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COSTING SYSTEM DESIGN AND MANAGERIAL BEHAVIOR: UNDERLYING MECHANISMS

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Executive summary

A rapidly changing business environment requires organizations to manage costs effectively. Ineffective cost management can lead to the decrease of organizational profit and may cause organizations to be withdrawn from industries. Effective cost management requires a costing system that provides accurate cost information for managers to control current operations and to plan for the future.

Previous studies have shown that there is a link between costing system design and behavior. The effect of costing systems design and use on behavior may depend on the purpose of its use. A costing system carries the characteristics of information systems, and as such plays different roles depending on the purposes of its use in an organization. Such system may provide relevant accounting information for problem-solving, attention-directing and scorekeeping. The aim of this dissertation is to address this effect.

The first study examines the impact of managers' participation in costing system design on process improvements. Particularly, drawing on the participation literature, this study hypothesizes that the link between managers' participation in costing system design and their contribution to process improvements is driven by two factors, namely autonomous motivation for cost management and perceived usefulness of cost information. The survey results reveal that participation in costing system design enhances managers' perceived usefulness of cost information, which in turn stimulates their contribution to process improvements.

The second study deals with national culture influencing the link between a form of costing system formalization and managers' willingness to use this system. According to the formalization literature, a coercively formalized costing system reduces managers' willingness to use the system. However, this literature does not take into account the impact of national culture. This study addresses this issue by conducting a case study in a Vietnamese company. The results show that two cultural dimensions, namely collectivism and power distance, positively influence managers' willingness to use a coercively formalized costing system.

The third study focuses the impact of a costing system on agency problems. More specifically, this study seeks to investigate how four functionality characteristics of a

costing system, namely the level of cost information detail provided, the ability to classify costs according to their behavior, the frequency of cost reporting, and the extent to which variance are analyzed, influence superiors' ability to detect budgetary slack and managers' creation of budgetary slack. The results of the survey suggest that only the first and the last characteristics increase superiors' ability to detect budgetary slack, and this, in turn lowers managers' creation of budgetary slack.

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1. Introduction

Nowadays a rapidly changing business environment requires organizations to manage costs effectively. Ineffective cost management can lead to the decrease of organizational profit and may cause organizations to be withdrawn from industries. Effective cost management requires a costing system that provides accurate cost information for managers to control current operations and to plan for the future.

Most research in cost management has focused on technical aspects of a costing system. More specifically, these studies seek for optimal overhead cost allocation methods. A concern is that a shift in manufacturing priorities away from the production of a standardized product at low cost to strategic priorities focusing on responding to customers' demands for greater product diversity challenges the validity of traditional costing systems (Abernethy, Lillis, Brownell, & Carter, 2001). Traditional costing systems allocate overhead costs to products based on volumes, such as the number of units produced, the direct labor hours, or the machine hours. By using systems that allocate overhead costs based on volumes, an increase of product diversity introduces the risk of significant distortion in cost allocation when the overhead costs no longer rise in proportion to production volume (e.g., Banker and Johnston, 1993; Banker et al., 1995; Datar et al., 1993).

Recently, also behavioral aspects associated with costing systems have received much attention from researchers because behavioral aspects can hinder costing system success and as such may stifle effective cost management. For example, non-accounting users' resistance to use new cost allocation methods may hamper successful implementation of this system (see Malmi, 1997). A participatory approach in the implementation overcomes this limitation and results in system success (Shields, 1995). This approach also allows users to efficiently use organizational resources, which may result in operational improvements (Eldenburg, Soderstrom, Willis, & Wu, 2010). Furthermore, a participatory approach fosters these improvements if a discussion among participants is led by a superior with a considerate, people-oriented leadership style (see

Hoozée & Bruggeman, 2010). As a result, behavioral aspects are as critical to effective cost management as technical aspects.

However, the effect of costing system design and use on behavior may depend on the purpose of its use. A costing system carries the characteristics of information systems, and as such plays different roles depending on the purposes of its use in an organization. Such system may provide relevant accounting information for problem-solving, attention-directing and scorekeeping (Figure 1) (see Emmanuel, Otley, & Merchant, 1990).

INSERT FIGURE 1 ABOUT HERE

First, a costing system can be used for problem-solving purposes. For example, a costing system can assist managers to determine the cost of products/services relative to their revenues generated. Furthermore, managers may use cost information to detect high cost products/services and reduce or eliminate the waste products/services. In this way, a costing system may generally serve as a tool for understanding product and customer cost and profitability based on the performed activities or processes (Cooper & Kaplan, 1991). Hence, it plays a decision-support system, which assist managers to make decisions relating to pricing, outsourcing, identification and measurement of improvement initiatives (see Swenson, 1995).

Second, a costing system can serve for attention-directed purposes. For example, lower management levels can use cost information provided by a costing system to communicate with higher management levels. This communication becomes a channel for reporting exceptions caused by inefficiency and ineffectiveness at the lower management levels. Acknowledging these exceptions, higher management levels pay more attention to and focus on these exceptions. Hence, a costing system can be purposely used to direct higher management levels' attention. In this example, the costing system may carry the characteristics of a control system (see Bisbe & Otley, 2004).

Third, a costing system is purposely used for score keeping. This system can be used to keep track of managers' past cost performance. Superiors can used these data gain insight into performance managers' capacity, and in turn reduces managers' creation

of budgetary slack (Chow, Cooper, & Haddad, 1991). In this situation, a costing system can plays the roles of a performance measuring system.

The aim of this dissertation is to address these three purposes of costing system use by conducting three studies. Instead of focusing on purposes of costing system use alone, these studies examine how each role of a costing system may influence individuals' behavior. Particularly, the first study focuses on a costing system used for problem-solving purposes and shows how managers participating in this costing system design can enhance their problem-solving skills, and as such it improves the quality of their decision-making. The second study demonstrates the use of a costing system as a control system, and explains how why culture has a positive impact on lower managers' willingness to use a coercive formalized costing system. Because of these dimensions, the lower managers are more willing to use the system to direct accountants' attention to focus on their variances resulted from exceptions. Finally, the third paper displays that a costing system is used as a performance measurement system to keep track of managers' cost performance, and each of four functionality characteristics of this system can allow superiors to detect managers' creation of budgetary slack.

2. Dissertation structure

As previously noted, this dissertation views that a costing system can be used for three purposes. As such, the costing system consists of three components, which serve for three following purposes: decision-support, attention-directing, and scorekeeping purposes. Three following studies address these three purposes.

Study 1 – The impact of participation in costing system design on process improvements

Costing systems, such as activity-based costing (ABC) systems, are used to increase organizations' financial performance by improving organizational business processes (e.g., Banker, Bardhan, & Chen, 2008). Despite this potential of ABC systems, many organizations that had adopted and implemented ABC decided to abandon their ABC projects because of employee resistance (e.g., Argyris & Kaplan, 1994; Shields & Young, 1989). To mitigate motivational issues encountered in the design of information systems, Ives & Olson (1984) suggest a participative strategy. In addition, user participation may also have cognitive effects in that it may act as a conduit of information exchange and

knowledge transfer and, as such, enhance decision-making (Locke, Alavi, & Wagner III, 1997).

The purpose of this survey study is to investigate the motivational and cognitive effects of participation in the context of costing system design. Drawing from the literature on business process management, participative decision making and self-determination theory, it is proposed that participation in costing system design fosters managers' contribution to process improvements through managers' autonomous motivation for cost management and their perceived usefulness of cost information.

Study 2 – A study of manager's willingness to use coercively formalized costing systems: the moderating effects of national culture

A certain form of costing system formalization has an impact on individuals. On the one hand, enabling formalization has been found to make employees feel supported and motivated by the rules and systems in place (Wouters & Wilderom, 2008). As a consequence, it is promising for improving performance (Proença, 2010). On the other hand, coercive formalization has a negative impact on employees' feelings, which in turn undermines employees' performance (Adler & Borys, 1996).

Culture may influence this impact. According to Adler and Borys (1996), employees show positive feelings toward enabling formalization because this form of formalization provides work autonomy. However, the needs of autonomy vary among employees due to culture (Erez, 2010). As such, culture may affect employees' feeling toward to a form of costing system formalization.

To address this gap, the aim of the second study is to investigate how and why culture may influence managers' feeling towards to a coercively formalized costing system. In particular, this survey study examines the impact of two cultural dimensions, such as collectivism and power distance, on managers' willingness to use a coercively formalized costing system.

Study 3 – The impact of costing system functionality characteristics on manager's creation of budgetary slack

The third papers studies the impact of costing systems functionality on creation of budgetary slack. There are three possible reasons for which managers are less likely to create budgetary slack. First, superiors have information about managers' performance capacity, and as such it is difficult for managers to exert this behavior (Chow, Cooper, & Haddad, 1991). Second, there is a high ability to monitor managers' performance. For example, high monitoring ability (e.g. through budget reviews, variance follow-ups) is negatively associated with slack (Kren, Control system effects on budget slack, 1993). Besides, a policy like a variance investigation policy can also provide a high monitoring ability of superiors, and as such reduces managers' creation of budgetary slack (see Webb, 2002). Third, managers are less likely to create budgetary slack when there is a precise information system (Hannan, Rankin, & Towry, 2006). As a result, it is argued that an information system provides information about managers' performance capacity, and in turn leads to a high superiors' ability to detect budgetary slack.

A costing system carries the characteristics of an information system, namely scorekeeping. It may enhance superiors' ability to detect budgetary slack. According to the accounting literature, there are 4 functionality characteristics of a costing system, namely the level of cost information detail provided, the ability to classify costs according to their behavior, the frequency of cost reporting, and the extent to which variances are analyzed. Although these characteristics can be used to control managers' behavior (see Pizzini, 2006), there is no research on the link between these characteristics and managers' creation of budgetary slack. Hence, the third study fills this gap in the budgeting literature by investigating costing system functionality characteristics, namely the level of cost information detail provided, the ability to classify costs according to their behavior, the frequency of cost reporting, and the extent to which variances are analyzed on managers' creation of budgetary slack.

The remainder of this dissertation is structured as follows. Chapter 2 contains the first study that investigates the impact of managers' participation in costing system design on process improvements. Chapter 3 presents the second study that indicates the moderating effects of national culture on managers' willingness to use a coercively formalized costing system, and how the managers use the system to direct attention of people from higher management levels. Chapter 4 details the third study that shows the

impact of four functionality characteristics of a costing system on managers' creation of budgetary slack. Finally, chapter 5 elaborates on the main findings, limitations, avenues for future research and the practical implications of this dissertation.

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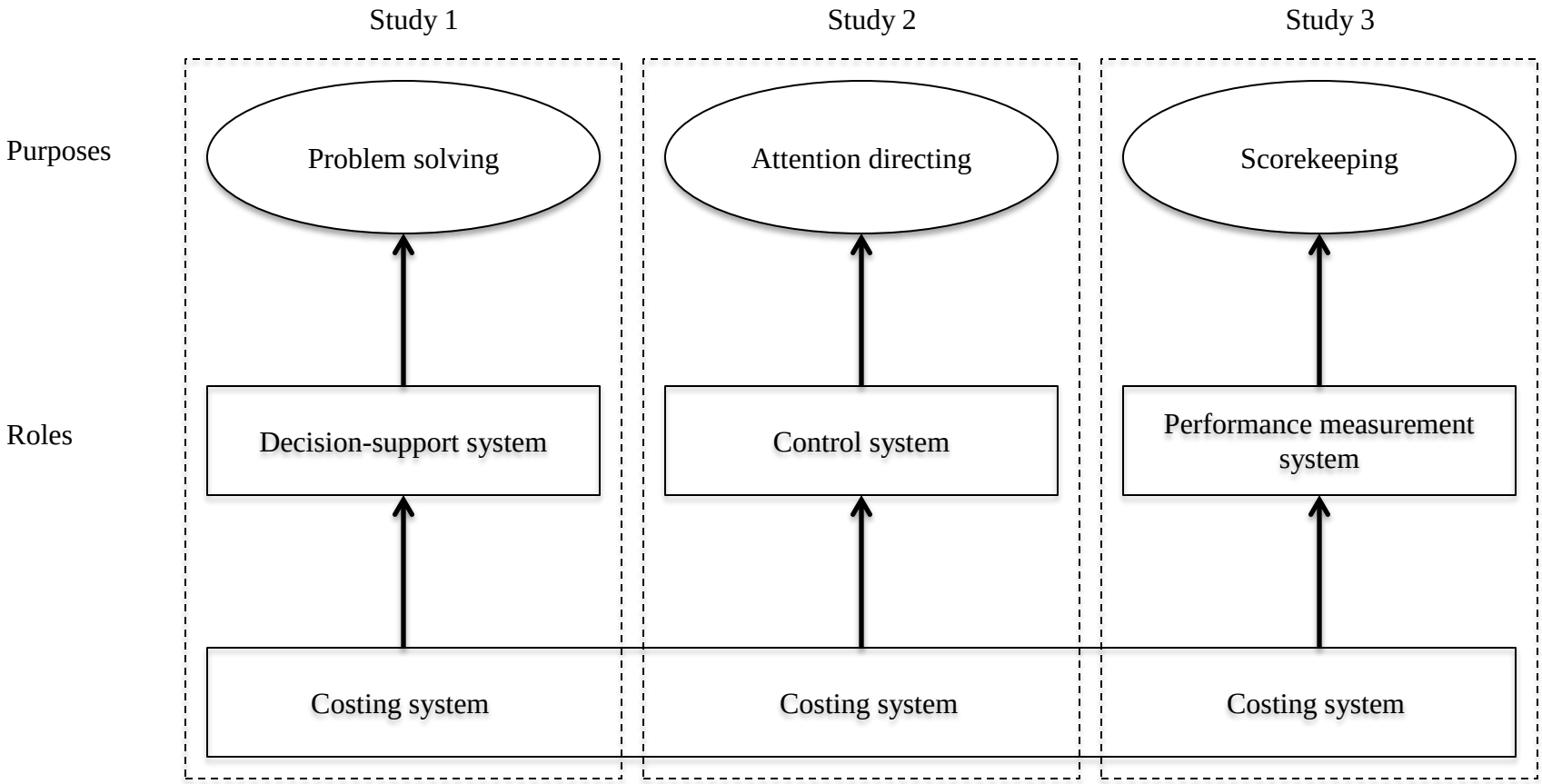
Figure 1. Costing system roles and its purposes of use



CHAPTER 2 - THE IMPACT OF PARTICIPATION IN COSTING SYSTEM DESIGN ON PROCESS IMPROVEMENTS

ABSTRACT: The aim of this paper is to investigate the impact of managers' participation in costing system design on process improvements. Drawing from the literature on business process management, participative decision making and self-determination theory, we propose that participation in costing system design fosters process improvements through managers' autonomous motivation for cost management and their perceived usefulness of cost information. Questionnaire data obtained from 173 Belgian managers were used to test the proposed model. The results suggest that participation in costing system design increases managers' autonomous motivation for cost management and enhances their perceived usefulness of cost information. The perceived usefulness of cost information, in turn, results in process improvements. The effect of managers' autonomous motivation for cost management on process improvements is, however, not significant. Taken together, our findings imply that process improvements mainly emerge through cognitive mechanisms rather than motivational mechanisms triggered by the participation process.

KEYWORDS: autonomous motivation; business process management (BPM); costing system design; cost management; perceived usefulness.

1. Introduction

Organizations often use costing systems such as activity-based costing (ABC) to increase their financial performance by improving their business processes (e.g., Banker, Bardhan, & Chen, 2008). Despite this potential of ABC systems, many organizations that had adopted and implemented ABC decided to abandon their ABC projects as a result of employee resistance (e.g., Argyris & Kaplan, 1994; Shields & Young, 1989). To mitigate motivational issues encountered in the design of information systems, Ives & Olson (1984) suggest a participative strategy. In addition, user participation may also have cognitive effects in that it may act as a conduit of information exchange and knowledge transfer and, as such, enhance decision making (Locke, Alavi, & Wagner III, 1997). The purpose of this study is to investigate the motivational and cognitive effects of participation in the context of costing system design. In particular, using survey data from 173 Belgian managers, we investigate the impact of managers' participation in the design process of a costing system on business process improvements. Our results demonstrate the pivotal role of managers' perceived usefulness of cost information as a result of their participation in the costing system design process.

Compared with prior studies, this study provides some unique contributions. First, with respect to the literature on cost accounting, this study complements prior work on the potential of ABC information to improve business processes (e.g., Hoozée & Bruggeman, 2010; Innes & Mitchell, 1990). In particular, we refine the results of these studies by unravelling the mechanisms that enable participation to result in process improvements.

Second, our study contributes to the literature on participation by highlighting the importance of cognitive mechanisms over motivational mechanisms in explaining why participation could lead to process improvements. This is in line with Locke et al. (1997), who argued that studies on participation, instead of focusing on motivational mechanisms, should be redirected to investigate cognitive mechanisms because the efficacy of participation as an organizational process lies not only in its potential to promote motivation or commitment, but also in its ability to facilitate information exchange and knowledge transfer. As such, participation in the design process of a costing system may enable managers to improve their business processes. In addition, by

showing that a participative system design strategy could actually be used to enhance motivation, we clarify equivocal results of previous research on the link between participation and motivation in the context of budgeting (cf. Mia, 1989). According to Brownell and McInnes (1986), the inconsistent results in budgeting studies investigating the participation-motivation relationship may be due to differences in the approaches used to measure motivation. We addressed their concern by using well-developed scales from research on self-determination theory to measure autonomous motivation. As such, we also contribute to the growing body of accounting evidence on the effects of autonomous motivation, for example regarding subordinates' work effort induced by subjective performance evaluation (Kunz, 2015) and managers' creation of budget slack (De Baerdemaeker & Bruggeman, The impact of participation in strategic planning on managers' creation of budgetary slack: The mediating role of autonomous motivation and affective organisational commitment, 2015).

Finally, by surveying managers from different hierarchical levels and demonstrating how their involvement in costing system design may foster process improvements, our results extend the literature on business process management. In particular, business process reengineering is typically considered as a top-down approach because it focuses on the role of top management and ignores the role of middle management (Bashein, Markus, & Riley, 1994). As a result, employees, and especially middle-level managers, are more likely to resist to change, which may cause business process reengineering to fail (Hall, Rosenthal, & Wade, 1993; Terziovski, Fitzpatrick, & O'Neill, 2003). Indeed, our results reflect the crucial role of participation in costing system design, in that it fosters managers' knowledge about their business processes and, as such, increases their perceived usefulness of cost information, which, in turn, stimulates process improvements.

The remainder of this paper is structured as follows. The next section presents the theoretical background and hypotheses development. Section 3 describes the data collection, methodology and variable measurement. Section 4 shows the results of this study. The last section concludes, discusses the limitations and offers suggestions for future research.

2. Literature Review and Hypotheses Development

Drawing from the literature on business process management, we first introduce the definition of a business process and the role of costing systems in process improvements. Second, using the literature on participative decision making and self-determination theory, we identify the characteristics of participation in costing system design and explain the motivational and cognitive mechanisms through which participation may foster process improvements.

2.1. The Use of Costing Systems for Process Improvements

Davenport and Short (1990, p. 4) defined the concept of business processes as 'a set of logically related tasks performed to achieve a defined business outcome'. Hammer and Champy (1993, p. 53) later emphasized the client-centred aspects of a business process: 'a collection of activities that takes one or more kinds of input and creates an output that is of value to the customer'. These general definitions are widely adopted in the literature on business process management (Reijers, 2003). In the context of the present study, we conceive of a business process as an umbrella term that combines various more operational work processes, such as order processing, product/service delivery, product/service development or administration.

Organizations may improve their business processes in the redesign stage (Davenport, 1993). In particular, in both manufacturing and service environments business processes may be redesigned by breaking them down in activities or work processes in order to reveal sources of inefficiency and ineffectiveness (Davenport, 1993). As such, business process redesign focuses on the rethinking and restructuring of work processes through which value is created and delivered in order to achieve process improvements (Hammer & Champy, 1993; Talwar, 1993).

To detect inefficient and ineffective parts of work processes, information systems are required (Attaran, 1997; Mudie & Schafer, 1985; Parets & Torres, 1996). In this respect, costing systems, as a particular example of information systems, serve four important purposes (cf. Pizzini, 2006). The first function, the ability to provide detailed cost information, refers to the costing system's ability to supply data about cost objects that vary in size, from entire divisions to individual products, components and services

(Chenhall & Morris, 1986; Kaplan & Norton, 1992; Karmarkar, Lederer, & Zimmerman, 1990). The second function is the ability to separate and classify costs according to their behaviour (e.g., fixed/variable costs, controlled/non-controlled costs) (Feltham & Xie, 1994; Johnson, 1992; Karmarkar et al., 1990). The third function, cost reporting frequency, enables users to expediently address problems and identify opportunities for improvement (Hilton, 1979; Karmarkar et al., 1990; Simons, 1987). The final function, variance analysis, highlights differences between budgeted and actual outcomes and seeks to explain such differences (Karmarkar et al., 1990; Khandwalla, 1972; Simons, 1987). Hence, costing systems are equipped to help users identify process improvements. For instance, a costing system such as ABC may reveal opportunities for process improvement by providing detailed insights into the consumption of resources by each activity in a firm (Cooper & Kaplan, 1988; Kaplan, 1992; Turney, 1996).

Although a costing system has the potential to result in process improvements, its implementation may fail when users do not understand how the costing system could provide information to enhance their operations (Beaujon & Singhal, 1990) or when they have too much information to make a decision (Schick, Gordon, & Haka, Information overload: A temporal approach, 1990). More generally, for business process redesign to be effective, fit between the human and the system is required (Corrigan, 1996). Misfit may occur when an information system does not meet users' requirements in terms of information provided (Ives & Olson, 1984). When system designers have a poor understanding of the organization, users may be demotivated to implement the system because the information does not reflect actual processes (Kutschker, 1994).

To foster users' acceptance of the information system and to make sure that it meets users' information requirements, Tarafdar, Tu, and Ragu-Nathan (2010) suggest a participative strategy. In a similar vein, the beneficial outcomes of user participation have been investigated in the context of costing systems (Bhimani & Pigott, 1993; Hoozée & Bruggeman, Identifying operational improvements during the design process of a time-driven ABC system: The role of collective worker participation and leadership style, 2010; McGowan & Klammer, 1997).

2.2. Participation in Costing System Design

Accounting research on participation assumes that the relationship between participation and its desired outcomes is driven by two mechanisms: motivational and cognitive mechanisms (Locke & Schweiger, 1979). First, from a motivational point of view, participation enables greater trust, greater job control, more ego involvement in the work, more group support and acceptance, and higher goal setting and goal acceptance (Locke, Schweiger, & Latham, 1986). Performance can then be improved through lower resistance to change and higher acceptance of difficult targets (Locke & Schweiger, 1979). Second, cognitive mechanisms include factors such as the acquisition and the use of information and the comprehension of job requirements (Locke et al., 1986). From a cognitive perspective, participation is viewed as a conduit for upward information exchange, which allows better communication and understanding of job requirements as well as decision-making processes. Hence, cognitive factors are important for the enhancement of information flows between participants (Locke & Schweiger, 1979).

In line with this reasoning, we propose that the relationship between managers' participation in costing system design and process improvements is driven by both motivational and cognitive effects (see Figure 1).

INSERT FIGURE 1 ABOUT HERE

2.2.1. Motivational Effects

Previous research has criticized the use of the term motivation in an accounting context (Covaleski, Evans III, Luft, & Shields, 2003; Wong-On-Wing, Lan, & Lui, 2010). Traditionally, motivation has been referred to as a concept varying in size rather than quality (Gagné & Deci, 2005). Motivation theorists, however, emphasize the importance of distinguishing between several types of motivation because each type of motivation can lead to different outcomes (Deci, 1971; Deci, 1975; Vansteenkiste, Ryan, & Deci, 2008).

To provide insight into different types of motivation, Deci and Ryan (1985) proposed self-determination theory (SDT). The first generation of SDT examined the distinction between intrinsic and extrinsic motivation (Vansteenkiste, Lens, & Deci, 2006). Whereas intrinsic motivation is driven by a person's self-interest, extrinsic motivation is controlled by external contingencies. In particular, when employees feel

demotivated, it may sometimes be required to add extrinsic factors (e.g. reward, punishment) to boost their motivation in order to enhance their performance (Gagné & Deci, 2005). Extrinsic motivation thus refers to people performing an activity as a result of a desired outcome more than out of self-interest (Ryan & Deci, 2000). SDT later proposed, however, that extrinsic motivation may vary in the degree to which it is controlled or autonomous based on the degree of internalization (Gagné & Deci, 2005; Ryan & Deci, 2000; Vansteenkiste et al., 2008). Internalization refers to people taking in values, attitudes or regulatory structures, which enables external regulation of behaviour to be transformed into internal regulation and, as such, renders the presence of an external contingency unnecessary (Gagné & Deci, 2005).

The first type of extrinsic motivation is external regulation, which is not internalized at all because the person's behaviours are initiated and maintained by external contingencies such as rewards or demands (Gagné & Deci, 2005). This is the classic type of extrinsic motivation and a prototype of controlled motivation. Introjected regulation, a second type of extrinsic motivation, implies that people perform activities in order to avoid guilt or anxiety, or attain ego enhancement such as pride (Ryan & Deci, 2000). This type of motivation is also a form of controlled motivation because external factors reside within the person in such a way that s/he feels controlled by internal contingencies that link feelings of self-esteem and social acceptance to the enactment of specific behaviours or attributes (Assor, Roth, & Deci, 2004). The next type of extrinsic motivation is referred to as identified regulation. This type of motivation results from identifying the importance of a behaviour, such that regulations of activity become accepted (Ryan & Deci, 2000; Vansteenkiste et al., 2006). An even higher degree of internalization is called integrated regulation, which enables people to fully internalize regulations and assimilate them to the self (Ryan & Deci, 2000) so that they form a coherent and unified sense of self-reflection and self-awareness (Vansteenkiste, Niemiec, & Soenens, 2010). Both identified and integrated regulation are considered as autonomous motivation because people experience a sense of self-determination (Roth, Assor, Kanat-Maymon, & Kaplan, 2007). The last and most autonomous form of motivation is termed intrinsic motivation. This type of motivation, as already mentioned, motivates people to be involved in an activity for its own sake. It is characterized by

feelings of enthusiasm, spontaneity, excitement, intense concentration and joy. In sum, the first two forms of motivation (i.e. external and introjected regulation) represent controlled motivation, whereas the last three forms (identified regulation, integrated regulation and intrinsic motivation) are merged to autonomous motivation (Gagné, Chemolli, Forest, & Koestner, 2008).

SDT assumes that three basic psychological needs drive the motivational mechanisms that energize people's behaviour (Deci & Ryan, 2000). The satisfaction of these needs is an essential nutriment for individuals' autonomous motivation (Vansteenkiste, Niemiec, & Soenens, 2010). The three needs are the needs for autonomy, relatedness and competence. The first one, the need for autonomy, represents individuals' inherent desire to feel volitional and to experience a sense of choice and psychological freedom when involving in an activity (deCharms, 1968). Hackman and Oldham (1976, p. 258) defined autonomy in terms of 'substantial freedom, independence and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out'. Second, the need for relatedness is an individual's inherent propensity to feel connected to others, to be a member of a group, to love and care and be loved and cared for (Baumeister & Leary, 1995). Satisfaction of this need enables an individual to experience a sense of communion and develop close and intimate relationships with others (Deci & Ryan, 2000). Third, the need for competence is defined as individuals' inherent desire to feel effective in interacting with their environment (White, 1959). It is prominent in the way in which it enables an individual to explore and manipulate the environment and to engage in challenging tasks to test and extend his skills.

Prior studies indicate that participation in decision-making processes may enable the satisfaction of the three basic psychological needs, which, in turn, fosters autonomous motivation. First, participation in decision-making processes provides employees with a wider range of choices, resulting in better feelings about the environment and greater job control (Chenhall, 2003; Deci, Connell, & Ryan, 1989). These feelings satisfy the need for autonomy because they foster senses of choice and psychological freedom. Second, participation in decision-making processes enables employees to receive positive feedbacks and performance evaluations, stimulating a friendlier atmosphere (Deci, Koestner, & Ryan, 1999). This atmosphere induces employees' sense of caring for and

being recognized by other colleagues, both of which trigger the sense of relatedness. Third, participation may enhance self-efficacy, which has been shown to be related to the feeling of competence (Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010). More specifically, Bandura (1986) conceptualized self-efficacy as task-specific self-confidence. It can be a powerful determinant of performance through such mechanisms as effort, persistence and high personal goals (Wood & Bandura, 1989).

In the context of budget participation, De Baerdemaeker and Bruggeman (2015) found that participation can engender autonomous budget motivation. In a similar vein, we posit that a high degree of participation in costing system design may enable a high degree of autonomous motivation for cost management. Through participation, managers are more likely to self-decide how to define the important components of the costing system (e.g., cost allocation bases, cost pools, frequency of reporting) used in their departments. Hence, the more managers are involved in the design of a costing system, the greater their perceived sense of autonomy. Participation in costing system design creates opportunities for cost-related discussions among managers from different functions in an organization. Positive evaluations and supports from colleagues in discussions about the factors influencing costs could trigger managers' sense of relatedness because they feed the sense of group belongingness. Furthermore, participation also equips managers with knowledge about cost-related issues, which provides them with opportunities to exercise cost management tasks and, as such, induces their feeling of competence. Hence, through participation in costing system design managers may internalize and assimilate the importance of cost management, which results in autonomous motivation for cost management (cf. Ryan & Deci, 2000). Accordingly, our first hypothesis proposes a positive association between managers' participation in costing system design and their autonomous motivation for cost management.

H1: Participation in costing system design is positively associated with autonomous motivation for cost management.

Although research on motivation suggests that individuals who are extrinsically motivated may be just as motivated to engage in activities as those who are intrinsically

motivated (Vallerand, 1997), various forms of motivation could lead to different performance outcomes (Gagné & Deci, 2005). More specifically, although economists argue that external factors such as incentives or tangible rewards can reinforce employees' effort and performance (Deci, 1971; Gibbons, 1995), psychologists have investigated the negative impact of such controlled motivation on employees' behaviour. In particular, research has shown that tangible rewards and other extrinsic factors such as evaluation and competition can be detrimental to outcomes such as creativity, cognitive flexibility and problem solving (Amabile, Goldfarb, & Brackfield, 1990; McGraw, 1978). Autonomous motivation, on the other hand, has been demonstrated to facilitate persistence, effective performance and psychological well-being, particularly if the task requires creativity, cognitive flexibility or deep processing of information (Deci & Ryan, 2008; Gagné & Deci, 2005). As a result, autonomous motivation may result in a high degree of knowledge-sharing attention among employees (Gagné, 2009). These distinctions reveal the benefits of autonomous motivation over controlled motivation.

In the context of the present study, we argue that a high degree of autonomous motivation for cost management can enable managers to enhance the performance of their business processes because it may increase their effort to search for sources of waste in business processes and reduce or eliminate them. More specifically, since participation in costing system design could autonomously motivate managers to focus their effort on cost management, they may internalize the importance of cost management. As a result, they are more likely to try to achieve the lowest cost and share knowledge about business processes with other managers (cf. Kock, 1998). A greater focus on cost management may stimulate managers to take actions in order to reduce or eliminate waste resulting from unnecessary activities, which, in turn, can enhance the efficiency and effectiveness of business processes (Chan, 1993; Harrington, 1991). In line with SDT, our second hypothesis predicts that when managers are more autonomously motivated for cost management, process improvements are more likely to occur.

H2: Autonomous motivation for cost management is positively associated with process improvements.

2.2.2. Cognitive Effects

Although participation may foster employees' motivation, there are also cognitive effects resulting from participation. Cognitive effects refer to the discovery and dissemination of task-relevant knowledge which a participative strategy can facilitate (Latham, Winters, & Locke, 1994). Because subordinates often hold more information about their jobs, they perform their tasks more effectively than their superiors. As a result, inclusion of subordinates in the decision-making process enables superiors to receive more of subordinates' private information in order to make better decisions than they could make alone (Peters & Waterman, 1982).

Including users in the design process helps to ensure the success of the new system in terms of information quality because users are considered as experts in their work due to a better understanding of their working environment (Beyer & Holtzblatt, 1995). In particular, users may provide more reliable estimates in the case of process variability (Kim & Lee, 1986; Tait & Vessey, 1988). For instance, because of variations in personal productivity, tasks performed by humans are rarely identical (AbouRizk & Halpin, 1992). Besides, even when there is a high degree of repetition, many processes are subject to errors, rework, unforeseen change and a multitude of other elements, which cause variations in tasks' duration, cost, frequency of occurrence or precedence relationship with other tasks (Back & Bell, 1995a, 1995b). User participation also enhances designers' understanding of users' requirements, which, in turn, enables them to design better system functionalities (Damodaran, 1996). Participation in the design of an information system thus allows users to customize the output information according to their working habits and, as such, fosters satisfaction as well as higher intensity of use (Allen, et al., 1993; Venkatesh, Morris, Davis, & Davis, 2003).

Hence, the cognitive effects resulting from participation in information system design refer to the process of including users' information and knowledge as well as their desired system features, which may help them to enhance their task performance (Ives & Olson, 1984). In addition, participation may also improve users' understanding of their work processes and, as such, increase the system's perceived usefulness or the belief that using a particular information system would enhance task performance (Davis, 1989). In particular, users could get insight into processes by breaking them down into activities and, as such, they may better comprehend the detailed relationship between processes and

activities in a process (Cooper & Kaplan, 1991; Davenport, 1993). Through the analysis of activities, users may identify performance problems by detecting sources of inefficiency and ineffectiveness at the activity level and, subsequently, develop strategies for improvement (Furey, 1993). Through participation, systems can also be designed at the appropriate level of detail (Choe, 1998; Tarafdar et al., 2010).

Similarly, in the context of costing systems, cost disaggregation may help managers to monitor the performance of each activity within a process and identify value-added versus non value-added activities (cf. Cooper & Kaplan, 1991; Feltham & Xie, 1994; Pizzini, 2006). As such, managers' participation in the costing system design process may increase managers' belief about the importance of information supplied by the costing system or the usefulness of this information for decision making (cf. Chenhall & Morris, 1986; Pizzini, 2006). Furthermore, as a result of common costs of joint processes, costing system design also requires input from managers from other functions (Harrison D. a., 1993). By including them in the participation process, group discussions may arise that enhance managers' analyzing ability (Hackman & Walton, 1986). In particular, since each individual has partial and biased information about current processes, group discussions may perform a corrective function that enables members of the group to collectively gain more access to private information (Stasser & Titus, 1985).

To summarize, participation in costing system design is affected by cognitive effects, in that it not only enhances managers' understanding of their work processes, it also enables them to add their knowledge and desired system features in order to obtain a costing system that is useful in supporting their work processes. This reasoning leads to our third hypothesis.

H3: Participation in costing system design is positively associated with perceived usefulness of cost information.

The literature on business process redesign indicates that process redesign begins with defining what the business process under consideration means for an organization and then selecting the most critical areas where it can be redesigned (Davenport & Stoddard, 1994). The improvement of these critical areas is referred to as the detection of areas of inefficiency and ineffectiveness (Hammer & Champy, 1993). Inefficiency

implies that a process generates too much wasteful resources even though it meets operational goals (Wastell, White, & Kawalek, 1994). By constructing detailed maps of current processes, users may determine the boundaries of current processes as well as the activities within a process (Pojasek, 2003; Soliman, 1998). Informative process maps enable users to gain a better insight into current processes and interrelationships between activities and, as such, they may reveal unnecessary elements or activities (e.g., too many management levels, wasteful bureaucracy, duplicated work) caused by organizational complexity (Greasley, 2006; Wastell et al., 1994). As a result, users can improve processes by taking action to reduce the complexity of processes and minimize the non-value adding activities. The second problem, ineffectiveness, is defined as variance caused by customer complaints, late or incomplete output, and the need to repeat work (Wastell et al., 1994). Disaggregated information may provide better insight into process performance (Carpinetti, 2003) because it enables the identification of the most ineffective parts of a process (Somerville & Ransom, 2005). When the most critical redesign areas are detected, benchmarking may be used to compare the performance of sub-processes or activities in a process with other best-in-class ones (Gunasekaran & Kobu, 2002) and to set performance standards in order to redesign processes (Jones, 1995). Variance analysis then allows users to detect areas of ineffectiveness by explaining the actual performance of processes compared with their standard performance in terms of costs generated or resources consumed (Weber, Dodd, Wood, & Wolk, 1997).

In a similar vein, cost management consists of the tasks of resource planning, cost estimation, and cost budgeting and control (Kwak & Ibbs, 2002). These tasks aim to maximize the use of organizational resources (e.g., labour, materials, machines) to gain optimal performance by minimizing resources consumed (Swansburg & Swansburg, 1997). Through the reduction and elimination of unnecessary resources, cost management thus allows organizations to deliver products and services that meet customers' demands at lowest cost (Monden & Hamada, 1991). As such, cost management can enhance the performance of business processes. Our fourth hypothesis posits that when managers believe in these beneficial outcomes of cost management, they are more likely to identify process improvements.

H4: Perceived usefulness of cost information is positively associated with process improvements.

3. Research Method

3.1. Data Collection

The data used in our study were collected through an online survey. An invitation asking for participation in this study was sent via email to 3,000 Belgian managers responsible for departments of accounting and finance, manufacturing, HR, marketing, R&D, sales or logistics. The email addresses were obtained from a Belgian commercial mailing list provider holding approximately 300,000 email addresses. We targeted managers who work in companies that have more than 50 employees because these companies are more likely to have a formal costing system.

The procedure for sending the surveys consisted of two phases. In the first phase, 3,000 invitations containing the link to access the survey were sent to respondents by email. In the second phase, we sent a second email to thank the respondents who had completed the survey and to remind the respondents who had not. In total, 354 emails failed to reach target respondents due to invalid email addresses, retirement or firm leaving so that the target sample of this study consists of 2,646 managers. In total, 173 questionnaires were completed, yielding a response rate of 6.54%.[1] To investigate the possibility of non-response bias, an early/late respondents' analysis was conducted, in which early and late respondents were respectively defined as having sent back the initial or the replacement questionnaire. The results of the *t*-tests show a non-significant difference in means (all $p > 0.05$) for all measured items. This suggests the absence of non-response bias.

3.2. Sample Characteristics

Table 1 presents the respondents' characteristics as well as the companies' background. 78.03% of our respondents are male. The majority of the respondents (67.06%) graduated more than 20 years ago and obtained at least a master degree (69.94%). Most respondents

[1] Three respondents had problematic answer patterns: two respondents chose the neutral option for all questions and one respondent chose a score of six for all answers. When we exclude these three respondents from our analyses, our results do not change.

are top (66.47%) or middle-level managers (26.01%) and work at the department of accounting and finance (65.90%). The number of years the respondents have been working in their organizations and current positions varies greatly. The companies in which they work operate in wide range of different sectors and mostly employ between 50 and 500 people (72.26%).

INSERT TABLE 1 ABOUT HERE

3.3. Measures

Participation in costing system design (PARTICIPATION). To measure participation we adapted an instrument from the budgeting literature (Milani, 1975) to reflect the specificities of costing system design. This instrument was intensively tested in prior studies (Dunk A. S., 1993; Maiga, 2007). To introduce the meaning of participation in costing system design, we first specified the tasks that respondents may have been involved with: establishing cost pools/centres and defining the areas of responsibility; specifying cost categories; identifying product/service flows from the input stage to the output stage of a product or service; determining the cost allocation methods (e.g., process costing, job costing, batch costing, service costing, contract costing, activity-based costing, etc.); providing frequency of reporting; identifying the cost of each activity/task providing products/services; choosing the proper allocation methods and identifying cost drivers; and analyzing factors influencing costs. Next, we revised the original instrument of budget participation by replacing 'your involvement in the budget' by 'your involvement in designing the current costing system' (see Table 2). Respondents were asked to indicate their involvement in the design of the costing system for six items on 7-point Likert scales.

INSERT TABLE 2 ABOUT HERE

Perceived usefulness of cost information (USEFULNESS). Perceived usefulness is defined in the information systems literature as the degree to which an individual believes that using a particular information system would enhance task performance (Davis, 1989). In the costing literature, perceived usefulness is defined as the manager's belief about the importance of information supplied by the costing system or the extent to which this information could be used in making managerial decisions (Chenhall & Morris, 1986;

Pizzini, The relation between cost-system design, managersÕ evaluations of the relevance and usefulness of cost data, and financial performance: an empirical study of US hospitals , 2006). We asked managers to specify the degree to which they believe cost information is useful for the improvement of their work processes through six statements. This measure also used 7-point Likert scales.

Autonomous motivation for cost management (A_MOTIVATION). We used the multidimensional work motivation scale developed by Gagné et al. (2014) to measure the degree of autonomous motivation for cost management. To fit with the purpose of this study, the original question 'Why do you or would you put effort into your current job?' was replaced by the altered question 'Why would you put effort into cost management?' In line with a prior study on autonomous motivation (Gagné et al., 2008), we provided statements that indicate two types of autonomous motivation. The first three statements represent intrinsic motivation. The last three statements reflect identified regulation. To test the hypotheses, we later merge these two scales and use one construct for autonomous motivation (see Van den Broeck et al., 2010) by including the scores of all six items.[2] Again, 7-point Likert scales were used.

Process improvements (P_IMPROVEMENTS). This instrument measures managers' perceptions about their contributions to the improvement of their business processes. The survey asked the respondents to rate their contributions for the following eight tasks (on 7-point Likert scales): (1) reduction of costs of current processes providing products/services; (2) reduction of process errors (e.g., stoppage, scrap, rework); (3) reduction of process lead times (e.g. queue, waiting time); (4) controlling work processes to ensure their correctness; (5) checking work processes to prevent defects in product/service; (6) redesigning and testing new work processes; (7) setting standards for improvement of work process; and (8) continuously evaluating work processes to find opportunities for improvement. These tasks are critical to process improvements because prior studies have shown that the improvement of processes can be achieved by

[2] All results remain consistent when we re-run our analyses with either the first three or the last three items. We also calculated the Pearson correlation between the two types of autonomous motivation. In particular, we first standardized the scores of all six items and created two new variables. The first variable, INTRINSIC_MOTIVATION, was obtained by adding the first 3 items' scores. The second variable, IDENTIFIED_REGULATION, was obtained by adding the last 3 items' scores. The Pearson correlation between the two variables is 0.525 (significance level: 0.01; two-tailed).

eliminating waste (e.g., scrap, rework and other redundant activities), preventing defects (e.g., avoiding mistakes), setting new standards for improvement and continuously evaluating the process to improve (Bhatt, 2000). Although several authors have criticized the use of self-rated measures for individuals' contribution as well as performance, advocates of self-rated measures have argued that they are valid and tend to exhibit less bias than superior-rated measures (Dunk A. S., 1993; Marginson & Ogden, 2005; Parker & Kyj, 2006). Moreover, self-rated measures of subordinate performance have been shown to be correlated with measures rated by superiors (Furnham & Stringfield, 1994; Heneman, 1974; Venkatraman & Ramanujan, 1987). In order to ensure validity of our instrument, we examined the Pearson correlation between P_IMPROVEMENTS and a variable asking respondents to indicate which percentage of their time they spend on process improvement (TIME_SPENT). The purpose of this test was to examine the honesty of respondents in filling out the P_IMPROVEMENTS instrument. We first computed a composite score by adding the *z*-scores of each of the eight items and then calculated the Pearson correlation between P_IMPROVEMENTS and TIME_SPENT. The results suggest that the two variables are indeed related (Pearson correlation = 0.393, $p = 0.01$). Therefore, we conclude that our instrument is valid in terms of reflecting respondents' contributions to process improvements.

DEPARTMENT. Traditionally, costing system design only included accountants and lacked non-accounting users. However, a more advanced costing system like ABC requires the presence of non-accounting users (Eldenburg et al., 2010). Because it is possible that the level of participation between accountants and non-accounting users is different, we controlled for the effect of the different groups on participation. More specifically, we created a dummy variable, which takes value "0" for people from accounting and finance departments, and "1" for people from other departments.

3.4. Assessment of Common Method Bias

The subjective measures used in this study were gathered from the same source in the same questionnaire, which may create an issue of common method bias. We therefore executed Harman's single-factor test (Podsakoff & Organ, Self-reports in organizational research: Problems and prospects, 1986). This test assumes that if a substantial amount of

common method variance is present, a factor analysis of all the data will result in a single factor accounting for the majority of the covariance in the independent and dependent variables. More specifically, we performed a principal components factor analysis on the 26 items measuring our four main variables (USEFULNESS, PARTICIPATION, A_MOTIVATION, P_IMPROVEMENTS). The results of Harman's single-factor test revealed that no single factor accounts for the majority of the variance in the instruments,[3] showing that this type bias was not a concern in this study.

4. Results

In the research model, we added a path between PARTICIPATION and P_IMPROVEMENTS to control for the direct effect. The research model was analyzed using partial least squares (PLS),[4] a structural equation modelling tool that first assesses the psychometric properties of the measurement model and then estimates the parameters of the structural model. We chose PLS because this method makes minimal data assumptions and requires relatively small sample sizes (Hair, Ringle, & Sarstedt, 2011). Moreover, PLS has been used in a number of recent management accounting studies (e.g., Du, Deloof, & Jorissen, 2013; Hall, 2008; Naranjo-Gil, Maas, & Hartmann, 2009).

The inter-correlations among variables in this study are shown in Table 6. First, we observed a significant correlation between A_MOTIVATION and PARTICIPATION and USEFULNESS respectively. Second, DEPARTMENT is significantly associated with PARTICIPATION and P_IMPROVEMENTS. Third, PARTICIPATION is significantly correlated with USEFULNESS. Finally, P_IMPROVEMENTS is significantly correlated with USEFULNESS.

4.1. Measurement Model

We assessed the measurement model in two steps. In the first step, to analyze the dimensionality of the constructs, we ran a principal component analysis (PCA) (Gefen, 2003; Gerbing & Anderson, An updated paradigm for scale development incorporating unidimensionality and its assessment, 1988). The second step consists of assessing the

[3] The total variance explained by one single factor is 24.7%.
[4] We used SmartPLS (version 3.1.2).

two elements of factorial validity, convergent validity and discriminant validity (Gefen & Straub, 2005; Straub, Boudreau, & Gefen, 2004).

First, we conducted a PCA on all items from the measurement model using Varimax rotation with Kaiser Normalization. Extraction was based on Eigenvalues above 1.0. Five components were extracted, which corresponds with the number of intended constructs.[5] Next, we analyzed the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. The KMO measure (0.788) was above the suggested rule-of-thumb threshold of 0.6, which indicates adequate sample size. The Chi-square value for Bartlett's test was large (2,121.91) and significant ($p < 0.001$) implying that the correlation matrix is not an identity matrix. Taken together, these two tests indicate that it is safe to proceed with and interpret the principle components analysis (Cascardi, Avery-Leaf, O'Leary, & Slep, 1999). Next, as suggested by Hair, Black, Babin, & Anderson (2010), poorly performing items (i.e. loadings below the 0.50 standard) and items that correlated highly with unintended components (i.e. cross-loadings above 0.40) were removed. More specifically, after the removal of an item, a new PCA was conducted and the above steps were repeated. This allowed us to rigorously assess construct dimensionality as the PCA algorithm artificially disallows correlations between items (Rook & Fisher, 1995). In total, three items were deleted: P_IMPROVEMENTS_4, USEFULNESS_1 and USEFULNESS_2.

Second, a confirmatory factor analysis (CFA) was conducted to examine the factor loadings of the measurement items on their respective latent constructs as well as their cross-loadings. The results, presented in Table 3, show that each item's loading on its respective construct is highly significant ($p < 0.001$).

INSERT TABLE 3 ABOUT HERE

To assess convergent validity, we examined the average variance extracted (AVE). An AVE value of 0.50 and higher indicates a sufficient degree of convergent validity, which means that the latent variable explains more than half of its indicators' variances (Fornell & Larcker, 1981). Table 5 demonstrates that the AVE of all constructs is above the threshold of 0.50. Moreover, Table 4 shows that all items load on their

[5] As expected, autonomous motivation for cost management consists of two factors: intrinsic motivation and identified regulation.

respective construct with a lower bound of 0.607. In line with Fornell and Larcker's (1981) suggestion, they also load higher on their respective construct than on any other. These analyses confirm the convergent validity of our constructs.

INSERT TABLES 4 AND 5 ABOUT HERE

After establishing convergent validity, we assessed discriminant validity to ensure that all construct measures are empirically unique and represent phenomena of interest that other measures in the structural equation model do not capture (Hair et al., 2010). To determine discriminant validity, we first used the AVE values from Table 5 and, in line with Fornell & Larcker (1981), found that the square root of the AVE for each latent variable is larger than any correlation among any pair of latent variables (see Table 6). Therefore, we conclude that discriminant validity is established (Chin W. , 1998).

INSERT TABLE 6 ABOUT HERE

In the next step, we assessed the internal consistency reliability of the measurement model by calculating the composite reliability (CR) and Cronbach's Alpha for each latent variable. Table 5 demonstrates that all composite reliability and Cronbach's alpha scores are above the threshold value of 0.70 (Hair et al., 2011).

Finally, we investigated multicollinearity by examining the VIF scores of the measurement items and latent variables. Following the suggestion of Hair et al. (2011), all VIFs are below the threshold value of 5 (see Tables 4 and 7), suggesting that the issue of multicollinearity is not present.

INSERT TABLE 7 ABOUT HERE

4.2. Structural Model

The second phase in the PLS analysis is the estimation of the specified structural equations. The path coefficients indicate the strength and direction of the relationships among the latent variables. We assessed statistical significance of parameter estimates using a bootstrap procedure with 5,000 replacements, as suggested by Hair et al. (2011). In addition, in line with prior accounting research (e.g., Hartmann & Slapničar, 2009), we also examine the predictive validity of the parameter estimates. Tenenhaus, Vinzi, Chatelin, & Lauro (2005) and Vandenbosch (1996) argued that in order to provide sufficient evidence of model fit, it is necessary to examine the Stone-Geisser Q^2-test

because PLS models lack an index providing the goodness of fit statistics like in variance-covariance-based structural equation models. Q^2 values larger than zero for a certain endogenous latent variable indicate the path model's predictive relevance for this particular construct (Chin, 2010; Hair et al., 2011). Table 8 shows that the Q^2 values of all endogenous variables are greater than zero, suggesting sufficient evidence of model fit. Table 8 also reports the R^2 values.

INSERT TABLE 8 ABOUT HERE

Next, we examine the magnitude and strength of the paths, where each of our hypotheses corresponds to a specific structural model path. The results suggest that all but two paths are significant (see Figure 2). More specifically, the path between PARTICIPATION and A_MOTIVATION is significant (t = 4.659, p < 0.01), which supports Hypothesis 1. The path between A_MOTIVATION and P_IMPROVEMENTS is not significant (t = 0.479, p = 0.632), such that Hypothesis 2 is not supported. In line with Hypothesis 3, the path between PARTICIPATION and USEFULNESS is significant (t = 3.417, p < 0.01). In the same vein, the path between USEFULNESS and P_IMPROVEMENTS is also significant (t = 4.345, p < 0.01) and therefore supports Hypothesis 4. Finally, the control path between PARTICIPATION and P_IMPROVEMENTS is not significant (t = 0.172, p = 0.864) and the control path between DEPARTMENT and PARTICIPATION is significant (t = 2.032, p = 0.042). Hence, as expected, managers' participation in costing system design increases their perceived usefulness of cost information as well as their autonomous motivation for cost management. Moreover, whereas managers' perceived usefulness of cost information is positively associated with process improvements, autonomous motivation for cost management does not seem to have a significant influence.

INSERT FIGURE 2 ABOUT HERE

Finally, we also explicitly examined the effect of perceived usefulness of cost information (USEFULNESS) as a mediator in the relationship between participation in costing system design (PARTICIPATION) and process improvements (P_IMPROVEMENTS). More specifically, following the bootstrapping procedure of Preacher and Hayes (2004) and Hayes (2009), we tested a model consisting of the three variables PARTICIPATION, USEFULNESS and P_IMPROVEMENTS, as well as the

control variable DEPARTMENT. As required, the results show a significant path between PARTICIPATION and USEFULNESS (t = 3.440, p = 0.001) as well as between USEFULNESS and P_IMPROVEMENTS (t = 4.935, p < 0.001), and an insignificant path between PARTICIPATION and P_IMPROVEMENTS (t = 0.049, p = 0.961). The control path is significant (t = 2.020, p = 0.043). We also estimated the total indirect effect by multiplying the statistically significant coefficients of the PARTICIPATION-USEFULNESS path (0.282) and the USEFULNESS-P_IMPROVEMENTS path (0.357). The bootstrapped 95% confidence interval ([0.038; 0.172]) for the USEFULNESS mediation path (0.090) does not include zero, indicating a significant indirect effect. Taken together, these analyses suggest that perceived usefulness of cost information mediates the link between participation in costing system design and process improvements.

4.3. Robustness Tests

In order to ensure that the structural equation model is robust, we ran two alternative models to compare the consistency of our results with previous literature. First, Schoute (2009) suggested that the usefulness of cost data is positively related to the use of the costing system for product planning and cost management. Accordingly, we expect a similar effect of those two purposes on the perceived usefulness of cost information and, in turn, on process improvements. To test this alternative model, we first conducted an exploratory factor analysis on nine items indicating the purposes of costing system use[6] by using principle component analysis with Varimax rotation to extract two factors with (initial) Eigenvalues greater than one (see Table 9). Second, we inspected the primary factor loadings to interpret each of the two dimensions underlying the nine purposes of costing system use and used a cut-off value of 0.7. Following the study of Schoute (2009), the first factor, which loads heavily on the items 'new product design' and 'product output decisions' is interpreted as 'costing system use for product planning' (CS_P). The second factor, which loads heavily on the items 'budgeting' and

[6] The respondents were asked to rate the use of the following nine items on seven-point Likert scales: (1) cost reduction; (2) product pricing; (3) performance measurement; (4) cost modelling; (5) budgeting; (6) customer profitability analysis; (7) product output decisions; (8) new product design; and (9) stock valuation.

'performance measurement', is interpreted as 'costing system use for cost management' (CS_CM). In the next step, we ran our alternative model including these two new constructs.[7] As expected, both costing system use for product planning (CS_P; $p < 0.001$) and cost management (CS_CM; $p = 0.001$) influence the perceived usefulness of cost information (USEFULNESS), which, in turn, stimulates process improvements (P_IMPROVEMENTS; $p < 0.001$).

INSERT TABLE 9 ABOUT HERE

Second, because the motivational and cognitive routes towards process improvements may be interrelated (Gagné, 2009) we also re-ran our model including the path between A_MOTIVATION and USEFULNESS. The added path is indeed significant ($t = 3.412$, $p = 0.001$), but it does not affect the consistency of our results. As a result, we conclude that our model is robust.

5. Conclusion, Limitations and Future Research

The purpose of this study was to investigate the impact of managers' participation in costing system design on process improvements. We hypothesized that this relationship is driven by two mechanisms: autonomous motivation for cost management and the perceived usefulness of cost information. The results of our survey show that managers' participation in costing system design is positively associated with both their autonomous motivation for cost management and their perceived usefulness of cost information. However, only the perceived usefulness of cost information is significantly related to process improvements. Our data do not support the predicted effect for autonomous motivation. In particular, although participation in costing system design enhances managers' autonomous motivation for cost management, this increase in motivation as such does not seem to drive process improvements. Process improvement thus appears to be a matter of better process knowledge rather than a higher autonomous motivation for reducing costs.

Our findings are in line with prior studies that have shown cognitive mechanisms to drive the relationship between participation and performance. Chenhall and Brownell

[7] Similar to the baseline model, we also assessed AVEs, convergent validity, discriminant validity and internal consistency validity of each construct and the results suggest they are all valid.

(1998) found that budgetary participation provides information that reduces role ambiguity, which, in turn, may stimulate contributions to improve performance. Similarily, Kren (1992) also showed that budget participation facilitates job-relevant information and thus enables individuals to enhance performance. Consistent with these two prior studies, our results show that participation in costing system design allows managers to understand the usefulness of cost information and, as a result, they contribute more to process improvements.

Furthermore, our results are also consistent with the literature on business process management. The most common rationale for process improvements is to increase financial performance, typically through cost management (Bourne, Franco, & Wilkes, 2003; Neely, Gregory, & Platts, 1995). One criticism of this approach, however, is that by focusing too heavily on cost management, activities that add value to products/services and customers may be eliminated (Davenport, 1995). Hence, the purpose of process improvement is not only to make processes more efficient (i.e. minimize the resources consumed) but also to enhance their effectiveness by producing desired results (Bhatt, 2000). As such, process improvement does not only require cost management but also the enhancement of outputs' quality (Davenport & Short, The new industrial engineering: information technology and business process redesign, 1990). Our study confirms this argument since managers' autonomous motivation for cost management did not foster process improvements. In particular, we argue that autonomous motivation for cost management focusses managers' attention on the reduction of wasted resources. This increased efficieny, however, could lead to the loss of value-adding activities, which, in turn, may reduce process quality (e.g., customer services, reliable delivery) (Ghalayini & Noble, 1996). As a result, a high focus of efficiency without considering effectiviness might explain the insignificant effects on process improvements.

As with any study, the results of our study are subject to some caveats. First of all, similar to prior accounting studies that used a self-rating scale to measure managerial performance (Chalos & Poon, 2000; Chong & Chong, 2002; Marginson & Ogden, 2005; Otley & Pollanen, 2000; Parker & Kyj, 2006; Wentzel, 2002), our instrument to measure process improvements is potentially subject to the problem of high mean values. In

addition, by conceiving of a business process as a broad umbrella term, we may have overlooked some important process improvement areas. Second, cross-sectional studies such as ours can establish associations, but not causality. Third, because our sample not only includes managers working in accounting and finance but also in other departments, their costing system knowledge may not be sufficient. This might have increased the noisiness of our measures. Fourth, the response rate in this study is rather low and, consequently, our sample size is rather small. Finally, although the sample of this study includes managers working in a wide range of industries, given that the data were gathered in Belgium, the generalizability of our results to other countries may be problematic.

Despite these potential limitations, this study presents a step further in our understanding of the role of participation in costing system design on process improvements. Future research may extend this study by examining the interaction between participation in the design process of a costing system and costing system complexity on the usefulness of cost information. Such research could provide insight into the conditions under which costing system complexity is warranted. Another interesting research avenue would be to examine the impact of participation in the design process of a costing system in different operating environments, such as static versus dynamic environments, since the usefulness of cost information to improve businesses processes might differ in different environments. For instance, information sharing and knowledge transfer among employees may be more important for organizations operating in rapidly changing environments (Lawler, 1994). Finally, despite the fact that we found process improvements to be mainly driven by cognitive mechanisms, this does not imply that increased autonomous motivation for cost management should be ignored. In fact, it may be more relevant for organizations following a low cost strategy. In these organizations, tight control is usually performed to enhance efficient use of resources, which is critical to process improvement (Menguc, Auh, & Shih, 2007). On the one hand, performance measurement based on cost savings, referred to as controlled motivation according to self-determination theory, may create dysfunctional behaviour (Bond T. C., 1999). On the other hand, since autonomous motivation for cost management can result from a participative strategy, allowing managers to participate in the costing system

design process might counter this negative effect. Hence, future research that explicitly studies both autonomous and controlled motivation is required in order to fully understand the motivational effects of participation in costing system design.

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Table 1. Respondents' characteristics and companies' background

Panel A: Respondents' characteristics			
Gender		Department	
Male	78.03%	Accounting and finance	65.90%
Female	21.39%	Manufacturing	10.98%
Not specified	0.58%	HR	0.58%
Education		Marketing	1.73%
Secondary education or less	2.31%	R&D	5.20%
Professional bachelor	15.61%	Sales	2.31%
Academic bachelor	10.98%	Logistics	5.20%
Master	50.87%	Not specified	8.09%
Postgraduate degree	16.76%	Years in organization	
PhD	2.31%	< 1	5.78%
Not specified	1.16%	From 2 to 5	21.97%
Years since graduation		From 6 to 10	18.50%
< 1	0.00%	From 11 to 15	15.61%
From 2 to 5	1.73%	From 16 to 20	9.83%
From 6 to 10	7.51%	From 21 to 25	10.40%
From 11 to 15	10.98%	From 26 to 30	10.40%
From 16 to 20	12.72%	>31	7.51%
From 21 to 25	27.75%	Years in current position	
From 26 to 30	21.97%	<1	6.36%
> 31	17.34%	From 2 to 5	37.57%
Professional level		From 6 to 10	21.39%
Top-management level	66.47%	From 11 to 15	13.29%
Middle-management level	26.01%	From 16 to 20	12.14%
Lower-management level	6.36%	From 21 to 25	3.47%
Not specified	1.16 %	From 26 to 30	4.05%
		>31	1.73%
Panel B: Companies' background			
Sector		Size	
Processing industry	10.40%	50 to 100	24.28%
Construction	7.51%	101 to 250	32.95%
Metal	14.45%	251 to 500	15.03%
Wholesale and retail trade	12.72%	501 to 1,000	9.83%
Hotel, restaurant, tourism	9.25%	1,001 to 2,000	6.94%
Chemical industry	9.83%	2001 to 5,000	5.20%
Energy and water	3.47%	5,001 to 10,000	1.16%
Agriculture and forestry	0.00%	> 10,001	4.62%
Transportation and communication	15.03%		
Banking and insurance	5.78%		
Health care or welfare services	5.20%		
Not specified	6.36%		

Table 2. Measurements of variables

	Cronbach's Alpha	Cronbach's Alpha
PARTICIPATION	0.894	
To what extent do you agree with each of the following statements regarding to your involvement in designing the current cost system (1-7 scale)	X	
1. I am involved in developing each element in the design of the cost system.	X	
2. When an element in the design of the cost system is revised, the reasons provided by my supervisor are logical.	X	
3. I frequently discuss the elements in the design of the cost system with my supervisor.	X	
4. I have a great deal of influence on the elements in the final design of the cost system.	X	
5. My contribution to each element in the design of the cost system is very important.	X	
6. My direct superior seeks my requests, opinions, or suggestions very frequently when each element in the design of the cost system is changed.	X	
USEFULNESS	0.749	0.713
Please indicate the degree to which you agree with the proposed statements (1-7 scale)		
1. The cost information helps us to identify wasted resources.	X	
2. The cost information helps us to identify opportunities for cost reduction.	X	
3. The cost information helps us to control and improve the quality performance.	X	X
4. The cost information helps us to easily update costs of a process when adjustments in a process are made.	X	X
5. The cost information helps us to identify which activities or processes can be shared across departments.	X	X
6. The cost information is a key factor to set standards for work process improvement	X	X
A_MOTIVATION	0.837	
Why would you put effort into cost management? (1-7 scale)		
1. Because it is fun doing it.	X	
2. Because what I do in my task is exciting.	X	

3. Because the task I do is interesting.	X	
4. Because I personally consider it important to put efforts in this task.	X	
5. Because putting efforts in this task aligns with my personal values.	X	
6. Because putting efforts in this task has personal significance to me.	X	
P_IMPROVEMENTS	0.892	0.892
How do you rate your contribution in work process improvement in the areas indicated below? (1-7 scale)		
1. Reduction of cost of current processes providing products/services.	X	X
2. Reduction of process errors (e.g., stoppage, scrap, rework).	X	X
3. Reduction of process lead times (e.g. queue, waiting time).	X	X
4. Controlling work processes to ensure their correctness.	X	
5. Checking work processes to prevent defects in product/service.	X	X
6. Redesigning and testing new work processes.	X	X
7. Setting standards for improvement of work process.	X	X
8. Continuously evaluating work processes to find opportunities for improvement.	X	X

Table 3. Item loadings

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
P_IMPROVEMENTS_1 <- P_IMPROVEMENTS	0.753	0.747	0.059	12.876	0.000
P_IMPROVEMENTS_2 <- P_IMPROVEMENTS	0.734	0.729	0.066	11.085	0.000
P_IMPROVEMENTS_3 <- P_IMPROVEMENTS	0.839	0.833	0.050	16.748	0.000
P_IMPROVEMENTS_5 <- P_IMPROVEMENTS	0.760	0.754	0.057	13.299	0.000
P_IMPROVEMENTS_6 <- P_IMPROVEMENTS	0.747	0.741	0.059	12.675	0.000
P_IMPROVEMENTS_7 <- P_IMPROVEMENTS	0.826	0.819	0.043	19.199	0.000
P_IMPROVEMENTS_8 <- P_IMPROVEMENTS	0.78	0.775	0.049	15.959	0.000
DEPT_DUMMY <- DEPARTMENT	1	1	0		
MOTIVATION_1 <- A_MOTIVATION	0.673	0.665	0.090	7.494	0.000
MOTIVATION_2 <- A_MOTIVATION	0.780	0.769	0.076	10.257	0.000
MOTIVATION_3 <- A_MOTIVATION	0.792	0.783	0.053	14.931	0.000
MOTIVATION_4 <- A_MOTIVATION	0.728	0.724	0.054	13.567	0.000
MOTIVATION_5 <- A_MOTIVATION	0.760	0.753	0.069	11.096	0.000
MOTIVATION_6 <- A_MOTIVATION	0.699	0.689	0.087	8.035	0.000
PARTICIPATION_1 <- PARTICIPATION	0.827	0.825	0.035	23.632	0.000
PARTICIPATION_2 <- PARTICIPATION	0.663	0.660	0.064	10.334	0.000
PARTICIPATION_3 <- PARTICIPATION	0.753	0.748	0.047	15.896	0.000
PARTICIPATION_4 <- PARTICIPATION	0.876	0.875	0.025	35.629	0.000
PARTICIPATION_5 <- PARTICIPATION	0.888	0.887	0.022	39.522	0.000
PARTICIPATION_6 <- PARTICIPATION	0.833	0.830	0.032	25.980	0.000
USEFULNESS_3 <- USEFULNESS	0.708	0.704	0.063	11.288	0.000
USEFULNESS_4 <- USEFULNESS	0.806	0.800	0.060	13.436	0.000
USEFULNESS_5 <- USEFULNESS	0.607	0.605	0.092	6.573	0.000
USEFULNESS_6 <- USEFULNESS	0.796	0.789	0.050	15.868	0.000

Table 4. Cross-loadings and multicollinearity

	Cross-loadings					Multi-collinearity
	A_MOTIVATION	DEPARTMENT	PARTICIPATION	P_IMPROVEMENTS	USEFULNESS	VIF
P_IMPROVEMENTS_1	0.204	-0.180	0.034	**0.753**	0.282	1.911
P_IMPROVEMENTS_2	0.137	-0.224	-0.023	**0.734**	0.195	2.309
P_IMPROVEMENTS_3	0.042	-0.277	-0.011	**0.839**	0.237	3.308
P_IMPROVEMENTS_5	0.014	-0.220	0.068	**0.760**	0.265	2.046
P_IMPROVEMENTS_6	0.024	-0.233	0.071	**0.747**	0.174	2.054
P_IMPROVEMENTS_7	0.117	-0.162	0.154	**0.826**	0.346	2.452
P_IMPROVEMENTS_8	0.143	-0.158	0.113	**0.780**	0.253	2.218
DEPT_DUMMY	-0.002	**1.000**	0.200	-0.259	0.090	1.000
MOTIVATION_1	**0.673**	0.056	0.210	-0.002	0.079	2.38
MOTIVATION_2	**0.780**	0.069	0.240	0.023	0.185	3.321
MOTIVATION_3	**0.792**	0.055	0.244	0.046	0.224	2.178
MOTIVATION_4	**0.728**	-0.023	0.277	0.139	0.288	1.598
MOTIVATION_5	**0.760**	-0.068	0.227	0.190	0.235	2.031
MOTIVATION_6	**0.699**	-0.093	0.118	0.166	0.193	1.765
PARTICIPATION_1	0.230	0.177	**0.827**	0.028	0.19	3.031
PARTICIPATION_2	0.198	0.144	**0.663**	-0.073	0.14	1.566
PARTICIPATION_3	0.278	0.12	**0.753**	0.106	0.262	1.991
PARTICIPATION_4	0.257	0.226	**0.876**	0.088	0.146	4.497
PARTICIPATION_5	0.281	0.161	**0.888**	0.164	0.24	4.298
PARTICIPATION_6	0.229	0.15	**0.833**	0.031	0.281	2.579
USEFULNESS_3	0.238	0.089	0.243	0.230	**0.708**	1.291
USEFULNESS_4	0.217	0.041	0.149	0.354	**0.806**	1.469
USEFULNESS_5	0.143	0.099	0.142	0.173	**0.607**	1.280
USEFULNESS_6	0.221	0.051	0.243	0.194	**0.796**	1.596

Table 5. AVE, $\sqrt{\text{AVE}}$, composite reliability and Cronbach's alpha

	AVE	$\sqrt{\text{AVE}}$	Composite Reliability	Cronbach's Alpha
A_MOTIVATION	0.547	0.74	0.879	0.837
DEPARTMENT	1.000	1.000	1.000	1.000
PARTICIPATION	0.657	0.81	0.919	0.894
P_IMPROVEMENTS	0.605	0.778	0.915	0.892
USEFULNESS	0.539	0.734	0.822	0.713

Table 6. Inter-correlations (discriminant validity) of constructs

		1	2	3	4	5
A_MOTIVATION	Correlation					
	p-value					
DEPARTMENT	Correlation	-0.002				
	p-value	0.975				
PARTICIPATION	Correlation	0.306**	.200**			
	p-value	0.000	0.008			
P_IMPROVEMENTS	Correlation	0.133	-0.259**	0.083		
	p-value	0.080	0.001	0.28		
USEFULNESS	Correlation	0.284**	0.09	0.265**	0.334**	
	p-value	0.000	0.237	0.000	0.000	

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

Table 7. VIFs between latent variables

	A_MOTIVATION	DEPARTMENT	PARTICIPATION	P_IMPROVEMENTS	USEFULNESS
A_MOTIVATION				1.160	
DEPARTMENT			1.000		
PARTICIPATION	1.000			1.147	1.000
P_IMPROVEMENTS					
USEFULNESS				1.130	

Table 8. R^2 and Q^2

	R^2	Q^2
A_MOTIVATION	0.0940	0.044
DEPARTMENT PARTICIPATION	0.0400	0.023
P_IMPROVEMENTS	0.1140	0.056
USEFULNESS	0.0700	0.028

Table 9. Explanatory factor analysis for purposes of costing system use

	Factor 1: Costing system use for product planning	Factor 2: Costing system use for cost management
New product designs	**0.853**	0.022
Product output decisions	**0.827**	0.077
Product pricing	0.651	0.167
Stock valuation	0.636	0.133
Customer profitability analysis	0.518	0.205
Cost modelling	0.285	0.604
Cost reduction	0.152	0.492
Performance measurement	0.021	**0.722**
Budgeting	0.046	**0.751**
Variance explained by each factor	29.059	19.858

Figure 1. Research model

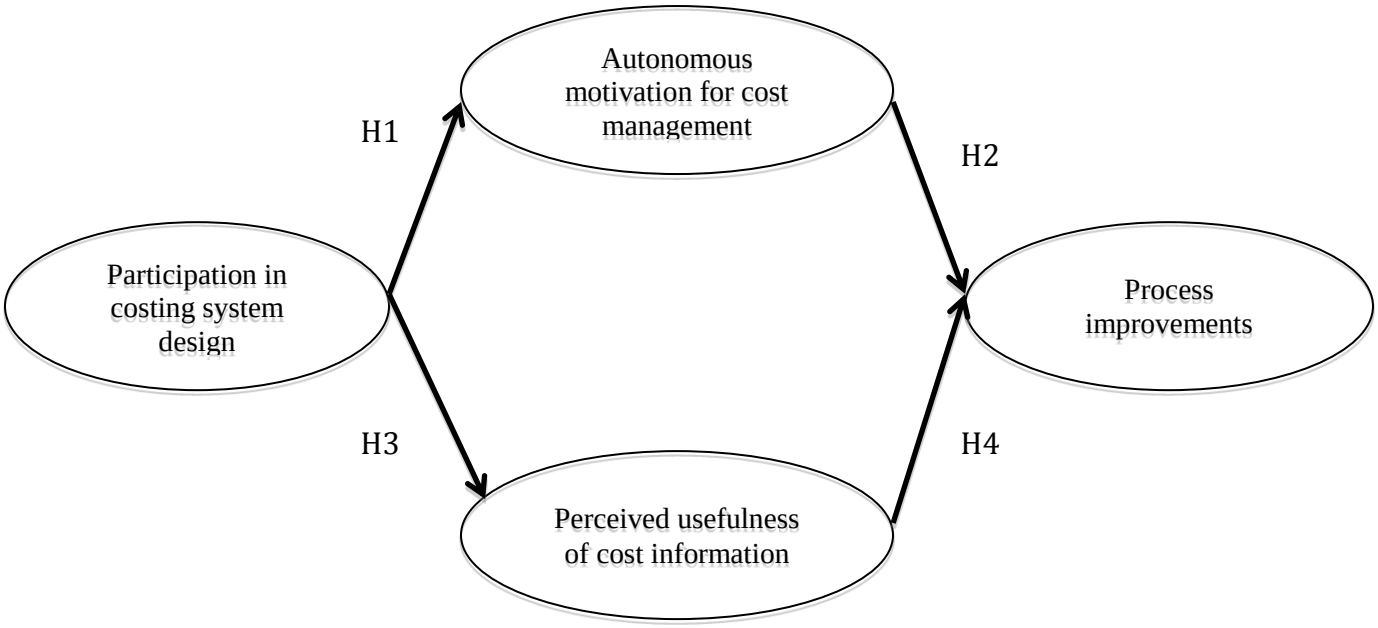
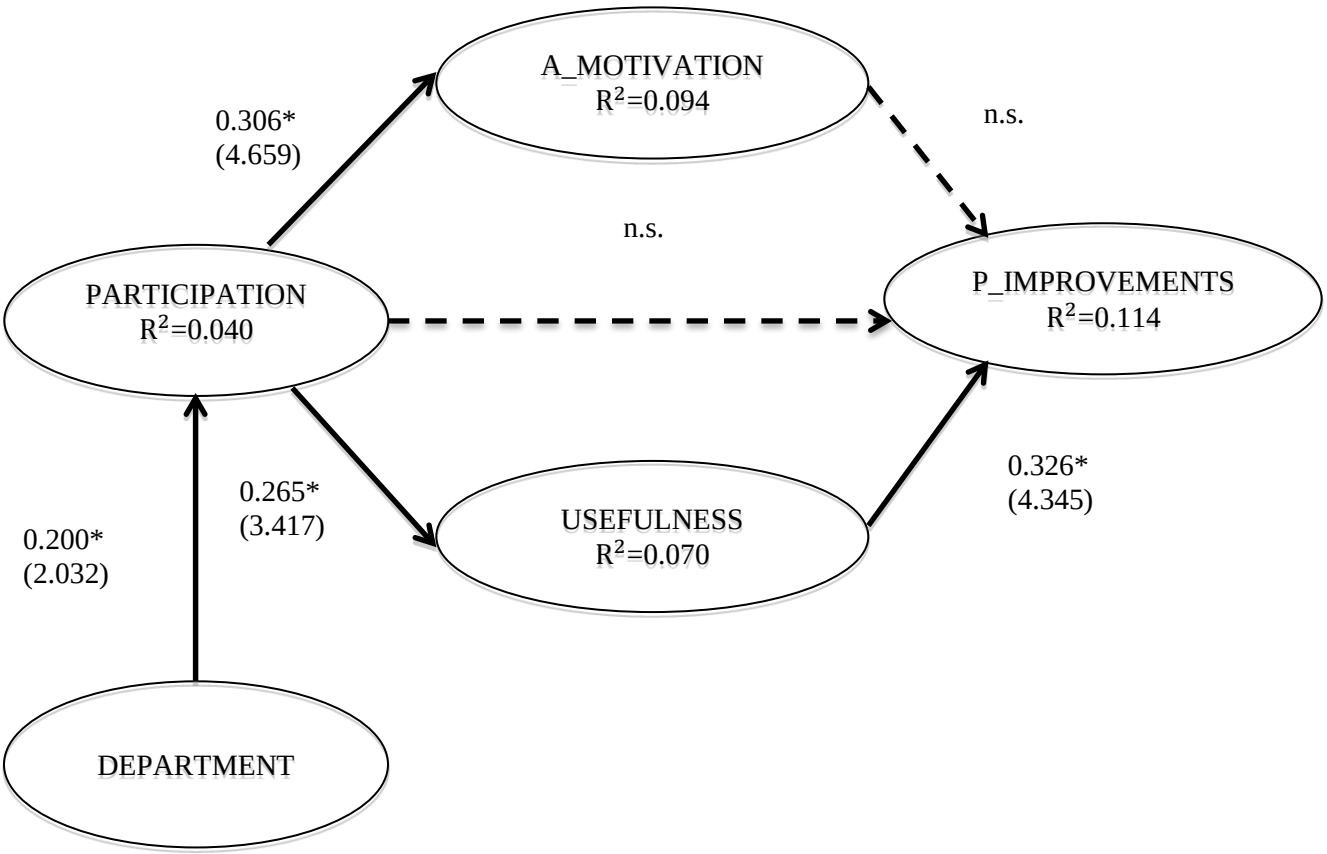


Figure 2. Results of the structural model with path coefficients (associated t-statistics are in parentheses)



* Significant at the 0.01 level (two-tailed).

Appendix. Survey questions

Number of cost pools

Cost pools/centers are groups of associated costs (e.g., a department, job, activity, behavior pattern) that all relate to a specific product or service in some manner.

How many cost pools/centers are used in the current cost system?

□ 0,

□ 1–2,

□ 3–4,

□ 5–8,

□ 9–16,

□ 17–32,

□ 33–64,

□ 65–128,

□ >128.

□ I don’t know.

Type of cost pools

What types of cost pools are used?

□ Functionally oriented (e.g. departmental) cost pools.

□ Process oriented (e.g. activity) cost pools.

□ Functionally and process oriented cost pools.

□ I don’t know.

Number of cost allocation bases

Cost allocation is the process of identifying, aggregating, and assigning overhead costs to cost objects (e.g. products, services)

How many cost allocation bases are used?

□ 0,

□ 1–2,

□ 3–4,

□ 5–8,

□ 9–16,

□ 17–32,

□ 33–64,

□ 65–128,

□ >128.

□ I don’t know.

Type of cost allocation bases

What types of cost allocation bases are used?

□ Only unit-level allocation bases.

□ Both unit-level and batch-level allocation bases.

□ Both unit-level, batch-level, and product-sustaining allocation bases.

□ I don’t know.

Purposes of costing system use (CS_CM, CS_P)

For each of the following purposes, please indicate the extent to which if your company uses the cost system referred to in the former question for following purposes

1. Cost reduction
2. Product pricing
3. Performance measurement
4. Cost modeling
5. Budgeting
6. Customer profitability analysis
7. Product output decision
8. New product designs
9. Stock valuation.

Perceived usefulness of cost information (USEFULNESS)

Please indicate the degree to which you agree with the proposed statements.

1. The cost information helps us to identify wasted resources.

2. The cost information helps us to identify opportunities for cost reduction.
3. The cost information helps us to control and improve the quality performance.
4. The cost information helps us to easily update costs of a process when adjustments in a process are made.
5. The cost information helps us to identify which activities or processes can be shared across departments.
6. The cost information is a key factor to set standards for work process improvement.

Costing system satisfaction

Overall, how do you rate the degree to which you are satisfied with the current cost system?
Scale: 1 (Not at all) – 7 (Completely)

Participation in costing system design (PARTICIPATION)

Please indicate to what extent you agree with each of the following statements regarding to your involvement in designing the current cost system.
Scale: 1 (strongly disagree) – 7 (strongly agree)

1. I am involved in developing each element in the design of the cost system.
2. When an element in the design of the cost system is revised, the reasons provided by my supervisor are logical.
3. I frequently discuss the elements in the design of the cost system with my supervisor.
4. I have a great deal of influence on the elements in the final design of the cost system.
5. My contribution to each element in the design of the cost system is very important.
6. My direct superior seeks my requests, opinions, or suggestions very frequently when each element in the design of the cost system is changed.

Superiors' leadership style

Please indicate the degree to which you agree with the proposed statements about the characteristics of your direct superior/boss.

Scale: 1 (not at all) – 7 (Completely)

1. My direct superior does personal favors for group members.
2. My direct superior does little things to make it pleasant to be a member of the group.
3. My direct superior is easy to understand.
4. My direct superior finds time to listen to group members.
5. My direct superior keeps things to himself.
6. My direct superior looks out for the personal welfare (e.g., well being) of individual group members.
7. My direct superior refuses to explain his actions.
8. My direct superior acts without consulting the group.
9. My direct superior backs up the members in their actions.
10. My direct superior treats all group members as his equals.
11. My direct superior is willing to make changes.
12. My direct superior is friendly and approachable.
13. My direct superior makes group members feel at ease when talking with them.
14. My direct superior puts suggestions made by the group into operation.
15. My direct superior gets group approval on important matters before going ahead.

Autonomous motivation for cost management (A_MOTIVATION)

Why would you put effort into cost management?

Scale: 1 (not at all) – 7 (Completely)

1. Because it is fun doing it.
2. Because what I do in my task is exciting.
3. Because the task I do is interesting.
4. Because I personally consider it important to put efforts in this task.
5. Because putting efforts in this task aligns with my personal values.
6. Because putting efforts in this task has personal significance to me.

Controlled motivation for cost management

Why would you put effort into cost management?

Scale: 1 (not at all) – 7 (Completely)

1. Because I have to prove to myself that I can.
2. Because it makes me feel proud of myself.
3. Because otherwise I will feel ashamed of myself.
4. Because otherwise I will feel bad about myself.
5. Because others will reward me financially only if I put enough effort in this task (e.g., employer, direct superior...).
6. Because others offer me greater job security if I put enough effort in this task (e.g., employer, direct superior…).
7. Because I risk losing my job if I don't put enough effort in this task.
8. To get other's approval (e.g. direct superior, colleagues, family, clients...).
9. Because others will respect me more (e.g., direct superior, colleagues, family, clients...).
10. To avoid being criticized by others (e.g., direct superior, colleagues, family, clients...).

Contribution to process improvements (P_IMPROVEMENTS)

How do you rate your contribution in work process improvement in the areas indicated below?

Scale: 1 (poor) – 7 (good)

1. Reduction of cost of current processes providing products/services.
2. Reduction of process errors (e.g., stoppage, scrap, rework).
3. Reduction of process lead times (e.g. queue, waiting time).
4. Controlling work processes to ensure their correctness.
5. Checking work processes to prevent defects in product/service.
6. Redesigning and testing new work processes.
7. Setting standards for improvement of work process.
8. Continuously evaluating work processes to find opportunities for improvement.

Process improvement efforts

Please indicate the degree to which you agree with the proposed below statements.

1. I spend a lot of time in evaluation, testing new methods for improvement of work process.
2. I always actively discuss with colleagues to improve work process.
3. I always examine the work process to prevent errors/defects in products/services.
4. The current standard of work process does not meet my requirements. I can make it better.

Improvement projects

In your organization, how many work improvement projects (e.g., resources efficiency improvement, product/service quality improvement) are you currently working on?

……

Time spent on process improvements

Which percentage of your working time do you spend on process improvement (e.g., resources efficiency improvement, product/service quality improvement)?

□ less than 1%

□ between 1% and 5%

□ between 5% and 10%

□ between 10% and 15%

□ more than 15%

Performance evaluations

Is your departmental performance mainly evaluated based on financial indicators (e.g., cost, profit)?

Scale: 1 (not at all) – 7 (completely)

CHAPTER 3 - A STUDY OF MANAGERS' WILLINGNESS TO USE A COERCIVELY FORMALIZED COSTING SYSTEM: THE MODERATING EFFECTS OF NATIONAL CULTURE

ABSTRACT According to the formalization literature, coercive formalization negatively affects individuals' feelings toward this formalization. However, little attention has been paid to how people's feelings toward coercion may depend on culture. The purpose of this study is to investigate the impact of cultural dimensions, namely power distance and collectivism, on managers' willingness to use a coercively formalized costing system in cost management tasks. The data of this study was collected by interviewing 11 Vietnamese managers, who work in the same plant of a Vietnamese company. Our data shows that these cultural dimensions, namely a high power distance and high degree of collectivism, positively influence managers' willingness to use a coercively formalized costing system.

KEYWORDS: coercive formalization; collectivism; costing system; individualism; national culture; power distance.

1. Introduction

In the 1980s, the Vietnamese government initiated an economic renovation, commonly called Doi Moi (The Renovation). The purpose of this program was to create a market-orientated economy through implementing a series of structural reforms to end Vietnam's economic stagnation (Beresford, 2008; Turner & Nguyen, 2005). Vietnamese companies, thanks to this program, have experienced major changes in the regulatory framework, which has allowed these companies to grow rapidly (Irvin, 1995). However, due to this program, Vietnamese companies are also faced with high competitive forces not only from local but also from foreign companies. These competitive forces oblige Vietnamese companies to adopt Western management accounting practices for profit enhancement (Doan et al., 2011).

Although foreign management accounting practices are increasingly adopted, there is little understanding of the impact of foreign practices on Vietnamese managers. This lack of understanding thwarts the practices' effectiveness because many management accounting problems in less developed countries are caused by behavioral rather than technical issues (Wallace, 1990). One possible explanation for the cause of these behavioral issues is that the foreign practices are not consistent with local cultural values (see Newman & Nollen, 1996). As argued by Argyris (1953) and Hopwood (1973), these practices affect and are affected by the feelings of managers. This is important because managers' feelings are linked to cognition, motivation and social processes (Hall M. , 2015). Thus, these practices have a certain impact on feelings in both positive and negative ways. Positive feelings potentially broaden managers' action repertoires, which in turn enhance the development of physical, intellectual, social and psychological resources (Fredrickson, 2001) while negative feelings created by the practices cause resentment, suspicion, fear, hurt, anxiety, frustration, aggression, hostility, apathy, and indifference (Argyris, 1953). The incompatibility between cultural values and management accounting practices can cause managers to exert negative feelings toward the practices. As such, it reduces managers' willingness to use the practices.

The purpose of this study is to shed light on managers' feelings associated with Western management accounting practices in the Vietnamese context. In particular, we

investigate the impact of two cultural dimensions, namely power distance and collectivism, on managers' willingness to use a coercively formalized costing system. In order to do that, we interviewed 11 Vietnamese managers working in the same plant of a Vietnamese company.

Our findings provide valuable contributions to the literature on management accounting in several ways. First, this study extends formalization research in management accounting (e.g., Ahrens and Chapman, 2004; Wouters & Wilderom, 2008) (Wouters & Wilderom, 2008) by taking into account the impact of cultural dimensions on individuals' feelings toward formalization. Second, these findings are in line with a commonly accepted view that national culture causes management accounting practices to differ across countries (cf. Ahrens, 1996; Carr & Tomkins, 1998; Chow et al., 1999) and a consistence between local culture and these practices fosters positive effects on individuals (cf. Newman & Nollen, 1996). Third, by focusing on Vietnam, we extend the cross-cultural literature on management accounting research in developing countries by investigating a country apart from China (Hopper et al., 2009).

This paper is structured as follows. The next section presents literature review. Section 3 describes the methodology and company background. Section 4 describes the case. In Section 5, we analyze the case. The last section concludes, discusses the limitations and offers suggestions for future research.

2. Literature Review

2.1. Two Types of Formalization

Adler and Borys (1996) distinguished two forms of formalization in bureaucracies, which are known as enabling and coercive. They developed those two forms of organizational formalization by comparing deskilling versus usability approaches to technology design (Zuboff, 1988; Adler & Winograd, 1992). The first form, enabling formalization, designs organizational rules to deal with the intelligence of workers so that formal procedures are designed to make work processes less foolproof. It supports employees to do their work better by providing feedback, identifying problems, revealing improvement opportunities, helping to prioritize action. The second form, coercive formalization, specifies organizational rules with the aim of producing a foolproof system. For instance, it relies

on elaborate pre-production design, specifies a vast range of eventualities with which the system can deal automatically, and gives workers only limited options for action. The coercive nature of this type of formalization lies in the imposition of its logic on organizational members. Such coercive systems are analogous to traditional models of cybernetic organizational control in which the focus is on policing adherence to preplanned objectives and standards (Anthony 1965).

These two forms of formalization differently influence employees' feelings. Enabling formalization has been found to make employees feel supported and motivated by the rules and systems in place (Wouters & Wilderom, 2008). As a consequence, it is promising for improving performance (Proença, 2010). In contrast, coercive formalization has a negative impact on employees' feelings, which in turn undermines employees' performance (Adler & Borys, 1996). Hence, scholars shift their attention from coercive to enabling formalization because enabling formalization is normally portrayed as "a good control" and coercive formalization is normally referred to as "a bad control" (Tessier & Otley, 2012).

According to Adler and Borys (1996), a different degree of work autonomy provided in daily work leads to different outcomes between enabling and coercive formalization. Enabling formalization provides managers with sufficient work autonomy while coercive formalization forbids managers' work autonomy. In the context of costing system use, a formalization of a costing system, which results in a lack of work autonomy associated with a costing system, is coercive. This lack of work autonomy is characterized by the high extent to which lower management levels rely on organizational rules and policies in order to attain organizational goals, and higher management levels control their managers' tasks by relying on preplanned objectives and standards and in turn provide limited options for actions. As such, a coercively formalized costing system allows decision-making to be centralized at higher management levels.

A lack of work autonomy in daily tasks negatively alters managers' feelings because the need of autonomy is one of the most important human needs (Chirkov et al., 2003). It causes negative feelings for managers, such as a high degree of stress (Averill, 1973), withdrawal (Langer & Rodin, 1976), sabotage (Allen & Greenberger, 1980), depression (Seligman, 1992), and a decrease of performance (Glass & Singer, 1972). In

the context of information systems, a lack of work autonomy in the implementation of an information system also has negative impact on managers' feelings, and as such reduces managers' willingness to use the system (Baronas & Louis, 1988). The managers for instance refuse or avoid using the information systems by arguing or delaying (Enns et al., 2003; Markus M. L., 1983). In summary, a low degree of work autonomy seems to reduce managers' willingness to use information systems.

However, it is argued that Western culture has always emphasized the role of autonomy, and this value has influenced the development of Western concepts (Marks, 1998). A cross-cultural study shows that Japanese individuals consider work autonomy to be less important than American individuals (Lundberg & Peterson, 1994). The use of Western concepts in other cultures leads to an overemphasis on the role of autonomy, and in turn causes biased interpretations of non-Western individuals' behavior. Cultural dimensions are suggested to have an impact on the feelings toward management practices (Robert et al., 2000). Two cultural dimensions, namely individualism/collectivism and power distance, possibly have a strong impact on managers' feelings toward a coercively formalized costing system.

2.2 National Culture

National culture refers to the values, beliefs, assumptions and norms that influence an individual in early childhood, which allow the distinction of one group of individuals from another (Beck & Moore, 1985). Hofstede (1991) defined national culture as the software of the mind and Jaeger (1986) argued that national culture can be defined as mental programs that are shared. National culture also affects individuals' feelings toward external events, which in turn influence individuals' approaches to certain circumstances, as well as expectations of consequences of their actions. It possibly explains why one way of acting or one set of outcomes is preferable to another. Hence, national culture can be used to predict an individual's view on a certain circumstance (Wright & Mischel, 1987).

Management accounting practices should be consistent with national culture to foster positive effects (Newman & Nollen, 1996). On the one hand, if management accounting practices are inconsistent with national culture, they can have negative

consequences for employees (Schuler & Rogovsky, 1998). As a result, the employees may be less able or willing to perform their tasks well. On the other hand, management accounting practices that reinforce national cultural values, are more likely to positively affect employees' feelings, which results in a high performance (Earley, 1994). Thus, the fit between the practices and national culture can "promise" better performance outcomes because they are consistent with existing employees' expectations and routines that transcend the workplace (Newman & Nollen, 1996).

In this research, we focus on two cultural dimensions, namely individualism/collectivism and power distance (Hofstede, 1980). In particular, we expect that a high degree of collectivism and a high power distance may have an impact on managers' willingness to use a coercively formalized costing system.

2.2.1. Individualism/Collectivism

Individualism causes individuals to prioritize their own goals over their group goals, while collectivism forces individuals to subordinate their personal goals to their group goals (Triandis et al., 1988). In individualistic societies, individuals are taught to be autonomous and independent from their in-group (Triandis, 1995). They tend to give priority to their personal over their group goals. As a result, they think and behave individually rather than prioritizing the group. In contrast, in collectivistic cultures, individuals are interdependent within their group (e.g. family, tribe, nation). As a result, they give priority to the goals of their groups, shape their behavior primarily on the basis of group benefits, and behave in a communal way (Mills & Clark, 1982). Individuals in collectivistic societies are more concerned with relationships, while individuals in individualistic societies are more concerned about personal benefits (Ohbuchi et al., 1999). In this way, collectivistic individuals reciprocate cooperation with more cooperation, but individualistic individuals do not (Chatman & Barsade, 1995; Cox et al., 1991).

Collectivistic characteristics may increase managers' willingness to use a coercively formalized costing system. Vietnam constitutes a collectivistic society (e.g. a score of 20 on the individualistic dimension) (see Hofstede, 2001). Because Vietnamese managers are influenced by collectivistic characteristics, they prioritize group goals over

their personal goals. As such, they can be expected to be willing to use a coercively formalized costing system even if the formalization leads to a lack of work autonomy. There are two possibilities to explain this high degree of willingness to use this type of formalization. First, managers holding collectivistic values value the importance of interpersonal relationships within the organization. Therefore, Vietnamese managers are more inclined to modify their own preferences associated with the formalization of a costing system, and cooperatively try to coordinate their actions with their colleagues to minimize social friction because they have an abiding fear of being separated or disconnected from their group (Bond, 1986; Zhang et al., 2007). Second, managers holding collectivistic values have a strong desire to cooperate (Chen et al., 1998). This cooperation leads to a high degree of managers' willingness to use a coercively formalized costing system, because they perceive the acceptance to use the system as a sign of cooperation. As such, Vietnamese managers from lower management levels rely on rules and policies provided by people from higher management levels to do tasks associated with a costing system, such as analyzing causes of cost variances.

2.2.2. Power Distance

Power distance refers to the extent to which inequality among persons in different positions of formal power is viewed as a natural and possibly desirable aspect of the social order (Hofstede, 1980). Because of this cultural dimension, individuals accept unequal power distributed between them and their bosses, and as such follow their supervisor's orders willingly (Clugston et al., 2000).

We argue that a high power distance may enhance managers' willingness to use a coercively formalized costing system. Adler and Borys (1996) suggested that a high asymmetric power between employees and supervisors leads to coercive formalization. However, when power distance is high managers are more familiar with autocratic leadership, and the overall working environment is fairly structured and formal (Barsoux & Lawrence, 1990). This cultural dimension also forces managers to believe that they should not go against their higher management levels. As a consequence, they tend to be submissive and receptive to the decisions provided by higher management levels (cf.

Bochner & Hesketh, 1994). They thus respect, defer to, and trust higher management levels (cf. Kirkman et al., 2009; Sully de Luque & Sommer, 2000).

3. Research Methodology and Company Background

3.1. Research Methodology

The aim of this study is to discover the impact of cultural dimensions on managers' willingness to use a coercively formalized costing system. Particularly, we focus on how and why two cultural dimensions, namely power distance and collectivism, can influence managers' willingness to use this costing system. This focus allows us to gain insight into the moderating impact of the cultural dimensions on the relationship between adoption of Western management accounting practices and managers' feeling toward the practices in the context of a non-Western society.

Since the aim of this study is to find the answer to 'how' and 'why' questions, a case study method was used (Yin, 2003). This method provides a unique approach for studying behavioral issues associated with a formalization of a costing system. Moreover, the case study method has the distinct advantage of directly being able to observe the interviewees' feelings toward a coercively formalized costing system.

We used semi-structured interviews because the company's policy forbids outsiders to access company's documents. In the interview, we used a set of questions, which cover two main topics: (1) the design of the costing system and (2) decision-making associated with the costing system. Supplementary questions were asked to elaborate on interviewees' feelings about information sharing and the usefulness of cost data for operational activities. Prior to the interviews, we consulted a general overview of the managerial structure of the organization on the company website. In order to gain the participants' trust, we asked some simple questions relating to their background and their job descriptions. This made the participants more comfortable with the interview situation and it simulated honesty.

The interviews were all conducted by one of the researchers in the interviees' mother tongue. We did not use a tape recorder because interviewees in this country rarely agree to discussions about their job when being recorded, even if their name is anonymized. Hence, we wrote down their responses to the questions as quickly as

possible. These notes included some direct quotes. To reduce participants' social desirability bias (Dunk & Perera, 1997), whereby interviewees might try to give answers they think interviewers want rather than expressing how they truly feel, the purpose of the study was explained at the beginning of the interview. For instance, we used some statements (e.g. I am a little confused about this point?; Can you describe it more in detail?) to allow interviewees to elaborate on a particular point.

3.2 Company Background

Company A is considered one of the biggest companies operating in the Vietnamese dairy industry. The principal activities of this company are producing and distributing products derived from milk for both domestic and international markets. This company was established in 1976 as a state-owned company. Before 1986, like other Vietnamese state-owned companies, the company's production and sales quota were imposed by the central government under the central planning system. Thanks to the abandonment of the old system and the adoption of the market-oriented socialist economy under state guidance, this company is currently no longer restricted to quota and has gained sufficient autonomy in production. In an attempt to obtain an external source of capital for technological development and expansion, the company went public by offering IPO on the Vietnamese Stock Exchange and was recently legally transformed into a joint-stock company. The company owns more than 40% of the domestic market shares and exports its products internationally. We selected this particular company because a focus on one of the top leaders in the dairy industry could ensure the adoption of Western management accounting practices.

The structure of this company is as follows. The headquarters of this company are located in the centre of the South of Vietnam. The company has 13 manufacturing plants located across the country, owns two logistic centers responsible for warehousing and transportation, and three subsidiaries responsible for the assurance of quality and stability of raw materials (see Figure 1). Manufacturing processes among these plants can be similar or identical because of the uniformity of processes. In addition, top managers of this company emphasize the importance of material control because the materials constitute more than 70% of the company's expenses.

The case study was taken in plant C, located south of the headquarters of the company. This plant was established in 2001 and has three manufacturing processes, which produce three different dairy products (e.g. milk, yogurt, and condensed milk). The total number of employees is 250 people. We could only conduct our study in one plant of this company, namely Plant C, due to strict company policies. More specifically, we visited this plant from mid-July 2014 to mid-September of 2014. During this time, we interviewed 11 managers working at this plant (see Table 1).

4. Case Description

During the interviews, two types of employees were referred to, namely the local managers and the people from higher management levels. The local managers are the interviewees, who work at the plant and are responsible for manufacturing processes. The people from higher management levels are management accountants working at the accounting and planning departments of the headquarters.

First, we analyzed whether the company formalized its costing system in a coercive way. Next, we asked questions associated with managers' willingness to use the system and daily tasks related to the system, such as joint investigations of variances between managers and management accountants.

4.1. A Coercively Formalized Costing System

The organization centralizes decision-making associated with the costing system. The management accountants decide on the design of the costing system, more specifically the design of the standard costing system, without the managers' inputs. The accountants only provide standard rates to the managers in order to analyze cost variances at the plant level.

> "We only know about the standard rates but do not know how to get to these numbers. People in the planning department provide us the rates. We use these rates to compare with actual rates (variance analysis) in order to control costs of the plant…." (Interviewee 6)

Furthermore, the managers have a lack of work autonomy associated with the costing system. For instance, the company's policies require them to send reports to the management accountants when there are variances.

> "I need to report to the chief executive director of the plant and these reports will be sent to the planning department at the headquarters. The accountants will further examine the issues and provide us the instructions." (Interviewee 3)

Furthermore, the managers have limited options for actions. They are not allowed to adjust or change anything regarding procedures, rules, and settings associated with the costing system. If the managers want to change them, they need to ask for permission. Such situation leads to a strict control on the managers.

> "We don't know about the allocation rules (e.g. cost allocation methods). The managers at the headquarters only provide us the standard rates to control the costs of our plant.... They control everything relating to the costs of the plant. If we want to change these rates, we need to ask for permission." (Interviewee 2)

In summary, the formalization of the costing system is coercive. This formalization requires the local managers to follow organizational rules and policies provided by the management accountants to complete their tasks associated with the costing system. The management accountants rely on these rules and policies to control managers' tasks. As such, the managers have a lack of autonomy to accomplish their tasks.

4.2. Willingness to Use a Coercively Formalized Costing System

During the interviews, the managers showed a high degree of willingness to use the costing system even if the costing system was formalized in a coercive way. The managers indicated that the system allows them to gain effectiveness in cost management. In particular, the managers showed a high degree of willingness to use standard rates for analyzing cost variances even if these rates are provided by the

management accountants. By using these rates in variance analysis, they can identify the cause of variances in manufacturing processes and take actions.

> "These numbers (standard material rates) are useful. Although I do not know much about these numbers, they help me to control actual cost easily. I can compare these numbers with the actual numbers (variance analysis) so that I can identify any problem in my responsible processes. Some problems are caused by the quality of the material or by an exceptional event." (Interviewee 3)

The managers believe that people from higher management levels have more power to control tasks of people at lower management levels. In this way, people from higher management levels, such as the management accountants, are responsible for providing orders, instructions, and commands associated with the costing system and the managers from lower management levels have a responsibility to follow them.

> "They are from the headquarters. They have more power so that we (the managers) have to follow rules set by them." (Interviewee 8)

The managers also rarely reason about and question the formalization. They are more dependent on and trust the management accountants. The managers prefer the management accountants to provide instructions and rules associated with the costing system. The managers view the standard rates as instructions.

> "I have never thought about it. They provide us and I follow it. Isn't it obvious?" (Interviewee 10)

> "Why would I doubt about them? These numbers are provided by the management accountants. They are accountants and we are technicians. They know more about accounting numbers than us. Our job is to deal with technical stuff. So I think it is better for the organization if we follow these numbers." (Interviewee 10)

The second quote from interviewee 10 also reflects that the managers emphasize the importance of organizational goals, such as effective cost management. They believe that using standard rates provided by the management accountants allows their organization to gain effectiveness in cost management. As such, they are willing to use the costing system although the formalization of the costing system allows the headquarters, specifically the management accountants, to control the managers' tasks.

> "This approach allows the headquarters to control actual costs in every plant… Controlling sometimes makes us stressful, but it is obvious to do that." (Interviewee 1)

In summary, a coercively formalized costing system does not negatively impact on managers' feelings toward the costing system. The managers are willing to use the system although the formalization allows the management accountants to control their tasks, and as such results in a low degree of work autonomy. In daily activities associated with the system, such as joint variance analysis, the managers are willing to use to the system to control cost even if the system requires the managers to report and follow the orders of the management accountants.

4.3. Joint Variance Analysis

Cost variances can be caused by three possible factors. First, human mistakes cause ineffectiveness in manufacturing processes. In order to detect the cause of ineffectiveness, the managers examine their own area of responsibility to assure that every step in a procedure is strictly and correctly followed. An inappropriate step, which is not fully followed, can result in unfavorable cost variances.

The second cause of the cost variances is the technology of the manufacturing processes. More specifically, variation in technology leads to variation in consumed material. It is typical that a plant is equipped with the most advanced technology at the time the plant is built. The difference in age of plants leads to the variation of technology equipped among plants. The more advanced technology allows a manufacturing process

to consume less material than an out-of-date one because of the lower number of technical failures.

The third cause is a variation of material quality. The organization purchases material from many suppliers, which in turn leads to variations of material quality. Bad quality of material causes unfavorable cost variances. The managers do not have sufficient information to further investigate material quality due to the strict policies, which inhibit people from lower management levels to access confidential information (e.g. material suppliers, cost performance of other plants). Hence, the managers need to report the cost variances to the management accountants, who further investigate this.

> "The rates can vary because we purchase materials from many suppliers. Sometimes, the standard rates are not accurately set. In this case, I need to report the variances to the headquarters." (Interviewee 3)

The third potential cause of variances requires joint investigation between managers and the management accountants. The management accountants cooperatively investigate the accuracy of the information recorded by the managers. The former gather additional information by closely examining other processes, which have similar, or identical characteristics. The management accountants compare the performance (e.g. material consumed) between two similar or identical processes, and in turn ensure the accuracy of the recorded information.

> "It is not easy to convince them. They will ask other managers for further information. These managers are responsible for the manufacturing processes in other plants. And more importantly, these processes are identical to ours. By asking these managers responsible for these processes to send a report, they can compare actual rates generated by activities within two processes. Based on comparisons, they will respond." (Interviewee 3)

There are two possible responses from the management accountants. First, if the management accountants recognize the same issue in other plants, which use the same

material provided from the same supplier, the management accountants will conclude that the cause of variances is due to material quality, and identify the name of the supplier. Then the accountants adjust the standard rates in the costing system and alert the managers.

> "Standard material rates are not consistent over time. The rates vary due to inconsistent quality of material purchased from different suppliers. As a result, the quality of the material is difficult to control. Especially, when our company purchases from new suppliers, the likelihood of change is high…. If the other managers experience the same issues, the management accountants will change the rates" (Interviewee 10)

The joint investigation also reflects cooperation between different departments of the headquarters. When the management accountants identify the supplier who provides bad quality material, the management accountants send a report to the material department of the company. The report allows the material department to take actions on the supplier.

> "One possible response resulting from the supplier is a reduction of the material price. Another one is that the supplier promises to provide additional material without additional payments. They also probably give a discount for the next purchase." (Interviewee 10)

> "The supplier will reduce the price of the bad material. If they do not do anything, we will no longer purchase material from this supplier." (Interviewee 7)

Second, if the management accountants do not observe "the same issue", they refuse to adjust the rates and require the managers to search and eliminate the cause of variances. In addition, the management accountants provide performance information about other managers. The information shows that other managers, who are responsible

for a similar or identical process as the managers working at the Plant C, have no issue associated with the variance. The information motivates the managers to search for the cause of variances.

> "We need to re-investigate the issued process one more time. There is something wrong within the process that we have not identified yet. This causes the differences. If the managers in other plants can do that, we can do it too." (Interviewee 1)

The above quote shows the cooperative behavior of this manager. He is willing to search for the cause of the variance one more time without questioning because he values the importance of group goals, such as effective cost management.

In summary, joint variance analysis illustrates the characteristics of a coercive formalization, and provides evidence that the managers are willing to use the system in variance investigations.

5. Case Analysis

The interviewees show a high willingness to use a coercively formalized costing system. More specifically, the managers from plant C continue using cost data for cost management in daily activities, even if the system is formalized in a coercive way. The coercive formalization of the system inhibits the managers to influence the components of the system (e.g. standard rates). And the coercive formalization requires the manager to strictly follow procedures, rules and policies to operate manufacturing processes and to frequently report to the accountants if there are cost variances. Taken together, both characteristics demonstrate a dominant role of the accountants in the decision-making associated with the costing system because of the lack of autonomy provided to the managers (cf. Adler & Borys, 1996). The coercive formalization would negatively affect managers' feelings if culture dimensions were not taken into account. Based on a difference in the degree of individualism/collectivism and power distance, we propose that a coercively formalized costing system is appropriate in a Vietnamese context because the formalization is consistent with the Vietnamese culture.

5.1. The Impact of Power Distance and Collectivism on Managers' Willingness to Use the System

Vietnamese individuals score high on the dimension of power distance and Vietnam belongs to collectivistic societies. These two characteristics may create a high degree of willingness to use the coercively formalized costing system. First, high power distance increases managers' willingness to use the system. On the one hand, this cultural norm influences managers' belief that people from higher management levels, such as the management accountants, have more power and play an important role in the provision of instructions and orders associated with the costing system (cf. Hofstede, 1980). The managers prefer the accountants to behave autocratically and not to consult them and view the accountants as 'good fathers' to trust and depend on (cf. Hofstede, 1984). The 'fathers' are responsible for setting rules and orders, which the managers are strictly required to follow. On the other hand, the management accountants also expect that the managers strictly follow their rules and orders. Hence, this cultural norm is a mental program automatically shaping managers' feelings, and therefore the managers accept this formalization, which in turn leads to a high willingness to use the coercively formalized costing system (cf. Lamet al., 1999).

Furthermore, a high degree of collectivism also contributes to a high degree of managers' willingness to use the system. As suggested by the literature on cross-cultural differences, collectivists, who are more likely to emphasize the importance of group relationships, are more inclined to modify their own preferences and positions to conform to a group and behave more cooperatively than the individualists (Bond, 1986). As a result, the managers have never demanded a provision of personal preferences and inputs associated with the costing system without being asked. Such demand would possibly be against the group interests and possibly creates a feeling of separation or group disconnections (Zhang et al., 2007). Consequently, they accept the dominant role of the management accountants in the decision-making associated with the costing system. Additionally, the managers emphasize interdependence and view themselves as a part a larger group rather than separate units because of being collectivists (Markus & Kitayama, 1991). They prefer to interdependently work and commit to their group

benefits rather their own benefits (Kim et al., 1990; Kirkman & Shapiro, 2000). This emphasis on interdependence among group members, such as the managers and the management accountants, allows a high degree of members' contribution to group objectives, such as effective cost management (cf. Chatman & Flynn, 2001). It also leads to strong cooperation between these two parties because both of them strongly desire and emphasize cooperation among group members (Chatman & Barsade, 1995). As a coercively formalized costing system allows the managers to cooperate with other group members, such as the management accountants, they show a positive feeling toward to the system, which in turn results in a high degree of willingness to use the system. In summary, collectivistic values drive the managers to automatically follow rules and orders of their group. As such, they are willing to use the costing system in order to maintain the group integrity (e.g. relationships) as well as to achieve the group goals, such as effective cost management.

5.2. Joint Variance Analysis

Collectivistic individuals are more likely to prefer team-based work arrangements over individualized work arrangements (Hofstede, 1980; Triandis et al., 1988). However, if individuals referred to variance analysis as an 'out-group' cross-functional task, there would be no impact of collectivism on managers' willingness to cooperate with the management accountants (see Brewer, 1998). However, because the managers refer to management accountants as 'in-group' members, they view joint variance analysis as an 'in-group' rather 'out-group' cross-functional task. As such, they are more willing to cooperate with them.

5.3. Institutional Collectivism

According to House et al. (2004), institutional collectivism reflects the degree to which organizational and societal institutional practices encourage and reward collective distribution of resources and collective action. First, this form of collectivism drives the local managers to interdependently act with other organizational members. Second, it also encourages the managers to be loyal to their plant by establishing a performance evaluation system to maximize collectivistic interests (e.g. plant rewards) although this

system undermines managers' individual interest. Third, this form of collectivism allows rewards to be driven by managers' seniority or within-group equity. Finally, this form of collectivism fosters collectivistic decision making (e.g. management accountants cross-check information before making a decision regarding the change of standard rates). The influence of institutional collectivism on local managers is illustrated in table 3.

5.4. Alternative Explanations

There are several alternative explanations that suggest managers' high willingness to use a coercively formalized costing system. The economic condition of the organization is the first one. Organizations suffering from economic crisis can be expected to formalize their costing systems in a coercive way in order to survive. In such instances, organizational employees have no other choice than accepting the system. However, at the time of the interviews, organizational performance was outstanding. Besides, as stated above, this organization is considered as the strongest company working in the dairy industry in Vietnam. Therefore, economic conditions do not seem to create a bias on our findings.

Another explanation may be that managers are willing to use a coercively formalized costing system because of a high likelihood of getting fired if they do not accept the system. However, Vietnamese regulations are higher than average in the employment laws and collective relations laws indexes, which suggest that the cost of firing employees is high; it is also illegal to fire or replace a striking worker (Botero et al., 2004). Besides, all the interviewees signed a permanent contract with the company and there is a strong labor union. As a result, we argue that managers' acceptance of a coercively formalized costing system is not driven by their fear of getting fired easily. We conclude that the second alternative explanation is invalid in our study.

6. Conclusions, Limitations and Directions for Future Research

This study sought to improve our understanding of managers' feelings associated with Western management accounting practices in the Vietnamese context. Specifically, the goals of this study were to investigate the impact of two cultural dimensions, such as power distance and collectivism, on managers' willingness to use a coercively formalized

costing system. Our case shows that these two cultural dimensions positively influence managers' willingness to use the system. In addition, our findings suggest that managers' behavior is influenced by institutional collectivism.

Our findings are in the line with prior cross-culture studies, which show that two cultural dimensions, such as power distance and collectivism, moderate the relationship between formalization of organizational structure and individuals' feelings toward this formalization. Harrison et al. (1994) found that these two dimensions together influence individuals to accept a lack of work autonomy and in turn assume decisions made by higher management levels. Similarly, Newmand and Nollen (1996) showed that in this culture, individuals from lower management levels also embrace a lack of emphasis on individuals in work groups, which result in higher group performance. The findings are also in line with the study of Brewer (1998). He predicted that high power distance causes employees to prefer top-down approaches (e.g. not inputs) in the implementation of ABC systems. Consistent with these three studies, our findings suggest that these two cultural dimensions positively affect managers' willingness to use a coercively formalized costing system.

Furthermore, our results are in agreement with prior studies on the process of planning and control in the East Asian region, which have shown that companies in this region are more likely to formalize their planning and control processes in a coercive way. In comparison to companies in Australia and the United States, companies in East Asian countries, such as Singapore and Hong Kong, formalize their processes of planning and control to be more rule-oriented, and more rigidly and tightly administered from higher management levels (Harrison et al., 1994). In addition, in comparison to the United States, Japanese companies also prefer centralized formalization, which allows decisions made by higher management levels and more reliance on formal rules (Chow et al., 1994). Efferin and Hopper (2007) also showed that the ways in which Chinese owners control their employees' behavior are characterized by a low degree of participative planning and a high degree of centralization. Consistently, our case study showed that Company A coercively formalized its costing system, which allows coercive control from people from higher management levels, such as the management accountants.

Our study has a number of limitations. The first limitation of this paper is the limited number of interviewees. Therefore, the findings are subject to selection bias because we interviewed only 11 managers during 3 months in one plant of a company. The second limitation of this paper also results from a focus on one plant of the company. We could not observe the feelings of the management accountants working at the headquarters. As we argued that the accountants also exert cooperative behavior in the joint variance analysis, interviewing only the managers working at Plant C cannot ensure the accuracy of the argument. However, it does not heavily affect the finding of this paper because we focus on the managers at the low hierarchical levels of Company A. Third, we argued that management accountants' cross-checking of information is a characteristic of institutional collectivism because it encourages group decision making. However, only the management accountants make the final decision, which also includes the plant managers' feedback regarding the standard rates.

Finally, we suggest some potential ways for future research. First, it would be interesting to investigate the degree of managers' willingness to use coercively formalized costing system in other Vietnamese companies. Second, it would be worthwhile to investigate other dimensions of national culture. Such a study would allow a complete understanding of the impact of cultural dimensions on the link between the adoptions of foreign management accounting practices on local individuals' feelings toward the practices.

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Figure 1: Location of the case unit in the group hierarchy.

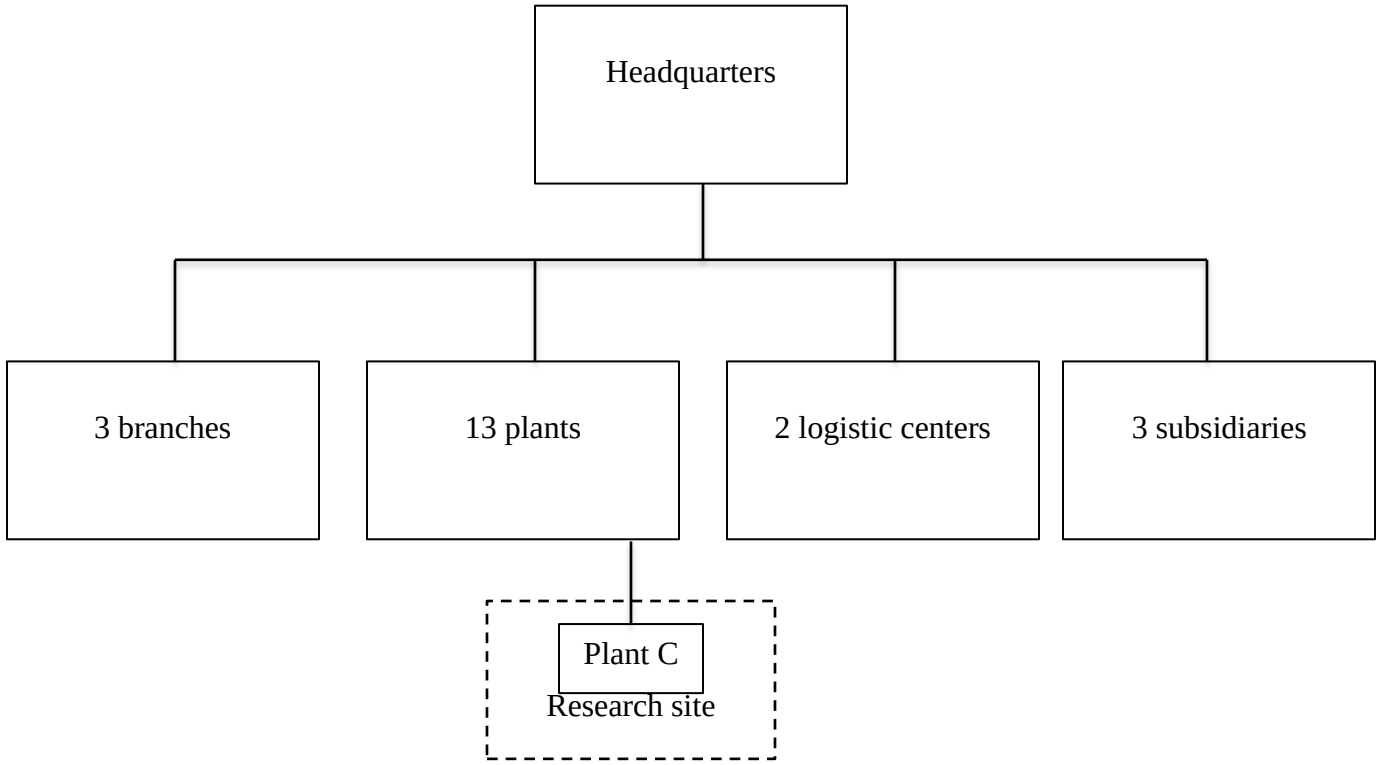

Table 1. Details of the interviewees

Round	Who	Job title	Gender	Age	Background	Interview duration (approximately)
1st	Interviewee 1	Chief executive director of the plant C	Male	52	Ph.D in microbiology	60 minutes
	Interviewee 2	Head of the planning and accounting department of the plant C	Female	39	Bachelor of finance	70 minutes
2nd	Interviewee 3	Material management manager of the milk production process.	Male	37	Bachelor in food technology	50 minutes
	Interviewee 4	Machine operation manager of the milk production process.	Male	36	Bachelor in mechatronic engineering	55 minutes
	Interviewee 5	Maintenance manager 1	Male	40	Bachelor in mechanical engineering	35 minutes
	Interviewee 6	Maintenance manager 2	Male	42	Bachelor in mechanical engineering	60 minutes
3rd	Interviewee 7	Material management manager of the yogurt production process.	Male	34	Bachelor in food technology	50 minutes
	Interviewee 8	Machine operation manager of the yogurt production process.	Male	37	Bachelor in mechatronic engineering	45 minutes

4th	Interviewee 9	Material management manager of the condensed-milk production process.	Male	35	Bachelor in food technology	60 minutes
	Interviewee 10	Machine operation manager of the condensed-milk production process.	Male	34	Bachelor in mechatronic engineering	35 minutes
	Interviewee 11	Packaging manager	Male	39	Bachelor in mechanical engineering	45 minutes

Table 2. The coercively formalized costing system

Indicators	Quotes	Interviewees
Lacks of work autonomy	"We only know about the standard rates but do not know how to get to these numbers. People in the planning department provide us the rates"	Interviewee 6
	"I need to report to the chief executive director of the plant and these reports will be sent to the planning department at the headquarters. The accountants will further examine the issues and provide us the instructions."	Interviewee 3
	"They control everything relating to the costs of the plant. If we want to change these rates, we need to ask for permission."	Interviewee 2
	"This approach allows the headquarters to control actual costs in every plant"	Interviewee 1
	"I have to check whether the employees strictly follow the procedures provided by the headquarters. An inappropriate procedure leads to excessive material consumption."	Interviewee 10
	"Procedures, rules, and rules are given by the headquarters. We follow them to operate our plant."	Interviewee 1
	"Manufacturing plans can be changed if only the headquarters approve"	Interviewee 7
	"Most of important decisions relating to our plant are from the headquarters. As a result, they ask us to send report on a frequent basis to know our plant's situation"	Interviewee 9

Table 3. The impact of cultural dimensions on interviewees' willingness to use the system

Dimensions	Indicators	Quotes	Interviewees
Power distance	Belief of people from high management levels having more power	"They are from the headquarters. They have more power so that we (the managers) have to follow rules set by them."	Interviewee 8
		"I have never thought about it. They provide us and I follow it. Isn't it obvious?"	Interviewee 10
		"The director of the plants is always credited when there is a improvement idea although this idea is not originally from him. If someone claims that the idea does not belongs to him, that person is in trouble. He is our boss, and we need to respect him."	Interviewee 3
		"Normally, improvement ideas are from high position people in our plants."	Interviewee 7
	Interdependent	"Why would I doubt about them? These numbers are provided by the management accountants. They are accountants and we are technicians. They know more about accounting numbers than us. Our job is to deal with technical stuff. So I think it is better for the organization if we follow these numbers."	Interviewee 10
		"It is not easy to convince them. They will ask other managers for further information. These managers are responsible for the manufacturing processes in other plants. And more importantly, these processes are identical to ours. By asking these managers responsible for these processes to send a report, they can compare actual rates generated by activities within two processes. Based on comparisons, they will respond."	Interviewee 3

Institutional collectivism	Group loyalty	“We need to re-investigate the issued process one more time. There is something wrong within the process that we have not identified yet. This causes the differences. If the managers in other plants can do that, we can do it too.”	Interviewee 1
	Encouragement of group's interest	"The headquarters reward us based on the plant’s cost performance. The lowest total cost plants are ranked higher than the highest cost ones. These top-performed plants receive more bonus"	Interviewee 2
	Rewards based on seniority and/or within-group equity	“The plant’s bonus is allocated based on some criteria such as positions, working experience, individual performance evaluation…. Higher position people are received more bonus than the lower position ones…. "	Interviewee 6
	Group decision-making	"It is not easy to convince them. They will ask other managers for further information. "	Interviewee 3
		"If the other managers experience the same issues, the management accountants will change the rates”	Interviewee 10

CHAPTER 4 - THE IMPACT OF COSTING SYSTEM FUNCTIONALITY CHARACTERISTICS ON MANAGERS' CREATION OF BUDGETARY SLACK

ABSTRACT: The aim of this paper is to investigate the impact of costing system functionality characteristics on managers' creation of budgetary slack. In particular, we propose that a costing system that provides a higher level of detail, has a higher ability to classify costs according to their behaviour, reports cost information more frequently and calculates more types of variances, reduces budgetary slack. Questionnaire data from 86 Belgian managers were used to test the proposed model. We found that only the level of cost information detail and the number of variances are related to superiors' ability to detect budgetary slack, which, in turn, is associated with managers' creation of budgetary slack. Taken together, our results suggest that a costing system that provides more detail and calculates more variances allows superiors to detect budgetary slack more effectively, and as a result, limits managers' creation of budgetary slack.

KEYWORDS: budgetary participation; budgetary slack; costing system functionality; slack detection.

1. Introduction

The accounting literature has identified four functionality characteristics of costing systems, namely the level of cost information detail provided, the ability to classify costs according to their behaviour, the frequency of cost reporting and the number of variances calculated. Although these characteristics can influence managers' beliefs about the relevance and usefulness of cost data (Pizzini, 2006), there is no research on the link between these characteristics the use of costing systems for control purposes. The present study fills this void by investigating managers' creation of budgetary slack. Prior experimental studies have revealed that information precision (Hannan et al., 2006) and the existence of a variance investigation policy (Webb, 2002) influence honesty in managerial reporting. These studies, however, did not specifically investigate costing systems. By examining the impact of costing system functionality characteristics on managers' creation of budgetary slack, the present study addresses this shortcoming. Our hypotheses were tested with questionnaire data from 86 Belgian managers.

In line with Dunk and Nouri (1998), Merchant (1985) and Onsi (1973), who argued that an effective management control system can enhance superiors' ability to detect budgetary slack, we first examine the link between the four costing system functionality characteristics and superiors' ability to detect budgetary slack. We find that the level of cost information detail and the number of variances are indeed related to superiors' ability to detect budgetary slack. As expected, superiors' ability to detect budgetary slack is also negatively associated with managers' creation of budgetary slack. Although prior studies have intensively investigated the impact of management control systems on budgetary slack (Simons, 1989; Kren, 1993), little attention has been paid to how the specific features of a costing system are associated with superiors' ability to detect budgetary slack. As such, the findings of this study contribute the budgeting literature.

Our results also specifically extend the results of two prior experimental studies. First, Webb (2002) showed that the existence of a variance investigation policy reduces managers' creation of budgetary slack because they are afraid of being held accountable for the causes of variances (Prendergast, 1997). This study, however, did not capture the extent to which variances are calculated or superiors' ability to detect budgetary slack. When more types of variances are calculated, it can be expected that superiors are better

able to detect budgetary slack because they can conduct more detailed variance investigations. Our research extends Webb's (2002) study by examining the impact of the extent to which variances are calculated on superiors' ability to detect budgetary slack. In particular, our results suggest that subordinate managers are less likely to create budgetary slack when costing systems calculate more variances because these allow superiors to better seek for the accountability for budget variances.

Second, Hannan et al. (2006) proposed that managers trade off the benefits of their creation of budgetary slack against the benefits of appearing honest. On the one hand, managers want to increase the likelihood that they will obtain desired outcomes (e.g., monetary rewards) in the future, which forces them to create budgetary slack. Such behaviour may, for instance, be induced by performance-based compensation (Jensen, 2003). On the other hand, managers are also aware of the advantages of honestly proposing budget plans; that is, they perceive the self-esteem associated with social approval as beneficial (Leary, et al., 2003). The experimental study of Hannan et al. (2006) suggests that when an information system becomes more precise, managers must forgo greater benefits of misrepresentation (e.g., monetary rewards) in order to achieve the same appearance of honesty. As a result, they are less inclined to honestly propose budget plans, such that budgetary slack is higher. Our study contradicts this finding by revealing that when a costing system provides a greater level of detail, superiors are better able to detect budgetary slack, which, in turn, reduces managers' creation of budgetary slack.

Finally, although Pizzini (2006) found three of the four functionality characteristics of costing systems to be related to managers' belief about the relevance and usefulness of cost data, this belief was not different for costing systems that calculate more types of variances. As such, our finding that a greater number of variance calculations is positively associated with superiors' ability to detect budgetary slack, complements the results of Pizzini's (2006) study.

The remainder of this paper is structured as follows. The next section reviews the literature. Section 3 presents the hypotheses development. Section 4 describes the data collection and variable measurement. Section 5 shows the results. The last section concludes, discusses the limitations and offers suggestions for future research.

2. Literature Review

2.1. Budgetary Slack

Prior literature describes budgetary slack as a way used by managers to influence standards, against which their performance will be evaluated. Managers deliberately understate their budget proposals in order to easily achieve good evaluation (Lukka, 1988). Dunk and Nouri (1998) defined budgetary slack as "the intentional underestimation of revenues and productive capabilities and/or overestimation of costs and resources required to complete a budgeted task".

The literature on budgeting identified some characteristics to explain managers' creation of budgetary slack (Dunk & Nouri, 1998). First, empirical evidence indicates that budget emphasis is positively related to budgetary slack (Merchant, 1985; Onsi, 1973; Walker & Johnson, 1999) because it enhances the importance of budget targets for responsibility centre managers' social and economic rewards (Hopwood A. , 1972; Otley D. T., 1978; Dunk A. S., 1995; Merchant, 1985). Second, although budgetary participation may lead to better performance thanks to managers' increased morale, sense of control and commitment (Locke & Latham, 1990) as well as information exchange between managers and their superiors (Shields & Shields, 1998), it also provides managers with an opportunity to intentionally influence budget targets (Lukka, 1988) and build budgetary slack (Young, 1985). Third, information asymmetry describes settings where managers and their superiors have different private information (Lambert, 2001). When managers have an informational advantage, they can misrepresent the information to negotiate easier targets and create budgetary slack (Kirby et al., 1991). Fourth, uncertainty refers to the lack of information for planning (Chapman, 1997; Galbraith, 1973; Macintosh, 1985) and creates an incentive for the managers to create budgetary slack as a way of hedging against the lack of predictability (Brownell & Dunk, 1991; Lukka, 1988; Merchant, 1985).

Managers' creation of budgetary slack may be limited by an effective slack detection system, i.e. a system that provides relevant information to superiors to detect budgetary slack (Dunk & Nouri, 1998). In this paper we argue that superiors' ability to detect slack is determined by the functionality characteristics of costing systems.

2.2. Functionality Characteristics of Costing Systems

The accounting literature has defined four important characteristics contributing to a costing system's functionality. The first characteristic, the level of detail provided by a costing system, refers to the system's ability to supply cost information about cost objects that vary in size from entire divisions to individual products, components and services (Chenhall & Morris, 1986; Kaplan & Norton, 1992; Karmarkar et al., 1990). The second characteristic is the ability to separate and classify costs according to their behaviour (Feltham & Xie, 1994; Johnson, 1992; Karmarkar et al., 1990). The third characteristic, the frequency of reporting, allows users to expediently address problems and identify opportunities for improvement (Hilton, 1979; Karmarkar, Lederer, & Zimmerman, 1990; Simons, 1987). The final characteristic, the number of variances calculated, highlights differences between budgeted and actual outcomes and the degree to which such variances are explained (Karmarkar, Lederer, & Zimmerman, 1990; Khandwalla, 1972; Simons, 1987). A costing system that provides a high level of cost information detail, has a high ability to classify costs according to their behaviour, frequently disseminates cost information throughout the organization and calculates various types of variances, can be expected to produce more useful and relevant cost information for decision making (Pizzini, 2006). In the next section, we will relate each of these four functionality characteristics of costing systems to superiors' ability to detect slack.

3. Hypotheses Development

Our research model is summarized in Figure 1.

INSERT FIGURE 1 ABOUT HERE

3.1. Level of Detail Provided

The level of cost information detail refers to the extent to which cost information is collected, processed by costing systems and presented to managers in various forms depending on the managerial purpose of cost analysis (Karmarkar et al., 1990; Shank & Govindarajan, 1993). Chenhall and Morris (1986) found that managers perceive an information system as useful in uncertain environments when the system accurately provides information about the impact of specific events on different functions. Feltham (1977) analytically demonstrated that the decision-making process regarding prediction and forecasting is more useful when managers use detailed rather than aggregated

information. As a result, a costing system that provides more detailed cost data can enhance managerial belief of relevance and usefulness of cost information (Pizzini, 2006).

In a similar vein, we expect a costing system that provides a high level of cost information detail to increase superiors' ability to detect budgetary slack. Detailed cost information is more beneficial than aggregate cost information in forecasting or predicting budgets for the next year (Feltham & Xie, 1994). It allows superiors to analyze in-depth the cost budgets proposed by managers at different levels (e.g., activities, products, customers). As such, this information allows superiors to question, debate and reason with subordinate managers about the appropriateness of their budgets, which, in turn, enables superiors to detect slack in subordinates managers' budget proposals. Hence, our first hypothesis proposes a positive association between the level of detail provided by a costing system and superiors' ability to detect budgetary slack.

H1: the higher the level of detail provided by a costing system, the higher superiors' ability to detect budgetary slack.

3.2. Ablity to Classify Costs According to their Behaviour

The ability to classify costs according to their behaviour directly supports the ability to provide highly detailed of cost information. Indeed, correctly classifying costs according to their behaviour is the first step to have accurate cost information at detailed levels (Cooper & Kaplan, The design of cost management systems: Text, cases, and readings. , 1991). In particular, direct costs must be traced to products and indirect fixed and variable costs must be allocated to products. This requires costing systems to separate and classify costs as direct/indirect and fixed/variable. Costs can also be categorized into controllable and non-controllable costs, which aids performance evaluation (Feltham & Xie, 1994). Accordingly, we argue that a costing system enhances superiors' ability to detect budgetary slack when it has the ability to classify cost according to their behaviour. This reasoning leads to our second hypothesis.

H2: the higher the ability of a costing system to classify costs according to their behaviour, the higher superiors' ability to detect slack.

3.3. Frequency of Cost Reporting

The frequency of cost reporting allows managers to expediently address problems and find opportunities for operational improvement (Hilton, 1979; Karmarkar et al., 1990; Simons, 1987). According to Chenhall and Morris (1986), the perceived usefulness of a management accounting system is higher when it generates frequent reports and provides managers with feedback on decisions and information on recent events that they can use to guide future courses of action. In particular, in uncertain environments, a high frequency of cost reporting allows managers to receive more information when the pressure of cost control is increased (Coombs, 1987). In addition, in a cost-volume-profit decision setting, managers also highly value a costing system that provides more timely information (Hilton, 1979). As a result, a costing system that provides frequent cost reporting stimulates the usefulness and relevance of cost information (Pizzini, 2006).

Frequent provision of information allows superiors to assess the conditions of managers' operational environments. This enables them to gain insight into managers' working environment, and it in turn reduces the degree of asymmetric information between superiors and managers. As such, a higher frequency of cost reporting increases superiors' ability to detect budgetary slack. Consequently, our third hypothesis predicts a positive association between the frequency of reporting and superiors' ability to detect budgetary slack.

H3: the more frequently a costing system reports information, the higher superiors' ability to detect budgetary slack.

3.4. Extent to Which Variances are Calculated

Variance analysis allows managers to highlight differences between planned and actual outcomes and search for the causes of variances in order to explain the differences (Karmarkar, Lederer, & Zimmerman, 1990; Simons, 1987). Proponents of variance analysis suggest that it aids managerial decision-making processes by identifying corrective managerial actions (Johnson & Kaplan, 1987). As such, variance analysis also helps managers in controlling costs when there are uncertainties in both task technology (Ouchi, 1979) and output (Cooper et al., 1981). By specifying cost targets and measuring performance associated with these targets, managers use variance analysis to allocate resources consumed by processes and measure their performance. By using variance

analysis, managers compare processes that are similar or identical to each other, to identify ineffectiveness and inefficiencies.

Variance analysis can aid superiors to specify cost targets, allocate resources to managers, and measure the performance of managers in budgetary control (see Pizzini, 2006). If a costing system calculates variances to a great extent (e.g., calculates more types of variances), superiors are better able to detect budgetary slack by using variance analysis to closely monitor managers' performance. In particular, superiors are likely to pay more attention to large unfavourable cost variances (Merchant, 1989). Hence, we expect the fourth characteristic of a costing system, namely the extent to which variances are calculated, to increase superiors' ability to detect budgetary slack.

H4: the higher the number of variances calculated by a costing system, the higher superiors' ability to detect budgetary slack.

3.5. The Link Between Budgetary Slack Detection and Creation

Previous studies have successfully proven the negative relationship between superiors' ability to detect budgetary slack and managers' propensity to create budgetary slack (Lau & Eggleton, 2003; Lal et al., 1996; Merchant, 1985). This leads to our fourth hypothesis.

H5: the higher superiors' ability to detect budgetary slack, the lower managers' creation of budgetary slack.

4. Research Method

4.1. Data Collection

We collected the data by using an online survey, sent to 3,000 Belgian managers responsible for departments of general management, accounting and finance, manufacturing, HR, marketing, R&D, sales, logistics or information technology. We used individual email addresses obtained from a Belgian commercial mailing list provider holding approximately 300,000 email addresses. We selected only the managers who work in companies with more than 50 employees, because these companies are more likely to have a formal costing system.

The procedure for sending the questionnaire consisted of two phases. In the first phase, we sent out 3,000 emails with a link to access the online survey. In the next phase, we sent a reminder to the respondents who had not completed the questionnaire. After

sending the first invitation emails, 871 emails failed to reach the target respondents due to invalid email addresses, retirement or firm leaving so that the target sample of this study consists of 2,129 managers. In total, 100 answers were returned. Fourteen respondents were removed because of a high degree of missing values (5 respondents) and patterned answers (9 respondents). We removed the observations with patterned answers[8] because *t*-tests revealed significant differences in means between the patterned answers and the other answers. To investigate the possibility of non-response bias, an early/late respondents' analysis was conducted, in which early and late respondents were respectively defined as having sent back the questionnaire after the first email or after the reminder. The results of *t*-tests show a non-significant difference in means (all $p > 0.05$) for all measured constructs. Hence, non-response bias is not a concern of this study. In total, 86 questionnaires were further analyzed, yielding a response rate of 4.04%. The characteristics of the final sample are displayed in Table 1.

INSERT TABLE 1 ABOUT HERE

4.2. Measures

All survey items used to measure the constructs were scored on seven-point Likert scales ranging from 1 (strongly disagree) to 7 (strongly agree), unless stated otherwise. First, we performed an exploratory factor analysis using SPSS to establish the unidimensionality of the constructs and examine the item loadings. More specifically, we conducted a principal axis factoring (PAF) analysis using oblique rotation (direct Oblimin) with Kaiser Normalization (Fabrigar, Wegener, MacCallum, & Strahan, 1999). Second, we calculated Cronbach's alpha of each construct to establish reliability (see Table 2). Third, we investigated multicollinearity by examining the variance inflation factor (VIF) scores of the measurement items and latent variables.

INSERT TABLES 2 AND 3 ABOUT HERE

The level of cost information detail (DETAIL)

We adopted the measurement instrument from Cohen and Kaimenaki (2011). More specifically, respondents were asked to indicate the extent to which costing systems provide cost information that allows them to (1) analyze costs by customer, product, cost

[8] Some respondents chose the neutral option for all answers (i.e. 4). Other respondents indicated increasing (1, 2, 3, etc.) or decreasing (7, 6, 5, etc.) scores.

centre, activity and geographic region, and (2) prepare customized reports according to user specifications. The results of the PAF show that two items (DETAIL_3 and DETAIL_4) should be left out of further analysis because their loadings are too low (i.e. below 0.50). The Cronbach's alpha coefficient of the revised instrument is 0.78, which is higher than the threshold value of 0.70 (Hair, Black, Babin, & Anderson, 2010). It should be noted that this value is also higher than in the study of Cohen and Kaimenaki (2011).

The ability to classify costs according to their behaviour (CLASSIFY)

We again adopted the measurement instrument from Cohen and Kaimenaki (2011). More specifically, we asked the respondents to indicate the extent to which the costing system classifies costs according to following categories: direct and indirect costs, fixed and variable costs, controllable and non-controllable costs. The results of the PAF analysis show that the item CLASSIFY_3 should be deleted due to insufficient loading (i.e. below 0.50). Moreover, these results also reveal that two items measuring CLASSIFY (i.e. CLASSIFY_1, CLASSIFY_2) and two items measuring FREQUENCY (i.e. FREQUENCY_1, FREQUENCY_2) load onto the same component. Hence, we decided to remove the two items measuring CLASSIFY and omit this instrument from further analysis. We acknowledge that this may create a problem of correlated omitted variable bias and will discuss this issue later in section 4.4.

The extent which variances are calculated (VARIANCE)

As in Cohen and Kaimenaki (2011), we asked the respondents to indicate the extent to which the costing system calculates the following types of variances: direct material price variances, direct material quantity variances, direct labour rate variances, direct labour efficiency variances, variable manufacturing overhead variances, fixed manufacturing overhead variances, non-manufacturing overhead variances, and activity cost variances. The results of the PAF analysis show that the item VARIANCE_8 should be left out of further analysis because of insufficient loading (i.e. below 0.50). Furthermore, following the suggestion of Hair et al. (2011), we removed the item VARIANCE_5 because its VIF is above the threshold value of 5. The Cronbach's alpha coefficient of the revised instrument is 0.87, indicating sufficient reliability. This value is also higher than in the study of Cohen and Kaimenaki (2011).

The frequency of cost reporting (FREQUENCY)

This instrument, again adopted from Cohen and Kaimenaki (2011), contains two questions. Respondents are asked to rate the extent to which (1) a costing system provides reports frequently on a systematic, regular basic and (2) a costing system provides information upon request. The Cronbach's alpha coefficient for this instrument is 0.66. Although this value is lower than the threshold value of 0.70 (Hair, Black, Babin, & Anderson, 2010), Hair et al. (2016) suggested that Cronbach's alpha tends to be underestimated in a partial least squares (PLS) model, and researchers should rely more on the average variance extracted (AVE) and composite reliability values (cf. infra).

Superiors' ability to detect budgetary slack (DETECTION)

To measure superiors' ability to detect budgetary slack, we relied on the 3-item instrument of Onsi (1973), which was also used in prior budgeting studies (e.g., Merchant, 1985; Lal, Dunk, & Smith, 1996). Its Cronbach's Alpha is 0.79, which indicates acceptable reliability.

Managers' creation of budgetary slack (SLACK)

Managers intentionally create budgetary slack by setting their budget targets lower than their best guess forecast about the future so that the target becomes easier to achieve (Lukka, 1988). A high degree of slack in the budget enables managers to negotiate easy budget targets. As a result, a high degree of slack in the budget does not require managers to put considerable effort in order to gain a high degree of efficiency (Simons, 1988). To measure the degree of slack in budgetary targets, we relied on the instrument of Dunk (1993). This instrument is valid and reliable as it was used in previous studies on budgetary slack (De Baerdemaeker & Bruggeman, 2015; Dunk A. S., 1993; Indjejikian & Matejka, 2006; Van der Stede, 2000). The results of the PAF analysis show that the loading of item SLACK_1 is too low (i.e. below 0.50) and should be removed. The Cronbach's alpha coefficient of the revised instrument is 0.76 and thus indicates sufficient reliability.

4.3. Control Variables

In this study, we also included two control variables in our model. First, we control for the effect of budget participation (PARTICIPATION) on managers' creation of budgetary slack (SLACK). Although the results of research on the relationship between budgetary participation and budgetary slack are equivocal, the large amount of research on it indicates the importance of controlling for it (De Baerdemaeker & Bruggeman, 2015). We use the well-established six-item instrument developed by Milani (1975) to measure budgetary participation. The results of PAF show that the item PARTICIPATION_3 should be deleted because of insufficient loading (i.e. below 0.50). Moreover, the item PARTICIPATION_2 should also be left out of further analysis because it highly loads onto an unintended component. The Cronbach's alpha coefficient of the revised instrument is 0.80, which demonstrates its reliability.

Second, about half of our sample consists of managers from accounting and finance departments. We controlled for the heterogeneity in our sample by creating a dummy variable GROUP. This variable takes value '0' for managers from accounting and finance departments; all others are coded as '1'.

4.4. Assessment of Common Method Bias

The subjective measures used in this study were gathered from the same source in the same questionnaire, which may create an issue of common method bias. We therefore executed Harman's single-factor test (Podsakoff & Organ, 1986). This test assumes that if a substantial amount of common method variance is present, a factor analysis of all the data will result in a single factor accounting for the majority of the covariance in the independent and dependent variables. More specifically, we performed a PAF analysis on the 25 items measuring our six main variables (DETAIL, FREQUENCY, VARIANCE, DETECTION, SLACK, PARTICIPATION).[9] The results of the test reveal that no single factor accounts for the majority of the variance in the instruments[10] showing that this type bias was not a concern in this study.

[9] Extraction was based on Eigenvalues above 1.0. We also analyzed the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. The KMO measure (0.726) was above the suggested rule-of-thumb threshold of 0.6, which indicates adequate sample size. The Chi-square value for Bartlett's test was large (1,554.33) and significant ($p < 0.001$) implying that the correlation matrix is not an identity matrix. Taken together, these two tests indicate that it is safe to proceed with and interpret the results of the PAF analysis.

[10] The total variance explained by one single factor is 28.73%.

4.5. Assessment of Correlated Omitted Variable Bias

We omitted CLASSIFY due to a correlation between some items measuring CLASSIFY and FREQUENCY. As such, our model may be subject to correlated omitted variable bias because we failed to include CLASSIFY and FREQUENCY at the same time while these two variables are correlated to each other. To further explore this possibility, we replaced FREQUENCY by CLASSIFY and re-ran the model. The consistent results suggest that correlated omitted variable bias may indeed influence our findings. We acknowledge that this is a limitation of our study.

5. Results

5.1. Descriptive Statistics

Table 1 presents the respondents' characteristics as well as the companies' background. 87.21% of our respondents are male. 60.47% labelled themselves as top managers and 33.72% as middle-level managers. 45.35% work at the department of accounting and finance. The number of years the respondents have been working in their organizations and current positions varies greatly. The companies in which they work operate in wide range of different sectors. About half of the companies employ more than 500 people (51.16%).

The inter-correlations among the variables in this study are shown in Table 4. First, we observe significant correlations between DETAIL and all others variables except GROUP. The same holds for DETECTION. Third, FREQUENCY is significantly correlated with DETAIL, VARIANCE, DETECTION and SLACK. Fourth, GROUP is only significantly correlated with VARIANCE. Fifth, PARTICIPATION is significantly correlated with DETAIL, VARIANCE, DETECTION and SLACK. Next, SLACK is significantly correlated with all other variable respectively except GROUP. Finally, VARIANCE is significantly correlated with all other variables.

INSERT TABLE 4 ABOUT HERE

5.2. Hypotheses Testing

Our hypotheses were tested using SmartPLS, a structural equation modelling tool that first assesses the psychometric properties of the measurement model and then estimates the parameters of the structural model. We chose partial least squares (PLS) because this

method makes minimal data assumptions and requires relatively small sample sizes (Hair, Ringle, & Sarstedt, 2011). Moreover, PLS has been used in a number of recent management accounting studies (e.g., Du, Deloof, & Jorissen, 2013; Hall, 2008; Naranjo-Gil, Maas, & Hartmann, 2009).

5.2.1. Measurement Model

First, we evaluated the measurement model by investigating convergent validity, discriminant validity, internal consistency and multicollinearity among variables. To assess convergent validity, we examined the average variance extracted (AVE). An AVE value of 0.50 and higher indicates a sufficient degree of convergent validity, which means that the latent variable explains more than half of its indicators' variances (Fornell & Larcker, Structural equation models with unobservable variables and measurement error: Algebra and statistics, 1981). Table 5 demonstrates that the AVE of all constructs is at least as high as the threshold of 0.50. Moreover, Table 6 shows that all items load highest on their respective construct with a lower bound of 0.521. In line with Fornell and Larcker's (1981) suggestion, they also load higher on their respective construct than on any other. These analyses confirm the convergent validity of our constructs.

After establishing convergent validity, we assessed discriminant validity to ensure that all construct measures are empirically unique and represent phenomena of interest that other measures in the structural equation model do not capture (Hair, Black, Babin, & Anderson, 2010). To determine discriminant validity, we first used the AVE values from Table 5 and, in line with Fornell & Larcker (1981), found that the square root of the AVE for each latent variable is larger than any correlation among any pair of latent variables (see Table 4). Therefore, we conclude that discriminant validity is established (Chin W. W., 1998).

In the next step, we assessed the internal consistency reliability of the measurement model by calculating the composite reliability (CR). Table 5 demonstrates that all composite reliability scores are above the threshold value of 0.70 (Hair, Black, Babin, & Anderson, 2010).

Finally, we assessed multicollinearity among variables by examining the VIF scores. Table 7 indicates that all VIFs are less than the threshold value of 5, which

suggests the absence of multicollinearity among variables (Hair, Ringle, & Sarstedt, 2011).

INSERT TABLES 5, 6 AND 7 ABOUT HERE

5.2.2. Structural Model

The second phase in the PLS analysis is the estimation of the specified structural equations. The path coefficients indicate the strength and direction of the relationships among the latent variables. We assessed the statistical significance of parameter estimates using a bootstrap procedure with 5,000 replacements, as suggested by Hair et al. (2011). In addition, in line with prior accounting research (e.g., Hartmann & Slapničar, 2009), we also examined the predictive validity of the parameter estimates. Tenenhaus, Vinzi, Chatelin, & Lauro (2005) and Vandenbosch (1996) argued that in order to provide sufficient evidence of model fit, it is necessary to examine the Stone-Geisser Q2-test because PLS models lack an index providing the goodness of fit statistics like in variance-covariance-based structural equation models. Q2 values larger than zero for a certain endogenous latent variable indicate the path model's predictive relevance for this particular construct (Chin W. W., 1998; Hair, Ringle, & Sarstedt, 2011). Table 8 shows that the Q2 values of all endogenous variables are greater than zero, suggesting sufficient evidence of model fit. Table 7 also reports the R2 values.

INSERT TABLE 8 ABOUT HERE

Next, we examine the magnitude and strength of the paths, where each of our hypotheses as well as the impact of our two control variables correspond to a specific structural model path (see Figure 2). The results suggest that three hypothesized paths are significant. More specifically, the path between DETAIL and DETECTION is significant ($t = 3.657$, $p < 0.01$), which supports Hypothesis 1. The path between FREQUENCY and DETECTION is not significant ($t = 0.372$, $p = 0.710$), such that Hypothesis 3 is not supported by the data. In line with Hypothesis 4, the path between VARIANCE and DETECTION is significant ($t = 2.615$, $p < 0.01$). As predicted by Hypothesis 5, the path between DETECTION and SLACK is also significant ($t = 2.838$, $p < 0.01$) and in the expected direction. Finally, the two control paths, namely the path between PARTICIPATION and SLACK ($t = 1.469$, $p = 0.142$) and the path between GROUP and SLACK ($t = 0.377$, $p = 0.706$) are not significant. Hence, the results suggest that a

costing system that provides a high level of detail and calculates more types of variances enhances superiors' ability to detect budgetary slack. However, we could not detect a significant association between the frequency of reporting and superiors' ability to detect slack. Finally, in line with previous studies, a high ability to detect budgetary slack is negatively associated with the creation of budgetary slack.

5.2.3. Additional Analysis

We further explored whether or not DETECTION mediates the impact of costing system functionality characteristics (DETAIL, FREQUENCY, VARIANCE) on SLACK. To control for direct effects, we re-ran the model with three additional paths, namely the path between DETAIL and SLACK, the path between FREQUENCY and SLACK and the path between VARIANCE and SLACK. The results show that only two paths are significant, namely the path between DETAIL and DETECTION (t = 3.592, p < 0.01), and the path between VARIANCE and DETECTION (t = 2.484, p = 0.013). The remaining paths are not significant. These results suggest that there is no mediation effect in our model.

Our results suggest that when a costing system frequently provides information, this does not enhance superiors' ability to detect budgetary slack. However, when a costing system frequently provides detailed cost information or frequently calculates many types of variances, this may also enhance superiors' ability to detect budgetary slack. To get insight into these issues, we added the impact of two interactive effects on DETECTION, namely an interaction between DETAIL and FREQUENCY, and an interaction between VARIANCE and FREQUENCY. Our results appear to be robust to this alternative model specification in that only the three previously significant paths remain significant, namely: the path between DETAIL and DETECTION (t = 3.482, p < 0.01), the path between VARIANCE and DETECTION (t = 2.111, p = 0.035), and the path between DETECTION and SLACK (t = 2.892, p < 0.01). Hence, our findings suggest that although detailed cost information and voluminous cost information (i.e. more types of variance calculated) are significantly related to superiors' ability to detect budgetary slack, there is no interactive effect between these characteristics and the frequency of cost reporting.

6. Conclusion, Limitations and Future Research

The purpose of this study was to investigate the impact of four functionality characteristics of costing systems on managers' creation of budgetary slack. More specifically, we hypothesized that a costing system that provides a high level of cost information detail, has a high ability to classify costs according to their behaviour, reports cost information more frequently and calculates more types of variances may enhance superiors' ability to detect slack, which, as a result, could lower managers' creation of budgetary slack. The results of our survey show that a costing system that provides a high detail of cost information and calculates more types of variances enhances superiors' ability to detect budgetary slack, which, in turn, is negatively associated with managers' creation of budgetary slack. Our data, however, did not support our prediction that a higher frequency of cost reporting would be associated with a higher ability of superiors to detect budgetary slack. Moreover, due to measurement problems, we could not examine the hypothesized relationship between the ability to classify costs according to their behaviour and superiors' ability to detect budgetary slack.

The findings of this study complement previous research on budgetary slack in several ways. Our results confirm the argument that an effective information system limits slack creation (Onsi, 1973; Dunk & Nouri, 1998; Merchant, 1985). In particular, Onsi (1973) suggested that budgetary slack could be detected if superiors have enough information to detect it. Merchant (1985) proposed that superiors' ability to detect budgetary slack is improved by investing in a more effective information system, which provides more precise and accurate information. Our results support these two arguments because we showed that a costing system that provides a high level of detail and calculates more types of variances, improves superiors' ability to detect budgetary slack. These two functionality characteristics of a costing system thus allow superiors to gain insight into managers' budgets, which enables them to detect slack in their budgets.

As with any study, the results of our study are subject to some caveats. First, some of the instruments used to measure the functionality characteristics of costing systems appeared to be problematic. In particular, our results show that some items measuring reporting frequency are correlated to the items measuring cost classification. As a result, we omitted the latter instrument from our model and could not test our second hypothesis. We acknowledge that this may create a correlated omitted variable bias. Our results

should thus be interpreted with caution. Second, the heterogeneity of our sample may have contributed to the noisiness of our measures. In particular, 56% of our respondents are working in non-accounting/finance department and their costing system knowledge may be less adequate. In addition, 60% of our respondents are top-level managers. They may be less suited to rate budgetary slack creation. Third, cross-sectional studies such as ours can establish associations, but not causality. Fourth, the response rate in this study is rather low and, consequently, our sample size is rather small. Despite these potential limitations, this study presents a step further in our understanding of the role of costing system functionality characteristics on managers' creation of budgetary lack.

The results of this study suggest some interesting avenues for future research. First, due to the measurement issues we had to omit the ability to classify costs according to their behaviour from our analyses and we could not find a significant effect of cost reporting frequency on superiors' ability to detect budgetary slack. Future research could try to improve the measurement of these instruments in order to fully examine the impact of costing system functionality characteristics on managers' creation of budgetary lack. Second, future studies could investigate whether there are specific conditions under which more frequent cost reporting does improve superiors' ability to detect budgetary slack. Third, because managers working in uncertain environments may insert slack into their budgets to control for uncertainty (Dunk, 1990), it would be interesting to investigate whether the results of our study differ for managers operating in uncertain environments. In particular, it is possible that managers' tendency to create budgetary slack can be mitigated by frequent reporting of information. In uncertain environments, there is a need for more frequent information that is updated to solve problems as soon as they occur. Frequent reporting allows managers to continually adjust their activities in response to the changes in their operational environment (Agbejule, 2005) and control and reduce the degree of environmental uncertainty (Chenhall & Morris, 1986). As such, because a high reporting frequency can enable managers to control uncertainty, they may be less inclined to create budgetary slack. Finally, it should be acknowledged that budgetary slack may also have beneficial outcomes. For instance, slack can allow the pursuit of innovative plans because it causes a relaxation of controls and represents funds whose use may be approved even in the face of uncertainty (Bourgeois, 1981). Yang et al. (2009) found that the quality of information provided by an information system has a

positive and significant influence on innovation performance when the level of budgetary slack is low. Hence, future research could extend this study by examining the impact of costing system functionality characteristics on both budgetary slack as well as innovation performance.

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Table 1. Frequencies and descriptive statistic of the sample

Panel A: Respondent's characteristic			
Frequency			
Gender		Function	
Male	87.21%	General management	15.12%
Female	8.14%	Accounting and finance	45.35%
Not specified	4.65%	Manufacturing technical supports	12.79%
Education		R&D	4.65%
Secondary education or less	1.16%	Sales	4.65%
Professional bachelor	10.47%	Supply chain	3.49%
Academic bachelor	16.28%	Information technology	6.98%
Master	45.35%	Not specified	6.98%
Postgraduate degree	16.28%	Professional level	
PhD	4.65%	Lower-management level	1.16%
Not specified	5.81%	Middle management level	33.72%
		Top management level	60.47%
		Not specified	4.65%

Descriptive statistic	Min	Max	Mean	Std. dev.
Tenure				
Time since graduation	8	46	27.14	8.83
Years in organization	1	39	16.18	10.66
Years in current position	1	37	9.43	7.27

Panel B: Company's background			
Industry		Size	
Processing industry (textiles, food, beverages).	16.28%	50 to 100	1.16%
Construction.	3.49%	101 to 250	15.12%
Productions, manufactures and metal.	15.12%	251 to 500	23.26%
Wholesale and retail trade.	8.14%	501 to 1.000	17.44%
Hotel, restaurant, tourism, consultancy and other service industries.	6.98%	1.001 to 2.000	13.95%
Chemical industry.	8.14%	2001 to 5.000	11.63%
Energy and water.	2.33%	5.001 to 10.000	5.81%
Agriculture and forestry.	1.16%	> 10.001	2.33%
Logistic and transportation	13.95%		
Communication.	2.33%		
Banking and insurance.	3.49%		
Health care or welfare services.	5.81%		
IT	3.49%		
Other	9.30%		

Table 2. Measurements of variables

	Cronbach's alpha	Cronbach's alpha
DETAIL	0.79	0.78
The cost accounting systems provide data that allows you to analyze costs by the following aspects (1-7 scale).		
• Customer	X	X
• Product	X	X
• Cost center	X	
• Activity	X	
• Geographic region	X	X
• The cost accounting systems allow the preparation of customized reports according to user specifications	X	X
CLASSIFY	0.69	
The cost accounting systems categorize costs into the following ways		
• Direct and indirect costs	X	
• Fixed and variable costs	X	
• Controllable and non-controllable costs	X	
FREQUENCY	0.66	0.66
Please indicate the extent to which you agree with the following statement.		
• The cost accounting systems provide reports frequently on a systematic, regular basic.	X	X
• The cost accounting systems provide information upon request.	X	X
VARIANCE	0.89	0.87
The cost accounting systems calculate the following variances.		
• Direct material price variances	X	X
• Direct material quantity variances	X	X
• Direct labor rate variances	X	X
• Direct labor efficiency variances	X	X
• Variable manufacturing overhead variances	X	
• Fixed manufacturing overhead variances	X	X
• Non-manufacturing overhead variances	X	X
• Activity cost variances	X	
DETECTION	0.79	
To what extent you agree with each of the following statements regarding your cost budgets (1-7 scale).		
1. Top management has enough information to know if there is slack in my area of responsibility's	X	

operating cost budgets.		
2. Top management receives detailed information on the activities by area of responsibility and product.	X	
3. Top management has a way to know if there is slack in my area of responsibility's operating cost budgets.	X	
SLACK	0.77	0.76
To what extent you agree with each of the following statements regarding your cost budgets (1-7 scale).		
1. I succeed to submit the cost budgets that are easily attainable.	X	
2. The cost budget targets have not caused me to be particularly concerned with improving efficiency in my area of responsibility.	X	X
3. The cost budget targets require costs to be managed carefully in my area of responsibility because of budgetary constraints. *	X	X
4. Targets incorporated in the cost budget are difficult to reach. *	X	X
5. The cost budget targets induce high productivity in my area of responsibility. *	X	X
6. The cost budgets set for my organizational entity are not particularly demanding.	X	X
PARTICIPATION	0.81	0.80
To what extent you agree with each of the following statements regarding your involvement in cost budgets (1-7 scale).		
1. I am involved in setting all portions of my cost budget.	X	X
2. The reasoning provided by my supervisor when cost budget revisions are made is very logical.	X	
3. I very frequently state my requests, opinions or suggestions about the cost budget without being asked.	X	
4. I have a high amount of influence on the final cost budget.	X	X
5. My contribution to the cost budget is very important.	X	X
6. When the cost budget is being set, my supervisor seeks my requests, opinions and/or suggestions very frequently.	X	X

Table 3. Descriptive statistics of variables.

	Min	Max	Mean	Std. dev.
DETAIL	1.50	6.75	5.03	1.23
FREQUENCY	1.00	7.00	5.42	1.23
VARIANCE	2.00	7.00	4.87	1.24
DETECTION	1.67	7.00	5.07	1.13
SLACK	1.40	6.40	3.26	1.00
PARTICIPATION	2.00	7.00	5.59	0.93
GROUP	_	_	_	_

Table 4. Inter-correlations of constructs

		1	2	3	4	5	6	7
DETAIL	Correlation							
	p-value							
FREQUENCY	Correlation	.376**						
	p-value	0.000						
VARIANCE	Correlation	.528**	.466**					
	p-value	0.000	0.000					
DETECTION	Correlation	.543**	.251*	.507**				
	p-value	0.000	0.020	0.000				
SLACK	Correlation	-.364**	-.326**	-.382**	-.375**			
	p-value	0.001	0.002	0.000	0.000			
PARTICIPATION	Correlation	.240*	.128	.281**	.289**	-.354**		
	p-value	0.026	0.240	0.009	0.007	0.001		
GROUP	Correlation	-.166	.012	-.243*	-.071	.112	-.203	
	p-value	0.127	0.914	0.024	0.519	0.304	0.061	

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

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

Table 5. AVE, $\sqrt{\text{AVE}}$, and composite reliability

	Composite Reliability	AVE	$\sqrt{\text{AVE}}$
DETAIL	0.860	0.607	0.779
FREQUENCY	0.853	0.744	0.863
VARIANCE	0.905	0.615	0.784
DETECTION	0.876	0.703	0.838
SLACK	0.830	0.500	0.707
PARTICIPATION	0.861	0.609	0.780
GROUP	1.000	1.000	1.000

Table 6. Cross-loadings and VIFs

	DETAIL	FRE-QUENCY	VARIAN-CE	DETEC-TION	SLACK	PARTI-CIPATION	GROUP	VIF
DETAIL_1	**0.773**	0.135	0.360	0.442	-0.313	0.286	-0.155	1.620
DETAIL_2	**0.838**	0.264	0.435	0.456	-0.299	0.125	-0.107	2.050
DETAIL_5	**0.707**	0.288	0.383	0.369	-0.233	0.141	-0.107	1.443
DETAIL_6	**0.794**	0.496	0.468	0.421	-0.283	0.192	-0.146	1.836
FREQUENCY_1	0.367	**0.884**	0.491	0.231	-0.236	0.089	-0.054	1.317
FREQUENCY_2	0.275	**0.841**	0.302	0.200	-0.335	0.136	0.084	1.317
VARIANCE_1	0.323	0.423	**0.790**	0.330	-0.284	0.241	-0.096	2.924
VARIANCE_2	0.399	0.257	**0.751**	0.385	-0.394	0.247	-0.245	2.421
VARIANCE_3	0.317	0.355	**0.677**	0.308	-0.347	0.289	-0.274	1.822
VARIANCE_4	0.466	0.384	**0.783**	0.466	-0.379	0.207	-0.246	2.205
VARIANCE_6	0.369	0.310	**0.859**	0.403	-0.165	0.172	-0.141	3.167
VARIANCE_7	0.556	0.463	**0.834**	0.452	-0.241	0.196	-0.145	2.946
DETECTION_1	0.476	0.223	0.435	**0.812**	-0.240	0.252	-0.153	1.566
DETECTION_2	0.453	0.235	0.452	**0.864**	-0.472	0.267	-0.046	1.668
DETECTION_3	0.439	0.163	0.379	**0.838**	-0.185	0.197	0.030	1.838
SLACK_2	-0.204	-0.346	-0.277	-0.215	**0.630**	-0.143	0.141	1.288
SLACK_3	-0.153	-0.213	-0.164	-0.286	**0.793**	-0.265	0.047	1.656
SLACK_4	-0.182	-0.224	-0.212	-0.217	**0.549**	-0.049	-0.008	1.278
SLACK_5	-0.430	-0.274	-0.468	-0.399	**0.821**	-0.379	0.112	1.442
SLACK_6	-0.229	-0.121	-0.124	-0.117	**0.723**	-0.281	0.080	1.585
PARTICIPATION_1	0.251	0.079	0.248	0.363	-0.218	**0.762**	-0.058	1.678
PARTICIPATION_4	0.095	-0.008	0.093	0.211	-0.093	**0.698**	-0.012	1.764
PARTICIPATION_5	0.233	0.115	0.164	0.191	-0.306	**0.847**	-0.119	1.970
PARTICIPATION_6	0.144	0.134	0.297	0.189	-0.353	**0.806**	-0.303	1.356
DEPARTMENT	-0.166	0.012	-0.243	-0.071	0.112	-0.203	**1.000**	1.000

Table 7. VIFs between latent constructs

	1	2	3	4	5	6	7
DETAIL				1.429			
FREQUENCY				1.317			
VARIANCE				1.568			
DETECTION					1.091		
SLACK							
PARTICIPATION					1.132		
GROUP					1.043		

Table 8. R^2 and Q^2

	R^2	Q^2
DETAIL	-	-
FREQUENCY	-	-
VARIANCE	-	-
DETECTION	0.364	0.217
SLACK	0.208	0.053
PARTICIPATION	-	-
GROUP		

Figure 1. Research model

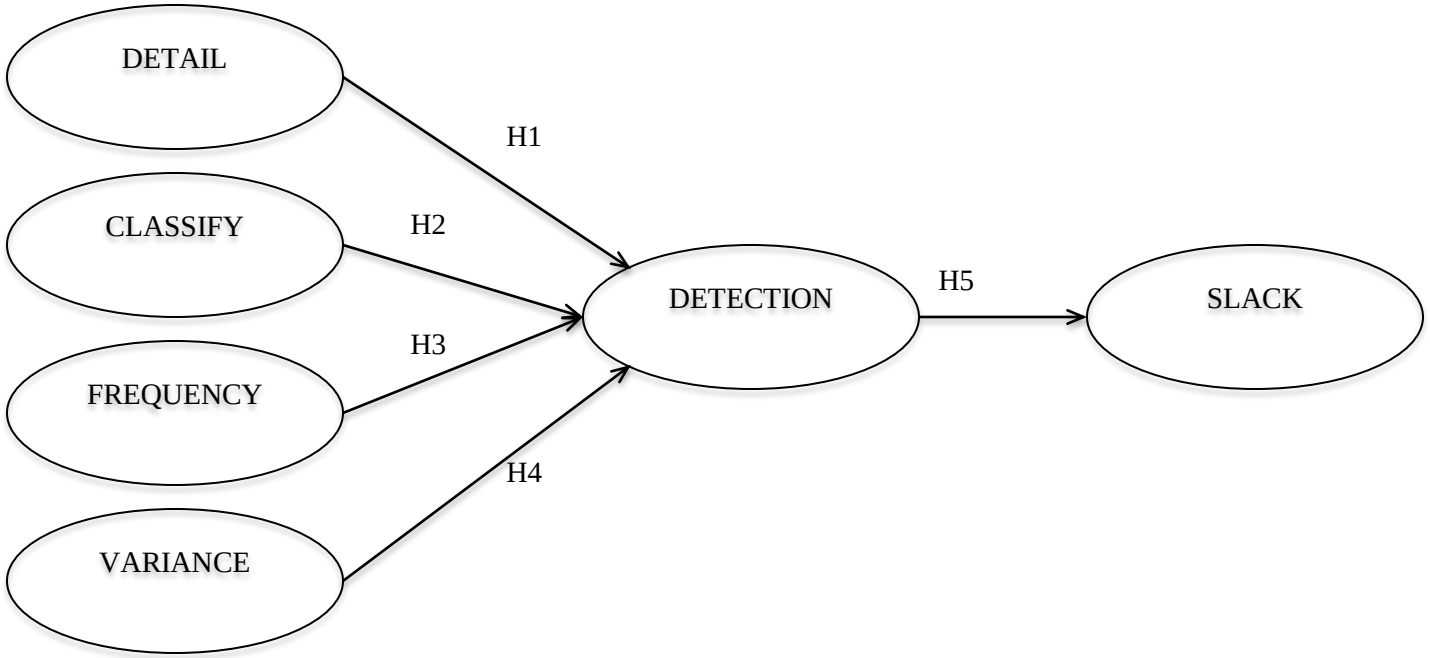
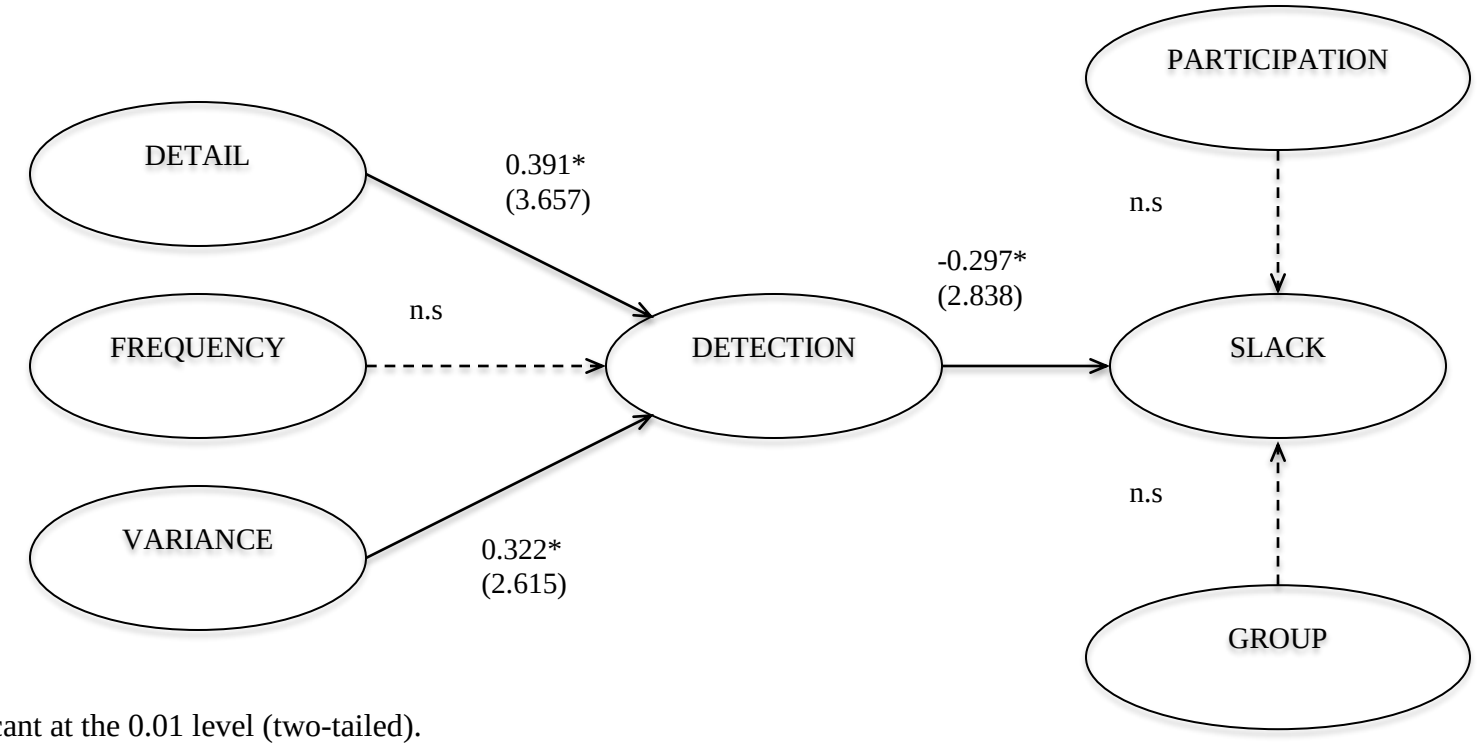


Figure 2. Results of the structural model with path coefficients (associated t-statistics are in parentheses)



*Significant at the 0.01 level (two-tailed).

Appendix. Survey questions

Managers' creation of budgetary slack (SLACK)

Please indicate to what extent you agree with each of the following statements regarding your cost budgets**.**

Scale: 1 (strongly disagree) – 7 (strongly agree)

a. I succeed to submit the cost budgets that are easily attainable.
b. The cost budget targets have not caused me to be particularly concerned with improving efficiency in my area of responsibility.
c. The cost budget targets require costs to be managed carefully in my area of responsibility because of budgetary constraints. *
d. Targets incorporated in the cost budget are difficult to reach. *
e. The cost budget targets induce high productivity in my area of responsibility. *
f. The cost budgets set for my organizational entity are not particularly demanding.

* Items are reversed scored

Propensity to create budgetary slack

Please indicate to what extent you agree with each of the following statements.

Scale: 1 (strongly disagree) – 7 (strongly agree)

a. In good business times, my superior is willing to accept a reasonable level of slack in my cost budgets.
b. Slack in the cost budgets is good to do things that cannot be officially approved.
c. To protect himself/herself, a business-unit manager submits cost budgets that can safely be attained.
d. To be safe, a business-unit manager sets two levels of cost budgets: one between himself/herself and his/her subordinates, and another between himself/herself and his/her superior.

Superiors' ability to detect budgetary slack (DETECTION)

Please indicate to what extent you agree with each of the following statements regarding your cost budgets**.**

Scale: 1 (strongly disagree) – 7 (strongly agree)

a. Top management has enough information to know if there is slack in my area of responsibility's operating cost budgets.
b. Top management receives detailed information on the activities by area of responsibility and product.
c. Top management has a way to know if there is slack in my area of responsibility's operating cost budgets.

Variance investigation policy

Please indicate to what extent you agree with each of the following statements regarding to variance investigation.

Scale: 1 (strongly disagree) – 7 (strongly agree)

a. I am required to trace the cause of unfavorable cost variances of my cost budgets to groups or individuals within my area of responsibility.
b. My explanation of unfavorable cost variances of my cost budgets is included in performance reports.
c. My superiors discuss cost budget items with me when unfavorable cost variances of my budgets occur.
d. I am required to submit an explanation about causes of large unfavorable cost variances.

Budgetary participation (PARTICIPATION)

Please indicate to what extent you agree with each of the following statements regarding your involvement in cost budgets.

Scale: 1 (strongly disagree) – 7 (strongly agree)

a. I am involved in setting all portions of my cost budget.
b. The reasoning provided by my supervisor when cost budget revisions are made is very logical.
c. I very frequently state my requests, opinions or suggestions about the cost budget without being asked.
d. I have a high amount of influence on the final cost budget.

e. My contribution to the cost budget is very important.
f. When the cost budget is being set, my supervisor seeks my requests, opinions and/or suggestions very frequently.

The level of cost information detail (DETAIL)

Please indicate to what extent you agree with each of the following statements.

Scale: 1 (strongly disagree) – 7 (strongly agree)

The cost accounting systems provide data that allows you to analyze costs by the following aspects.

- Customer
- Product
- Cost center
- Activity
- Geographic region
- The cost accounting systems allow the preparation of customized reports according to user specifications

The ability to classify cost according to their behavior (CLASSIFY)

Please indicate to what extent you agree with each of the following statements.

Scale: 1 (strongly disagree) – 7 (strongly agree)

The cost accounting systems categorize costs into the following ways:

- Direct and indirect costs
- Fixed and variable costs
- Controllable and non-controllable costs

The extent to which variances are calculated (VARIANCE)

Please indicate the extent to which you agree with the following statement.

Scale: 1 (strongly disagree) – 7 (strongly agree)

The cost accounting systems calculate the following variances.

- Direct material price variances
- Direct material quantity variances

- Direct labor rate variances
- Direct labor efficiency variances
- Variable manufacturing overhead variances
- Fixed manufacturing overhead variances
- Non-manufacturing overhead variances
- Activity cost variances

Frequency of cost reporting (FREQUENCY)

Please indicate the extent to which you agree with the following statement.

Scale: 1 (strongly disagree) – 7 (strongly agree)

a. The cost accounting systems provide reports frequently on a systematic, regular basic.
b. The cost accounting systems provide information upon request.

Purpose of costing system use

Please indicate the extent to which you agree with the following statement.

Scale: 1 (strongly disagree) – 7 (strongly agree)

Users rely on cost accounting information to make decisions regarding following aspects.

- Cost reduction
- Product pricing
- Performance measurement
- Cost modeling
- Budgeting
- Customer profitability analysis
- Product output decisions
- New product designs
- Stock valuation

Information asymmetry

Please indicate to what extent you agree with each of the following statements regarding information transparency**.**

Scale: 1 (strongly disagree) – 7 (strongly agree)

a. My superior is in possession of better information regarding the activities undertaken in my area of responsibility.
b. My superior is more familiar with the input-output relationships inherent in the internal operations of my area of responsibility.
c. My superior is more certain of the performance potential of my area of responsibility.
d. My superior is more familiar technically with the work of my area of responsibility.
e. My superior is better able to assess the potential impact of external factors on the activities of my area of responsibility.
f. My superior has a good understanding of what can be achieved in my area of responsibility.

CHAPTER 5 - CONCLUSION

The aim of this dissertation is to examine the impact of costing systems on managers' behavior when these systems are purposely used for problem-solving, attention-directing and scorekeeping. In particular, the first study investigates how managers' participation in costing system design enhances their problem-solving skills, and as such improve the quality of their decision-making regarding to process improvements. The second study focuses on the behavioral effects of the use of costing system for control purposes and explains how and why culture has a positive impact on lower managers' willingness to use a coercive formalized costing system. Finally, the third paper finds out which functionality characteristics enhance superiors' ability to detect managers' creation of budgetary slack, when a costing system is used as a performance measurement system.

This last chapter summarizes the main conclusions of the dissertation. Furthermore, the contextual and methodological limitations are discussed and opportunities for future research are highlighted. This chapter ends with an elaboration on the theoretical contributions and the implications for practice.

INSERT FIGURE 1 ABOUT HERE

1. Main Findings

1.1. Study 1 – The impact of participation in costing system design on process improvements

The purpose of this study was to investigate the impact of managers' participation in costing system design on process improvements. It is hypothesized that this relationship is driven by two mechanisms: autonomous motivation for cost management and the perceived usefulness of cost information. The results of the survey show that managers' participation in costing system design is positively associated with both their autonomous motivation for cost management and their perceived usefulness of cost information. However, only the perceived usefulness of cost information is significantly related to process improvements. The data do not support the predicted effect for autonomous motivation. In particular, although participation in costing system design enhances managers' autonomous motivation for cost management, this increase in motivation as

such does not seem to drive process improvements. Process improvement thus appears to be a matter of better process knowledge rather than a higher autonomous motivation for reducing costs.

Regarding the findings, this study provides some unique contributions. First, with respect to the literature on cost accounting, this study complements prior work on the potential of ABC information to improve business processes (e.g., Hoozée & Bruggeman, 2010; Innes & Mitchell, 1990). In particular, we refine the results of these studies by unraveling the mechanisms that enable participation to result in process improvements.

Second, our study contributes to the literature on participation by highlighting the importance of cognitive mechanisms over motivational mechanisms in explaining why participation could lead to process improvements. This is in line with Locke et al. (1997), who argued that studies on participation, instead of focusing on motivational mechanisms, should be redirected to investigate cognitive mechanisms because the efficacy of participation as an organizational process lies not only in its potential to promote motivation or commitment, but also in its ability to facilitate information exchange and knowledge transfer. As such, participation in the design process of a costing system may enable managers to improve their business processes. In addition, by showing that a participative system design strategy could actually be used to enhance motivation, we clarify equivocal results of previous research on the link between participation and motivation in the context of budgeting (cf. Mia, 1989). According to Brownell and McInnes (1986), the inconsistent results in budgeting studies investigating the participation-motivation relationship may be due to differences in the approaches used to measure motivation. We addressed their concern by using well-developed scales from research on self-determination theory to measure autonomous motivation. As such, we also contribute to the growing body of accounting evidence on the effects of autonomous motivation, for example regarding subordinates' work effort induced by subjective performance evaluation (Kunz, 2015) and managers' creation of budget slack (De Baerdemaeker & Bruggeman, 2015).

Finally, by surveying managers from different hierarchical levels and demonstrating how their involvement in costing system design may foster process improvements, our results extend the literature on business process management. In

particular, business process reengineering is typically considered as a top-down approach because it focuses on the role of top management and ignores the role of middle management (Bashein, Markus, & Riley, 1994). As a result, employees, and especially middle-level managers, are more likely to resist to change, which may cause business process reengineering to fail (Hall, Rosenthal, & Wade, 1993; Terziovski, Fitzpatrick, & O'Neill, 2003). Indeed, our results reflect the crucial role of participation in costing system design, in that it fosters managers' knowledge about their business processes and, as such, increases their perceived usefulness of cost information, which, in turn, stimulates process improvements.

1.2. Study 2 - A study of manager's willingness to use a coercively formalized costing system: the moderating effects of national culture.

This study sought to improve our understanding of managers' feelings associated with Western management accounting practices in the Vietnamese context. Specifically, the goals of this study were to investigate the impact of two cultural dimensions, power distance and collectivism, on managers' willingness to use a coercively formalized costing system. This case shows that these two cultural dimensions positively influence managers' willingness to use the system. Because of a high degree of this willingness, these managers use this system to direct management accountants' attention to focus on operational exception, and cooperatively identify the causes of these exceptions.

These findings provide valuable contributions to the literature on management accounting in several ways. First, this study extends formalization research in management accounting (e.g., Ahrens & Chapman, 2004; Wouters & Wilderom, 2008) by taking into account the impact of cultural dimensions on individuals' feelings toward formalization. Second, these findings are in line with a commonly accepted view that national culture causes management accounting practices to differ across countries (cf. Ahrens, 1996; Carr & Tomkins, 1998; Chow et al., 1999) and that a consistency between local culture and these practices fosters positive effects on individuals (cf. Newman & Nollen, 1996). Third, by focusing on Vietnam, we extend the cross-cultural literature on management accounting research in developing countries by investigating a country apart from China (Hopper et al., 2009).

1.3. Study 3 – The impact of costing system functionality characteristics on managers' creation of budgetary slack

The purpose of this study is to investigate the impact of four functionality characteristics of a costing system on managers' creation of budgetary slack. In particular, this study hypothesizes that a costing system, which provides a high level of cost information detail, classifies more costs according to their behavior, reports costs frequently, and calculates more variances, enhances superiors' ability to detect slack, which as a result lowers managers' creation of budgetary slack. The results of the survey show that a high level of cost information detail provided and a great extent of variance calculated are associated with a high ability to detect budgetary slack, which is, in turn, is negatively associated with managers' creation of budgetary slack. The data, however, do not support the hypothesis that a higher frequency of cost reporting would enhance superiors' ability to detect budgetary slack. Thus, managers' creation of budgetary slack is detected by a costing system that provides a high detail of cost information and calculates more variances rather than by a system providing cost information on a frequent basis. This study could not examine the relationship between the ability to classify costs according to their behavior and superiors' ability to detect budgetary slack because the results of our analysis show that two items measuring this functionality characteristic and two items measuring the frequency of cost reporting load on the same component.

The findings contribute to the budgeting literature in following ways. First, we extend the budgeting literature by examining the impact of management control system on superiors' ability to detect budgetary slack by considering a costing system as a performance measurement system. Dunk and Nouri (1998), Merchant (1985) and Onsi (1973) argued that an effective management control system might enhance superiors' ability to detect budgetary slack. As a result of being a component of a management control system, a performance measurement system allows superiors gain insight into performance managers' capacity, and in turn reduces managers' creation of budgetary slack (Kren, Control system effects on budget slack, 1993). In a similar vein, our results reveal that a costing system is a performance measurement system because the more cost information detail provided, or the more types of variances calculated, the higher

superiors' ability to detect budgetary slack. Furthermore, although prior studies have intensively investigated the role of management control systems on budgetary slack (Simons, 1989; Kren, 1993), limited attention has been paid to the influence of specific cost control features on superiors' ability to detect slack. Our results suggest that two costing system functionality characteristics, namely the levels of cost information details and the types of variances calculated, play an important role in managing budgetary slack.

Furthermore, our results also empirically extend the results of two experiments. First, Webb (2002) experimentally showed that variance investigations reduce managers' creation of budgetary slack because the managers are afraid of being held accountable for the cause of the variances. However, this study focused on a variance investigation policy and does not capture the extent to which variances are calculated. The more variances are calculated the higher superiors' ability to detect budgetary slack because they allow variance analysis to a deeper extent. Our study hence extends Webb's study by examining the impact of the extent to which variances are calculated on managers' creation of budgetary slack. Second, Hannan, Rankin, and Towry (2006) proposed that subordinate managers realize a trade-off between misinterpreting their private information to create budgetary slack and maintaining a positive impression to their superiors by honestly proposing truthful budgets. The results of this study indicate that the managers are less likely to manipulate their budgets when there is a precise information system because this system allows superiors to gain a high ability to detect misinterpretations in managers' budgets. Our study extends this aspect by examining the impact of a high level of cost information detail provided by a costing system on superiors' ability to detect budgetary slack, which in turn reduces managers' creation of budgetary slack.

Finally, our findings provide a possible explanation for the results of Pizzini's study (2006). Her results show that a costing system that calculates more variances does not enhance managers' belief about the relevance and usefulness of cost data. Our findings reveal that a high degree of variances calculated is significantly related to superiors' ability to detect budgetary slack. This suggests that managers may find this

functionality characteristic to be irrelevant and useless because it allows their superiors to detect their creation of budgetary slack.

2. Limitations

This dissertation is subject to some caveats. First of all, the first and the third study use the same population. In particular, the population of these studies was purchased from a Belgian company. By using the same population, these two studies have the same limitation regarding to the characteristics of the sample. For example, the majority of respondents is accounting and finance department. It leads to the heterogeneity issues in both studies. Besides, an issue, that more than 50% of respondents are from top management levels, challenges the appropriateness of target respondents in the third study. Specifically, it is probably less relevant when the questionnaire asks top managers how they rate their creation of budgetary slack.

Second, this limitation is directly related to the operationalization of measurements in the third study, compared to the first and third studies. In the first study, we operationalized the constructs found in the literature and we provided a definition of terminologies used in the questionnaire. By doing so, respondents feel more comfortable with these terminologies and understand the meaning of these terminologies. In contrast, in the third study, we did not provide such definitions. I adapted these measurements from a study in Greece without taking to account the importance of clear definitions as well as the consistency between measurements and literatures. As a result, some terminologies such as cost pools, or activities may have been not clear to non-academic people, as such it causes a potential limitation of the third study.

Third, we acknowledge that the third study lacks a strong theoretical underpinning. In the first study, I built a research model by using the participation literature. This literature has been intensively examined in different contexts, and as such more reliable. Different to the first paper, I did not use a strong literature basis to build the research model in the third paper.

Four, there are some limitations directly related to the second study. One limitation is the method used in this study. In particularly, I used a case-based method in this study, and as a result it is difficult to control all factors, which may influence

managers' willingness to use. As a result, managers' willingness to use a coercively formalized costing system can be argued due to other factors rather than culture. Another limitation is due to time constraint. In particular, I spent two months interviewing the Vietnamese managers and I could only interview managers in one plant of the company. Limited time allowed me to interview these managers only once, and as a result it may affect the quality of the paper.

Finally, a limitation is directly related to the first study due to the terminology used. In this study, I did not ask respondents whether their participation was related to the design of a new costing system or to a redesign of an existing system. As a result, it is likely that some of the respondents participated in a re-design rather than a design process.

3. Suggestions for Future Research

This dissertation examines three purposes of costing system use, namely problem-solving, attention-directing and scorekeeping, and each of them respectively influence managers' behavior. Based on the findings of this dissertation, we propose some fruitful avenues for future research.

First, future research could extend our third study by examining the impact of costing system functionality characteristics on budgetary slack when managers work in an uncertainty environment. Managers working in uncertain environments may insert slack into their budgets to control for uncertainty (Dunk, 1990), It would be interesting to investigate whether the results of this study differ for managers operating in uncertain environments.

Second, future study should examine how four functionality characteristics have an impact on both budgetary slack and innovation performance. It is argued that slack facilitates innovation because it causes a relaxation of controls and represents funds that can be used to pursuit innovative plans (Bourgeois, 1981). The results of the third study show that two characteristics reduce slack. As a result, it may reduce innovation performance. However, the quality of information provided by an information system positively influences on innovation performance when budget slack is low (Yang et al., 2009). Future studies should address this.

Third, future studies may also examine negative effects caused by participation. It is suggested that user participation in information systems can lead to conflicts (Robey, 1982). As a result I suggested that future studies should investigate whether or not participation in costing system design may trigger conflicts between participants.

Finally, future studies may explore whether managers' behavior also depends on the way the costing system is used. A fruitful way is to investigate benefits of interactive versus diagnostic use of cost measurement and reporting systems. Interactive use of costing systems fosters work autonomy, and satisfies people's needs of autonomy (see Simons, 1995). Interactive use of cost information can provide a forum for challenging and debating underlying managers' data, assumptions, and action plans (Simons, 1991). As such, it can foster the needs of competence and relatedness. In other words, interactive use of a costing system as a control system can foster autnomous motivation (Ryan & Deci, 2000).

4. Practical Implications

This dissertation provides a number of important practical implications.

First, when an organization intends to implement a new costing system, it is necessary to use a participatory approach in the design process of this system. This approach allows non-accounting users, namely managers to participate in the design process of the system. Allowing managers to participate in costing system design not only enhances manager's willingness to use the costing system but also encourages managers to understand the usefulness of cost information, which in turn results in more contributions to process improvements.

Second, this dissertation is valuable for organizations in high power distance/high collectivism countries that adopt a specific type of costing system formalization. The results of the second study indicate that Vietnamese managers show positive feelings towards to a coercively formalized costing system, and are willing to use this system because of cultural conditions. These results are crucial because an adoption of foreign management accounting practices, namely a specific form of costing system formalization, without considering the impact of culture can affect employees' feelings, and may result in a low degree of willingness to use this system.

Third, the results of the third study provide some practical implications for organizations that aim to use a costing system to control budgetary slack. Particularly, these results reveal that a costing system that provides a high degree of cost information detail and calculates more variances enhances superiors' ability to detect budgetary slack, which results in a low degree of managers' creation of budgetary slack. These results imply that organizations that want to reduce budgetary slack should invest in a costing system that provides more cost information detail and calculates more variances.

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Figure 1. Dissertation results