



# Management control systems across different modes of innovation: Implications for firm performance



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## ABSTRACT

This study examines the use of management control systems (MCS) across different modes of innovation and the effects on firm performance. Specifically, this study draws on Simons' levers of control framework to investigate how top managers attempt to simultaneously balance exploration and exploitation, which place contradictory requirements on firms. Using data collected from a survey of top managers in 400 firms this study demonstrates that the patterns of use and interdependencies among control levers associated with enhanced performance differ depending on the mode of innovation. The findings show that control levers are independently associated with enhanced performance in firms that specialize in either exploration or exploitation, suggesting that levers operate as supplementary rather than as complementary controls in these contexts. However, in ambidextrous firms, diagnostic and interactive levers are shown to have interdependent effects on performance. Furthermore, some evidence suggests that both the combined and balanced use of these levers contributes to generating dynamic tension necessary for managing contradictory innovation modes.

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## 1. Introduction

An emerging stream of research has revealed how management control systems (MCS) can play a central role in the management of innovation<sup>1</sup>. Once considered to be detrimental to innovative efforts (Amabile, 1988; Damanpour, 1991), there is now growing consensus that formal controls, when activated in an enabling, facilitative and interactive fashion, increase the capacity of an organization to derive benefits from innovation (Bisbe and Otley, 2004; Jørgensen and Messner, 2009). However, most prior systematic investigations have considered only variations

in the emphasis on innovation rather than the characteristics of innovation. As such, it is unclear as to whether the same control patterns are equally effective across different types of innovation, or how MCS are employed when pursuing multiple and potentially contradictory innovation modes. As Davila et al. (2009, p. 284) note:

Innovation is not a monolithic phenomenon but various processes that coexist in parallel, each one requiring different types of control systems. Yet, we know little about how management control systems vary across variations of these processes, how they are designed, how they are used, how they interact [...]

One common distinction in the innovation literature concerns the allocation of attention and resources between exploitation and exploration. Exploitation entails "refinement and extension of existing competencies" whereas exploration requires "experimentation with new alternatives" (March, 1991, p. 85). As the structures

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<sup>1</sup> Management control is defined as "formal, information-based routines and procedures managers use to maintain or alter patterns in organizational activities" (Simons, 1995, p. 5).

and routines associated with exploitation are fundamentally different to those necessary for exploration, firms will often specialize (Gupta et al., 2006). Some, however, attempt to pursue exploitation and exploration simultaneously. Managing the competing tensions and inconsistencies imposed by these contradictory innovation paths is signified by the term ambidexterity (Andriopoulos and Lewis, 2009; Lubatkin et al., 2006). While a significant body of research has documented the environmental, structural and behavioral antecedents of exploration, exploitation and ambidexterity (Jansen et al., 2006; Raisch and Birkinshaw, 2008; Simsek, 2009), little consideration has been given to how top managers employ MCS in these different innovation contexts (see Cardinal, 2001, for an exception).

Furthermore, researchers have only just begun to investigate the design and use of MCS in firms that jointly pursue multiple and contradictory strategic objectives. This is an important concern as the literature generally contends that the success of firms facing highly dynamic and competitive environments is dependent on their ability to balance conflicting requirements (Gibson and Birkinshaw, 2004; Simsek, 2009). To date accounting studies have provided insight into how firms design performance measurement systems when emphasizing both low cost and differentiation strategies. Recent research by Lillis and van Veen-Dirks (2008) and Dekker et al. (2013) show that joint strategy (ambidextrous) firms have more complex systems that emphasize a wider diversity of measures, reflecting managerial demands to balance rather than to tradeoff competing priorities.

The current study extends these streams of research by investigating the patterns of MCS use by top managers for firms that either specialize in, or jointly pursue, exploration and exploitation. In this study, MCS are conceptualized in terms of Simons' (1995, 2000) levers of control (LOC) framework. The LOC framework is particularly appropriate for this study as it explicitly draws attention to the interplay of controls in managing organizational tensions (Mundy, 2010). Apart from Widener (2007) broad-sample research has been primarily concerned with the effects of interactive control (Abernathy and Brownell, 1999; Bisbe and Otley, 2004; Bisbe and Malagueño, 2009; Henri, 2006; Naranjo-Gil and Hartmann, 2007), limiting our understanding of how and when the full range of control levers are activated or combined and with what consequence. Recent field work has, however, been quite insightful in illustrating how the levers of control function as an interdependent system (Chenhall et al., 2010; Frow et al., 2010; Marginson, 2002; Mundy, 2010). Building on these insights, this study investigates both the individual and complementary effects of control levers on performance across different innovation modes. Additionally, this study empirically distinguishes between the *combined* and *balanced* use of control levers in generating dynamic tension (Simons, 1995). Although recent case studies have elaborated on how managers attempt to balance competing priorities through MCS (Cardinal et al., 2004; Jørgensen and Messner, 2009; Mundy, 2010), the effects of balance between control levers has not been formally tested.

The remainder of this study is organized as follows. The next section reviews the literature and develops hypotheses that associate the use of control levers with firm performance across different modes of innovation. Section 3 describes the research method followed by the presentation and discussion of results. The study concludes with an outline of the limitations of this study and directions for future research.

## 2. Literature review and hypothesis development

Exploitation and exploration represent fundamentally disparate modes of learning and innovation (March, 1991). Exploitation is encapsulated by terms such as “refinement, choice, production, efficiency, selection, implementation, execution” while exploration is indicative of “search, variation, risk taking, experimentation, play, flexibility, discovery, innovation” (March, 1991, p. 71). Exploitative activities are directed toward increasing the efficacy of the technical system by leveraging experiential learning gained through the repetition of routines. Through successive iterations the organization makes modifications to established processes to increase the proficiency and reliability of task performances. This process of incremental learning reinforces and deepens organizational capabilities along a given technological trajectory (Benner and Tushman, 2002; He and Wong, 2004). Conversely, exploratory activities involve the search for new and emerging markets and the development of novel prototypes and path-breaking technologies. This requires organizations to pursue radical departures from prevailing competencies and learnt routines, and generate a tolerance for slack, persistent experimentation and improvisation of practices (Andriopoulos and Lewis, 2009; Jansen et al., 2006)<sup>2</sup>.

Although March (1991) contends that exploitation and exploration place fundamentally incompatible requirements on an organization, he nevertheless maintains that both are essential for long-term survival. Firms investing in exploitation to the exclusion of exploration risk becoming trapped in suboptimal positions when environments shift, while those engaging in exploration at the expense of exploitation often fail to develop adequate competencies to capitalize on initial advantages (Holmqvist, 2004; Levinthal and March, 1993). Researchers investigating how balance can be achieved between exploitation and exploration present two main adaptive strategies: ambidexterity and punctuated equilibrium (Boumgarden et al., 2012; Gupta et al., 2006). Firms pursuing ambidexterity attempt to simultaneously manage the contradictory requirements of exploitation and exploration, while punctuated equilibrium refers to cycling between periods of specialization

<sup>2</sup> Exploration and exploitation are also closely related to other fundamental organizational tensions – e.g. incremental and radical innovation (Abernathy and Clark, 1985; Davila et al., 2009; Tushman and O'Reilly, 1996), local and distant knowledge search (Levinthal, 1997), single and double-loop learning (Argyris and Schön, 1978; Van de Ven, 1986), first-order and second-order competencies (Danneels, 2008), variation-reducing and variation-increasing strategic processes (Adler et al., 1999; Burgelman, 1991, 2002) and environmental adaptation and adaptability (Weick, 1979).

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