UNSW Business School

Accounting Research Seminar Series
Term 3, 2019

Performance Measurement System Design Choices, Top Management Team Conflict, and Consequences for Innovation Ambidexterity

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Date: Friday Oct 4, 2019
Time: 3.00pm – 4.00pm
Venue: BUS 119
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ABSTRACT
Drawing on theories of social psychology, this study examines how performance measure system design choices (i.e. broad scope and integration) influence the effects of two types of conflict (i.e. cognitive and affective) between top management team (TMT) members on innovation ambidexterity outcomes. Based on cross-sectional data collected from a survey of 90 top managers, our findings indicate that broad scope amplifies the positive effects of cognitive conflict. In contrast, integration suppresses both the positive effects of cognitive conflict as well as the negative effects of affective conflict. These findings suggest that while PMS with broad scope information is beneficial, there is a trade-off with integrated PMS for the achievement of innovation ambidexterity outcomes.

Keywords: Performance measurement systems; scope; integration; cognitive conflict; affective conflict.
1.0 Introduction

Performance measurement systems (PMSs) have become widely adopted in practice (Franco-Santos et al., 2012). The performance measurement literature argues that the appeal of PMSs are that they provide a broad overview of firm performance across multiple dimensions through a set of quantified metrics. This information enhances the capacity of managers to evaluate organizational activity and make decisions that maximise the long-term performance of the firm (De Geuser, Mooraj, & Oyon, 2009; Kaplan & Norton, 1996, 2000). Research investigating the implications of PMSs for organization level outcomes, such as the development of organizational capabilities (e.g. Chenhall, 2005; Choi et al., 2013; Fried, 2010; Widener, 2007) and performance (e.g. Crabtree & DeBusk, 2008; Davis & Albright, 2010; Ittner et al., 2003), has typically conceptualised PMSs as a single practice, even though there are multiple design decisions that go into constructing a PMS. As a result, the effects of distinct design choices on organization level outcomes are not well understood.

A more recent stream of research has investigated how certain design choices influence psychological processes and decision outcomes at the individual level (e.g. Burney et al., 2009; Cheng & Humphreys, 2012; Hall, 2008, 2011; Humphreys et al., 2016; Taylor, 2010). While this research has been insightful, less is known about how the design of the PMS influences cognitive processes and their effects at the group level. Decisions that are of strategic importance to firms are often undertaken by groups such as the top management team (TMT), rather than individual managers (Hambrick & Mason, 1984; Carpenter et al., 2004), and PMSs are a primary information source used by TMTs during decision-making (Neely et al., 2000). The purpose of this study is to extend understanding in this area by examining how PMS design choices influence the effects of socio-cognitive processes within the TMT.

Specifically, we examine the two main design choices that underpin what have come to be known as comprehensive PMS (Homburg et al., 2012; Hall, 2008, 2011) – the scope or diversity of performance measures captured, and the degree of integration between measures and objectives in the form of causal linkages. Although a comprehensive PMS incorporates both attributes, i.e. they are broad in scope and have a high degree of integration, in practice there is variation in how PMS are configured. Moreover, as prior literature suggests that these attributes are associated with different social (Burchell et al., 1980; Tuomela, 2005) and cognitive (Taylor, 2010; Cheng & Humphreys, 2012; Humphreys et al., 2016; Dalla Via et al., 2018) mechanisms, we expect that they will have different implications for the decision-making process and outcomes of the TMT.
We examine these design choices in the context of intra-group conflict within the TMT. Intra-group conflict is one of the pivotal socio-cognitive mechanisms that shape the dynamics and outcomes of TMT decision-making (Amason & Schweiger, 1994; Amason, 1996; Rahim, 2015; De Church & Marks, 2001). There are two main forms of conflict at the TMT level - cognitive conflict, which arises due to task-related differences, and affective conflict, which is due to interpersonal incompatibilities. While there is a significant amount of research in management and psychology pointing to the critical role of conflict for group and firm level outcomes, few studies in accounting have considered how accounting information and conflict are related. Marginson (2002), for instance, suggests that the development process of a PMS creates tensions among TMT members, while Bedford, Bisbe and Sweeney (2019) investigate how PMS contributes to an increase in cognitive conflict between TMT members. In this study, we develop theory and empirically test the effects of different PMS design choices on the consequences of TMT conflict for firm level outcomes.

Hypothesised associations are tested using cross-sectional data collected from a survey of 90 top managers of firms operating in innovative industries. We select firms in these industries because the high task and environmental uncertainty and the long-term orientation that are generally associated with innovation (Chenhall & Moers, 2015) tend to generate intra-group conflict at the TMT level (Smith, 2014). We use innovation ambidexterity as a measure of organizational level outcomes of TMT decision-making. Innovation ambidexterity refers to the ability to effectively realize radical and incremental innovations outcomes (Cao et al., 2009; Lin et al., 2013 Kortmann, 2014; Raisch & Birkinshaw, 2008). This is an appropriate outcome measure for our sample as maximizing long-term performance in innovative industries requires development of both incremental and radical innovations (Fernhaber & Patel, 2012).

The results of our study show that broad scope and integration have somewhat opposing roles in the management of TMT conflict. Our results show that broader scope PMS increases the positive effect of cognitive conflict on innovation ambidexterity. In contrast, we find that the higher the integration of the PMS, the less positive the association between cognitive conflict and innovation ambidexterity. However, higher integration also reduces the negative effects of affective conflict. Our findings indicate that scope acts as an amplifier that strengthens the positive effects of cognitive conflict, while integration functions as a suppressor, weakening both the positive effects of cognitive conflict and the negative effects of affective conflict on innovation ambidexterity (Jehn & Bendersky, 2003). Moreover, the results imply a trade-off for the achievement of ambidexterity innovation when incorporating greater integration into a PMS.
Our study contributes to the literature in several ways. First, we explicitly examine how PMS interact with group level cognitive processes. While earlier studies (e.g. Burney et al., 2009; Cheng & Humphreys, 2012; Hall, 2008; 2011; Humphreys et al., 2016; Tayler, 2010) have examined the effects of the psychological mechanisms triggered by the design attributes of PMSs on individual performance, in this study we extend the literature by examining how different PMS design choices interact with socio-cognitive mechanisms (i.e. conflict) at the TMT level. Second, we add to the few studies in accounting literature that have considered the consequences of intra-group conflict. While prior studies have examined how accounting practices affect the level of intra-group conflict (see Bedford et al., 2019; Chenhall, 2004; Du & Xu, 2018), this is the first study to consider how accounting influence the consequences of existing conflict for group or organization level outcomes (i.e. innovation ambidexterity). This also responds to Hall’s (2016) call for research addressing how the interrelationship between PMS and psychological mechanisms are translated into organization outcomes.

Third, we contribute to understanding the complexity of the design choices concerning PMS. While prior studies on PMS indicate that design attributes tend to have either positive or negative consequences for performance outcomes, our study suggests a more nuanced picture. Specifically, we show that PMS integration influences the effect of conflict on innovation ambidexterity in both positive and negative ways. In practice, this suggests that the optimal degree of integration is partly dependent on the level of cognitive and affective conflict experienced by the TMT. Finally, our study also contributes more generally to research on organizational conflict. Maltarich et al. (2018) note the lack of consistency in findings on the direct impact of conflict on organizational performance and the dearth of research examining factors that moderate the conflict – performance relationship (Jehn et al., 2008; Jehn & Bendersky, 2003). Our study highlights the relevance of PMS design attributes in understanding this relationship in TMTs.

The remainder of the paper is divided into five sections. In Section 2, we provide the theoretical background of our study, followed by the development of hypotheses in Section 3. The research method and results are presented in Sections 4 and 5. This is followed by a discussion of the findings in Section 6, along with concluding comments.

2.0 Theoretical background

2.1 Performance measurement system design
PMSs are devices that support managerial decision-making by translating organizational performance and processes into quantified metrics (Micheli & Mari, 2014; Neely et al., 2000). We focus on PMS design attributes as the PMS is a primary source of information for TMTs (Franco-Santos et al., 2012; Rigby, 2015; Cooper et al., 2017) and the way it is designed shapes managers’ attention patterns (Dalla Via et al., 2018), cognitive representations (Hall, 2011; Krishnan et al., 2005; Micheli & Mari, 2014) as well as the visibility of managers’ areas of responsibility (Hopwood, 1974; Tuomela, 2005). In this study we are specifically concerned about the design decisions of comprehensive PMS (Hall, 2008, 2011; Homburg et al., 2012), which have also been referred to as contemporary (Cheng et al., 2007; Hyvönen, 2007), strategic (Burney et al., 2009; Gimbert et al., 2010) or integrative (Chenhall, 2005) PMS. Despite the variation in terminology, each refers to PMSs that attempt to translate an organization’s strategic objectives into operational terms through a concise set of financial and non-financial metrics, and are associated with two main design choices.

The first is the scope of performance measures that are incorporated into the PMS (Chenhall, 2005; Naranjo-Gil & Hartmann, 2007; Hall, 2008, 2011). Scope is comprised of a number of aspects, including focus, quantification, time horizon and orientation (Gordon & Narayanan, 1984; Naranjo-Gil & Hartmann, 2007). Narrow scope PMSs incorporate measures that are typically internally-focused, financial, short-term, and historically-orientated, providing only a partial view of activities important for organizational performance. In contrast, broad-scope PMSs include a wider diversity of measures that also provide externally-focused, non-financial, long-run, and future-oriented information (Bouwens & Abernethy, 2000; Hall, 2008; Ittner et al., 2003). Broader scope PMS provides greater informational diversity by provide a more complete picture of organisational performance.

The second design decision is the extent of integration, which refers to the degree to which the PMS provides information about causal linkages between activities across the organization’s value chain and how activities influence achievement of strategic objectives (Chenhall, 2005; Tayler, 2010; Cheng & Humphreys, 2012; Hall, 2008). Highly integrated PMSs incorporate causal linkages between measures so that managers can see how decisions made in one area of the firm may influence the performance of other areas (Bouwens & Abernethy, 2000), and how the performance of activities are linked to the firm’s strategy and goals (Chenhall, 2005; Ittner & Larcker, 2003; Malina et al., 2007; Campbell et al., 2015).

Much of the prior research has combined these design choices into a single construct to capture the degree of “comprehensiveness” of the PMS. This research suggests that comprehensive PMS influence
individual performance through various cognitive mechanisms such as role conflict, role clarity (Burney & Widener, 2007), and psychological empowerment (Hall, 2008). Researchers have also examined how the translation of an individual’s assumptions, beliefs, values and experiences around task-related issues into a mental model (Vandenbosch & Higgins, 1996, Knight et al., 1999) is influenced by the nature of the information sets that the individual encounters (Birnberg et al., 2007; Krishnan et al., 2005; Markman & Gentner, 2001; Vandenbosch & Higgins, 1996). For example, Cheng et al. (2018) reveal how the presentation structure of a PMS affects individual mental models, while Capelo and Ferreira (2009) and Hall (2011) examine how PMSs influence the way individuals confirm or revise their mental models.

In practice, there is variation in how firms configure their PMSs. The scope and integration attributes can be presented separately or be combined to different degrees. For example, a firm’s PMS can include broad scope performance measures with or without causal linkages. Analogously, a firm’s PMS can set forth causal linkages between a more or less diverse set of performance measures. This variation and the consequent multiple versions of performance measurement practice have induced some ambiguity regarding when a PMS should be labelled as a “comprehensive” PMS (Speckbacher et al., 2003; Chenhall, 2005; Franco-Santos et al., 2012; Dalla Via et al., 2018). Moreover, the two design choices (i.e. scope and integration), have different decision-facilitating effects on managers’ cognitive representations and on their strategic judgements (see Cheng & Humphreys, 2012; Humphreys et al., 2016; Tayler, 2010; Cheng et al., 2018). In order to better understand how PMS influences the consequences of socio-cognitive mechanisms, we examine these two design choices separately.

Additionally, the research examining the association between PMS and the cognitive mechanisms that influence information-processing and decision-making outcomes has been conducted at an individual level. Cognitive mechanisms at the group or team level (Curseu et al., 2012; De Church & Mesmer-Magnus, 2010; Langan-Fox et al., 2000, 2001; Kellermanns et al., 2008; Klimoski & Mohammed, 1994; Mohammed et al., 2000;) have so far been given little attention in the PMS literature. One exception, which explores cognitive implications in a social context, is Busco and Quattrone (2014). They show how the role of PMSs go beyond being mere representational devices, as PMS inform processes of inquiry, interrogation and mediation among groups, including TMT members. In the next section we consider information-processing at a group level.

2.2 Top management teams as information processors
Senior managers are not isolated decision makers – they engage in decision-making through interactions with other members of the TMT (Burkert & Lueg, 2013; Hambrick and Mason, 1984). TMTs, which generally include the top two tiers of a firm, typically form the dominant coalition, with its members sharing decision-making power (Finkelstein et al., 2009; Sanders & Tuschke, 2007). Consequently, in many firms, the TMT is the centre of decision-making and ultimately responsible for strategy development and deployment. Upper echelons theory acknowledges that the characteristics of individual TMT members heavily influence organizational outcomes, either directly or indirectly through strategic and structural choices (Carpenter et al., 2004; Finkelstein et al., 2009; Hambrick & Mason, 1984; Hambrick et al, 2015). Studies in management accounting have also drawn on this theoretical strand to investigate the relationship between individual TMT member characteristics and the design and use of management accounting and control systems, as well as how such systems intervene in the association between TMT characteristics and organizational outcomes (e.g. Abernethy et al., 2010; Hiebl, 2014; Naranjo-Gil & Hartmann, 2007).

Upper echelon studies have, however, paid less attention to how TMTs as a whole engage in group decision-making to develop and realize firm strategies. Decisions in TMTs are determined not only by the characteristics of individual managers but also by complex interplay and group dynamics within the team (Du & Xu, 2018). A stream of social psychology research provides cognitive theoretical foundations to understand how groups such as TMTs process information and engage in decision-making. This work draws upon earlier Human Information Processing (HIP) perspectives, which depict individual decision-making as an interaction between the characteristics of the individual decision-makers and the objective characteristics of the information set (Krishnan et al., 2005; Libby, 2017; Libby & Lewis, 1982; Lord & Maher, 1990; Newell & Simon, 1972; Salterio, 2012).

Applied at the group level, the information processing approach conceptualizes small groups, such as TMTs, as socio-cognitive systems that act as information processors (Curseu et al., 2012; de Dreu et al., 2008; Hinsz et al. 1997).¹ Group information processing involves the degree to which information, ideas or cognitive representations are socially shared (i.e. exchanged and transferred) (de Dreu et al., 2008).² The way information is processed is affected by the interplay between the patterns of

¹ A related theoretical strand is organizational information-processing theory (Galbraith, 1973), which focuses on how uncertainty influences organizational structure and processes. This theory has been useful for accounting research at the organizational level (e.g. Abernethy & Lillis, 1995; Bouwens & Abernethy, 2000) but does take into account either interpersonal characteristics or social cognition aspects, and is therefore less directly relevant for our study given that the top management teams is the unit of analysis.

² In contrast to social cognition research, whose focus is on the individual processing of ‘social information’ (i.e. information about other people and social situations), research that conceptualizes groups as information processors focuses on the ‘social processing of information’ (Hinsz et al., 1997).
interpersonal interactions and the objective characteristics of the information set that is shared among them (Curşeu et al. 2012; de Dreu et al., 2008; Olson, Parayitam & Bao, 2007). In this study we focus on intragroup conflict as it is a pervasive characteristic of TMT interactions, \(^3\) influences the development of shared mental models and consequently the effectiveness of TMT decision-making (Amason & Mooney, 1999; Bengtsson et al., 2018; de Church & Marks, 2001; de Dreu et al., 2003; de Wit et al., 2012).\(^4\)

2.3 Top management team conflict

Conflict refers to the perception among parties that their goals, interests, beliefs or values are different, incompatible or in opposition, and is a relatively enduring state embedded in an individual’s thoughts and feelings (De Church & Marks, 2001; De Church & Mesmer-Magnus, 2013; Zhao et al., 2019). Prior research distinguishes between two forms of intragroup conflict at the TMT level. Affective conflict, or relationship conflict, is the perception among group members that there are inter-personal clashes as a result of differences or incompatibilities relating to matters such as individual preferences, norms, values, attitudes, dislike among group members or other non-task related issues (Jehn, 1995; Pelled, 1996). Cognitive conflict, or task conflict, relates to differences in task-related judgements, interpretations or perspectives on issues such as the nature and importance of the group’s objectives, the procedures for task accomplishment and the appropriate choice for action (Jehn, 1995; Pelled, 1996).\(^5\)

The distinction between affective and cognitive conflict is important because the expected consequences for group and organisational performance differ (Amason, 1996; Jehn, 1997). Affective conflict tends to be dysfunctional for group outcomes as disputes about personal issues reduces cohesion, identification and trust between TMT members (Hulsheger et al., 2009). Threat-rigidity (Staw et al., 1981) and social self-preservation (Oatley & Johnson-Laird, 1987) theories explain how perceived social threats activate a stress reaction that narrows the attentional field, inhibits cognitive flexibility, reduces receptiveness to the ideas of others, and diverts energy and attention away from the decision task (Carnevale & Probst, 1998; Jehn & Mannix, 2001; Pelled et al., 1999). Furthermore, affective conflict is likely to diminish psychological safety – the belief that one can share ideas and

\(^3\) Conflict is common within TMTs as they are typically composed of individuals that come from different backgrounds, bring together expertise from different domains, and represent different sub-units and/or functions within the organization. Consequently, the assumptions, beliefs, values, and objectives held by TMT members tend to diverge (De Church & Marks, 2001; Samba et al., 2017).

\(^4\) While the experience of conflict is an individual-level phenomenon, dyadic, intragroup, and intergroup conflicts are social phenomena that manifest at higher levels of analysis (Korsgaard et al. 2008).

\(^5\) Although cognitive conflict may coincide with emotive or animated interactions, these do not involve the relational tensions or personal animosities characteristic of affective conflict (Jehn &ga Mannix, 2001).
take risks without negative social ramifications – which is an important precondition to knowledge sharing and integration (Edmonson, 1999; O’Neill & McLarnon, 2018). If egos are at stake, team members will be tempted to restrain or strategically manipulate their knowledge sharing and use (Gardner et al., 2012). This impedes the development of shared mental models, erodes consensus around the strategic priorities of the firm and the actions that need to be taken to achieve them. As such, affective conflict reduces the capacity of the firm to achieve innovation ambidexterity outcomes.6

Conversely, most prior research theorises that cognitive conflict is beneficial for group and firm outcomes (Forbes & Milliken, 1999). However, recent meta-analyses (e.g. De Dreu & Weingart, 2003; De Dreu, 2006; de Wit et al., 2012; Samba et al., 2017) suggest that cognitive conflict is not universally beneficial, but contingent on decision processes and context. In particular, cognitive conflict is important for groups facing multifaceted and ambiguous decision tasks that require creative and non-routine problem solving (De Dreu & Weingart, 2003; de Wit et al., 2012; Simons & Peterson, 2000). Cognitive conflict exposes the TMT to the unique information and differing perspectives of individual members, which facilitates the incorporation of greater complexity into shared mental models (Curseu et al., 2012). The greater the complexity of shared cognitive structures, the more effective the TMT is at processing and synthesising large amounts of information. This is especially relevant for the achievement of innovation ambidexterity, in which TMTs need to identify how to balance multiple and contradictory strategic objectives (Bedford et al., 2019; Smith & Tushman, 2005). Moreover, cognitive conflict may positively influence certain performance outcomes but not others. The main reasons for expecting positive effects from cognitive conflict are based on a greater capacity for learning and complex problem solving. Given that these processes inevitably take time, cognitive conflict is likely to be detrimental for proximal task performance (e.g. efficiency) but beneficial for more distal outcomes (e.g. innovation) (De Dreu, 2006).

However, even in these contexts the presence of cognitive conflict may still have an overall negative effect. In general, top managers do not readily compromise their strongly held ideas, preferences and beliefs, and as cognitive judgements are likely to intertwine with an individual’s ego and identity (Gardner et al., 2012), task-related disagreements can easily trigger emotional reactions (Simons & Peterson, 2000; Mooney et al., 2007; Samba et al., 2017). This is consistent with the premise of the

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6 Empirical support for the negative effects of affective conflict has been found for outcomes such as decision quality (Amason, 1996), decision commitment (Parayitam & Dooley, 2009), implementation of management tools (Chenhall, 2004), team performance (Jehn & Mannix, 2001; De Dreu & Weingart, 2003), and firm performance (Eisenhardt, Kahwajy, & Bourgeois, 1997).
similarity-attraction paradigm that individuals tend to like those that are similar to them, and dislike people that have divergent views and opinions (Byrne, 1971). Relatedly, social categorization theory explains that individuals subconsciously classify others into subgroups (Tajfel & Turner, 1979), often along “faultlines” that reflect combinations of correlated personal characteristics (Lau & Murnighan, 1998). This can result in reduced cooperation and communication as in-group versus out-group antagonisms and biases shape group interactions (Carton & Tewfik, 2016; Hoever et al., 2012).

Furthermore, self-verification theory suggests that when differing viewpoints are challenged or ignored, individuals can interpret this as a personal attack on their knowledge or competency (Swann et al., 2004). Misattribution can also result from individual interpretations of the intentions and motivations of others (Fiske & Taylor, 1991). In complex and ambiguous situations, where positions are difficult to justify objectively, individuals may attribute views or positions as being politically motivated or reflecting a personal agenda, which can lead to a cycle of distrust and reprisal (Mooney et al., 2007; Gardner et al., 2012). The co-occurrence of the two forms of conflict creates a paradox that may confound the otherwise beneficial effects of cognitive conflict: cognitive conflict can easily escalate into affective conflict, causing a theoretically positive form of conflict to have an overall negative effect on group and firm outcomes (Amason & Schweiger, 1994; de Wit et al., 2012).

3.0 Hypothesis development

In this section we construct a set of hypotheses to explain how the information characteristics of a PMS influence the effect of cognitive conflict on affective conflict, and on the effects of both forms of conflict on the achievement of innovation ambidexterity.

3.1 PMS scope and conflict

The presence of cognitive conflict within a TMT implies that individual managers’ have dissimilar mental models (Mathieu et al., 2008; Kellermanns et al., 2008; Langan-Fox et al., 2001). Through cognitive conflict, a shared cognition is developed within the TMT. The more complex and elaborated the shared cognitive representations, the greater the capacity of the TMT to interpret information, develop shared expectations, more fully evaluate available alternatives and have higher levels of understanding about the reasons that particular decisions were made (Ensley & Pearce, 2001; Mohammed et al., 2010). Greater cognitive complexity is generated through individual team members sharing their unique and diverse knowledge and perspectives (Curseu et al., 2012).
The scope of information presented in the PMS is likely to influence the extent to which individuals draw upon unique perspectives during group interactions. Even if all TMT members may access the same PMS information set, different team members are likely to process information differently, as they place it in the context of their own assumptions, interests, beliefs and values (de Dreu et al., 2008; Klimoski & Mohammed, 1994; Langan-Fox et al., 2000; Samba et al., 2017). Because of these unique positions, team members will pay selective attention to data, will weight data items differently, and subject data items to different interpretations. However, these perspectives need to be given sufficient attention during group interactions. Prior research demonstrates that groups are more likely to attend to information that is common to the group (Stasser et al., 1989). Having a PMS that is broad in scope provides a more diverse set of information from which individual group members can draw upon to support their unique perspectives.

We therefore expect that TMTs where cognitive conflict interplays with members’ exposure to a broad scope PMS will be more inclined to engage in a collective critical evaluation of task-relevant information. The resulting deeper understanding should lead to the creation and dissemination of new insights and syntheses that are superior to the initial positions of the TMT members (Baron, 1991; Jehn, 1995; Maltarich et al., 2018). This richer understanding should also facilitate the generation of a wider set of alternatives in which to achieve contradictory strategic objectives (Menguc & Aug, 2005) and may prevent the TMT from opting too easily for existing or suboptimal courses of action (Van Knippenberg, De Dreu, & Homan, 2004). We formalise the expected moderating effect of PMS scope as:

H1: The broader the PMS scope, the more positive the effect of cognitive conflict on innovation ambidexterity.

TMT members’ discrepancies in task-related positions are likely to intertwine with their self-concept (Bechtold et al., 2010; de Wit et al., 2012; Gardner et al., 2012). When the differing positions they hold are challenged, disdained or ignored, TMT members can interpret this as a personal attack on their knowledge or competency (Swann et al., 2004) and threaten their ego (Bechtold et al., 2010; de Wit et al., 2012). When task-related disagreements trigger emotional reactions because of ego threats, cognitive conflict escalates into affective conflict (Jehn 1995; Simons & Peterson, 2000; Mooney et al., 2007; Kellermanns et al., 2008). We expect PMS scope to moderate the association between the two forms of conflict because of its implications for ego threats. The broader the PMS scope, the greater the likelihood that metrics on the activities, sub-units or functions represented by a given TMT
member are captured by the PMS. This increases the visibility and salience of a more diverse array of activities, as managers tend to pay attention to those organizational aspects for which performance is measured, often at the expense of other relevant but non-measured aspects (Hopwood, 1974).

The greater visibility and salience provided by broader scope PMSs increases the likelihood that individual TMT members self-affirm. Broader scope PMS may be valued as being more inclusive of the responsibilities of different TMT members. In the absence of a sufficient representation of one’s areas, a TMT member may to develop animosity. The inclusion of measures of one’s area enables a self-affirmed TMT member to remain comfortable and coolheaded in the face of multiple measures of other areas. Thus, TMT members whose areas are the object of measurement in the PMS are likely to be less pre-occupied with divergence in viewpoints and to perceive less ego threats coming from cognitive conflict (Bechtoldt et al., 2010). This self-affirmation argument suggests that PMS scope mitigates the escalation of cognitive conflict into affective conflict. Hence:

**H2:** The broader the PMS scope, the less positive the effect of cognitive conflict on affective conflict.

Affective conflict is expected to be negatively associated with innovation ambidexterity outcomes because emotionally charged disputes over interpersonal issues reduces cohesion, identification and trust between TMT members (Hulsheger et al., 2009), diverts energy and attention from the decision task (Carnevale & Probst, 1998; Jehn & Mannix, 2001; Pelled et al., 1999), and diminishes knowledge sharing and development of shared cognitive structures (Edmondson, 1999; O’Neill & McLarnon, 2018).

We predict that the negative effects of affective conflict on innovation outcomes will be more pronounced in the presence of broad scope PMS. Affective conflict tends to activate hostility, anxiety and stress reactions (de Dreu & Van Knippenberg, 2005; de Wit et al., 2012) that narrow the TMT members’ attentional field, and distract members from substantive task issues (Carnevale & Probst, 1998; Jehn & Mannix, 2001; Pelled et al., 1999). This tendency is likely to be compounded if affective conflict acts conjointly with a broad scope PMS informing TMT’s decision-making. When TMT members have access to a broader scope PMS, they have more opportunities to use a wider range of measures as ammunition machines to engage in games of power (Tuomela, 2005), legitimacy-seeking and ex-post rationalization (Burchell et al., 1980). As a broader scope PMS provides a more diverse set of information to interested parties to politically promote their own particular positions, they are
more likely to induce tactics that put other parties’ egos at stake, enhancing the negative consequences of existing affective conflict. Thus, affective conflict combined with broad PMS scope increases the likelihood of team members unproductively spending their time and energy focusing on each other rather than on the team’s innovation task-related problems, which decreases the information processing ability of the team and is eventually likely to harm decision quality and innovation ambidexterity outcomes (Simons & Peterson, 2000; de Dreu & Weingart, 2003).

Moreover, affective conflict tends to diminish TMT members’ psychological safety, which may tempt them to restrain or strategically manipulate their knowledge sharing and use (Gardner et al., 2012; O’Neill & McLarnon, 2018). Given a level of affective conflict, the inclination to restrain or manipulate knowledge sharing is likely to get stronger as PMS scope gets broader, since PMS scope triggers perceived risks of attention dilution and dynamics of competition among TMT members. Overall, we expect that the effects of affective conflict on innovation ambidexterity outcomes will turn more negative when PMS scope is broader. We formalize this expectation as:

**H3**: The broader the PMS scope, the more negative the effect of affective conflict on innovation ambidexterity outcomes.

### 3.2 PMS integration and conflict

PMS integration in the form of causal linkages shapes the cognitive mechanisms used by individual managers in processing information (e.g. Cheng & Humphreys, 2012; Humphreys et al., 2016; Tayler, 2010; Cheng et al., 2018). It provides a cue-to-causality by signalling the order in which effects supposedly occur, and consequently affects managers’ causal reasoning (Cheng et al., 2018; Dalla Via et al., 2018). The causal linkages presented in a PMS act as reference points and learning tools that reduce managers’ causal ambiguity in favour of more commonly shared framings and interpretations of information (Chenhall, 2005; Hurtado et al., 2012; Vera-Muñoz et al., 2007; Tayler, 2010; Humphrey et al., 2016). As mental models generally involve causal reasoning (Konce et al., 2011; Luft & Shields, 2009), the degree of PMS integration is likely to influence the cognitive representations of TMT members concerning what the strategy should be and how it should be pursued (Busco & Quattrone, 2014; Samba et al., 2017).

While prior research has demonstrated the potential benefits of having causals links explicitly represented in the PMS (Cheng & Humphrey, 2012; Humphrey et al., 2016; Vera-Muñoz et al., 2007), integrated PMS is expected to be detrimental for translating cognitive conflict into decisions that lead
to the achievement of innovation ambidexterity. A PMS that presents a previously developed cause-and-effect associations is likely to lead to the reinforcement and confirmation of existing mental models. An integrated PMS will also increase the propensity of TMT members to selectively perceive information that is consistent with existing ideas and perspectives (Hall, 2011). As such, managers are likely to give less critical attention to competing alternatives and approaches over how to best achieve the organization’s objectives, increasing the risks of falling into confirmatory biases (Cannon-Bowers et al., 1993; Jehn, 1995), group-think (Janis, 1972; Mohammed et al., 2010) and premature closure. This compromises the ability to achieve innovation ambidexterity outcomes, which requires decision-makers to continually seek new ways to maintain balance between contradictory strategic objectives (Birkinshaw & Gupta, 2013; Lin et al., 2013). In sum, we expect that in presence of a PMS with high integration, the predicted positive association of cognitive conflict with innovation will be weaker than in the case of lower PMS integration. We formalise this expectation as:

\[ H4: \text{The more integrated the PMS, the less positive the effect of cognitive conflict on innovation ambidexterity outcomes.} \]

TMT members constantly interpret the behaviour of other team members—they infer intentions and assess the accuracy and completeness of the arguments made by others. A lack understanding of teammates’ reasoning may cause team members to engage in misattribution, i.e. interpreting disagreements on task issues as personal attacks or politically motivated (Swann et al., 2004; Gardner et al., 2012). When this misattribution process points toward personal considerations and emotional reactions, cognitive conflict is likely to escalate into affective conflict because of biased information processing and self-fulfilling prophecies (Simons & Peterson, 2000; Mooney et al., 2007; Samba et al., 2017).

Misattribution can be attenuated by gaining a better understanding for the reasons behind the positions adopted by other members of a group. The causal linkages provided by an integrated PMS provide one such mechanism for an enhanced understanding of other TMT members’ positions. Through the inclusion of explicit causal linkages, highly integrated PMS describe a firm’s intended strategy based on covariation, logical or finality relationships (Koonce et al, 2011; Malina et al., 2007). This formal representation discloses how decision areas under one TMT member’s responsibility are expected to relate to other members’ decision areas as well as to the firm as a whole (Cheng & Humphrey, 2012; Malina & Selto 2001). The awareness of causal linkages across areas of responsibility will help TMT members to better understand not only the relations embedded in the PMS (Chenhall,
2005; Vera-Muñoz et al., 2007; Tayler, 2010; Humphrey et al., 2016), but also the task-based rationales that underlie other teammates’ divergent positions and behaviours (Busco & Quattrone, 2014). Thus, highly integrated PMS helps to counteract misattribution errors by which, when team members attempt to causally explain the behaviour of others, they tend to overestimate the role of personal factors and overlook the impact of the situation (Koonce et al., 2011). Hence, we expect that the more integrated the PMS, the less likely it is that cognitive conflict escalates into affective conflict. We formalize this expected moderating role as:

**H5:** The more integrated the PMS, the less positive the effect of cognitive conflict on affective conflict.

We expect PMS integration to mitigate some of the dysfunctional consequences of affective conflict for the achievement of innovation ambidexterity. On its own, affective conflict activates anxiety and stress reactions that narrow the TMT members’ attentional field, and divert energy and attention away from the TMT’s innovation decision tasks (Carnevale & Probst, 1998; Jehn & Mannix, 2001; Pelled et al., 1999). However, an integrated PMS drives managerial attention to the causal logics of the business and to the interdependence of innovation activities (Bisbe & Malagueño, 2012; Dalla Via et al., 2018). Consequently, if an integrated PMS is in place, affective conflict is less likely to result in team members spending their time and energy unproductively through focusing on each other rather than on the team’s task-related innovation problems. Thus, the higher the integration of the PMS, the lesser the effect of affective conflict on the achievement of innovation ambidexterity.

Further, affective conflict may diminish psychological safety and tempt TMT members not to engage in the knowledge sharing that is needed for innovation ambidexterity (Gardner et al., 2012; O’Neill & McLarnon, 2018). However, the existence an integrated PMS entails that, even if inter-personal clashes and negative emotions remain active, some degree of knowledge-sharing across functional areas has taken place in order to establish the causal reasoning captured by the PMS. We expect that, once a PMSs induces knowledge sharing in a context of affective conflict, TMT members’ psychological barriers to knowledge sharing are lessened. Thus, the higher the PMS integration, the more likely that the negative consequences of a certain level of affective conflict on knowledge sharing are attenuated. In sum, we expect that affective conflict is less likely to negatively affect the achievement of innovation ambidexterity in the presence of more integrated PMS. Thus:
H6: The more integrated the PMS, the less negative the effect of affective conflict on innovation ambidexterity outcomes.

4.0 Method

4.1 Sample selection and survey implementation

Data for this study were gathered by means of a survey that targeted the CEO or another member of the TMT of Irish firms, defined as a legal entity that is either independent or a subunit of a larger organization, that operate in innovative industries (e.g. information technology, semi-conductors, pharmaceuticals). The target population of 807 firms was constructed from four sources: 1) Irish Business and Employers’ Confederation (IBEC) (330 firms), Irish Times Top 1000 firms (271 firms), the FAME listing of medical device companies (151 firms), and an online listing of IT firms in Ireland (makeITinIreland.ie) (55 firms). To increase the likelihood that a formal PMS was in place, firms in the sample were required to have a minimum size of 20 employees, and to have operated for at least three years. Additionally, to ensure that respondents had sufficient knowledge, the TMT member was required to have at least one year of tenure at the firm.

Survey implementation followed the recommendations of Dillman (2011) where possible. Questionnaires were distributed either electronically through an email link or as a hardcopy where requested. Prior to administering the survey, respondents were telephoned to ensure that both the firm and respondent were suitable for the purpose of this study.7 Reminder emails were sent weekly for three weeks to those completing the survey electronically. For hardcopy recipients, a follow-up telephone call was made after two weeks. This procedure resulted in a total of 125 responses. Firms were removed from the sample if either the industry, size, or age of the firm did not meet the requirements of this study or the respondent had insufficient tenure at the firm. Additionally, we included a question in the survey to assess whether subunits of larger firms had decision rights on innovation investment decisions. Subunits without any decision rights were excluded. These requirements result in 35 responses being removed, leaving a usable sample of 90 firms. Information on the size and industry classification of firms in the usable sample are detailed in Table 1.

<Insert Table 1 about here>

7 However, due to confidentiality, this was not possible for the firms identified through IBEC. Instead, IBEC sent an email outlining the purpose of the study along with an electronic link to the questionnaire directly to their members.
To examine the presence of non-response bias, we compare the variable means of early and late respondents as well as the industry and size characteristics of respondents to non-respondents. No significant differences were identified in either comparison. To minimise common method bias we reverse-coded selected items, paid close attention to wording, provided succinct instructions for survey completion, and separated items of constructs throughout the questionnaire (Podsakoff et al., 2003). In addition, a Harmann’s single factor test was conducted on the survey items used to measure each construct. The variance accounted by the first component is well below half the total explained variance, suggesting that single-source bias is not a significant concern.

4.2 Variable measurement
Prior to implementation we pilot-tested the questionnaire with three academics and five TMT members in firms operating in innovative industries. A small number of changes were made to the survey design and item wording to enhance face validity. Further, while we draw upon prior measurement instruments where available, we carefully considered the conceptual definitions of each construct to ensure that each was assessed with the appropriate measurement model and dimensionality (Bedford & Speklé, 2018a, 2018b). Questionnaire items are reported in Appendix A.

We treat cognitive and affective conflict as shared team properties (Park et al., 2019). Cognitive conflict (COGCON) and affective conflict (AFFCON) are reflectively measured constructs and are assessed with the four item scales developed by Simons and Peterson (2000). These measures, based on Jehn (1995), have been specifically tailored to the TMT context. The four COGCON items load on a single factor, as do the four items of AFFCON.

PMS scope (PMSSCOPE) and PMS integration (PMSINT) are each measured with four items. Prior literature indicates that PMSSCOPE is generally comprised of four components – financial and non-financial, internal and external, current and future, and short- and long-run aspects of business performance (Chenhall & Morris, 1986; Hall, 2008; Naranjo-Gil & Hartmann, 2007). As these do not necessarily covary, we construct PMSSCOPE as a causal formative measure (Bedford & Speklé, 2018a). The measure for PMSINT is based on four items that reflect the underlying construct. These items are derived from Hall’s (2008) measure of comprehensive PMS and the measure of integrative PMS of Chenhall (2005).

Innovation ambidexterity (INNAMB) is assessed in terms of the radical and incremental product and service innovation outcomes of the firm over the previous three years. Three items, taken from Lin et
al. (2013) and Atuahene-Gima (2005), are used to assess each of radical and incremental innovation. An exploratory factor analysis revealed that the six items loaded on two factors, with three items representing incremental innovation and three items representing radical innovation, with Cronbach’s alphas of 0.91 and 0.82 respectively. Consistent with prior research (Bedford et al., 2019; Cao et al., 2009; Simsek, 2009), innovation ambidexterity is conceptualized as an aggregate multidimensional construct comprised of the interaction of two dimensions (Bisbe et al., 2007; Edwards, 2001). The dimensions relate to the two defining aspects of innovation ambidexterity – the balance between radical and incremental innovation and their combination. The balance is measured as the absolute difference between radical and incremental innovation. The measure is reversed scored so that higher values representing greater balance. The combination is calculated as the multiplication of the scores for radical and incremental innovation. The aggregate measure of \textit{INNAMB} is constructed as the interaction of both balance and combination dimensions.

We control for a number of theoretically relevant factors. Organizational slack (\textit{SLACK}) is included as firms with available resources may have greater capacity to achieve innovation ambidexterity (Jansen et al., 2012). \textit{SLACK} is measured with the three-item instrument developed by Atuahene-Gima (2005). We also include two TMT factors that might influence conflict and innovation ambidexterity. The first is the heterogeneity of the individual characteristics of TMT members, which is measured using three items developed by Campion, Medsker and Higgs (1993). The second is the turnover of TMT members. We assessed turnover by asking respondents to indicate the percentage of turnover in the TMT over the past three years.

5.0 Results

Given the relatively small sample size, we assess our expectations using partial least squares (PLS) analysis (Hair et al., 2013). PLS simultaneously considers a measurement model and a structural model. The measurement model results report adequate reliability and validity. Cross-loadings, shown in Table 2, reveal all items for reflectively measured constructs load above 0.5 on their expected components. Reliability was assessed by calculating Cronbach’s alpha and compositive reliability scores. As reported in Table 3, the scores for all constructs were above the minimum threshold 0.7. Convergent validity was acceptable, with average variance extracted (AVE) scores above 0.5. Discriminant validity was assessed using the square root of the AVE as well as the heterotrait-monotrait (HTMT) ratio of correlations. The square root of the AVE, shown along the diagonal of the correlation matrix in Table 4, is higher than the correlation with all other constructs, while Table 5

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8 Two additional items loaded on separate factors and were removed (see Bedford et al., 2019).
shows that the HTMT ratios fall below the threshold of 0.90, thus providing support for discriminant validity. A potential issue in testing for interaction effects is the presence of multicollinearity. We assess multicollinearity by examining the variance inflation factors (VIFs). The VIFs for all constructs were below 3.3, indicating that multicollinearity is unlikely to be a significant concern.

<Insert Table 2 about here>

<Insert Table 3 about here>

<Insert Table 4 about here>

<Insert Table 5 about here>

Results of the structural model are displayed in Table 6. H1 argues that PMSSCOPE positively moderates the effect of COGCON on INNAMB. The interaction terms is positive and significant, providing support for H1 ($p < 0.05$). No support is found for either H2 or H3. Regarding H2, the interaction term between PMSSCOPE and COGCON has an insignificant association with AFFCON. Likewise, there is an insignificant association between INNAMB and the interaction of PMSSCOPE and AFFCON. H4 implies that PMSINT should negatively moderate the effect of COGCON on INNAMB. The results indicate support for H4, with a negative and significant interaction term ($p < 0.01$). The results for H5, which predicts that PMSINT negatively moderates that association between COGCON and AFFCON, do not provide support with an insignificant interaction term. Finally, there is a significant association between INNAMB the interaction term of PMSINT and AFFCON ($p < 0.05$), providing support for the expected moderation effect specified in H6.

<Insert Table 6 about here>

To assess the robustness of our results we include additional control variables for AFFCON and INNAMB. First, we include a measure for the size of the TMT, as additional team members may increase the likelihood of affective conflict (Amason & Sapienza, 1997). Second, we include a dummy variable that represents whether the survey respondent is the CEO of the firm, as perceptions of conflict may vary between a CEO and other TMT members. Third, we control for environmental dynamism, which is measured as a composite of four items from Jaworski and Kohli (1993). Higher levels of uncertainty and variability may impact upon the degree of conflict experienced by TMT
members, as well as provide greater opportunity for innovation (Jansen et al., 2006). We also control for firm age (natural logarithm of the number of years since the firm was founded) and firm size (natural logarithm of the number of full-time employees). On the one hand, older and larger firms may find it more difficult to achieve ambidexterity due to institutionalized routines and behavioural rigidities (Lubatkin et al., 2006). However, larger firms are likely to have greater resources and be able to buffer external shocks, while older firms have had time to develop the necessary competencies to effectively balance competing objectives (Jansen et al., 2009). Finally, potential industry effects are controlled for by including a dummy variable that indicated whether the firm was primarily product oriented, as opposed to service oriented (Sidhu et al., 2007). The addition of each control variable to the model reported in Table 6 has only minor changes on coefficients and does not substantively change the interpretation of the hypothesis tests, providing further support for our findings.

6.0 Discussion and conclusion

PMSs influence individual and organizational performance through cognitive and motivational mechanisms (Hall, 2008, 2011; Burney and Widener, 2007; Burney et al., 2009). There is, however, little understanding about the social psychological mechanisms at the TMT level through which PMSs influence organizational level outcomes (Hall, 2016). In this study we examine the interaction of TMT conflict and PMS design and the implications for organizational level outcomes.

While prior research suggests that cognitive conflict amongst TMT members facing complex and uncertain task contexts, such as those for firms pursuing innovation ambidexterity, tends to be beneficial (Bedford et al., 2019; de Wit et al., 2012), cognitive conflict tends to trigger affective conflict, which is consistently observed to negatively influence group and organisational performance (de Wit et al., 2012; Samba et al., 2017). The challenge for these TMTs is how to take advantage of the benefits of cognitive conflict while not suffering the potential negative consequences of affective conflict. We investigate the role of PMSs in this regard by examining how the design of the PMS influences the effects of cognitive conflict on affective conflict, and the effect of both forms of conflict on the achievement of innovation ambidexterity. In examining two separate design choices, scope and integration, our findings reveal that they have important and somewhat opposing effects.

Our results suggest broad scope PMS is generally beneficial as it positively moderates the effect of cognitive conflict on innovation ambidexterity. This beneficial effect is consistent with previous research on the need for informational diversity in completing complex tasks. When team members use broad scope information, this creates a mechanism to draw out the informational diversity among
TMT members and enables a focus on different dimensions of the decision which enhances team decision quality (Jehn et al., 1999; Van Knippenberg et al., 2004). Consequently, broad scope accentuates the strength of the positive association between cognitive conflict and organizational outcomes and, specifically, the association between cognitive conflict and innovation ambidexterity.

Integration, however, is a double-edged sword. On the one hand, our findings indicate that the more integrated a performance measurement system is, the less positive the association between cognitive conflict and innovation. This attenuation is consistent with arguments suggesting that higher integration drives more uniform framing of information (Chenhall, 2005) and mental models (Hall, 2008). As Maltarich et al. (2018) point out, a beneficial outcome of cognitive conflict is overcoming confirmatory biases in decision making. More uniform framing of information could be expected to induce less thorough evaluations of competing alternatives and approaches over how to best achieve the organization’s goals, which is detrimental for the achievement of innovation ambidexterity. In addition, PMSs with close links to strategy have been associated with lower levels of role ambiguity and role conflict (Burney & Widener, 2007) and less conflicting demands in a role is likely to limit the power of work-related disagreements to stimulate rich debates of alternatives and create the dynamic tension which has been associated with the effective management of innovation (Curtis & Sweeney, 2017; Bedford, 2015; Bisbe & Malagueno, 2009).

On the other hand, the interaction between integration and affective conflict mitigates the negative impact of affective conflict on innovation. This is consistent with arguments suggesting that PMS integration clarifies linkages between strategy and operations thus improving task clarity (Hall, 2008). Connections between metrics are emphasized in an integrated PMS and the activities of the business are linked together. Given previous research showing a negative association between PMSs with a close link to strategy and role stressors (Burney & Widener, 2007), it can be expected that an integrated PMS acts to mitigate role stress and anxiety among TMT members. This is likely to be particularly important when affective conflict exists between members of the TMT. Also, Maltarich et al. (2018) point out that affective conflict “results in a situation in which, in addition to opposing relationships, members are likely to approach conflict as an individual win–lose proposition, and they become less concerned about collective goals” (p. 10). De Church et al. (2013) find that collectivistic conflict management processes are associated with enhanced outcomes for affective conflict. When TMT members are informed by data from performance measurement systems with high levels of integration, collective goals are emphasised by linking activities across the organization and affective conflict is less likely to reduce the information processing ability of the TMT. Given these findings, we
identify integration as a moderator variable that acts as a suppressor (Jehn & Bendersky, 2003), weakening both the positive effects of cognitive conflict and the negative effects of affective conflict on innovation ambidexterity.

Overall, our study suggests that the consequences of both forms of TMT conflict on innovation ambidexterity can be manipulated through the design of the PMS. In practice, PMSs can combine varying degrees of scope and integration (Speckbacher et al., 2003). As our study considers the separate effects of scope and integration, our findings insight into the overall effect of different PMS designs. As an example, if a PMS emphasizes broad scope but provides few or no causal links, our findings suggest that the effect of cognitive conflict on innovation ambidexterity will be accentuated. In contrast, if a CPM emphasizes integration through elaborated causal maps but relies on a narrower scope of measures, our findings suggest that the effects of both cognitive and affective conflict on organizational outcomes will be less pronounced. An important consideration is the identification of the existing types of conflict present among the TMT (Maltarich et al., 2018). Thus, if affective conflict is predominantly present in an organization, our results suggest that it is particularly important for conflict management to emphasize the integration of different performance measures. In contrast, if cognitive conflict is predominantly present, conflict management will benefit from avoiding an emphasis on the integration between the measures and draw instead on the breadth of the performance measures.

More research is needed on the extent to which TMTs have flexibility to draw on or shift between the integrated nature versus the breadth of scope of performance measures at different stages of the decision-making process. Additionally, research could shed further light on design choices by adopting a longitudinal perspective. Qualitative studies could explore the influence of relative levels of different types of conflict on PMS design. Furthermore, the process of PMS design is likely to lead to the generation of TMT conflict and future research could examine how the conflict that may arise in the pre-implementation design stages shapes the post-implementation dynamics, including the generation and management of organizational conflict once the PMS is in place. Also, Jehn and Mannix (2001) find that the effects of different conflict types vary depending on the stage of the group’s development. Adopting a temporal view of conflict which takes account of the phase of the group’s existence would be beneficial in further research. For example, a temporal view on how frequently the causal map is updated in the PMS is likely to also yield deeper insights into the relationships between these dimensions of PMS, conflict and group and organisational outcomes.
This study has a number of potential limitations. First, as the study uses a cross-sectional data obtained through a survey, typical caveats concerning inferences of causality, common method bias, and the use of perceptual measures need to be considered. Second, we examine only two PMS design choices. While scope and integration are two major considerations, there are many other characteristics that could be considered (see e.g., Chenhall & Morris, 1986). Additionally, prior research has pointed to the potential interdependence between design choices of PMSs and the way in which it is used (Guenther & Heinicke, 2018), as well as how PMSs may be affected by choices of other accounting and control practices within the firm (Bedford, Malmi & Sandelin 2016; Grabner & Moers, 2013). Notwithstanding these limitations, the findings of this study demonstrate the importance of PMS design for the consequences of TMT conflict.
References


Cheng, M.M., Humphreys, K.A., & Zhang, Y.Y. (2018). The interplay between strategic risk profiles and presentation format on managers’ strategic judgments using the balanced scorecard. *Accounting, Organizations and Society*, 70, 92-105,


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Appendix A
Survey items

Incremental innovation
1. The organization I lead has frequently introduced new incremental products/services in the last 3 years
2. Compared with major competitors, my organization has introduced more incrementally new products/services in the last 3 years
3. The percentage of total sales from new incremental product/service innovations implemented in my organization in the last 3 years, was greater than major competitors
4. Please indicate the approximate % of total sales from incremental products/services introduced in the last 3 years by the organization you lead (<5%, 5-10%, 11-15%, 16-20%, >20%)*

Radical innovation
1. The organization I lead has frequently introduced radically new products/services into markets that are totally new to the firm in the last 3 years
2. Compared with major competitors, my organization has introduced more radically new products/services in the last 3 years
3. The percentage of total sales from new radical product/service innovations implemented in my organization in the last 3 years, was greater than major competitors.
4. Please indicate the approximate % of total sales from radical products/services introduced in the last 3 years by the organization you lead (<5%, 5-10%, 11-15%, 16-20%, >20%)*

Cognitive conflict
1. How much do members of your senior management team disagree about the content of strategic decisions?
2. To what extent are there differences of professional opinion among members of your senior management team?
3. How frequently are there disagreements about ideas among members of your senior management team?
4. How often do people in your senior management team disagree regarding this organization’s strategic decisions?

Affective conflict
1. How much personal friction is there among members of your senior management team?
2. How much are personality clashes evident among members of your senior management team?
3. How much tension is there among members of your senior management team?
4. To what extent are grudges evident among members of your senior management team?

PMS broad scope
1. It contains a broad range of both financial and non-financial performance information about different areas of the business
2. It provides information on a variety of external as well as internal factors that are important for business performance
3. It contains a diverse set of measures that indicate not only current but also future business performance
4. It contains a range of measures that cover the critical short and long-run aspects of business operations

PMS integration
1. It provides consistent and mutually reinforcing links between current operating performance and long-term strategies of the business
2. It shows how activities across the organization affect each other
3. It indicates how different dimensions of performance are connected
4. It links together all activities of the business with the achievement of strategic goals and objectives

**TMT diversity**
1. The members of my team vary widely in their areas of expertise
2. The members of my team have a variety of different backgrounds and experiences
3. The members of my team have skills and abilities that complement each other.

**TMT size**
1. How many managers are members of the senior management team in the organization you lead?

**TMT tenure**
1. What percentage turnover has there been in your senior management team in the past 3 years? (0-20%, 21-40%, 41-60%, 61-80%, 81-100%)

**Organizational slack**
1. We have uncommitted resources that can quickly be used to fund new strategic initiatives
2. We are able to obtain resources at short notice to support new strategic initiatives
3. We have substantial resources at the discretion of management for funding new strategic initiatives

**Environmental dynamism**
1. The actions of local and foreign competitors in our major markets were changing quite rapidly
2. The market competitive conditions were highly unpredictable
3. Customers’ product preferences changed quite rapidly
4. Changes in customers’ needs were quite unpredictable.

* Items removed from the analysis.
Table 1
Sample characteristics

<table>
<thead>
<tr>
<th>Panel A: Industry</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical equipment</td>
<td>37</td>
<td>41.1</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>2</td>
<td>2.2</td>
</tr>
<tr>
<td>Information technology</td>
<td>18</td>
<td>20.0</td>
</tr>
<tr>
<td>Food and drink</td>
<td>10</td>
<td>11.1</td>
</tr>
<tr>
<td>Electronics</td>
<td>2</td>
<td>2.2</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>5</td>
<td>5.6</td>
</tr>
<tr>
<td>Other</td>
<td>16</td>
<td>17.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>90</strong></td>
<td><strong>100</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: Firm size</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-50</td>
<td>19</td>
<td>21.1</td>
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<td>51-100</td>
<td>15</td>
<td>16.7</td>
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<tr>
<td>101-250</td>
<td>19</td>
<td>21.1</td>
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<td>251-500</td>
<td>13</td>
<td>14.4</td>
</tr>
<tr>
<td>501-1000</td>
<td>13</td>
<td>14.4</td>
</tr>
<tr>
<td>&gt;1000</td>
<td>11</td>
<td>12.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>90</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
Table 2
Loadings from PLS measurement model for reflectively measured constructs

<table>
<thead>
<tr>
<th>Construct</th>
<th>AFFCON</th>
<th>COGCON</th>
<th>PMSINT</th>
<th>SLACK</th>
<th>TMTHET</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFFCONA</td>
<td>0.866</td>
<td>0.520</td>
<td>−0.171</td>
<td>−0.045</td>
<td>−0.222</td>
</tr>
<tr>
<td>AFFCONB</td>
<td>0.834</td>
<td>0.539</td>
<td>−0.128</td>
<td>0.068</td>
<td>−0.129</td>
</tr>
<tr>
<td>AFFCOND</td>
<td>0.808</td>
<td>0.498</td>
<td>−0.238</td>
<td>−0.082</td>
<td>−0.249</td>
</tr>
<tr>
<td>COGCONA</td>
<td>0.356</td>
<td>0.700</td>
<td>−0.057</td>
<td>−0.176</td>
<td>−0.213</td>
</tr>
<tr>
<td>COGCONB</td>
<td>0.515</td>
<td>0.819</td>
<td>−0.140</td>
<td>−0.037</td>
<td>−0.181</td>
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<td>COGCONC</td>
<td>0.518</td>
<td>0.834</td>
<td>−0.012</td>
<td>−0.137</td>
<td>−0.141</td>
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<td>0.479</td>
<td>0.843</td>
<td>−0.217</td>
<td>−0.084</td>
<td>−0.137</td>
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<td>PMSINTA</td>
<td>−0.213</td>
<td>−0.056</td>
<td>0.874</td>
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<td>−0.195</td>
<td>0.909</td>
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<td>0.236</td>
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<td>0.130</td>
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<td>−0.124</td>
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<td>0.894</td>
<td>0.029</td>
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<td>SLACKB</td>
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<td>−0.066</td>
<td>0.414</td>
<td>0.796</td>
<td>−0.042</td>
</tr>
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<td>SLACKC</td>
<td>−0.024</td>
<td>−0.131</td>
<td>0.065</td>
<td>0.646</td>
<td>0.066</td>
</tr>
<tr>
<td>TMTHETA</td>
<td>−0.052</td>
<td>−0.134</td>
<td>−0.044</td>
<td>0.026</td>
<td>0.738</td>
</tr>
<tr>
<td>TMTHETB</td>
<td>−0.228</td>
<td>−0.209</td>
<td>−0.022</td>
<td>−0.028</td>
<td>0.890</td>
</tr>
<tr>
<td>TMTHETC</td>
<td>−0.251</td>
<td>−0.162</td>
<td>0.039</td>
<td>0.043</td>
<td>0.889</td>
</tr>
</tbody>
</table>

AFFCON = affective conflict of top management team, COGCON = cognitive conflict of top management team, PMSINT = integration of performance measurement system, SLACK = organizational slack, TMTHET = heterogeneity of top management team members. Bold values denote the factor with the highest loading of the item.
Table 3
Descriptive statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Theoretical Range</th>
<th>Min.</th>
<th>Max.</th>
<th>Cronbach alpha</th>
<th>Composite reliability</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation ambidexterity (INNAMB)</td>
<td>104.56</td>
<td>82.35</td>
<td>1–343</td>
<td>7.00</td>
<td>343.0</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Affective conflict (AFFCON)</td>
<td>2.14</td>
<td>0.69</td>
<td>1–5</td>
<td>1.00</td>
<td>4.00</td>
<td>0.82</td>
<td>0.88</td>
<td>0.65</td>
</tr>
<tr>
<td>Cognitive conflict (COGCON)</td>
<td>2.58</td>
<td>0.66</td>
<td>1–5</td>
<td>1.00</td>
<td>4.50</td>
<td>0.81</td>
<td>0.88</td>
<td>0.64</td>
</tr>
<tr>
<td>PMS integration (PMSINT)</td>
<td>4.81</td>
<td>1.26</td>
<td>1–7</td>
<td>1.75</td>
<td>7.00</td>
<td>0.90</td>
<td>0.93</td>
<td>0.77</td>
</tr>
<tr>
<td>PMS scope (PMSSCP)</td>
<td>4.99</td>
<td>1.17</td>
<td>1–7</td>
<td>1.25</td>
<td>7.00</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Organizational slack (SLACK)</td>
<td>2.34</td>
<td>0.93</td>
<td>1–5</td>
<td>1.00</td>
<td>5.00</td>
<td>0.70</td>
<td>0.83</td>
<td>0.62</td>
</tr>
<tr>
<td>TMT diversity (TMTHET)</td>
<td>3.87</td>
<td>0.82</td>
<td>1–5</td>
<td>1.00</td>
<td>5.00</td>
<td>0.81</td>
<td>0.88</td>
<td>0.71</td>
</tr>
<tr>
<td>TMT turnover (TMTTURRN)</td>
<td>1.58</td>
<td>0.82</td>
<td>n/a</td>
<td>0.00</td>
<td>1.00</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>
Table 4.  
Correlations

<table>
<thead>
<tr>
<th></th>
<th>INNAMB</th>
<th>AFFCON</th>
<th>COGCON</th>
<th>PMSINT</th>
<th>PMSSCOPE</th>
<th>SLACK</th>
<th>TMTHET</th>
<th>TMTTURN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation ambidexterity (INNAMB)</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affective conflict (AFFCON)</td>
<td>–0.00</td>
<td>0.81</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive conflict (COGCON)</td>
<td>0.11</td>
<td>0.59</td>
<td>0.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>PMS integration (PMSINT)</td>
<td>0.19</td>
<td>–0.21</td>
<td>–0.13</td>
<td>0.88</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PMS scope (PMSSCP)</td>
<td>0.25</td>
<td>–0.22</td>
<td>–0.05</td>
<td>0.66</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational slack (SLACK)</td>
<td>0.25</td>
<td>–0.04</td>
<td>–0.13</td>
<td>0.27</td>
<td>0.35</td>
<td>0.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TMT heterogeneity (TMTHET)</td>
<td>0.18</td>
<td>–0.25</td>
<td>–0.20</td>
<td>0.00</td>
<td>0.10</td>
<td>0.01</td>
<td>0.01</td>
<td>0.84</td>
</tr>
<tr>
<td>TMT turnover (TMTTURN)</td>
<td>–0.11</td>
<td>0.12</td>
<td>0.07</td>
<td>0.01</td>
<td>0.02</td>
<td>–0.11</td>
<td>0.03</td>
<td>–</td>
</tr>
</tbody>
</table>

Pearson bivariate correlations. Square-root of AVE shown on the diagonal.
**Table 5.**  
Heterotrait-monotrait ratio of correlations

<table>
<thead>
<tr>
<th></th>
<th>AFFCON</th>
<th>COGCON</th>
<th>PMSINT</th>
<th>SLACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affective conflict (AFFCON)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive conflict (COGCON)</td>
<td>0.70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PMS integration (PMSINT)</td>
<td>0.24</td>
<td>0.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational slack (SLACK)</td>
<td>0.12</td>
<td>0.20</td>
<td>0.31</td>
<td></td>
</tr>
<tr>
<td>TMT heterogeneity (TMTHET)</td>
<td>0.26</td>
<td>0.25</td>
<td>0.07</td>
<td>0.09</td>
</tr>
</tbody>
</table>
Table 6.
Results of PLS model

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Affective Conflict</th>
<th>Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef.</td>
<td>T-stat</td>
</tr>
<tr>
<td>Cognitive conflict</td>
<td>0.571</td>
<td>(6.869)***</td>
</tr>
<tr>
<td>Affective conflict</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>PMS scope</td>
<td>–0.156</td>
<td>(1.254)</td>
</tr>
<tr>
<td>PMS integration</td>
<td>–0.029</td>
<td>(0.268)</td>
</tr>
<tr>
<td>PMS scope * Cognitive conflict</td>
<td>–0.072</td>
<td>(0.287)</td>
</tr>
<tr>
<td>PMS scope * Affective conflict</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>PMS integration * Cognitive conflict</td>
<td>–0.037</td>
<td>(0.344)</td>
</tr>
<tr>
<td>PMS integration * Affective conflict</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Organizational slack</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>TMT heterogeneity</td>
<td>–0.121</td>
<td>(1.313)</td>
</tr>
<tr>
<td>TMT turnover</td>
<td>0.103</td>
<td>(1.168)</td>
</tr>
</tbody>
</table>

\[ R^2 \quad 41.3\% \quad 28.9\% \]

* p < 0.10, ** p < 0.05, *** p < 0.01 (1 tailed for hypothesized associations, 2 tailed otherwise)