beyond budget and alternative to the budget from different perspectives in order to get a comprehensive picture of our study's area.

Further, the validity is high under the interpretivism paradigm, because it focuses on accessing the essence of the phenomena and capturing data providing rich and detailed explanations (Collis, 2009). Merriam (1998) suggests some strategies that researchers can use to enhance the validity. For instance, various sources of information and different methods can be used to confirm the results. To ensure the internal validity of our study, all articles were read thoroughly by both researchers and summarized individually. The articles were summarized based on the 12 elements of PMS framework. When reading every article we tried to identify which element is discussed and how it is related to the rolling forecast. The summaries were later discussed and a single unified summary for each article was arrived at. Notably, while reviewing the literature sources, we could not find any new MCSs that were not covered in this study. Moreover, the external validity in this study is high, because we covered all the literature on rolling forecasts.

## **2.5 Reliability**

According to Collis & Hussey (2009), reliability refers to how the researchers' findings can be repeated by a new study of the same object. That is, for research findings to be reliable, a repeat study should have the same findings. However, under the interpretivism paradigm, reliability is of little importance, because the researchers can influence the research. Therefore, how the research procedures are established to reach the findings is important for the authenticity of the research (Collis, 2009). Merriam (1998) suggests that in order for the research to be reliable, the researchers can explain their fundamental theories, the positions of the group they study, the social context in which the information is obtained, as well as use several methods to collect and analyze data. Since our study is an interpretivism research, it is difficult to discuss its reliability. However, in order to increase the reliability of our study, we clearly interpret our theoretical foundations, and explain the whole research process and the techniques we use to collect and analyze our data.

### **3. Theoretical framework**

#### **3.1 Definitions of rolling forecasts**

Different terminologies such as rolling budgets, continuous budgeting, and rolling forecasts have been used in the extant literature. Lynn and Madison (2004) refer to rolling budgets as continuous budgeting. Hansen (2011) terms rolling budgets as rolling forecasts. However, most of the literature uses the term “rolling forecasts.”

The following definitions have appeared in literature:

“Rolling budgets always involve maintaining a plan for a specified time period in the future. This result is achieved by adding a new time period in the future as the current time period that ended is dropped” p.60 (Marc P. Lynn, 2004)

De Leon (2012) defined a rolling forecast as “a process of budget planning that removes historical periods to add future periods and iteratively compels an organization to focus on the future. This rolling approach allows for the forecasted periods to remain the same, regardless of the accounting close. As one month or quarter closes, it is simply dropped from the forecast and a new month or quarter is added to the end of the forecasted scope. The rolling forecast end period is constantly projected forward.” (p.8)

“A rolling forecast is a forecast for sales, or for costs, but more often than not for both, that always extends a set number of financial periods into the future. The term ‘roll’ refers to the regular update that takes place – typically monthly or quarterly: the forecast horizon is extended so that the number of periods included remains the same; figures are entered for the new periods at the horizon; and all the figures already in place from earlier forecasts are updated” p.22 (Clarke, 2007 )

Consistent with the definitions above, Tanlu (2008b) identifies four aspects that distinguish rolling forecasts from traditional annual budget: (1) rolling forecasts are not static – they require regular updating; (2) rolling forecasts are made for horizons that are not limited to the fiscal year; (3) rolling forecasts generally are not used explicitly for performance measurement and incentive compensation; and (4) rolling forecasts generally require less detail than a traditional annual budget. (p.2)

As can be seen from the above definitions, the one on rolling budgets is more general, while the definitions of rolling forecasts are more specific and yet similar. Most of the articles use the term “rolling forecasts,” as will be seen in the discussion of articles later in this section. Although a few articles use “rolling budgets” or “continuous budgeting,” it is clear that the authors are referring to rolling forecasts. Therefore, in this thesis, we view rolling budgets, continuous budgeting as synonymous with rolling forecasts.

### **3.2 Ferreira and Otley’s (2009) PMSs framework**

The concept of MCSs operating as a package has existed for decades, however, few studies have been conducted on this topic despite regular calls to investigate this phenomenon (Malmi and Brown, 2008). Fisher (1998) argues that studying a specific MCS component without considering its links with the other components leads to improper conclusions. This notion is supported by many researchers who argue that it is important to study MCS as a package (Malmi and Brown, 2008; Otley, 1999; Cäker, 2012). Malmi and Brown (2008) view MCS packages as a set of controls and control systems. Moreover, adopting a broad approach to study MCS provides a holistic view and enables an organization and its managers to engage in the design of an MCS that can direct employee behavior toward the achievement of organizational goals and drive organizational performance (Malmi and Brown, 2008; Cäker, 2012).

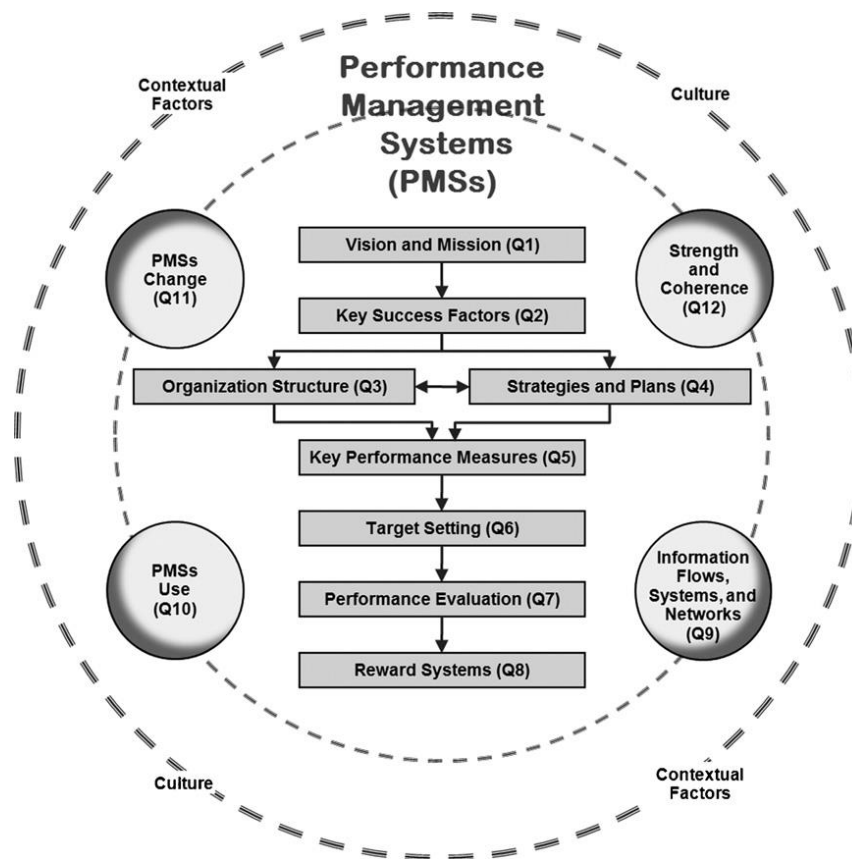
However, few studies were conducted on this area (Malmi and Brown, 2008; Abernethy and Chua, 1996; Alvesson and Karreman, 2004; Simons, 1995). One of the well-known frameworks in this respect is Merchant and Van der Stede’s (2007) object of control framework (Malmi and Brown, 2008). However, Malmi and Brown (2008) criticize Merchant and Van der Stede’s (2007) framework by stating that it links planning to finance, and that planning should be treated as a separate MCS. Moreover, Malmi and Brown (2008) point out that provision of necessary resources of Merchant and Van der Stede’s (2007) personnel controls is not a control mechanism.

By analyzing and synthesizing the past four decades of research on MCS (e.g. Chenhall, 2003; Fisher, 1995, 1998; Flamholtz et al., 1985; Langfield-Smith, 1997; Otley, 1980; Simons, 1995), Malmi and Brown (2008) developed a broad framework which includes five types of controls: planning, cybernetic, reward and compensation, administrative and cultural controls. However, Malmi and Brown (2008) state that their aim is not presenting a final solution to MCS package, but stimulating more discussion and research on this area. The authors (ibid) also claim that more



new controls may be discovered and added to their framework. How the elements in the framework interrelate with each other is also not addressed. (Malmi and Brown, 2008)

Extended 5 questions of Otley's (1999) performance management framework and integrated Simons' (1995) levers of control framework, Ferreira and Otley (2009) developed a more holistic PMS framework. The PMS framework describes 12 questions on the performance management process and also explains the interrelation between different questions to help the framework have a more systematic view. As such, the PMS framework can be seen as a MCS package, thus to be a broad approach. As Ferreira and Otley (2009) argue, the framework is a valuable tool that not only provides a comprehensive checklist of elements that should be considered when designing and using MCSs, but also illustrates the links between the different elements, Thus presenting a robust and systematic framework for the analysis of a company's options on MCSs. PMS framework provides a comprehensive tool for researchers to describe the design and use of the package of controls as well as examine the structure, operation and use of PMSs in a holistic manner within a specific organization. (Ferreira and Otley, 2009) Schläfke (2013) also states that Ferreira and Otley (2009) introduce a comprehensive PMS framework that highlights the potential key aspects of the performance management process. Therefore, we choose to use this PMS framework as our theoretical foundation. The overview of this framework can be seen in the figure below:



Source: Ferreira and Otley (2009) p. 268

### 3.2.1 Vision and mission

A vision and mission statement defines the purposes and values of an organization, in order to measure the performances and convey the direction of the organization (Johnson et al., 2005). How vision and mission statements are established and communicated influences the organizational behavior (Ferreira and Otley, 2009).

### 3.2.2 Key success factors

Key success factors (KSFs) are defined by Ferreira and Otley (2009) as “activities, attributes, competencies, and capabilities that are seen as critical pre-requisites for the success of an organization in its industry at a certain point of time” (p.268). Ferreira and Otley (2009) state that KSFs are concrete measures that must be reported regularly on different timescales and are used to examine whether the vision and mission is successfully achieved.

### 3.2.3 Organizational structure

Organizational structure is, in itself, a control system and is a significant factor that affects the design and use of PMSs. The identification of KSFs must be in harmony with the extant organizational structure (Ferreira and Otley, 2009). Chenhall (2003) states that organizational structure concretely establishes individual roles and tasks to determine their responsibilities and accountabilities. According to Johnson et al. (2005), organizational structure involves decentralization/centralization of authority, differentiation/standardization, formalization, and configuration. Otley (1999) argues that organizational control configurations must be changed to suit different strategies and plans to achieve effectiveness of the MCSs.

### 3.2.4 Strategies and plans

Ferreira and Otley (2009) refer strategy as a set of unique activities guiding actions of an organization over a long period of time in order to achieve organization goals. In this element, the authors see process as equally important to outcomes, and suggest that the process of designing and communicating strategies and plans be given an explicit consideration for individuals to understand how their actions contribute to the overall strategy (Ferreira and Otley, 2009). Ferreira and Otley (2009) describe two approaches for the generation and communication of the strategies and plans; i.e., a top-down approach and a bottom-up approach. Langfield-Smith (2007) reviewed literature on relationship between strategy and MCSs, and concluded that different strategies and plans require relevant organizational structure to guarantee the effectiveness of MCSs.

### 3.2.5 Key performance measures

In the view of Ferreira and Otley (2009), key performance measures are key performance indicators used by organizations to measure the achievement of its objectives. These measures can be both financial and non-financial (Otley, 1999). The identification of these indicators is commonly connected with organizational objectives, KSFs, and strategies and plans (Ferreira and Otley, 2009). Furthermore, one thing that should be kept in mind is that too many measures may confuse employees on the real key points and reduce the effectiveness (Kaplan and Norton, 1996)

### 3.2.6 Target setting

Setting targets and using them to evaluate and reward performance is critical to performance management (Otley, 1999). Ferreira and Otley (2009) believe that appropriate targets are significant in motivating employees and enhancing their performance. Chan (1998) recommends

taking situations into account when setting targets. In other words, targets should be set to adapt to the dynamic environment. Chenhall (2003) supports this proposition and recommends organizations to continuously improve their targets in order to set an appropriate target. Furthermore, benchmarking provides a good way for target setting (Ferreira and Otley, 2009).

### 3.2.7 Performance evaluation

In the reviewed literature, Ferreira and Otley (2009) state that performance evaluation can be subjective, objective, or a mixture of both elements (that is, relative performance evaluations, or RPEs). Dye (1992) referred RPEs as measuring performance by comparing with that of another.

### 3.2.8 Reward systems

Stringer (2007) argues that field studies on target setting and reward systems are very limited. Rewards are broadly discussed in Ferreira and Otley's (2009) model and involve both financial and non-financial elements. Financial rewards are related to bonuses and salary increases, while non-financial rewards are associated with attitudes and recognition of superiors. The authors also state that rewards can be positive (i.e., rewards) and negative (i.e., penalties), and both must be considered when evaluating performance of subordinates.

### 3.2.9 Information flows, systems, and networks

The logic of this element in Ferreira and Otley's (2009) model is how systems are organized in networks and provide a platform for information to flow. Information flows, as Ferreira and Otley (2009) stated, have both feed-back information and feed-forward information flows. In this sense, information involves both financial and non-financial information. Systems are interdependent with other control systems (Chapman, 2005) and, in many organizations, are organized in formal networks available to various units within the organization for financial information to flow, while information can also be diffused through the informal networks of individuals (Ferreira and Otley, 2009).

### 3.2.10 PMS use

Although 'use' can be more important than the design of the control system, research on 'use' is very limited (Ferreira and Otley, 2009). According to Ferreira and Otley (2009), Simons' (1995) concept of interactive use is the one most valuable and discussed. However, the weakness of this concept is that interactive use of control systems is confused with the use of strategic validity

controls (Ferreira and Otley, 2009). Moreover, Simons' (1995) interactive use is stated as from an individual level of analysis. To complement Simons' (1995) concept of use, Ferreira and Otley (2009) introduce Broadbent and Laughlin's (2007) transactional use and relational use, which is viewed as from an organizational level of analysis. Transactional use implies that "integration and control are achieved through the rigorous implementation of contractual specifications. Furthermore, transactional tools for management control are agreed in advance, monitored during delivery, and evaluated after a set of goals has been achieved" (Spekle, 2001). Whereas, the relational use of MCSs implies less specification about the goals and targets and how managers achieve them is relied on the interpersonal attachment, mutual trust, altruism and cooperation between teams within a company.

### 3.2.11 PMS change

The main focus of this element in Ferreira and Otley's (2009) model is how PMSs should be changed to adapt to the changes of environments and organizations. It is stated that PMS design and use must be proactive or reactive to the changes. In other words, the PMSs must predict changes, or may be changed to satisfy the new demands. Therefore, change dynamics should be taken into account in the design of PMSs. The authors also emphasize that strategic change is the core components of PMSs and should be paid more attention when changing the PMS design (Ferreira and Otley, 2009).

### 3.2.12 Strength and coherence

This element of the model discusses that, for PMSs to be successful, every component has to be aligned and coordinate well with each other (Ferreira, 2002). That is, each component has to link well with strategies and maintains consistency with the organizational objectives (Ferreira and Otley, 2009).

The first eight elements are the core aspects of the PMSs and constitute the first level of the framework. Ferreira and Otley (2009) illustrate the connections and coherence between the above eight MCSs. The vision and mission statements express the core objectives and overall direction that the organization expects to pursue. Key success factors (KSFs) should be identified to achieve the vision and mission. Organization structure and strategies and plans should be matched with each other and should serve the identification of KSFs. Key performance measures are used at different levels in organizations to evaluate the success in meeting objectives, setting

KSFs, developing strategies and plans, and thus satisfying the expectations of different stakeholders. Targets have to be set to evaluate performance, the outcomes of which will determine how rewards are distributed.

The remaining four elements addressed in Ferreira and Otley's (2009) framework can be perceived to relate to every component of the PMS and help the framework have a holistic and broad approach. They form the second level of analysis. A well-integrated information system should be in place to diffuse the information among different MCSs. Use is seen as more important than the design of a control system and Simon's four levers of control show how a PMS may be used. Ferreira and Otley (2009) also contend that the design and use of PMSs need to be changed proactively or reactively to respond to both environmental and organizational change. Moreover, the last aspect – strength and coherence – highlights that different components of PMSs should be aligned and coordinated with each other to deliver a successful outcome. If the components do not fit well together, a PMS can fail even if the individual components are well-designed.

However, the framework developed by Ferreira and Otley (2009) has a few gaps. One of the weaknesses observed by Conrad and Guven Uslu (2012) is, that the framework excludes the culture factor and claims that it forms another level of investigation. Further, the authors (ibid) stated that the framework focuses on “PMS design and use, rather than trying to capture the relationship between external circumstances and such design and use” p.232. In addition, the framework developed by Ferreira and Otley (2009) address to a very limited extent the underlying elements that influence the nature of performance management systems, for instance, “how objectives are determined, how targets are set and how the means of their achievement are decided” p.232(Conrad and Guven Uslu, 2012). Likewise, Adler (2011) points out that the framework developed by Ferreira and Otley (2009) does not pay enough attention to the “non-accounting” based PM factors, such as organizational culture and the selection, training and development of human resources. According to the author, Ferreira and Otley have given a frugal discussion regarding organizational culture by dismissing it as one element among a set of “contingent variables that might explain why certain patterns of control are more or less effective, rather than characteristics of the control model that need to be incorporated into a description” p. 267. Besides, employee selection, training and development are totally ignored in the framework, despite the significant impact they might have on the implementation and function of any new

management tool (Adler, 2011).

Regarding rolling forecasts, shifting to rolling forecasts is stated by many authors as entails a major culture change for all levels of employees. They have to abandon their mindset of preparing annual budget (Lynn and Madison, 2004, Myers, 2001a, Hope, 2011). Lynn (2004) argued that the problems with annual budgeting some authors identified, are in fact management or human resource problems. The author went further and claimed that the problem is not in the annual budget itself, but in managers who do not understand and misuse it. Therefore, organizations should manage the implementation process of rolling forecasts really well and mainly explain what the objective of the change is and how they will do to implement the change process and what key metrics will be used to measure the success of the change. Specifically, organizations have to communicate to employees that the objective of shifting to rolling forecasts is to check reality to identify profitability opportunities (Montgomery, 2002, Clarke, 2007, Lisa De Leon, 2012). In addition, Mark Rolfe, an IBM financial performance management expert who has been giving a series of lectures to ACCA members on the topic of Rolling forecasts in turbulent times”, argues that managers should give some transparency and accountability into their process and that even business managers should take a part of planning a rolling forecast and have ownership of their contributions. The author continues and says that rolling forecasts should give an honest picture of the future and that “there needs to be a culture of wanting to discover how to change the business – not the forecast – if you see a result that you don’t like.” (p.2, Get Ready to roll). Therefore, training managers and making them ready to use the rolling forecast are major issues that have to be addressed when contemplating rolling forecasts (Marc P. Lynn, 2004, Clarke, 2007, Stretch, 2012b). Clarke (2007) also advises organization to avoid cheap implementation and to know that “It takes time to build a rolling forecast that has integrity and the trust of those who use it” p. 23. Although, organization culture may have a considerable impact on the success of rolling forecasts, it is a rather large and complex area and handling it would exclude the scope of this study. Therefore, we decided to stick to the PMS framework and only refer to the importance of organization culture to induce future researchers to do more thoroughly research on the relation between organization culture and rolling forecasts.

## **4. Literature review**

### **1. Bittlestone, Robert. 2000, Tackling the numbers game.**

To avoid the dysfunctional behaviors that result from annual budgeting, Bittlestone (2000) suggested that companies adopt a 12- or 24-month ahead rolling forecast. Instead of a single set of targets, the author recommends that a risk range of possible outcomes should be included in the forecasts due to the uncertainty about the future. Regarding performance rewards, the author suggests that performance evaluation and rewards should be based on agreed benchmarks. In other words, performance goals should be set after studying the competitors' results from the last period or company's own performance during the earlier periods. Managers should be rewarded if they beat the performance goals and the competitors' achievement. In addition, the author also highlights that modern technology should be used in a good way to visualize the cause-and-effect relationships between different business phenomena. The automation of work processes can relieve back office workloads and allow them to see the big picture of the financial dynamics in their business. Moreover, it makes understanding corporate information correctly and effectively much easier for different line managers.

### **2. Gurton, Annie. 1999, Bye bye budget...the annual budget is dead.**

Gurton (1999) argues that unlike the 12-month commitment of an annual budget, which can make a company uncompetitive in today's world, rolling forecasts enable managers to review the business strategies and plans and make changes, as needed, to their budgets to cope with the gap between the planning scenario and the business reality, which results from rapidly changing market conditions. The targets will be reset with the changes in the budgets. The author also states that well-integrated software should be in place to make the budgeting process be quick, easy, and successful. In addition, the author argues that a new approach of management is required to handle the feelings of insecurity among managers that may result from the transition to rolling forecasts. Managers should be empowered and involved in the whole rolling forecast process. Problems can arise if remuneration is linked to the rolling forecasts. Therefore, a different model may be needed to determine salary once an organization starts using rolling forecasts. Moreover, a successful rolling forecast also needs the appropriate cultural support.

### **3. Haka, Susan and Krisnan, Ranjani. 2005. Budget type and performance – the**



### **moderating effect of uncertainty.**

In this article, Haka and Krisnan (2005) investigate the effects of environmental uncertainty on the budget type and performance. The authors found that rolling forecasts result in better performance than annual budgets when the environmental uncertainty is high, because learning is the key to success in this condition. The features of forward-looking and continuous updating of predictions under rolling forecasts improve managers' learning about the environment, which enable them to make better decisions. However, the authors also claim that rolling forecasts can negatively impact performance by reducing goal specificity of a long-term goal because of the multiple short-term goals that result from continuous updating and forecasting, finally leading to lower goal commitment. In this way, managers may reduce their efforts or produce new ineffective strategies to reach the goal. Moreover, frequently updated budget targets make it difficult to decide which target to use for the performance evaluation, which, in turn, negatively affects the performance evaluation. However, the authors argue that for rolling forecasts, less clear goals do not impede performance, because learning is more important than specific goals.

### **4. Sivabalan et al. 2009. An exploratory study of operational reasons to budget.**

Although Gurton (1999) and Haka and Krishnan (2005) argue that rolling forecasts have a negative impact on performance evaluation, Sivabalan et al. (2009) believe that the impact is mixed. With regard to problems related to performance evaluation targets under rolling forecasts, the authors state that periodically updating budget targets to evaluate individuals frequently leads to higher administrative workload and inefficient performance evaluations. In addition, the authors also state that rolling forecasts can have a positive impact on performance evaluation by providing more relevant accounting numbers, because rolling forecasts reduce the "free ride" period, which can occur when targets are met before the end of a period, by updating numbers monthly or quarterly.

### **5. Myers. 2001. Budgets on a roll.**

Myers (2001) states that rolling forecasts can be a useful tool to overcome the weaknesses of static annual budgets, which provide not-so-timely and irrelevant information and may lead to dysfunctional behaviors among managers. The author claims that a more effective and efficient implementation of rolling forecasts can be achieved by involving everyone in the budgeting process. However, for this, companies need to embrace technology that allows managers to

access, diffuse, and process information needed for decision making and forecasting more quickly. The new specially designed, internet-based software provides such a platform. However, the author emphasizes that “the only holdback is the willingness of a company’s managers to use these new technology tools that are now available.” (p. 87)

#### **6. P. Lynn and L. Madison. 2004. A closer look at rolling budgets.**

Lynn and Madison (2004) argued that the problems with annual budgeting identified in Myers’s (2001) article “Budgets on a roll”, are in fact management or human resource problems. The author further claimed that the problem did not lie with the annual budget itself, but with the managers who do not understand and misuse it. Inappropriate incentive systems that have undesired effects on manager’s behaviors are another reason for the failing of the annual budget. Therefore, training managers and making them ready to use the rolling forecast are the major issues that have to be addressed when contemplating a switch to rolling forecasts. Moreover, rolling forecasts have also to be supported by a well-integrated information system that eases the managers’ jobs and enables them to look at the “big picture”. At the same time, managements have to understand that “budgeting is not a piece of software nor simply a mindless algorithm. It is a management process, and software is merely a tool to help facilitate this process”. (p.61)

#### **7. Montgomery. 2002. Effective rolling forecasts.**

On rolling forecasts, Montgomery (2002) states “organizations often have trouble separating their forecast from and coordinating their forecast with the operational budget”, (p.41) which results in a budget (not a forecast) that “takes too much time and effort” (p.41) and fails to provide a clear direction, leading to ineffectiveness. A forecast should provide a clear vision, lead to effective resources allocation by linking short term with long term, and link the strategic plans with detailed operational budgets.

Therefore, to maximize the benefits from rolling forecasts, Montgomery (2002) advises organizations to “ensure that their forecasting process is truly strategic in nature and not simply an extended budget”. (p.44) An effective rolling forecast requires, according to the author (ibid), a clear strategic financial planning mindset. It should provide decision makers with the “big picture” view of the business and encourage them to focus on the comprehensive strategic plans rather than on the short-term goals of an organization. Rolling forecasts should also be based on a summarized level of detail. This will enable managers to focus on the “big picture” rather than

the minor details and anticipate the opportunities/threats that unexpectedly might occur. Furthermore, an effective rolling forecast should be driven by operating metrics and parameters rather than general updates of previous forecast figures. Trends of operational metrics can be visually presented, which provides a useful basis for projection and review of forecasts. Lastly, a rolling forecast should be separate from but closely integrated with the operating budgets. Budget managers should be empowered to make appropriate adjustments to keep the line-item budgets aligned with forecast targets, while an effective feedback loop can facilitate the alignment process, which requires a well-integrated information system in place.

### **8. Replacing the annual budget with rolling forecasts.**

Using rolling forecasts is seen as a better way to help organizations adapt to the dynamic business environment. However, the authors claim that there are some key steps that companies should take before embracing rolling forecasts. Firstly, organizations should move toward driver-based forecasting. That means only drivers relevant to analysis and decision-making should be emphasized to ensure organization-wide alignment and consistent decision-making. Secondly, rolling forecasts should be linked to strategic and operation decisions. Revisiting strategy and aligning resources quickly and efficiently are the key targets of a rolling forecast. “What-if” analyses and scenario planning should be adopted to reflect the risks and opportunities identified in the dynamic changing environment. Moreover, allocation of resources should be planned and the new performance targets should be set as key performance indicators, according to the strategies from the scenario planning. Thirdly, a rolling forecast should directly involve every budget owner into the forecasting process to help decision makers “gain a more accurate picture of the current position and future outlook” (p.2) (empowerment, bottom-up). Fourthly, robust technology should be in place because it is a vital ingredient needed for driver-based forecast modeling, for responding to changes in key performance drivers, and for providing timely integrated information for analysis and decision-making process. Lastly, appropriate change management policies should be designed. Shifting to rolling forecasts entails a major culture change for all levels of employees. They have to abandon their established patterns of work, associated with preparing an annual budget. Organizations should manage this change process really well and explain what the objective of the change is and how they will implement the change process and what key metrics will be used to measure the success of the change.

### **9. De Leon et al. 2012. Replacing the annual budget with business intelligence driver-based forecasts.**

De Leon et al. (2012) find the fixed annual budget cumbersome and disconnected from the business operations and strategic planning goals as it fails to allow organizations to respond rapidly to dynamic business environments. Instead, the authors recommend the use of a driver-based rolling forecast as it is a more flexible tool to identify new risks and opportunities and to respond to the unpredictable economic environment more effectively and efficiently by empowerment. However, a successful rolling forecast implementation requires key business drivers to be emphasized. Well-implemented technology-based business intelligence is needed to “help identify the appropriate drivers, predictability measures, and performance evaluators”. (p.9)

In addition, driver-based rolling forecasts encourage driver-based planning, which allows for the use of what-if scenario planning that helps managers make the optimum decision under volatile business environments. The authors state that this approach unifies different operating units under the overall organizational strategy by compelling and enabling managers to anticipate and take appropriate actions in response rapidly to changing business conditions in order to achieve strategic targets.

### **10. Quick 2012. Get ready to roll.**

Quick (2012) states that a more adaptable, responsive approach to budgeting, such as rolling forecasts, is needed to cope with the challenging conditions under highly uncertain times. Although a large number of organizations are interested in the use of rolling forecasts, only a few have implemented it. The author summarizes the possible challenges associated with and some useful insights for the adoption of rolling forecasts. Firstly, volatile economy conditions require scenario planning to be conducted to satisfy the increasing needs for faster decision-making. Secondly, rolling forecasts should be event-driven to capture the opportunities and emergent risks in a particular situation. For this, spreadsheets should be replaced with upgraded technology that satisfies timely information needs and provides a broad snapshot of the dynamic business conditions. Moreover, key business drivers should be focused on particularly volatile or significant areas, instead of detailed forecasting for other areas. It is important to engage every manager into the forecasting process to make him or her accountable and the process, transparent. Lastly, a distinction should be made between the forecasting and the budgeting process. Instead

of confusing forecasting with budgeting, which is solely used as a target-setting process that encourages dysfunctional behavior, a forecasting culture should be fostered to promote the acceptance of an honest view of the future and the discovery of how changes should be implemented to get the desired results.

### **11. Hope et al.,2011. The leaders' dilemma: how to build an empowered and adaptive organization without losing control.**

In chapter 9 of this book, Hope et al. (2011) offer some insights into a successful implementation of rolling forecasts. Firstly, instead of hundreds of lines of data, only a few key drivers should be focused on. The authors contend that too many details do not lead to more accuracy; therefore, drivers that are relevant to analysis and decision making, rather than detailed numbers, should be emphasized by managers when preparing rolling forecasts. Secondly, the authors claim that rolling forecasts should be bottom-up, and the ownership of the forecasts should be transferred from the corporate center to the front-line team, but negotiations should be conducted with senior managers who have the rights to challenge key assumptions. Thirdly, the authors argue that scenario planning rather than long-term planning should be emphasized to respond rapidly to highly uncertain environments. Scenario planning assumes that several different scenarios can be developed considering the possibly unpredictable events. Then managers can analyze the various future situations with corresponding scenarios and the possible implications of different outcomes. Fourthly, the authors believe that rolling forecasts help managers make decisions. To make the forecasts more reliable and action plans more relevant, the authors suggest that rolling forecasts should be separated from targets. In other words, if forecasts and targets are independent, implementers may be more willing to take risks and correct relevant actions, without worrying about reaching the targets. In addition, the authors emphasize that an integrated system, which can connect different parts of the organization and provide a continuous picture of both the current position and the future outlook, plays an important role in the rolling forecast preparation process.

### **12. Hope & Player, 2012. Beyond performance management.**

In the rolling forecasts, section (33) of this book, Hope & Player (2012) agree that too many forecasting details dilute decision-making, whereas aggregate forecasts, which are much more accurate than the individual forecast, lead to greater customer value. Therefore, it is better to base

rolling forecasts on an aggregate level of detail. Furthermore, since not so many numbers change across different periods in most businesses, it is more sensible to only focus on a few key drivers that are relevant for analysis and decision-making when preparing rolling forecasts. The authors also argue that organizations should adopt ranges and scenarios rather than single-point forecasts, because single-point forecasts “can lead to short-term gap-filling decisions and undermine longer-term strategy. They also lead to minimal targets and sub-optimal performance.” (p.36) With regard to ranges and scenarios forecasts, a range of outcomes can be set and the best option among them can be chosen. This can lead to the optimal performance of the team. The authors continue that “this removes the target ceiling and much of the dysfunctional behavior that is often a feature of poor goal-setting and forecasting.” (p.37)

### **13. Hope & Fraser, 2003. The time has come to abandon the budget. Hope & Fraser, 2003. Who Needs Budgets?**

The command and control management culture protected by traditional annual budgeting has been criticized by Hope & Fraser (2003c) as the reason for many companies failing to adopt other management tools to become more lean, adaptive, and decentralized. The authors recommend organizations to go beyond budgeting and use rolling forecasts as an example to show what principles companies need to implement. Instead of fixed targets, the authors suggest that stretch goals based on benchmarking should be set to maximize performance potential. Furthermore, the performance evaluation and rewards should be based on relative improvement contracts with hindsight. That is, business units are evaluated and rewarded against a range of relative KPIs at the end of a period, based on a comparison with peers, competitors or prior periods in the prevailing conditions. In addition, managers should be empowered to take any action to achieve their goals “within agreed governance principles and strategic boundaries.” (p.72) That is, operating managers should own the performance, and the senior managers should interfere only when the relative performance indicators deviate from the bounds. Moreover, an open and transparent information system makes information for forward-looking be more real and enables managers to project performance changes more effectively, as well as provides a dynamic performance picture for the strategy process.

**15. Lorain, M.-A.,2010. Should rolling forecasts replace budgets in uncertain environments?**

Using the case study of a Spanish company to investigate whether rolling forecasts should replace budgets in uncertain environments, Lorain (2010) explores some aspects relevant to successful implementation and use of rolling forecasts. The author finds that only a few key performance indicators rather than a lot of details are focused on and the preparation of rolling forecasts is separate from fixed targets. Rolling forecasts provide a better vision of the future and allow companies to frequently update their key performance indicators, constantly adjust, or develop action plans to connect planning with strategy. They also enable managers to make appropriate decisions under the fast-changing environment conditions and guide the operations toward the strategic objectives.

Although rolling forecasts serve as a dynamic strategic planning tool, it cannot replace the evaluation and motivation function of annual budgets, because it is updated periodically and cannot provide “a standard reference for control and performance measurement.”(p.182)

In addition, the author argues that involving both top management and frontline units into the forecasting process is crucial for the successful implementation. However, the consolidation of the information from both sources requires highly integrated IT support, which can standardize and automate the process to reduce the risk and complexity and free up more time for value-added activities.

**16. Clarke, P.,2007. The rolling forecast: as a catalyst for change. Clarke & West, 2007. Rolling forecasts.**

Clarke (2007) defines the rolling forecasts and explains how they can be used to activate change in organizations. The author lists some criteria that should be followed when running rolling forecasts. For instance, rolling forecasts should be kept free from fixed goals and incentives, but events can be planned to help achieve stretched goals. Clarke and West (2007) support the same proposition and claim that rolling forecasts should be separate from the influence of personal contracts and incentives to benefit the company effectively. In addition, key success indicators should be addressed and goals should accordingly be set and stretched several years into the future. Every manager should be involved in the forecasting process and be empowered to take

any actions to achieve the stretched goals. However, the mission should be clear enough to drive the identification of KPIs and serve as guidance toward reaching the goals.

**18. Frow, N., Marginson, D., & Ogden, S. 2010. Continuous budgeting: reconciling budget flexibility with budgetary control.**

In this article, Frow et al. (2010) elaborate how budgeting can be combined and coordinated with other MCSs to aid the achievement and flexible management of financial targets and strategic organizational goals in a dynamically changing business environment through a case study in one specific organization. Simons' four levers of control is used to explain how budgeting may be used and integrated with other MCSs.

Continuous budgeting involved the following processes: the original budget target is set at the beginning. If it is not reached, managers are empowered to interactively find out solutions with other managers. Going further, managers are entitled to reallocate resources and make changes as necessary. If a gap still exists, new targets can be set by managers. However, the new targets should be clearly specified and agreed, and accountabilities should be clearly assigned to the relevant people. During this whole process, belief systems and values serve as a guide toward reaching the strategic objectives, and boundary systems regulate what is appropriate to do.

Specifically, to explain how flexible management can be reconciled with budgetary control, the authors cite Hope and Fraser (2003), who suggest that relative improvement contract, rather than fixed performance contract should be used to evaluate and reward managers. Moreover, front-line managers should be empowered to be responsive and adaptable to unforeseen circumstances. However, Frow et al. (2010) argue that the steps for making and judging the trade-off between empowerment and performance targets are not clear. Moreover, although belief and boundary systems can direct and limit behaviors of managers, "they may be too generalized to provide sufficient detailed guidance as to what is most appropriate in any particular situation". (p.458)

In addition, Hope and Fraser (2003) cited by the authors advocate that stretch targets can be used for action plans, and performance can be evaluated and rewarded "against word-class benchmarks, peers, competitors and even prior performance." (p. xix) However, Hansen et al. (2003), cited by the authors, foresee two challenges in this situation: obtaining performance-based data about competitors and identifying relevant performance indicators from different globally used measures.



Hope and Fraser (2003), cited by the authors, ground their assumptions of the targets and performance evaluation on the fact that “people will use their best endeavors to continuously improve performance”, (p. xxii) however, the authors argue that they ignore “the self-interested behavior that informs agency theory” p. 459 (Frow et al. 2010).

#### **19. Bunce, 2007. Transforming financial planning in small and medium sized companies.**

Bunce (2007b) argues that rolling forecasts are used by most leading-edge organizations as the main tool to cope with the dysfunctional managerial behavior resulting from the fixed targets and incentives of annual budget. The author suggests that implementation of rolling forecasts should be independent from fixed targets and fixed performance contract to avoid the bias and distortion. Moreover, the performance evaluation and rewards should be based on benchmarks, such as growth over prior years. In addition, the accuracy of a rolling forecast can be improved by continuous learning and appropriate information systems. A well-integrated information system can connect the various components of control and ensure that the organization can visualize the existing and the future scenarios. The author also states that the rolling forecasts should be event-driven and at the aggregated level of detail. Furthermore, a few key drivers should be focused on to make the forecast process light and quick. Further, rolling forecasts are ideal to “support strategy reviews and test the impact of strategic options”. (p. 10) The author also recommends devolution to front-line teams to make rolling forecasts work effectively. The teams can set their own goals and plans and strive to achieve them. The corporate center plays monitoring role by setting “strategic direction, clear operating guidelines, governance procedures and performance standards” (p. 13) as well as ensuring that “each unit is within bounds in terms of agreed performance indicators”. (p. 13)

#### **20. Ekholm, B.-G., & Wallin, J. 2000. Is the annual budget really dead?**

Ekholm and Wallin (2000) state that rolling forecasts focus on a few key business drivers that allow the company to check whether it is on the right track to achieving its strategic goals. The use of benchmarking systems enables the company to constantly manage performance gaps. However, the uncertain feelings experienced by managers due to frequent updates make it difficult to link rolling forecasts with bonus remuneration.

### **21. Player, Steve. 2009. Managing through change: the power of rolling forecasts.**

In this article, Player (2009) reviews the purposes of and common associated problems with the existing less-effective budgeting alternatives and states that rolling forecasts can substitute them. To improve the success of rolling forecasts, instead of spreadsheets, the author advocates the use of a fast, open, integrated information system that can enable managers to access real-time information and conduct better analysis by visualizing the results. Key business drivers should be identified to focus the rolling forecasts on critical success factors and aggregated level of detail, rather than excessive details. Moreover, the author recommends scenario planning to help companies respond rapidly to developing events.

### **22. Hann, Christopher. 2012. Keep on rolling.**

The article follows an interview format, with Steve Player acting as the person who provides the answers. Player claims that the outdated process and fixed number achievement of the traditional annual budget constrain the development of a company, while rolling forecasts can provide up-to-date information by looking several months forward and establishing corresponding goals. In this way, people working with rolling forecasts try to optimize the process rather than hit the fixed targets. He also contends that rolling forecasts compel people to think proactively and consider contingencies when making a business plan. By so doing, companies can be more flexible and adaptive in their responses to unforeseen changes.

### **23. Sivabalan, P., 2011. Start rolling.**

In this article, the author lists five steps that companies can follow to better benefit from the use of rolling forecast. Getting the right people is important because rolling forecasts require not only a certain skill set, greater effort, evaluation of changes, but also frequent conversations with line/operating managers/staff and the ability to translate the conversations into new numbers. Companies should not rely too much on the past numbers if the future is full of uncertainty, but consult experienced line/operational managers before estimating numbers and future trends. Exploring cause-and-effect relationships of each item to identify the relevant events and staff, generating a forecast of this item by communicating with each identified individual and asking them to reflect on the estimation after the forecast is done. The right systems have to be in place before rolling forecasts are executed. That is, the complexity of the systems should be matched with the information needs and decision making of the organization, rather than as complexity as

consulting firms recommended. The adoption of the rolling forecast should be realistic and based on the real needs and ability of the organization; doing too much too soon may lead to decreased quality of rolling forecasts.

## **5. Analysis**

### **5.1 Vision and mission**

Although organizational vision and mission guide decision-making, and how the mission and vision are established and communicated influences the behaviors of both employees and managers (Hope et al., 2011; Ferreira and Otley, 2009), very few studies have discussed the relationship between vision and mission and rolling forecasts.

The case study by Frow et al. (2010) sheds light on how an organization's mission and vision can promote behaviors and decision-making that is aligned with the broader strategic goals of the organization, especially during highly volatile business scenarios. They inspire organizational members through core values, purpose, and direction that encourages value creation behavior among employees, leading them to align their owns with the strategic objectives of the organization (Frow et al. 2010).

In line with Frow et al. (2010), Hope et al. (2011) believe that companies have to set a “few” clear core values that enable leaders to take decisions that are supported by a company's stakeholders. The authors also state that a compelling and coherent vision is vital to guide the company to successful change implementation. Moreover, according to Hope et al. (2011), the visions should be “clear in intention, appealing to stakeholders, and ambitious yet attainable” and “focused enough to guide decision making” and at the same time “flexible enough to accommodate individual initiatives and changing circumstances” p.225. Clarke (2007 ) also points out that a clear mission helps organizations in identifying their cure KPIs and also could serve as guidance toward reaching the goals.

A considerable number of the reviewed articles argued that the rolling forecasts should be based on an aggregate level of detail and only focus on few key drivers that are relevant for analysis and decision-making. They also call for empowering managers. Therefore, it is important that an organization's vision and mission are well communicated and clearly understood; otherwise

employees may become uncertain about the company's priorities and unable to make the appropriate trade-offs. However, compared to other MCSs, mission and vision are an undeveloped element. Although, the works of Frow et al. (2010) and Hope et al. (2011) provide a good explanation on the role of an organization's mission and vision, the focus of Hope et al.'s (2011) book was not on rolling forecast itself, but on how organizations could abandon annual budgets. Rolling forecasts were cited as an example of an alternative to annual budgets. It would be quite interesting to see more studies focus on how mission and vision should be communicated when adopting rolling forecasts. Yet, works of Frow et al. (2010) and Hope et al. (2011) could be used by future researchers as a basic guideline to understand how mission and vision are established and communicated.

## **5.2 Key success factors (KSF)**

A considerable number of the reviewed articles noted that managers should ensure that only truly crucial factors are identified and included in the list of KSFs (Montgomery 2002; De Leon et al., 2012; Quick, 2012; Hope & Player, 2012; Lorain, 2010; Clarke, 2007; Bunce, 2007, Ekholm et al., 2000; Player, 2009). Hope et al. (2011) support the same notion and state that to enable leaders to take decisions that are supported by a company's stakeholders, companies have to set a "few" clear core values and communicate them to its people. The authors contend that too many forecasting details do not lead to more accuracy, and pose challenges to decision-making, while aggregate forecasts are much more accurate than individual forecasts and lead to greater customer values. Furthermore, Hope and Player (2012) and Quick (2012) argue that, since not so many numbers change across different periods in most businesses, it makes more sense to only focus on few key drivers that are relevant to analysis and decision making when preparing rolling forecasts. By so doing, managers can direct their attention toward the most important performance variables and lessen the workload burden of their subordinates. They will be able to see the "big picture" and be better equipped to identify the opportunities/threats that might unexpectedly occur (Hope & Player, 2012; Montgomery, 2002; Quick, 2012). However, the few key drivers should be detailed at different levels, such as, the value-center level and the operating-process level (Hope, 2011). Consistent with Hope's proposition, other authors also state that organizations should move toward driver-based forecasting to maximize the benefits from rolling forecasts (De Leon et al. 2012; <http://www.cognizant.com/>, 2011-05; Quick, 2012; Clarke, 2007; Bunce, 2007; Player, 2009). Consequently, aggregate level of detail might minimize the

monthly/quarterly deviations and thereby reduce the time, effort, and complexity of the business (Hope & Player, 2012; Montgomery, 2002).

However, in their case study of continuous budgeting process, Frow et al. (2010) state that it is important to ensure that the few key success factors are well communicated throughout the company so that managers understand and translate them into specific actions and initiatives. In this way, an agreement can be reached between each manager with superior managers about the personal performance control plan with specified individual goals and accountability.

Although a number of the reviewed articles (11 of 23) agreed on the same criteria for an organization's KSFs, very few of them explained how those KSFs could be communicated. In our opinion, which is in line with Frow et al.'s (2010) study, communicating KSFs to both managers and employees is as important as identifying them. By making employees well informed about an organization's KSFs, the management increases the likelihood of consistent organization-wide alignment and decision-making. Moreover, Hope et al. (2011) proposed in their book that the KSFs should differ from one team to another. For instance, a value center team may want to know how well they satisfy their customers, while a supportive service team might be more concerned about how well they satisfy their business partners (Hope et al., 2011). Although, different KSFs for different organization centers seem to be an interesting idea, none of the reviewed articles have commented on it and on how to avoid any possible conflicts between the different KSFs. Therefore, we believe that some crucial questions related to KSFs still need to be addressed by researchers studying rolling forecasts.

### **5.3 Organization structure**

Organization structures can shape an organization's future by affecting the work efficiency, individual motivation, information flows, and control systems (Ferreira and Otley, 2009) . However, despite the crucial role of organizational structure, very few studies on rolling forecasts have covered this issue. Myers (2001) advocates that rolling forecast should focus on the future and encourage managers to take the changing economic conditions into account when making decisions. The author believes that the transition to rolling budgets from an annual budget does not entail any major changes except for the fact that budgeting ceases to be one-time activity. However, involving everyone in the process is a fundamental change that can lead to a more effective and efficient budgeting process. In line with Myers, other authors contend that a rolling

forecast is mainly a reality check. In other words, active participation from the budget owners is essential to derive a holistic view of the current and future positions of the organization (<http://www.cognizant.com/>, 2011; Hope, 2011; Gurton, 1999; Clarke, 2007). Furthermore, Frow et al. (2010) provide empirical evidence on how budgetary control can be reconciled with budget flexibility. In their case study, strict accountabilities are distributed among managers to guarantee their commitment to reach their own and organization's financial targets. Meanwhile, managers are empowered to revise budget targets to accommodate unexpected contingencies. Similarly, Hope et al. (2011) state that rolling forecasts are better implemented from the bottom-up, and the ownership of the forecasts should be transferred from the corporate center to the front-line team, but negotiations should be conducted with senior managers who should have the right to make decisions and contribute to a mutual agreement. Frow et al. (2010) support this proposition and state that a little bit of control around the empowerment is essential to prevent free actions from deviating from the right track.

Many of the reviewed articles stress the essential role of involving all managers within an organization in the rolling forecast process and empowering them. But does that mean the authors are calling for a more decentralized organization when adopting the rolling forecast? Which organization structure is appropriate for the new management control system? What will be the consequences if a company's organizational structure does not suit the use of rolling forecast? Unfortunately, these issues have not been addressed in the literature on rolling forecasts.

## **5.4 Strategies and plans**

Since one of the most important and common reasons for shifting to the rolling forecast system is the need to equip managers to make appropriate decisions under rapidly changing business conditions, it is important that rolling forecasts serve as a dynamic strategic planning tool (Lorian 2010). They should guide and adjust organizational actions toward strategic objectives (ibid). Gurton (1999) supported this notion and declared that rolling forecasts should enable managers to make the necessary changes to their budgets to overcome the gap between the planning scenario and business reality. Montgomery (2002) and De Leon et al. (2012) added that organizations should "ensure that their forecasting process is truly strategic in nature and not simply an extended budget." p.44 (Montgomery, 2002). According to the authors, an efficient rolling forecast requires a clear strategic financial planning mindset (ibid). It should also provide

decision makers with the “big picture” view of the business and encourage them to focus on the comprehensive strategic plans rather than on the short-term goals. In this way, a rolling forecast functions as a strategic tool and ensures that the operating units are aligned with the organizational strategy. This promotes flexible resource allocation as well as strategic and fiscal interdependencies. (ibid)

Bunce (2007) and Hope et al. (2011) argued that effective rolling forecasts can serve as tools to measure the effect of strategic action. Furthermore, to achieve organizational goals, a flexible and adaptive approach rather than detailed planning is a better choice to respond quickly to today’s highly competitive and uncertain business environment (Hope, 2011, 2003; Montgomery, 2002). Hope et al. (2011) and De Leon et al. (2012) argued that scenario planning rather than long-term planning should be focused upon to respond rapidly to highly uncertain environments. Scenario planning assumes that several different scenarios can be developed on the basis of possibly unpredictable events. Then managers can analyze the various future situations with corresponding scenarios and the possible implications of different outcomes (Hope et al., 2011). Other authors support this view and claim that revisiting strategy and aligning resources quickly and efficiently are the key objectives of a rolling forecast. “What-if” analyses and scenario planning should be adopted to adapt to the potential risks and opportunities identified in a dynamic environment. Moreover, how resources will be allocated should be decided and the new key performance indicators should be set as, in line with the strategies from the scenario planning. (<http://www.cognizant.com/>, 2011) De Leon et al. (2012) also state that scenario planning is very useful when the environment is highly uncertain and projections significantly affect strategic objectives. It enables managers to evaluate various alternatives and choose the best one when preparing the forecasts.

To conclude, since rolling forecasts call for empowering managers, especially those at the front-line, it is important to ensure that managers are well informed about an organization’s strategy and plans. Strategies and plans should serve as both a guide and a barrier for managers’ various actions. Despite the significant role of strategies and plans, only seven of the reviewed articles addressed this aspect. Moreover, none of them discuss how strategies and plans are adapted, generated, and communicated to the front-line managers. While such a discussion may be beyond the scope of the reviewed work, we still believe that there is a need for more studies in the area. It would be interesting to learn of changes, if any, that have been made to organizational strategies

and plans when adopting rolling forecasts, and how these strategies and plans are communicated to front-line managers, and how those managers participate in the process.

## **5.5 Key performance measures and key performance evaluation**

Although there are some differences between performance measurement and evaluation, a considerable number of the reviewed article did not distinguish them. Therefore, we decided to combine key performance measures and key performance evolution. In contrast to the other MCSs, not all the reviewed articles expressed a common view on the relation between rolling forecasts and performance measurement and evolution. While Haka and Ranjani (2005) claim that frequently updated budget targets have a negative impact on performance evaluation, Sivabalan et al. (2009) argued that the impact is mixed. Apart from the fact that frequently changing budget targets impede target-setting for performance evaluation under rolling forecasts, Sivabalan et al. (2009) state that using periodically updating budget targets to evaluate individuals frequently leads to higher administrative workload and an inefficient performance evaluation process. However, the use of rolling forecasts can also have positive impact on performance evaluation: monthly or quarterly updates can provide more relevant accounting numbers and reduce the “free ride” period, which can occur when targets are met before the end of a period. Lorian (2010) supported the same notion and endorsed the view that rolling forecasts provide a better vision of the future and allow companies to frequently update their key performance indicators. They help managers to measure performance by comparing the actual performance of, for instance, one month against the projected numbers thirty days earlier. Consequently, the reduced time between the actual and planned performance leads to less variation and thereby less time spent on explaining such deviations (Quick, 2012). In this way, rolling forecasts help managers focus on the future instead of losing time in analyzing the past (Hope and Fraser, 2003a, Stretch, 2012a). However, to benefit from rolling forecasts, organizations should break free from the trap of performance contracts. To this end, many authors suggest that managers should shift from absolute to relative performance measures (Stretch, 2012a, Hope and Fraser, 2003a) or “relative improvement contracts.”. Under this kind of measurement, many factors such as peer performance and the prevalent circumstances are factored into performance measurement (ibid).



Furthermore, many scholars supported the notion that performance evaluation and rewards should be based on agreed benchmarks (Hope and Fraser, 2003; Bittlestone, 2000; Bunce, 2007; Ekholm, 2000). Such an approach enables organizations to constantly manage performance gaps arising from comparison with the benchmarks. However, Frow (2010) argued, “it may be difficult to get accurate information about competitors for this form of performance evaluation to work effectively. Moreover, it is unclear which performance criteria are to prevail if the different benchmarks offer different standards” p.459.

As discussed above, different authors hold different views on the relationship between rolling forecasts and performance measurement and evaluation. However, we believe that performance measurement and evaluation are two MCSs that cannot be handled separately from rolling forecasts. Even though rolling forecasts should not be used to measure and evaluate performance, as some authors advise, we believe that the measurement and evaluation system should be suited to the rolling forecast.

## **5.6 Target setting**

Many authors claimed that rolling forecasts should be separated from targets to make the forecasts more reliable and the action plans more relevant (Quick, 2012; Hope & Player 2012; Clarke, 2007; Christopher, 2012; Hope et al. , 2011; Lorain, 2010, Bunce, 2007) They argued that if forecasts and targets are independent, implementers would be more willing to take risks and correct relevant actions, without being overly concerned about meeting the targets. Consequently, a forecasting culture could be fostered to promote the acceptance of an honest view of the future and the urge to discover how changes should be introduced done to achieve the desired results (Bunce, 2007a, Quick, 2012). Moreover, since target setting has a significant impact on managers’ actions, separating rolling forecasts from targets may, as Christopher (2012) points out, drive people working with rolling forecasts to optimize the process rather than hit the fixed targets. The author also contends that rolling forecasts encourage managers to think proactively and consider contingencies when making a business plan. They promote a flexible and adaptive style of management with constant adjustments to respond to the unforeseen environment.

With regard to target-setting, many authors suggest that organizations should adopt ranges and scenarios rather than single-point forecasts, because single-point forecasts may lead to short-term gap-filling decisions and undermine an organization’ s longer-term strategy (Hope and Player,

2012; Bittlestone, Robert. 2000; Hope et al., 2011; Frow et al., 2010). They argue that ranges and scenarios predict a range of outcomes from which the best option can be chosen. This can lead to the optimal performance by the team. They also argue that the volatile market requires targets to be updated more often.

However, Haka and Ranjani (2005) points out that rolling forecasts can negatively impact performance: the multiple short-term goals that result from continuous updating and forecasting can reduce the goal specificity of a long-term goal and lead to lower goal commitment. In this way, managers may reduce their efforts or produce ineffective strategies to reach the goal.

To overcome the problem Haka and Ranjani (2005) advise managers to focus on the organizations' strategic goals, in line with Frow et al. (2010). In our opinion organizations' visions and missions, KSFs and reward systems play a very vital role in preventing managers from overly focusing on short-term goals as these MCSs guide managers' actions to be consistent with an organization's higher objectives. Moreover, although separating rolling forecasts from target setting has its advantages, as some of the reviewed articles have illustrated, we believe that target setting, as a MCS, should not be separated from rolling forecasts as the efficacy of target setting may depend on the reliability of rolling forecasts. Therefore, it is important to study the relation between rolling forecast and target setting and how the short- and the long-term targets are connected to each other.

## **5.7 Reward systems**

Organizations use reward systems to motivate employees to behave in the way the organization desires and align their own goals with the goals of the organization (Ferreira and Otley, 2009). Hope et al. (2011) argue that exaggerated incentives stimulate greed, and companies should guarantee that their financial incentives are appropriately designed. Nine out of 23 articles we reviewed discussed what performance rewards should look like when starting rolling forecasts.

Since managers are empowered and involved in the rolling forecast process, the uncertainty from the frequent updates may affect their behaviors. In this scenario, linking rewards with rolling forecasts can result in many problems. Therefore, rolling forecasts should be kept free from fixed incentives. In other words, a different model is needed to determine salary when an organization moves to using rolling forecasts. (Gurton, 1999; Ekholm and Wallin, 2000; Clarke, 2007; Clarke and West, 2007). Bittlestone (2000) recommends agreed benchmarks as the basis for performance

rewards. That is, performance goals should be set on the basis of competitors' results from the last period or the companies' own performance in the earlier periods. Managers should be rewarded for improving past performance goals and the competitors' achievement. Hope and Fraser (2003) support this proposition and contend business units should be evaluated and rewarded against a range of relative KPIs at the end of the period compared with peers, competitors or prior periods in the prevailing conditions (Bunce, 2007; Frow et al., 2010).

## **5.8 Information flows, systems, and networks**

Myers (2001) states that a company must embrace technology that allows managers to access, diffuse and process the information needed for decision making and forecasting more quickly, in order to cope with the limited time between budget results from implementing rolling forecasts (Montgomery, 2002). Everyone from senior managers to line managers should be involved in and committed to the budgeting process, which is crucial for successful implementation (Lorain, 2010). However, Lorain (2010) argues that the consolidation of information from several sources requires a highly integrated IT system that standardizes and automates the process, thereby reducing the risk and complexity and freeing up time for value-added activities.

Furthermore, Hope et al. (2011) emphasize that an integrated system, which can connect different parts of the organization and provide a snapshot of both current and future scenarios, plays an important role in the rolling forecast preparation process (Bittlestone, 2000; Bunce, 2007). It enhances the credibility of information used for forecasting and enables managers to project performance changes more effectively (Hope & Fraser, 2003). Besides, the automation of the budgeting process relieves back office employees from heavy workload (Bittlestone, 2000) and allows them to see a dynamic performance picture in the strategy process (Bittlestone, 2000, Hope & Fraser, 2003; Lynn and Madison, 2004). Visualizing these results allows managers to easily assimilate business information, spend more time analyzing the data, respond quickly and effectively to changes (Gurton, 1999; Bittlestone, 2000, Myers, 2001; Lorain, 2010; Player, 2009). Montgomery (2002) supports this proposition and claims that a well-integrated information system has to be in place to guarantee that budget managers can obtain dynamic information effectively to align the line-item budgets with forecast targets. In addition, such a system also improves the accuracy of the rolling forecasts (Bunce, 2007).

De Leon et al. (2012) state that a successful rolling forecast implementation requires key business drivers to be emphasized. A well-implemented technology system should be in place to facilitate the driver-based forecast modeling and adjustments in key performance drivers. It should also provide timely integrated information for analysis and decision-making (<http://www.cognizant.com/>). Similarly, Quick (2012) recommends that rolling forecasts should be event-driven and a few key business drivers should be focused on to identify and capture the emergent risks and opportunities, which require an upgraded technology.

Bunce (2007) argues that the information system should be appropriate, and Sivabalan (2011) specifies that the complexity of the systems should match the information needs and decision making of the organization. Although a well-integrated information system is highly recommended when implementing rolling forecasts, Lynn and Madison (2004) caution managers from confusing the process of budgeting with “a piece of software” or “a mindless algorithm.”. Although, there is no technique that can predict the future, having a well-planned and functioning information system can help organizations to “get much closer to the ideal” (Myers, 2001).

While most articles on rolling forecasts are in agreement on the advantages of adopting an information system, only one article (De Leon et al., 2012) specifically discusses how business intelligence-supported rolling forecasts can improve the budgeting process and add value to an organization. None of the reviewed articles detail how information systems can integrate different control systems. Since situations differ from company to company, it is impossible to have a standard system for running rolling forecasts. Naturally, information systems should be appropriate to and matched with the needs of organizations (Bunce, 2007; Sivabalan, 2011). More empirical research is needed to show how information systems connect different control systems of an organization and support the successful implementation of rolling forecasts.

## **5.9 PMS Use**

According to Ferreira and Otley (2009), research on PMS use is very limited even though it is rather important than the design of the control system. However, the authors (ibid) briefly introduced in their article some of different PMS use models. One of the models introduced is the transactional and relational use of PMS by Broadbent and Laughlin. Ferreira and Otley (2009) explain that "relational and transactional usage typifies the overall ‘use’ made of a range of control mechanisms across a whole organization, or by one organization in its dealings with

others" p.275. Therefore, we decide to focus on the relational and transactional use of PMS.

After analyzing the interrelation between rolling forecasts and the above nine MCSs, it is reasonable to say that the use of each of the studied MCSs has a considerable impact on the efficiency of rolling forecasts. We can also conclude that all the reviewed articles supported the relational use of the MCSs rather than the transactional use, by inducing companies to imply less specification about the goals and targets and how managers achieve them should be relied on the interpersonal attachment, mutual trust, altruism and cooperation between teams within a company. Moreover, as we could see from the analysis above, the reviewed articles gave companies some guidelines to increase the chance of success of rolling forecasts:

- *Vision and mission should be consistent with the core value of the organization.*
- *KSFs should be summarized and clear.*
- *Managers should be trusted and empowered and engaged in the implementation process.*
- *Strategies and plans should be clear and built on scenario planning rather than long-term planning.*
- *Performance measurement should be shifted from absolute to relative performance relative improvement contracts. Performance evaluation and rewards are bettered functioned if they are based on agreed benchmarks.*
- *Targets should adopt ranges and scenarios instead of fixed targets, and it should also be separated from the rolling forecasts.*
- *Managers should be evaluated and rewarded against a range of relative KPIs at the end of the period compared with peers, competitors or prior periods in the prevailing conditions.*
- *Everyone from senior managers to line-managers should have access to the information needed for decision-making and forecasting more quickly, in order to cope with the dynamic business environment they operate in.*

## **5.10 PMS Change**

The framework of Ferreira and Otley (2009) states that the change dynamics in the business environment and organizations should be taken into account when designing a MCS. By analyzing the reviewed articles, we can conclude that rolling forecast is seen as a better way to help organizations to adapt to the dynamic business environment. Under uncertain market conditions, the annual budget becomes cumbersome and disconnected from the business operations and strategic planning goals as it fails to allow organizations to respond rapidly to dynamic business environments (De Leon et al., 2012). In addition, Plyer, cited by Hann, Christopher, 2012, states that the outdated process and fixed number achievement of the traditional annual budget constrain the development of a company, while rolling forecasts can provide up-to-date information by looking several months forward and establishing corresponding goals. In this way, people working with rolling forecasts try to optimize the process rather than hit the fixed targets. Plyer also contends that rolling forecasts compel people to think proactively and consider contingencies when making a decision. By so doing, companies would become more flexible and adaptive in their responses to unpredictable changes. In line with Plyer, Gurton (1999) argues that unlike the 12-month commitment of an annual budget, which can make a company uncompetitive in today's world, rolling forecasts enable managers to review the business strategies and plans and make changes, as needed, to their budgets to cope with the gap between the forecast and the business reality, which results from rapidly changing market conditions. Therefore, all the reviewed articles recommend organizations to use rolling forecasts as it is a more flexible tool to identify new risks and opportunities and to respond to the unpredictable economic environment more effectively and efficiently.

## **5.11 Strength and Coherence**

It has been believed that in order to adapt to the changes of business environment and to the implementation of new control system (rolling forecast) some changes on some of the organization's MCSs need to be done. The aim of doing such changes is to keep an organization's various MCSs aligned and well-coordinated with each other and thereby increase the chance of success. Although all the authors of the reviewed articles call for change in order to keep MCSs consistent and coherent with each other, very few of them give a comprehensive description of how to keep rolling forecasts consistent with the above studied MCSs. Therefore, a

broad study of the interrelation between rolling forecasts and an organization's different MCSs is necessary.

## **6. Conclusions**

By reviewing the existing set of literature, we find that rolling forecasts interrelate significantly with other control systems, and that relevant control systems should be coherent with each other to serve the organizational objectives. Specifically, as an MCS, rolling forecast does not operate in isolation, and should be integrated with other control processes. In addition, because rolling forecasts call for empowering managers, especially those at the front line, and require fewer details than the annual budget, it is important to ensure that managers are well-informed about an organization's vision and mission, key success factors, and strategy and plans, as those control systems are meant to function as both a guide and a barrier for managers' various actions. In addition, the rolling forecasts also require regular updating, which may have a negative impact on managers' behavior, therefore it is rather important to ensure that managers are well-informed about how targets are settled, and how managers' performance is measured, evaluated, and rewarded. This knowledge will eliminate the risk for dysfunctional behaviors that result from personal contracts and incentives, and will increase the chance of making the right trade-offs and responding more flexibly and appropriately to today's unpredictable business environment and intensive competition. Relevant organizational structure and a well-designed information system are also required to guarantee the effectiveness of MCS. By so doing, the likelihood of consistent organization-wide alignment and decision-making will be increased.

Because rolling forecasts is an emerging topic, the associated literature is limited. Our search could only identify 23 relevant articles, 18 of which were written by practitioners. Academics are more open to observing the bigger picture surrounding a phenomenon, while practitioners are more likely to focus on their specialty area; however, the five academic articles included in this study were closer to practitioners' views than to those of academics, except the article written by Frow et al. (2010), which was more extensive and detailed. While De Leon et al. (2012) focused on the significant impact of information technology on the effectiveness of rolling forecasts, Sivabalan et al. (2009) and Haka & Krisnan (2005) examined the impact of rolling forecasts on performance measures and evaluation. Ekholm et al. (2000) focused on KSFs and benchmarking.

Although a considerable number of the reviewed articles focused on one or few perspectives only, none of these articles gave a thorough description of the relationship between rolling forecasts and the MCSs they studied.

However, the reviewed articles do reveal the relationship between rolling forecasts and the various MCSs, which gives a basic knowledge on how rolling forecasts interact with the different MCSs in an organization. Yet, we believe that a deeper investigation on the interrelation between rolling forecasts and the various MCSs is required, especially to include those MCSs that were overruled or given only fragmentary attention by the existing literature (e.g. organizational culture and structure, key performance measure and evaluation).

However, by studying the available literature on rolling forecasts on the basis of Ferreira and Otley's (2009) PMS framework, this study contributes to the field of management accounting in three ways. This study provides a theoretical support for readers to understand the role of rolling forecasts in a more holistic manner. It also provides practitioners with an overview of the interrelation between rolling forecasts and the various MCSs within an organization, and reminds them to have an MCS package thinking when designing and using rolling forecasts. Moreover, this study provides a foundation for future empirical and theoretical developments.

This study has two major limitations. The first limitation is language-based: the literature search was conducted in English, which may have limited our access to some interesting publications written in another language. The second limitation is that this study is built on the PMS framework and aims to examine the relationship between rolling forecasts and the involved control systems. Consequently, some other control systems, e.g., organizational culture, were excluded to avoid extending the scope of this study, although the people aspect is one of the most significant factors that may have a major impact on the efficiency of rolling forecasts.

Therefore, it is reasonable to say that more studies on rolling forecasts are required to enrich our knowledge and to help organizations improve their chance of success in the design and use of rolling forecasts. The need exists for some practical studies on how rolling forecasts work in practice and how they interact with an organization's various control systems. There is also a need for more broad studies, as well as focused studies, on the control systems, especially those that are underdeveloped (organizational culture and structure, key performance measures, and evaluation). Change management is also a very interesting field for future studies on rolling



forecasts, i.e., what changes have been made in an organization to align with rolling forecasts in their adaptation.

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