How do firms tackle strategic change? A theoretical model of the choice between dynamic capability-based and *ad hoc* problem-solving approaches

Purpose – The purpose of the paper is to provide a theoretical account of how firms make choices between dynamic capability-based and *ad hoc* problem-solving approaches towards strategic change.

Design/methodology/approach – A model is developed to answer the question of how and under what conditions firms develop appropriate approaches to handle strategic change.

Findings – Drawing upon structure inertia theory (SIT) and resource based view (RBV), our model predicts that firms, regardless of their age and size, are more likely to adopt *ad hoc* problem-solving approach to engage change in both highly dynamic and low-dynamic environments. However, in moderately dynamic environments, a dynamic capability-based approach may be more appropriate, depending on which theoretical logic (SIT or RBV) the decision is made upon.

Originality/value – The paper builds on the useful distinction made by Winter (2003) in terms of the ways to engage organizational change and extends the recent research on temporary vs. sustainable competitive advantages to investigate how firms tackle strategic change within the contexts of both environmental dynamism and organizational attributes.

Keywords – Strategic change, environmental dynamism, organizational attributes, dynamic capability, *ad hoc* problem solving

Paper type – Conceptual paper

1. Introduction

The study of how firms handle strategic change, or the change in decisions about products and markets in response to dramatic environmental shifts (Boeker, 1997), has been an important subject of interest (Li and Liu, 2014). The conventional wisdom is that, in a rapidly changing environment, the development of capabilities for strategic change can create value and lead to competitive advantage (Eisenhardt and Martin, 2000; Helfat *et al.*, 2007; Kelly and Amburgey, 1991). The most important theoretical advancement in this regard has been the development of a dynamic capability approach towards strategy (Teece, 2007). However, some recent research has questioned whether dynamic capabilities are necessary for strategic change (Arend and Bromiley, 2009; Chakrabarti, 2015; D'Aveni et al., 2010; Helfat and Peteraf, 2003). In particular, Winter (2003) makes a distinction between two different ways to engage strategic change— *ad hoc* problem solving and the exercise of dynamic capabilities— and argues that firms can accomplish change without relying on dynamic capabilities. Under certain circumstances, taking an *ad hoc* problem-solving approach towards change could be a more efficient option, as it involves non-repetitive behavior towards dealing with change, and the costs of *ad hoc* problem solving largely disappear if there is no similar problem to solve in the future (Winter, 2003). Winter, however, did not identify the circumstances under which firms should choose *ad hoc* problem-solving approach or dynamic capability-based approach other than pointing out that a cost-benefit analysis of these approaches towards change requires an understanding of how idiosyncratic attributes of individual firms affect such a choice in a particular competitive context (Winter, 2003). (R3-3 Authors' Response)

Winter's insight is anchored in an emerging stream of research on temporary competitive advantages, which has raised a question about whether the traditional thinking of developing dynamic capabilities to tackle strategic change is still appropriate when firms are increasingly facing sudden and unexpected changes in their external environment (D'Aveni

et al., 2010). This stream of research suggests that as the pace of environmental change accelerates, they become more difficult to predict, making the creation and implementation of well-planned strategies based on purposeful integration and reconfiguration of existing resources more difficult and more inappropriate. On the other hand, when the environment is relatively stable, with no significant technological or market changes, the development and use of dynamic capabilities are expensive or even disruptive, owing to the high maintenance cost (Li and Liu, 2014; Schreyögg and Kliesch-Eberl, 2007). Schilke (2014), for example, has demonstrated that dynamic capabilities have limited impact on competitive advantages within the context of either highly dynamic or stable environments. While studies within this stream of research often imply that there might be an alternative approach to the use of dynamic capabilities for handling change, they have not explored what such an alternative could be since their focus was on how different environmental dynamisms moderate the performance consequences of dynamic vs. ordinary capabilities. Our paper builds directly on insights generated from this emerging research but focuses on theorizing how environmental dynamisms shape firms' approaches toward strategic change.

Building on these recent developments, in this paper we propose a theoretical model that examines the conditions under which firms choose between a dynamic capability-based approach and an *ad hoc* problem-solving approach for strategic change. In addition to the role of environmental dynamism, we recognize that both the firm attributes and their resource base may also play critical roles in shaping firms' strategic responses to environmental dynamics, and we therefore develop a theoretical model on how firms handle strategic change within the contexts of both environmental dynamism and organizational attributes.

This paper represents the first theoretical attempt to explain the antecedents of the choice between dynamic capabilities and *ad hoc* problem solving for strategic change and is important in several aspects. First, our model contributes to the strategic change literature by

rationalizing the *ad hoc* problem-solving approach as a viable alternative to the dynamic capabilities approach. In particular, by theorizing under what environmental conditions this approach should be chosen over dynamic capabilities and vice versa, we fill the gap left by Winter's study (2003) and extend the recent contingent view that the impact of dynamic capabilities on competitive advantages varies with environmental dynamism (Li & Liu, 2014; Schilke, 2014; Wilden et al., 2013; Wilden and Gudergan, 2015). Second, while studies on temporary versus sustainable competitive advantages generally agree that dynamic capabilities have the strongest impact on competitive advantage in moderately dynamic environments, they give limited attention to the important role of organizational attributes. Our model extends this emerging stream of research to incorporate organizational attributes into the explanation of the organizational choice between the dynamic capability-based and *ad hoc* problem-solving approach in strategic change.

2. Literature review

2.1 Research on strategic change

Strategic change has been a controversial concept in the literature (Ginsberg, 1988). Some consider strategic change as a broad theoretical construct that encompasses any changes in the context of both a firm's corporate strategies such as changes in scope and resource deployment and business strategies such as competitive advantage (Tushman and Romanelli, 1985). Others define the concept narrowly as the change in corporate decisions on the domain of products and markets in response to dramatic environmental shifts (e.g., Boeker, 1997).

Difficulties also arise in attempting to differentiate between strategic adjustments and changes (Mintzberg *et al.*, 1998). Snow and Hambrick (1980) point out that a firm has made a strategic adjustment, rather than a strategic change, if it has not altered its overall orientation toward that environment. Thus, although fundamental change may occur as an

organization makes incremental changes in strategic subsystems over time (Quinn, 1980), changes in operational efficiencies, for example, are not generally regarded as strategic changes, as such changes do not result in a shift in the relation between an organization and its environment (Eppink, 1978).

The irreversible nature of strategic change is another criterion in determining whether an organizational change is strategic or not (Eppink, 1978). Judging by this criterion, we agree with Kelly and Amburgey (1991), who see discontinuous changes in an organization's strategy, goals, forms of authority and technology as strategic changes because they are changes in core organizational features (Hannan and Freeman, 1984) and are difficult to reverse. In contrast, we disagree with Hambrick (1981) and Markoczy (2001), who see improving manufacturing capacity to increase efficiency as a type of strategic change; instead, like other changes that improve operational efficiencies such as the introduction of a new accounting method or a new warehousing technique, they should be classified as operational rather than strategic changes as they are relatively easy to reverse. In this paper, we posit that strategic changes occur when a firm makes difficult-to-reverse corporate and business decisions on their product and market domains, resource allocation, competitive advantages and core technologies that fundamentally alter the relation between the organization and its environment.

Research on strategic change has drawn largely upon strategy literature (especially the dynamic capability approach and resource-based view) and organization studies (especially structure inertia theory). While the two bodies of literature have largely developed independently, there is a general consensus among organization theorists (e.g., Child, 1972; Tushman and Romanelli, 1985) and strategy scholars (e.g., Bourgeois and Eisenhardt, 1988; Grant, 1996) that firms engage in strategic change to achieve organizational alignment with environmental shifts. However, most studies are ambiguous on the link between

environmental dynamism and strategic change (Eisenhardt and Martin, 2000). In addition, while prior studies have recognized the critical role played by organizational resources in firms' approaches to strategic change (Zajac *et al.*, 2000), research that combines organizational and environmental variables, and addresses how they interact in shaping changes in a firm's strategy, has been rare. This paper aims to develop a theoretical model to delineate the environmental and organizational conditions under which firms will choose between the dynamic capability-based approach and the *ad hoc* problem-solving approach towards strategic change.

2.2 The role of dynamic capabilities in strategic change

Originally defined as a "firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece et al, 1997: 516), the concept of dynamic capabilities has been tightly linked to effectiveness at dealing with change (Basile and Faraci, 2015; Tsai and Yen, 2008). However, despite a substantial amount of research on dynamic capabilities, the relationship between dynamic capabilities and strategic change, especially the role of environmental dynamism in such a relationship, remains unclear (Barreto, 2010). Some scholars contend that dynamic capabilities can support organizations to achieve strategic change and sustainable competitive advantages regardless of the degree of environmental turbulence (e.g. Peteraf et al., 2013). Others emphasize the contingent role of environmental dynamism and show that the degree of environmental dynamism moderates the effect of dynamic capabilities on organizational change and competitive advantages (Ambrosini et al., 2009; Schilke, 2014; Gelhard et al., 2016). Arend and Bromiley (2009) go further to criticize the ability of the dynamic capabilities view to explain organizational change cohesively due to the lack of logical consistency and conceptual clarity.

In this paper, we argue that a deep understanding of the role of dynamic capabilities in strategic change requires us to separate environmental dynamism from the definition of dynamic capabilities, and we therefore adopt a refined definition proposed recently by Wilden et al. (2016). Based on a comprehensive literature review, the authors conceptualize dynamic capabilities as "processes relating to sensing, seizing opportunities and reconfiguring the firm's resource bases to achieve organizational survival and growth" (2016: 998). Sensing involves identification and assessment of technological and market opportunities. Seizing involves mobilization of resources to address an opportunity and to capture the value from doing so. Reconfiguring enables firms to continuously renew and transform existing operational capabilities as markets and technologies change and apply them into the task of building durable competitive advantages at the firm level (Teece et al., 2016).

On one hand, such a definition shares commonalities with some key aspects of the original definition provided by Teece et al. (1997). First, it follows evolutionary economics logic that a firm's ability to handle future change is constrained by its current stock of resources and capabilities and that such capabilities are developed systematically over time through a series of coordinated investments rather than discrete projects (Pisano, 2016); second, consistent with Teece and Pisano (1994), in Wilden et al.'s (2016) definition, it is the processes that underlie such sensing, seizing and reconfiguring capabilities that are called dynamic capabilities, and these processes are a collection of lower-order routines (operational or ordinary capabilities) that enable a firm to perform some activities on a consistent (repeatable) basis (Winter, 2003). In other words, the three clusters of sensing, seizing and reconfiguring capabilities require purposeful investment and constant management, and the performance of these dynamic capabilities draws upon lower-order operational routines or capabilities.

On the other hand, Wilden et al.'s definition differs importantly from Teece et al.'s in that it separates both organizational change and environmental dynamism from dynamic capabilities, paving the way to study environmental dynamism as a key antecedent of the choice of dynamic capabilities in dealing with change. The implication is that it would be inaccurate to equate dynamic capabilities with firms' abilities to deal with strategic change for two important reasons. First, firms develop sensing and seizing capabilities and integrate and reconfigure their existing competences even in relatively stable or static environments (Zollo and Winter, 2002). Second, not all environmental dynamisms require the deployment of highly developed sensing and seizing capabilities as an organizational response (Helfat and Peteraf, 2003; D'Aveni et al., 2010). Invoking processes that hinge upon reconfiguring existing resources into new capabilities may not solve the problem in some situations or may be too costly in other circumstances (Chakrabarti, 2015). Alternative approaches such as *ad hoc* problem solving (Winter, 2003) that are not reliant on dynamic capabilities may handle some environmental dynamics better than the dynamic capability-based approach.

2.3 Two different approaches toward strategic change

In this paper, we consider dynamic capabilities and *ad hoc* problem solving as two different approaches toward strategic change. A dynamic capability-based approach toward strategic change enables firms to adapt to changing enrolments through the processes of sensing and filtering opportunities and threats, seizing opportunities, and reconfiguring the firm's current resource bases (Chakrabarti, 2015; Teece, 2007). Such an exercise can be either emergent or intentional. Dynamic capabilities such as sensing and seizing opportunities and reconfiguring resource bases in changing markets are higher-order routines based on identifiable and measureable business processes such as alliance management capability and new product development capability (Eisenhardt and Martin, 2000; Schilke, 2014). Because the processes

relating to sensing, seizing and reconfiguring are themselves a collection of lower-order routines, dynamic capabilities as higher-order routines often emerge from repeated exercises of integration and reconfiguration of lower-order operational capabilities (Winter 2003).

A dynamic capability-based approach towards strategic change can be regarded as a general search routine that proactively seeks to bring about desirable changes in the existing set of operating routines to enhance organizational performance (Zollo and Winter, 2002). Based on this view, a dynamic capability-based approach is an intentional choice by executives and managers who seek to combine and process external resources and internal intangible assets to compete in rapidly changing environments (Tsai and Yen, 2008). The processes relating to sensing, seizing and reconfiguring capabilities are systematically developed by managers and are aimed to align changes with their firms' long-term strategic orientation (Gelhard et al., 2016; Wilden et al., 2016). In other words, a dynamic capability-based approach can be viewed as a firm's systematic efforts to solve problems, formed by its propensity to sense opportunities and threats, to make timely decisions and to implement strategic changes efficiently to ensure the right direction (Li and Liu, 2014). Whether emergent or intentional, the outcome of a dynamic capability-based approach towards strategic change is a structured and persistent response to environmental changes (Eisenhart and Martin, 2000), often manifested in a highly patterned behavior built upon existing operational or ordinary capabilities (Winter, 2000).

However, the development of dynamic capability is not without cost (Schilke, 2014). In practice, a dynamic capability-based approach generally involves specialized personnel (e.g., R&D staff) who are committed full time to their change roles (e.g., new product developments) and other types of resource investments (Winter, 2003). It would only make sense for firms to invest in dynamic capabilities if such higher-order capabilities will be used frequently in the future. Developing a dynamic capability that can be used only once or

occasionally for change is merely to carry a cost burden (Winter, 2003). Moreover, because the exercise of dynamic capabilities requires frequent reconfiguration of the existing lower-order operational/ordinary capabilities, such frequent reconfiguration can disrupt the underlying capabilities and outweigh the benefits brought by such exercises (Chakrabarti, 2015). An example of how the use of the dynamic capability-based approach can be disadvantageous is where innovative R&D does not pay off due to facing strong rivals who invest only in imitative R&D based on shifts in customer demands (Nelson and Winter, 1982).

In contrast to the dynamic capability-based approach, an *ad hoc* problem-solving approach toward strategic change involves the one-off creation and deployment of operational capabilities to cope with radical change and does not require costly long-term investment in specialized processes relating to sensing, seizing, and reconfiguring, and it may disappear from organizational memory once it has performed its task (Winter, 2003; Dosi et al., 2003). Thus, *ad hoc* problem solving is not a structured and patterned search routine and is not regarded as a constituent part of a firm's dynamic capabilities (Nelson and Winter, 1982).

Firms often have to tackle problems for which they are not well prepared, based on executive judgment and intuition, with no prior experience and knowledge. In such situations, firms may be pushed into a high-paced, contingent, and opportunistic search for alternative solutions rather than relying on highly-developed, highly-patterned dynamic capabilities (Winter, 2003). The *ad hoc* problem-solving approach does not require firms to invest in the development of long-term sophisticated and highly patterned organizational routines to deal with change, allowing firms to accomplish change when needed with a lower cost burden (Winter, 2003). Thus, the *ad hoc* problem-solving approach tends to be used in responding to disruptive but largely isolated events such as the September 11 terrorist attack (Li and Tallman, 2011) and 2008 global financial crisis (Makkonen et al., 2014), while the use of

dynamic capabilities such as sensing and seizing opportunities represents systematic change efforts, and deepens the firm's memory of routines that can be used in responding to similar and recurrent environmental shifts in the future.

The classification of firms' approaches towards strategic change into two distinctive types has important implications for developing a theory on how firms should develop appropriate responses to different environmental dynamics and choose either a dynamic capability approach or *ad hoc* approach. Research in this area has been hampered by a lack of studies directly addressing the relationship between specific environmental or organizational variables and firms' strategic changes (Li and Liu, 2014). Below, we link the two approaches, the nature of environmental dynamism, and organizational contingencies together into the development of a comprehensive model on how firms tackle strategic change in dynamic environments.

3. How do firms tackle strategic change in highly and low dynamic environments?

There are different classifications of dynamism of environmental forces in the management literature (Dess and Beard, 1984; Mintzberg, 1983; Tan and Litschert, 1994; Girod and Whittington, 2016). We use the classification developed by Bourgeois and Eisenhardt (1988), who focus on the two dimensions of unpredictability and velocity, where unpredictability means uncertainty and the term velocity concerns the rate or pace of change in a firm's environment. The classification is most relevant to the present study because a number of important past studies related to dynamic capabilities and organizational change use these two dimensions to distinguish between highly dynamic, moderately dynamic and stable environments (D'aveni et al., 2010; Eisenhardt and Martin, 2000; Schilke, 2014). However, their focus was on examining the contingent value of dynamic capabilities for competitive advantage in different environments. Our purpose is to investigate how environments with

varying degree of dynamism might serve the antecedents to the organizational choice between dynamic capabilities and *ad hoc* problem-solving for handling change.

Our general arguments are that in both highly and low dynamic environments, *ad hoc* problem-solving approach will be preferred over dynamic capability-based approach regardless of firm-specific attributes; but in moderately dynamic environments, whether firms will choose to use *ad hoc* problem-solving or dynamic capability-based approach towards strategic change is contingent not only upon environmental dynamism but also on firm-specific organizational attributes. In other words, a good understanding of the nature of environmental dynamism is sufficient for examining the choice between the two approaches towards strategic change in both highly and low dynamic environments, as we will discuss below in this Section 3; however, in explaining such a choice in moderately dynamic environments, organizational theories such as structural inertia theory and resource based view are required to provide additional insights, and that will be tackled in Section 4. (R3-1 Author's Response)

3.1 Handling strategic change in a highly dynamic environment

Highly dynamic environments are both fast-changing and highly unpredictable (Eisenhardt and Martin, 2000) and are often driven by unanticipated and disruptive environmental shocks (Chakrabarti, 2015; Li and Tallman, 2011). Such environmental dynamics result in the overall industry boundaries becoming blurred, successful business models and practices becoming unclear, and market players becoming ambiguous and shifting (Schilke, 2014). A high degree of volatility requires urgent firm actions to rapidly create new knowledge and practices to respond to unexpected change and remain relevant in the markets, but a high degree of unpredictability means firms have no specific experience and therefore no routine answer to handle such disruptive change (Li and Liu 2014).

Dynamic capabilities simply do not help in these situations. First, dynamic capabilities are only valuable if they create operational capability configurations that can shape a firm's options for dealing with change (Protogerou et al., 2012). The strength of a dynamic capability-based approach derives from a firm's cumulative previous knowledge and learning that enable firms to repeatedly add to their assets through reconfiguring resource bases into new capabilities for handling external environments (Helfat and Winter, 2011; Fourne et al., 2014). In highly dynamic environments, there are many factors that cause the unpredictability, and there is a great deal of uncertainty regarding what kinds of new capabilities should be created and what value they may bring to the firm. In other words, rapid and unpredictable changes in environments can also cause the uncertainty and unpredictability of the capability development, which in turn would undercut the appropriateness of developed routines (Bradley et al., 2011). Based on observations of some of the world's most renowned companies' change strategies, for example, Helfat and Winter (2011) found resources invested in routines of innovative capabilities for unknown change could be wasteful and concluded that dynamic capabilities are not necessarily useful in rapidly changing environments.

Second, as discussed earlier, whether emergent or intentional, dynamic capabilities are not randomly created; rather, they require systematic efforts and investments over time. To deal with highly dynamic environments, it would be too costly to invest in developing dynamic capabilities that create highly patterned knowledge and routines which are not necessarily well prepared for ambiguous, unpredictable sort-term disruptions (Eisenhardt and Martin, 2000). Recent studies of temporary competitive advantages emphasize that in hyper-competitive environments, especially in crisis, timely adjustments and quick response through an *ad hoc* approach is the only way for firms to get short-term advantages (D'Aveni et al, 2010; Chakrabarti, 2015). A number of empirical studies provide support that

sustainable competitive advantages are rare and even declining in increasingly dynamic and unpredictable environments (Chakrabarti, 2015; Danneels, 2010; Wiggins and Ruefli, 2005). Based on a meta-analysis of existing studies on the capabilities-performance relationship, for example, Karna et al. (2016) concluded that dynamic capabilities are not superior to ordinary capabilities for handling changing environments. Companies that invested systematically in developing processes relating to sensing, seizing and reconfiguring may find such efforts and investments are not only of little immediate benefit to solve the problems they are facing in a rapidly changing environment but also that they are difficult to recover in the long term as there is no certainty of the strategic value of such investments. By contrast, firms that embraced change through creative and temporary solutions (e.g. creating spin-offs) would be able to capture opportunities and mitigate threats in the external environment with speech and agility.

In addition, although highly dynamic environments may provide ample opportunities for resource reconfiguration and integration, such resource reconfiguration itself could disrupt organizational operation without strategic benefits (Schilke, 2014). Previous research found that extensive internal change compounds the risk presented by an uncertain external environment (Wan and Yiu, 2009). In such situations, firms may still need to use their existing operational capabilities but will not need to engage in the integration and reconfiguration of operational capabilities into sophisticated dynamic capabilities (Li and Tallman, 2011).

Thus, we argue that the unpredictable nature of highly dynamic environments means that the cost-benefit analysis of the two approaches would tip the balance in favor of lower-order operational capabilities supplemented by *ad hoc* problem solving to seek temporary advantages. If, by contrast, firms attempt too much organizational change through the systematic development of dynamic capabilities, it is very likely that such deliberate effort

will bring more costs than benefits to the firm because the characteristics of a highly dynamic environment means that investment in highly patterned and routinized response capabilities does not pay off when they have no future use (Chakrabarti, 2015). Thus, unpredictable environments warrant the use of an *ad hoc* problem-solving approach that allows spontaneous and creative responses to novel environmental challenges. Hence:

> *PROPOSITION 1:* In highly dynamic environments firms will take an *ad hoc* problem-solving approach towards strategic change

3.2 Handling strategic change in a low-dynamic environment

Low dynamic environments are characterized as relatively stable, with no significant technological disruption or market change, and changes in such environments are less frequent and more predictable (Li and Liu, 2014). Recent studies on temporary competitive advantages suggest that the impact of dynamic capabilities on competitive advantage is weak not only in highly dynamic environments but also in low-dynamic environments (D'Aveni et al, 2010; Schilke, 2014). Invoking dynamic capabilities to handle change in low-dynamic environments is unnecessary or even destructive, owing to the maintaining cost of dynamic capabilities (Schreyögg and Kliesch-Eberl, 2007; Drnevich, & Kriauciunas, 2011). Schilke (2014) supported this view with empirical findings of an inverse U-shaped moderating effect of environmental dynamics on the relationship between dynamic capabilities and competitive advantage. Based on longitudinal case studies, Kalali and Heidari (2016) found that during a period of environmental stability, dynamic capabilities had little effectiveness for consulting firms and operational capabilities met these firms' needs very well.

When facing stable and predictable environments, it may be unnecessary to commit to the systematic development of processes relating to sensing and filtering opportunities, generating new information, enacting and reconfiguring resources (Gelhard et al., 2016).

Even if such processes are developed, they may be of less value for firms since stable environments typically reward consistent exploitation of firms' existing operational capabilities (Teece, 2007), whereas constantly integrating and reconfiguring existing resources will disrupt the value of the firm's resources and the effectiveness of the current business models (Schilke, 2014).

While dynamic capabilities can exist in stable environments (Helfat and Winter, 2011), to operate dynamic capabilities, firms must invest significantly and constantly not only in integrating but also in modifying its current resources for new operations, technologies and products (Makkonen et al., 2014), and that will unnecessarily raise the costs of handling change resulting from wrong estimation of the need for resource alternations (Winter, 2003). In low-dynamic environments, therefore, firms should focus on maximizing the utility of the extant resources and capabilities and act quickly to take advantage of opportunities for competitive advantage. When facing environmental contexts where changes are largely predictable and infrequent, the *ad hoc* problem-solving approach, which draws upon firms' existing operational or ordinary capabilities, will be a more cost-effective way to come up with solutions quickly without heavy investment in higher-order dynamic capabilities (Dosi et al., 2003). In such environments, firms should focus primarily on identifying and deploying relevant resources and capabilities to handle the changes quickly and effectively rather than trying to generate complex combinations of organizational capabilities when there is no compelling need for such disruption of the resource base (Winter, 2003). Recent empirical studies show that when environmental dynamism is low, the value of dynamic capabilities such as alliance management capability and product development capability is weak because there are few occasions to exercise them effectively (Schilke, 2014). We therefore suggest:

PROPOSITION 2: In low dynamic environments firms will adopt an *ad hoc* problem-solving approach towards strategic change.

4. How do firms tackle strategic change in moderately dynamic environment?

4.1 Handling strategic change in a moderately dynamic environment

Compared to highly dynamic environments, moderately dynamic environments are characterized by a rapid pace of change but are relatively predictable (Eisenhardt and Martin, 2000), which means that firms can draw upon prior experience and existing operational capabilities to plan and organize their responses in a relatively ordered fashion (Gelhard et al. 2016). Typical examples are seasonal demand patterns and periodical inflow of orders within manufacturing industries (Eppink, 1978).

Although such environmental changes often demand quick actions from firms, firms are more or less familiar with the recurring turbulence and can normally refer to their response capacity stored in their organizational memory of dealing with similar shifts in the past (March, 1991). Even when the kind of dynamic is not a complete repeat of the challenges in the past, its relatively predictable nature and high probability of future occurrence justify developing and deploying dynamic capabilities that create situation-specific new knowledge (Eisenhardt and Martin, 2000) to routinize the response to possible similar environmental dynamics in the future (Winter, 2003). Compared to highly unpredictable environments, therefore, moderately dynamic environments give more room for firms to respond by integrating their existing knowledge, resources and capabilities (Danneels, 2010; Gellhard et al. 2016). These environments are dynamic enough to create opportunities for change but stable enough for firms to make good use of their routinized processes and practices that underlie the dynamic capabilities (Drnevich and Kriauciunas, 2011; Schilke, 2014).

As firms gain experience with changes in such environments, they will develop routines to respond to the environment dynamism so that change itself becomes routinized (Kelly and Amburgey, 1991; Wilden et al., 2016). For example, facing an extremely volatile market environment due to aggressive price-cutting and accelerated technological improvements by Asian manufacturers, Intel was able to respond effectively and consistently with a simple routine of resource allocation between memory chip and microprocessor businesses, as the company largely predicted the ever-increasing challenges from Asia (Burgelman, 1996; Fourne et al., 2014). Recent empirical studies on the relationship between dynamic capabilities and firm performance also found that dynamic capabilities are most beneficial when the level of environmental dynamism is intermediate (Karna et al. 2016; Schilke, 2014).

However, firms differ in terms of their initial resource base, prior experience, and their propensity for change. For firms who lack the kind of resources that Intel possesses, investing in building highly-patterned dynamic capabilities can be too costly. Instead, they may benefit from taking an *ad hoc* problem-solving approach towards strategic change. Similarly, firms characterized as showing relative inertia tend to preserve their strategies rather than change them to reflect changing environmental conditions (Quinn, 1980). When facing moderately dynamic environments, these firms may pursue an *ad hoc* problem-solving approach in order to limit their investment in adapting to environmental change. Thus, a more nuanced approach is needed to analyze how different firm attributes may influence the choice between dynamic capability-based and *ad hoc* problem-solving approaches toward strategic change.

4.2 Organizational attributes and strategic change

When examining the effect of organizational attributes on strategic change, we choose structural inertia theory (SIT) and resource-based view (RBV) to deduce our arguments because these two theories are among the most influential in informing us how organizational

attributes shape firms' behavior towards organizational change (Hannan and Freeman, 1984; Karna, et al., 2016; Nelson and Winter, 2002). They, however, often differ in their predictions of how firms behave. A theoretical model based on a combination of such competing frames would broaden our understanding of the proposed main/moderating effects by pointing to explanations/predictions that may be left aside in a model that incorporates theories with similar underlying logic and predications of firm behavior.

Firms begin with different initial conditions for change (Bradley et al., 2011; Eisenhardt and Martin, 2000). Among organizational scholars, some argue that firms are adaptive and able to change their strategies to stay aligned with changing environmental conditions (Zajac and Shortell, 1989), while others hold that a firm's usual state is inertial and stress the negative consequences of changing core organizational features (Hannan and Freeman, 1984). We take the view that firms are both inert and adaptive (Gersick, 1994). Our concern is the extent to which the adaptive (or inertia) attributes of firms will impact on the firms' choice between *ad hoc* problem-solving versus a dynamic capability-based approach in responding to environmental dynamism. Below, we incorporate firms' adaptive attributes and resource bases, as organizational contingencies, into the development of a more comprehensive model. Specifically, we develop competing propositions to predict how firms will choose between two very different approaches in responding to the environmental dynamism. The competing hypothesis approach not only helps to glean more insights by drawing upon different theories for arguments but also identifies boundary conditions for theories (Pleggenkuhle-Miles and Peng, 2009; Schilke, 2014).

4.3 The impact of firm attributes on strategic change: structural inertia perspective

First, when facing high environmental volatility and unpredictability, neither a firm's adaptive attributes nor its resource base has a significant impact on its propensity and capacity for strategic change because the firm has no prior experience, knowledge and

routines that it can draw upon for enacting change. Investing in reconfiguring existing operational capabilities into new dynamic capabilities is not necessary for handling the immediate (and possibly one-off) problem. It is also not justified economically, as the high degree of unpredictability means there may be little opportunity for future exploitation of the newly developed capabilities. Hence, in such environments, the *ad hoc* problem-solving approach remains an efficient and low-cost response to radical environmental challenges.

Similarly, dynamic capabilities are not worth keeping in low dynamic and stable environments. In such environments, dynamic capabilities are costly to build and maintain. Rather, firms will benefit more from skilful use and upgrading of their operational or ordinary capabilities to deal with frequent and predictable changes in stable environments. In addition, investing in systematic capability-building to prepare for the future during a period of relative stability may leave firms less competitive when environments change abruptly, since routines and capabilities developed in environments of relative stability may not match the dynamics in the future environments or even turn into potential liabilities as environments become unstable (Bradley et al., 2011). Thus, Proposition 2 stands both in highly dynamic and stable environments, and organizational contingencies do not alter our prediction of firm response in terms of the choice between the two approaches.

Second, in moderately dynamic environments, however, firm-specific attributes, such as prior experience, knowledge, resources, etc., will have greater roles in shaping the variety of firm responses to different levels of environmental dynamism. Structure inertia theory and the resource-based view differ in their predictions of how organizational attributes will affect a firm's choice between *ad hoc* problem-solving and the capability-based approach as the more efficient response.

Structural inertia theory (SIT), as fully developed by Hannan and Freeman (1984), conceptualizes organizational structure as composed of hierarchical layers of structural and

strategic features that vary in flexibility and responsiveness. According to the theory, each organization is subject to inertial forces to change its structures and strategies when facing opportunities and threats in external environments (Gilbert, 2005; Goodstein and Boeker, 1991), and among organizational attributes, age and size are most positively related to the degree or strength of inertia (Kelly and Amburgey, 1991). In the field of strategic management, there is also a growing consensus that dynamic capabilities function in firm-specific and idiosyncratic ways in terms of firm size and age (e.g. Drnevich & Kriauciunas, 2011; Gelhard et. al., 2016), but how these firm-specific attributes may influence a firm's approach towards strategic change has not been addressed.

The standard SIT argument is that older/larger organizations are more likely to be subject to inertia because of increased bureaucratization (Hannan and Freeman, 1984). As firms get old and increase in size, they put more emphasis on predictability, formalized systems and structural stability (Hannan and Freeman, 1984), and their behavior becomes rigid and resistant to change (Quinn and Cameron, 1983). Given the strong inertia, there are often time lags in their responses that can be longer than typical environmental fluctuations, and such inertia may block structural change completely (Hannan and Freeman, 1984). On average, large and old firms respond more slowly to environmental shifts than their smaller and younger counterparts, which increases the likelihood that the environment will have changed before a large and old firm can complete a complex process of developing dynamic capabilities for strategic change. Given the knowledge of their firm's internal inertia forces, it is likely that executives of such large and old firms will not initiate a complex process of dynamic capability building but rather opt for an *ad hoc* problem-solving approach when responding to moderate environmental dynamism. Danneels (2010), for example, shows how Smith Corona, formerly a well-established typewriter manufacturer, was slow in exercising dynamic capabilities to embrace technological changes in the industry.

It should be noted, however, that adopting an *ad hoc* problem-solving approach does not mean large and old firms do not use any capabilities; rather, it means such firms will tend to use their existing operational capabilities without expending much effort (due to their inertia) in developing higher-ordered dynamic capabilities through integrating and reconfiguring existing resources, routines and capabilities. In moderately dynamic environments, therefore, structure inertia provides organizational accountability and reliability, which promote organizational survival (Hannan and Freeman, 1984).

By contrast, young and small firms are seen as more flexible and responsive towards moderate environmental changes. Such firms may change strategy and structure in response to environmental changes almost as quickly as the individuals who control them (Hannan and Freeman, 1984). Without possessing relatively fixed repertoires of organizational routines and operational capabilities, young and small firms are more adaptive and face less of a cost burden in proactively developing new routines and capabilities that can be patterned and built up for future use when they grow and face similar environments. Young and small firms often benefit from their independence and flexibility in making decisions without the burden of large bureaucracies. In a study of manufacturing and technology firms in Sweden, Bradley et al. (2011) found the value of organizational flexibility often means these firms can benefit from their freedom to experiment and develop alternative routines, which will become an important resource base for handling future environmental changes. Hence we suggest:

> *PROPOSITION 3a:* In moderately dynamic environments, SIT predicts that old and large firms are more likely to take an *ad hoc* problem-solving approach towards strategic change, while young and small firms are more likely to adopt a dynamic capability-based approach as a response.

Figure 1 summarizes the links between environmental dynamism, organizational age and size, and firm approaches toward strategic change based on SIT predictions.

Insert Figure 1 about here

4.4 The impact of firm attributes on strategic change: resource-based perspective

Hannan and Freeman (1984) acknowledge that the relationship between age and size and strategic change is indeterminate and that age and size can be another proxy for resource endowment. With greater resource endowment, older and larger organizations are more likely to be able to embrace or adapt to changes (Zajac and Kraatz, 1993; Makkonen et al., 2014). This is RBV logic, which suggests old and large firms have more resources and hence are able to control their environments through superior resources and market power. Compared to younger and smaller firms, old and large firms have a wider range of choices for enacting strategic change by drawing upon their current resources and capabilities (Barker and Duhaime, 1997; Peteraf et al., 2013). More established firms also may have slack resources, with the potential to promote strategic change (Tan and Peng, 2003; Bradley et al., 2011). Firms with slack resources tend to have "open options" (Bowman and Hurry, 1993) that enhance their capacity to respond to external changes quickly (Li and Liu, 2014). Therefore, according to RBV, old and large firms are more capable of integrating and reconfiguring their existing operational capabilities into new dynamic capabilities for strategic change.

Young and small firms suffer from a lack of resources upon which to build and develop dynamic capabilities in a timely manner in order to respond to environmental changes. Even when they strive to build up their resource base for developing dynamic capabilities, such adaptive efforts by such resource-poor firms may turn out to be too costly with respect to future value. In addition, it is possible that each time young and small firms complete their internal change, the environment may have already shifted to some new configuration demanding a different organizational response. Thus, young and small firms adopting an *ad*

hoc problem-solving approach to accomplish change when needed will carry a lower cost burden than rivals who invest in dynamic capabilities, which typically involve investments into specialized resources and require high levels of maintenance to be successful (Winter, 2003). Thus, from a RBV perspective, it is more beneficial for young and small firms to adopt a more cost-efficient *ad hoc* problem-solving approach to tackle strategic change. Thus, we develop a competing proposition:

> *PROPOSITION 3b:* In moderately dynamic environments, RBV predicts that old and large firms are more likely to adopt a dynamic capability-based approach, while young and small firms are more likely to take an *ad hoc* problem-solving approach towards strategic change.

Figure 2 summarizes the links between environmental dynamism, organizational age and size, and firm approaches toward strategic change based on RBV predictions.

Insert Figure 2 about here

---

5. Contributions and future research

5.1 Contributions to research and practice

Previous strategy research has highlighted the importance of strategic change to firms' survival and value creation in acute market competition (e.g., Eisenhardt, 1990; Golden and Zajac, 2001). The question of how firms adopt and develop appropriate approaches to tackle strategic change in dynamic environments, however, has not been adequately addressed. The traditional view of developing dynamic capabilities for strategic change is challenged by recent studies that found dynamic capabilities are less important than ordinary capabilities in either highly dynamic or low-dynamic environments (Karna et al., 2016; Schilke, 2014). In a

research note, Winter (2003) recognized *ad hoc* problem solving as a viable alternative to the dynamic capability-based approach towards tackling strategic change, but the conditions under which firms should choose between the two approaches remains unidentified. This paper addresses the gap with several contributions to the relevant literature.

First, this paper advances Winter's notion of *ad hoc* problem-solving as an alternative to the dynamic capability-based approach that draws upon firms' existing ordinary capabilities to handle change. Second, we articulate that the key difference between the dynamic capability and *ad hoc* problem-solving approach is that the former is a learned, routinized and systematic response to relatively moderate environmental changes, while the later involves creative and discrete response to radical environmental changes. Third, these conceptual advancements enable us to contribute to the strategic change literature by clarifying the contingent role of environmental dynamism in selecting an appropriate approach toward strategic change. We argue that the dynamic capability-based approach is most suitable and effective for strategic change in moderately dynamic environments. In highly dynamic environments where changes are frequent and unpredictable, using a dynamic capability-based approach towards change may prove too costly since the future value of such highly-patterned processes relating to sensing and seizing opportunities and reconfiguring current resource bases is highly uncertain. In a stable environment, the value of dynamic capabilities toward strategic change is also low, and the development and use of dynamic capabilities in such an environment can be ineffective and even disruptive. Instead, an *ad hoc* problem-solving approach, which allows a spontaneous and creative response to change, will be the most efficient and economical approach in both low- and highly dynamic environments, regardless of firm attributes.

Finally, we extend our theoretical model to include a set of organizational attributes as internal organizational contingencies that interact with external environments in shaping

firms' choices of strategic change approaches. Specifically, drawing upon the resource-based view and organizational inertia theory, we derive competing propositions on how firms choose approaches toward strategic change based on the interactions between the degrees of environmental dynamics, firm age and size, and resource base.

We propose that according to RBV, for young and small firms, when concerned primarily with the limitation of their resources, they should take an *ad hoc* problem-solving approach towards handling strategic change regardless of the nature of environmental dynamism. In contrast, from the perspective of SIT, we advise that young and small firms should adopt an *ad hoc* problem-solving approach in highly dynamic environments and adopt a systematic dynamic capability-based approach when facing moderately dynamic environments. The development of dynamic capabilities only makes sense when firms can reasonably expect that investing in highly structured and patterned higher-order routines such as sensing and seizing capabilities in one environmental setting will bring foreseeable benefits in the future, a condition that is unlikely to be met in highly dynamic environment.

Yet, for old and large firms, SIT suggests that the development of dynamic capabilities becomes unnecessary; instead, an *ad hoc* problem-solving approach should be developed in both highly dynamic and moderately dynamic environments. This is because, with strong internal inertia forces, one can expect a slow speed of adjustment and response to environmental changes by these firms. In other words, it is likely that the changing pace of the environmental dynamics is faster than the process of dynamic capability-building. Although it is hard to know whether an *ad hoc* problem-solving approach would result in optimal organizational change to tackle environmental dynamism, it is a less costly and less risky approach which could result in speedy and satisfactory solutions for dealing with rapid and radical changes.

However, from a resource-based view, a choice needs to be made between the two approaches depending on the nature of environment dynamics. With a great resource base, old and large firms should be encouraged to invest in developing dynamic capabilities to tackle relatively predictable environmental changes, while they should also be capable of adhering to a low-cost *ad hoc* problem-solving approach for embracing radical changes in highly dynamic environments. Our competing propositions, derived from different theoretical lenses, thus pinpoint the possibility that certain organizational attributes can act simultaneously to promote or inhibit the choice of one particular approach over another towards strategic change.

It should be noted that the use of competing hypotheses differentiates our arguments from a previous study by Peteraf et al. (2013). On the surface, our arguments regarding the role of dynamic capabilities in moderately dynamic environments appear close to those of Peteraf et al. (2013), who suggest dynamic capabilities are best practices in moderately dynamic environments. But in our theory development, we have presented more nuanced arguments by combining the considerations of both environmental dynamism and organizational attributes and, more importantly, by drawing upon different theoretical reasoning; i.e., based on RBV, we argue that old and large firms will find a dynamic capability-based approach more appropriate in dealing with strategic change, while the SIT logic points to the opposite argument (i.e., young and small firms are more likely to adopt a dynamic capability-based approach to handle strategic change in such environments).

This study also has some useful insights for managers. It goes without saying that firms need the ability to make quick and extensive strategic changes to survive and create value in dynamic environments. But different from the traditional literature's emphasis on the development of highly patterned and routinized dynamic capabilities, our framework suggests that in many situations it would be more efficient for firms to look for more

effective use of existing operational capabilities or create new operational capabilities for quick problem-solving. The implication is that ordinary capabilities such as a radically new marketing method based on a mobile app or a new business model specifically catered to the exploding Chinese consumer market are not of less value than dynamic capabilities in dealing with change. In contrast, ordinary capabilities may help firms to take full advantage of new opportunities presented by a highly dynamic environment, for example by enabling firms to ramp up production quickly to meet the explosive demand (Karna et al. 2016).

As unpredictable and rapid technological, industrial and institutional changes are becoming normal, the distinction between ordinary and dynamic capabilities is also becoming blurred (Helfat and Winter, 2011). Our advice to managers is that they should embrace themselves with the age of temporary advantage (D'Aveni et al., 2010) or at least consider both ordinary and dynamic capabilities in their response to strategic change. Even if there exists a relatively stable environment in the short and intermediate term, firms that are good at using an *ad hoc* approach to solve problems can make better use of situations of predictability and stability in their industrial environments to prepare themselves for drastic changes later on or even for creating disruptive changes in their respective businesses and become the future industry leader (Peteraf et al., 2013).

5.2 Limitations and future research

Our theoretical model has some limitations as well as significant implications for future research. First, when discussing the use of different approaches in relation to different types of environmental dynamism, we assume the alignment between strategy and environment is desirable in terms of firm performance. As our model focuses on the antecedents of strategic change and does not address the performance consequences, a more complete theory of

strategic change would benefit from exploring the relationships between the choice of our prescribed approaches and subsequent firm performance.

Second, top managers may subjectively make sense of their environment (Herrmann and Nadkarni, 2014), and that in turn can influence their strategic decisions and actions (Nadkarni and Barr, 2008). Recently, for example, based on an extended historical case study, Danneels (2010) showed that executives at Smith Corona (formerly an established typewriter manufacturer) made erroneous inferences about the technological and market changes in their own and other product categories. As their main product category became obsolete, executives still believed they could reconfigure their existing resource base into some new capabilities with the help of their established brand to compete in other product categories. As a result, they mistook the rapid technological changes in the PC industry as something of a moderate environmental threat and did not act quickly to shift the company out of a declining business. It should be noted that while managerial cognition may moderate the relationship between environment and firm decisions as illustrated in the case of Smith Corona, environments may also influence the managerial cognition process; i.e., managers' subjective representations of environment may also differ across different environments (Nadkarni and Barr, 2008). To better understand the effect of environmental dynamism on how firms engage change, therefore, future research would benefit from incorporating the complex role of managerial cognition in examining the choice between dynamic capability-based and *ad hoc* problem-solving approaches towards change.

Third, other than age and size, there may be additional organization-level variables that have links with the way firms approach strategic change. For example, organizational adaption to environmental changes may be related to organizational structures (Bradley et al., 2011). The industry sectors in which firms operate may also have an important influence. In institutional theory terms (Scott, 2001), firms operating in highly structured organizational

fields will face a high level of institutional pressures to maintain their traditional practices and structures (institutional isomorphism) and hence may be more likely to adopt an *ad hoc* problem-solving approach towards changes. Indeed, structural inertia theory is closely related to institutional theory in this regard, as both theories view organizational inertia as pervasive in certain organizational fields. Future research might extend our model to integrate ecological and institutional arguments.

Figure 1. Environmental dynamism, organizational attributes and firm approaches toward strategic change, based on the logic of SIT

Environmental Dynamism	Young/small firms	Old/large firms
Highly dynamic environments	Ad hoc problem solving approach (P1)	Ad hoc problem solving approach (P1)
Moderately dynamic environments	Dynamic capability-based approach (P3a)	Ad hoc problem solving approach (P3a)
Low-dynamic environments	Ad hoc problem solving approach (P2)	Ad hoc problem solving approach (P2)

Organizational Characteristics

Figure 2. Environmental dynamism, organizational attributes and firm approaches toward strategic change, based on the logic of RBV

Environmental Dynamisms	Young/small firms	Old/large firms
Highly dynamic environments	Ad hoc problem solving approach (P1)	Ad hoc problem solving approach (P1)
Moderately dynamic environments	Ad hoc problem solving approach (P3b)	Dynamic capability-based approach (P3b)
Low-dynamic environments	Ad hoc problem solving approach (P2)	Ad hoc problem solving approach (P2)

Organizational Characteristics