



**BRITISH ACADEMY
OF MANAGEMENT**

BAM
CONFERENCE

3RD-5TH SEPTEMBER

ASTON UNIVERSITY BIRMINGHAM UNITED KINGDOM

This paper is from the BAM2019 Conference Proceedings

About BAM

The British Academy of Management (BAM) is the leading authority on the academic field of management in the UK, supporting and representing the community of scholars and engaging with international peers.

<http://www.bam.ac.uk/>

AMBIDEXTERITY AS A DYNAMIC CAPABILITY: A NEW PERSPECTIVE

Juan P. Escorcia-Caballero¹, María D. Moreno-Luzon², Odette Chams-Anturi³

Business School, Universidad del Norte. Barranquilla, Colombia¹

Department of Management, University of Valencia. Valencia, Spain²

Department of Economic Sciences, Universidad de la Costa. Barranquilla, Colombia³

juane@uninorte.edu.co¹

maria.moreno@uv.es²

ochams@cuc.edu.co³

ABSTRACT

Since the dynamic capabilities perspective has been suggested as the most suitable framework to understand organizational ambidexterity, this paper uses a contingency approach to analyze ambidexterity as a dynamic capability. Based on previous research, we propose that exploitation, exploration and ambidexterity are dynamic capabilities on different levels, and we discuss their suitability and modes of adaptation (sequential, contextual, structural, leadership-based, and alliance-based) in stable, dynamic, and hyper-dynamic business environments. This paper contributes to the research on ambidexterity by shedding additional light on the multi-level nature of essential capabilities to achieve dynamic ambidexterity and the role of business environments in this process. We conclude by showing how the proposed framework offers opportunities for new streams of research in the ambidexterity field.

1. INTRODUCTION

There are major concerns in organizational theory literature about explaining the tensions caused by organizational needs when simultaneously pursuing the goals of efficiency and adaptability. There is strong evidence to suggest that many organizations persist in improving efficiency without engaging in adaptability activities, so they are unable to adapt to environmental changes because they obstruct the development of learning and innovation capabilities. Consequently, an important number of researchers propose that the survival of organizations depends on their ability to simultaneously exploit existing knowledge and explore new opportunities (Gibson & Birkinshaw, 2004; He & Wong, 2004; Lubatkin, Simsek, Ling, & Veiga, 2006; March, 1991; Raisch & Birkinshaw, 2008; Tushman & O'Reilly, 1996), and they have adopted the human characteristic of ambidexterity (people ability to use both hands with equal skill) as a metaphor to describe such capability.

Research on ambidexterity has burgeoned in the last few years. However, despite this explosion of research and publications on the issue, there are still some open-ended issues that need to be clarified. This is particularly relevant in the case of the term 'organizational ambidexterity' which has been used in a generic and vague sense, simply referring to the firm's ability to do two things simultaneously (Moreno-Luzón, 2017). Therefore, as O'Reilly and Tushman mentioned, "If the term 'organizational ambidexterity' continues to be used to

describe highly disparate phenomena, our insights into how firm actually explore and exploit are likely to become less and less useful” (2013, p. 332).

Some authors proposed the framework of dynamic capabilities as being the most appropriate scenario to understand ambidexterity (Birkinshaw et al., 2016; Lee and Rha, 2016; Li and Huang, 2012; O’Reilly and Tushman, 2008). Dynamic capabilities can be defined as “the capacity of an organization to purposefully create, extend or modify its resource base” (Helfat et al., 2007, p.1). Hence, ambidexterity in this perspective is reflected “in a complex set of decisions and routines that enable the organization to sense and seize new opportunities through the reallocation of organizational assets” (O’Reilly and Tushman, 2013, p.17). Accordingly, ambidexterity is seen as a dynamic capability that allows companies to generate and orchestrate a balance between exploitation and exploration (Birkinshaw et al., 2016).

Following this vein, in this paper, we aim to improve the understanding of ambidexterity as a dynamic capability. To do so, we based on the general framework of dynamic capabilities of Ambrosini et al. (2009) which has allowed us to delve deeper into the relationships between exploitation, exploration, and ambidexterity, as well as into their different nature, functions, and utilities. In terms of theoretical contributions, we begin by conceptualizing both exploitation and exploration as dynamic capabilities. We suggest that exploitation can be understood as a first-level dynamic capability and exploration as a second-level dynamic capability. Therefore, contrary to previous research, we consider that exploitation and exploration are dynamic capabilities on different levels. Then, we propose that ambidexterity is a third-level dynamic capability that changes or alters the mix of exploitation and exploration dynamic capabilities. Furthermore, we shed additional light on the different business environments where firms may use exploitation, exploration, and ambidexterity and the different modes of adaptation that they commonly use.

In the following sections, we address the literature associated with organizational ambidexterity and we offer a new approach to conceptualized ambidexterity, opening new avenues for research in this field.

2. LITERATURE REVIEW

2.1 Organizational ambidexterity

The turning point and the consequent increase in interest in ambidexterity date back to (March, 1991) who suggested the need for organizations to explore and exploit simultaneously to ensure their survival. Gibson and Birkinshaw (2004) defined this capability as an organization's ability to efficiently manage today’s business demands, while also adapting to changes in its environment. According to Moreno-Luzón et al. (2014), this concept serves to identify organizations that are capable of balancing two different forms of learning and innovation, and it refers to the efficient meeting of current demands and the adaptation to future changes, on a simultaneous basis. Tushman and O’Reilly (1996) asserted that an ambidextrous company has the capabilities to compete both in mature markets where cost, efficiency, and incremental innovation are critical aspects, and in emerging markets where experimentation, speed, flexibility, and radical innovations are critical aspects. Table

1 summarizes several definitions of organizational ambidexterity put forward by different researchers.

Table 1. Organizational ambidexterity definitions

AUTHOR	DEFINITIONS
Tushman and O'Reilly (1996)	A firm's ability to pursue both incremental and radical innovations.
Adler et al. (1999)	A firm's ability to be efficient and flexible at the same time.
Gibson and Birkinshaw (2004)	A firm's ability to be aligned and efficient to face today's business management demands, while also being able to adapt to changes in the environment.
He and Wong (2004)	A firm's ability to search for exploration and exploitation strategic innovations.
Lubatkin et al. (2006)	A firm's ability to exploit existing competences as well as exploring new opportunities with equal dexterity.
O'Reilly and Tushman, (2008; 2013)	A set of routines that include decentralization, differentiation, targeted integration, and leadership skills that orchestrate the complex dilemma between exploration and exploitation requirements, making it easier for the organization to feel and take advantage of new opportunities through resource redistribution.
Birkinshaw et al. (2016)	Higher-order dynamic capability that enables firms to generate and orchestrate an appropriate balance between exploitation and exploration.

In general, ambidexterity is recognized as a firm's ability to balance exploitation and exploration capabilities. On one hand, exploitation is related to efficiency, control, certainty, refinement, reduction of variance, and the improvement of existing technologies and knowledge (Katila and Ahuja, 2002; O'Reilly and Tushman, 2008; Tushman and O'Reilly, 1996). Therefore, it implies the use of explicit knowledge, and it originates incremental innovations in existing products or processes (March, 1991; Nonaka, 1994). On the other hand, exploration is associated with experimentation, flexibility, divergent thinking, risk-taking, an increase in variance, new knowledge, and the use of new technologies (Lubatkin et al., 2006; March, 1991; O'Reilly and Tushman, 2008; Rivkin and Siggelkow, 2003). Therefore, it implies the use of tacit knowledge and it generates completely new product or process trajectories (Levinthal and March, 1993; Nonaka, 1994), and focuses on responding to environmental changes by creating radical innovations (Tushman and O'Reilly, 1996). Table 2 shows some important characteristics of exploration and exploitation.

Table 2. Characteristics of exploration and exploitation

EXPLORATION	EXPLOITATION
--------------------	---------------------

Flexibility Experimentation Autonomy Risk-taking Increase of variance New competencies New knowledge Adapting to changing conditions Cognitive efforts New distribution channels	Control Refinement Efficiency Improve current competencies Increased predictability Reduction of variance Stability requirement Replication of approaches Expansion of existing knowledge and skills
---	--

Ambidexterity is important because proper interaction between exploration and exploitation reflects a complex capability that provides a competitive advantage beyond that obtained by each activity individually (Colbert, 2004). On the one hand, firms that focus on exploitation make improvements in efficiency in the short term, but they are self-destructive in the long term. On the other hand, firms that focus on exploration do not obtain profitability from their knowledge, and tend to suffer from a lack of efficiency that diminishes their competitiveness (Levinthal and March, 1993). Therefore, ambidexterity researchers have argued that being involved in both exploration and exploitation processes is fundamental to the survival and long-term success of organizations (Gibson and Birkinshaw, 2004; Junni et al., 2013). The impact of ambidexterity on firm survival is widely supported by empirical evidence that shows its positive relationship with firm performance. Table 3 summarizes some relevant empirical studies.

Table 3. Relevant empirical studies about the impact of ambidexterity on firm performance

AUTHORS	INDUSTRY	FINDINGS
He and Wong (2004)	371 Singapore and 192 Malaysian firms	Positive effect of ambidextrous firms on sales growth.
Gibson and Birkinshaw (2004)	41 business units from different Japanese, American, Canadian, Indian, French, and South Korean industries	Contextual ambidexterity is positively related to business unit performance.
Atuahene-Gima (2005)	500 Chinese electronics firms	The positive effect of the interaction between competence exploitation and exploration on incremental and radical innovations performance was not supported.
Lubatkin, Simsek, Ling, and Veiga (2006)	139 New England small-to medium-sized firms	Positive effect of ambidextrous orientation on firm performance.
Lin, Yang, and Demirkan (2007)	95 USA firms	In an uncertain environment, ambidexterity enhances firm performance. Ambidextrous alliances benefit large firms, and exploratory or exploitative alliances benefit small firms.

Venkatraman, Lee, and Iyer (2007)	Software firms (4,153 observations with 1,005 panels) – Database	Sequential ambidexterity emerged as a more significant predictor of firm growth than simultaneous ambidexterity.
Morgan and Berthon (2008)	160 managers from the UK bioscience industry	Positive effect of ambidexterity on business performance.
Han and Celly (2008)	70 Canadian international new ventures	International new ventures can achieve superior performance by managing the ambidextrous strategy of a) fewer investments in many countries; b) standardization and innovation.
Cao, Gedajlovic, and Zhang (2009)	222 firms from three high-tech parks in China	Combined dimension of ambidexterity has a positive effect on firm performance. There is no evidence to indicate that a balanced ambidexterity dimension has a positive effect on firm performance. The interaction between a combined dimension of ambidexterity and a balanced dimension of ambidexterity led to better firm performance.
Kristal, Huang, and Roth (2010)	174 USA manufacturing firms	Positive effect of ambidextrous supply chain strategy on combinative competitive capabilities.
Jansen, Simsek, and Cao (2012)	285 business financial units from 88 European branches	Positive relationship between unit ambidexterity and its subsequent financial performance.
Li and Huang (2012)	253 Taiwanese firms	Positive effect of ambidexterity on new product performance.
Lin, McDonough, Lin, and Lin (2013)	214 Taiwanese firms	Positive effect of innovation ambidexterity on business performance.
Hsu, Lien, and Chen (2013)	207 Taiwanese high-tech firms with foreign direct investment experience	Positive relationship between international ambidexterity and performance.
Blome, Schoenherr, and Kaesser (2013)	97 firms with manufacturing standard industrial classification codes from Germany, Austria and Switzerland	Positive relationship between ambidextrous governance and both innovation and cost performance. The impact of ambidextrous governance on innovation performance is higher if organizational ambidexterity is high. However, this moderation was not observed when considering cost performance.

De Clercq, Thongpapanl, and Dimov (2013)	232 Canadian firms	Positive relationship between contextual ambidexterity and firm performance.
Derbyshire (2014)	45,113 firms from 15 European countries - Survey conducted by the European Commission	Ambidexterity is positively related to sales growth.
Lin and Ho (2015)	74 firms from the global automotive industry located in 13 countries. Questionnaires and several government and commercial databases	The higher level of ambidexterity a firm has, the higher the level of environmental performance a firm achieves.
Kauppila (2015)	172 Finnish manufacturing firms	Ambidextrous pursuit of simultaneous co-exploration and co-exploitation is negatively related to firm performance.
Lee, Woo, and Joshi (2017)	110 C-level executives in software firms in India	Ambidextrous orientation has a positive effect on NPD performance.
Lee, Kim, and Joshi (2017)	136 Korean firms	Balanced aspect of ambidexterity and a combinative aspect of ambidexterity significantly affects NPD performance.
Benitez, Castillo, Llorens, and Braojos (2018)	100 US small firms included in Forbes database	Positive relationship between ambidexterity and innovation performance.
Gualandris, Legenvre, and Kalchschmidt (2018)	95 purchasing functions of medium and large European firms	There is no evidence that a balanced dimension of purchasing ambidexterity positively impacts on a buyer's financial performance. A combined dimension of purchasing ambidexterity positively impacts on a buyer's financial performance.
Pertusa-Ortega and Molina-Azorín (2018)	164 Spanish manufacturing and service firms	Ambidexterity positively influences firm performance.

2.2 How to achieve an organizational ambidexterity capability

The organizational literature initially suggested focusing on exploitation or exploration alternatively (Denison et al., 1995; Ghemawat and Costa, 1993). However, more recent research has recognized that exploitation and exploration are interdependent, and firms can develop both capabilities at the same time, resulting in better performance (O'Reilly and Tushman, 2013; Raisch and Birkinshaw, 2008). Therefore, there are different ways to

achieve ambidexterity that can be divided into two main groups, sequential and simultaneous modes (contextual, structural, leadership-based, alliance-based). The first mode is known as sequential ambidexterity. This mode follows the idea of pursuing exploitation and exploration activities over different periods. Therefore, in this mode of adaptation, a firm can be ambidextrous changing its structure over time, i.e. ambidexterity is achieved through alternating periods of exploitation and exploration. The second mode is called contextual ambidexterity, where ambidexterity is achieved through an organizational context that supports and allows people to judge for themselves how to better divide their time between exploitation and exploration activities. The third mode is called structural ambidexterity, where ambidexterity can be achieved through the establishment of autonomous units to explore and exploit within the same organization. These units are structurally separated, each with their own alignment of people, structures, processes, and cultures. The fourth mode is referred to as leadership-based ambidexterity, and it states that top management teams are responsible for the tensions generated by the need to develop exploitation and exploration activities, implying that top managers play the most important role in achieving this capability. Finally, the fifth mode is called strategic alliance-based ambidexterity, it suggests that the tensions generated by the intention to achieve exploitation and exploration simultaneously can be resolved through the outsourcing of exploitation and exploration activities through the development of strategic alliances with external partners (Gibson and Birkinshaw, 2004; O'Reilly and Tushman, 2013; Raisch and Birkinshaw, 2008; Vahlne and Jonsson, 2017).

As mentioned by O'Reilly and Tushman (2013), some research has proposed a combination of the aforementioned types to achieve ambidexterity. For example, Raisch et al. (2009) found that mature companies initially employed structural ambidexterity, and then switched to integrated designs when exploration units gained tradition. Similarly, Kauppila (2010) suggested that ambidexterity can be developed through a combination of structural and contextual forms of adaptation at organizational or inter organizational levels. Therefore, obtaining an ambidexterity capability follows the equifinality principle. i.e., organizations can achieve a suitable balance for their exploitation and exploration capabilities through many potential ways starting from different initial conditions.

In summary, we found in our review that firms can achieve ambidexterity by using and combining several modes at different organizational levels. Figure 1 illustrates these points.

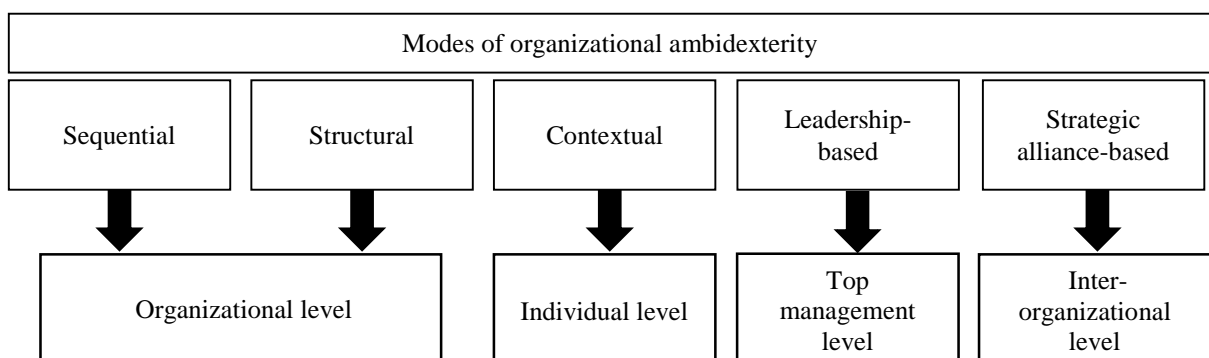


Figure 1. Modes of organizational ambidexterity

3. ORGANIZATIONAL AMBIDEXTERITY AS A DYNAMIC CAPABILITY

The meaning of exploitation and exploration depend on the theoretical context that is used to analyze ambidexterity. For example, incremental innovations and radical innovations use a technological innovation context, stability and change use an organizational change context, and induced processes and autonomous processes employ an organizational design context. However, as different researchers have warned, this use of different theoretical contexts has blurred some of the initial clarity about the definition of organizational ambidexterity and reduced its potential for resolving the tensions between exploration and exploitation (Nosella et al., 2012; O'Reilly and Tushman, 2013). As Raisch and Birkinshaw mentioned, "this has not only led to a lack of transparency in the vocabulary that is used but also, more critically, in respect of the different phenomena's specific effects" (2008, p. 376). Therefore, using the topic so broadly has caused a loss of its meaning, so our vision about how firms actually exploit and explore has become less useful (O'Reilly and Tushman, 2013).

In an attempt to solve the problem, some authors proposed dynamic capabilities as the most appropriate framework to explain ambidexterity (Birkinshaw et al., 2016; Lee and Rha, 2016; Li and Huang, 2012; O'Reilly and Tushman, 2008; Vahlne and Jonsson, 2017). As opposed to the static perspective, which focuses on specific configurations that remain in time without considering whether they are suitable in the external context (Birkinshaw et al., 2016; Dolz et al., 2014), the dynamic capability perspective argues that ambidexterity allows companies to develop and perform their exploration and exploitation according to environmental dynamism. i.e., this perspective recognizes that environmental dynamism can affect the mode of adaptation that companies choose to be ambidextrous and the focus that they have on the development of exploitation and exploration capabilities over time. To the best of our knowledge, Birkinshaw et al. (2016) were the first to propose a complete conceptualization of exploitation, exploration and ambidexterity as dynamic capabilities, using three categories: sensing, seizing, and reconfiguration (Teece, 2007, 2014). They equated exploitation with a seizing capability and exploration with a sensing capability, viewing both as lower-order dynamic capabilities. In this approach, ambidexterity was equated with a reconfiguration capability, viewed as a higher-order dynamic capability that enables the generation and orchestration of an appropriate balance between exploitation and exploration as lower-order dynamic capabilities.

Following this vein, we started from the model put forward by Birkinshaw et al. (2016) and identified some points of improvement: 1) both exploitation and exploration are defined as lower-order dynamic capabilities, which makes it hard to understand key questions, such as why is it more difficult for companies to develop exploration in relation to exploitation?, 2) Is ambidexterity only a balance between exploitation and exploration, or is it necessary for the ambidextrous company to also develop synergies between its exploitation and exploration capabilities? 3) Is ambidexterity necessary in all business environments? and 4) What are the appropriate adaptation modes in each business environment?

To answer these questions, we used the model put forward by Ambrosini et al. (2009) which centres on three categories of dynamic capabilities, and is similar to Teece's model (Teece, 2007, 2014). In this model, they suggest separating dynamic capabilities into three categories,

but also make an interesting differentiation about the levels or order of these dynamic capabilities. At the first level, there are incremental dynamic capabilities, which centre on the continuous improvement of the firm's resource base. At the second level, there are renewing dynamic capabilities, which are capabilities to update, adapt, and increase the firm's resource base. Finally, at the third level, there are regenerating dynamic capabilities, which affect the firm's current set of dynamic capabilities. These capabilities modify the way the company changes its resource base.

We equate exploitation with an incremental dynamic capability since it is based on existing knowledge to produce predictable results and incremental improvements in a firm's resource base, maintaining its value in relatively stable contexts. This follows Ambrosini et al.'s (2009) idea about incremental dynamic capability, which describes capabilities that made incremental improvements in a firm's resource base. Although there is some discussion about the conceptualization of exploitation as a dynamic capability, because of its relative stable nature, it is known that the line that separates dynamic capabilities and operational capabilities is unavoidably blurry (Helfat and Winter, 2011). Therefore, we consider that the exploitation capability can be dynamic and operational, depending on its intended use. Therefore, exploitation as a dynamic capability is seen as the firm's ability to continuously improve its existing resources, leading to the dynamic transformation of new competencies (Yalcinkaya et al., 2007).

On the other hand, we equate exploration with a renewing dynamic capability, since it allows firms to develop new processes, products, and services that are different from those used in the past (Yalcinkaya et al., 2007), i.e., it expands or modifies the firm's resource base using new knowledge to create or adapt products and processes to changing business environments. Furthermore, in the ambidexterity literature, it is recognized that firms tend to have greater difficulty in developing exploration activities compared to exploitation ones because of the higher risks and costs that it involves (Cao et al., 2009; Lewin et al., 1999; March, 1991; O'Reilly and Tushman, 2004). Therefore, our conceptualization of exploration as occupying a higher dynamic capability level (second-order) than exploitation (first-order) considers the different nature of these capabilities. Finally, it was also noted that the development of renewing dynamic capabilities is essential to obtain a competitive advantage in dynamic environments (Bowman and Ambrosini, 2003), since if it only has incremental dynamic capabilities, a firm's risk of not being able to adequately renew its resource base (Ambrosini et al., 2009). This is similar to the argument proposed in the ambidexterity literature, in terms of the differences between exploitation and exploration.

We argue that this dynamic form of ambidexterity can be understood as a third-level dynamic capability when firms achieve a balance and develop synergies between their exploitation and exploration dynamic capabilities at the highest level. We propose equating ambidexterity with a regenerating capability because it is not simply about the firm's ability to do two things simultaneously. It also involves the development of synergies between exploitation and exploration (Smith and Tushman, 2005) given that they involve interdependent processes that need to be combined and embedded to generate synergistic results (Floyd and Lane, 2000). This means that the ambidextrous organization can alter the combination of its exploitation and exploration routines, which allows them to modify its resource base in new ways according to changes in the business environment.

In summary, ambidexterity from this perspective is not only a suitable balance between exploitation and exploration, but also includes the development of synergies that allow learning, integration, and reconfiguration between them. This follows the Ambrosini et al. (2009) model about the existence of a third-level dynamic capability, whose objective is to act on other dynamic capabilities either by changing their form or by altering their combination. In Figure 2, we illustrate the proposed theoretical model of ambidexterity as a dynamic capability.

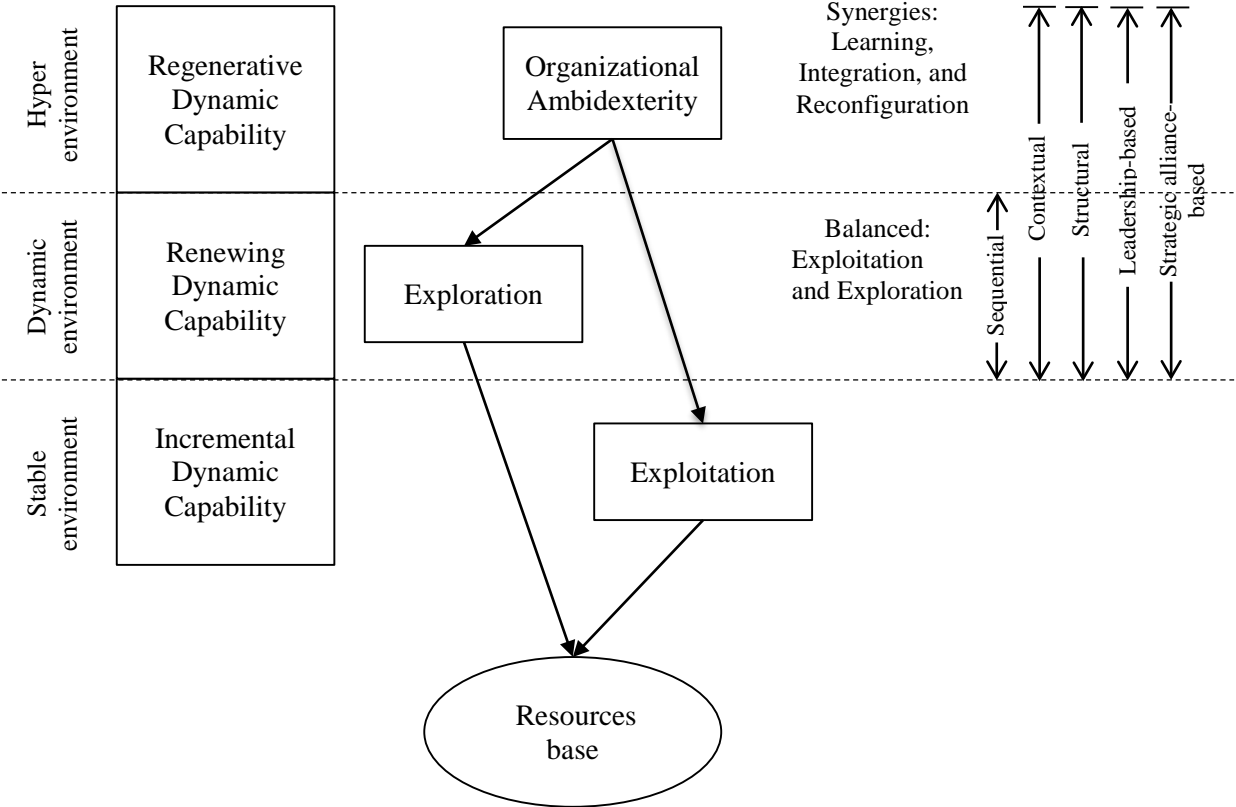


Figure 2. Organizational ambidexterity as a dynamic capability

Since the different types of dynamic capabilities are applied according to environmental dynamism (Ambrosini et al., 2009; Winter, 2003), the development of exploitation, exploration and ambidexterity and the modes of adaptation depend on the firm's business environment. In stable environments, where changes are predictable and infrequent, exploitation is more applied, and the need for exploration is reduced, i.e., firms can survive with incremental innovations that ensure the continuous improvements of their resource base (Uotila, 2018). However, in dynamic environments, where changes occur faster and are unpredictable, firms need to develop both incremental and renewing capabilities, so a firm's exploitation capability cannot ensure its survival, and exploration is also needed. The mode of adaptation in this environment can be in sequential or simultaneous modes, where the chosen mode will be based on organizational attributes and top managers' strategic choices (Birkinshaw et al., 2016).

Finally, in hyper-dynamic environments, where external changes are non-linear and discontinuous, there is a need for learning, integration, and reconfiguration between exploitation and exploration capabilities. Therefore, a balance between them is not enough to ensure a firm's survival, and ambidexterity as a regenerating dynamic capability is required. This dynamic form of ambidexterity can only be developed using simultaneous modes of adaptation. However, in this kind of environment, contextual ambidexterity is the most difficult to achieve, since "while conceptually easy to imagine how contextual ambidexterity might operate within a given setting or technological regime, it is harder to see how it would permit a company to adjust to disruptive or discontinuous changes in technologies and markets" (O'Reilly and Tushman, 2013, p 12). Furthermore, structural ambidexterity has to evolve towards more integrated units, where senior team leadership is needed to orchestrate these internally different alignments (O'Reilly and Tushman, 2004; Smith and Tushman, 2005). Alliance-based ambidexterity is extremely useful because cooperation between interdependent participants is required (Adler et al., 1999). Therefore, combined use of adaptation modes is considered as a key strategy to face environments with highly turbulent levels.

4. DISCUSSION AND CONCLUSIONS

In the specialized literature on ambidexterity, there is a consensus on the positive effects of this capability on the firm's resource base. Several studies have found empirical evidence that supports a positive relationship between ambidexterity and important performance measures like new product development, profitability and sales growth (Cao et al., 2009; Derbyshire, 2014; He and Wong, 2004; Jiang and Li, 2008; Lubatkin et al., 2006; Tippins and Sohi, 2003). However, this does not necessarily imply the development of a dynamic capability that leads to organizational adaptation (O'Reilly and Tushman, 2008). Therefore, recent research has argued for the need of a more complex and dynamic view about how firms use exploitation and exploration capabilities to adapt to high levels of turbulence (Birkinshaw et al., 2016; Uotila, 2018).

In this paper, we have discussed exploitation, exploration, and ambidexterity as different kinds of dynamic capabilities that need to be applied depending on the dynamism of the business environment. Based on Ambrosini et al.'s (2009) general dynamic capability framework, we propose that exploitation is an incremental dynamic capability and exploration is a renewing dynamic capability that allows incremental and radical improvement of the firm's resource base, respectively. We suggest that exploitation and exploration can be understood as two dynamic capabilities of different levels. Making this differentiation or classification allows us to clearly highlight why there is usually a bias in favor of exploitation, showing the greatest difficulties to achieve the exploration capability.

Then, following Birkinshaw et al. (2016), who argued that ambidexterity can be understood as a higher-level dynamic capability; we proposed that ambidexterity can be equated to a regenerating dynamic capability that changes the form or alters the mix of exploitation and exploration capabilities through synergies that allow learning, integration, and reconfiguration between them. The current literature on ambidexterity tends not to distinguish between balance and synergies as requirements for ambidexterity. Ambidextrous

firms are usually described as firms which achieve a balance between exploitation and exploration capabilities. However, our conceptualization of ambidexterity strongly emphasizes both balance and synergies between exploration and exploitation capabilities, i.e., the ambidextrous organization must be able to use the results obtained by exploration activities in exploitation activities and vice versa, since it can facilitate the transformation and recombination of these firm's dynamic capabilities. Table 4 summarizes the differences between our perspective and the previous perspectives on exploitation, exploration and ambidexterity.

Table 4. A comparison of perspectives about exploitation, exploration, and ambidexterity as dynamic capabilities

AUTHORS	COMPARISON
O'Reilly and Tushman (2008)	They do not distinguish between different levels, i.e., exploitation, exploitation and ambidexterity are understood as being dynamic capabilities on the same level.
Birkinshaw et al. (2016)	Exploitation and exploration as lower-order dynamic capabilities. Ambidexterity as a higher-order dynamic capability.
Perspective of this paper	Exploitation as a first-level dynamic capability. Exploration as a second-level dynamic capability. Ambidexterity as a third-level dynamic capability.

The dynamic capability view offers a more theoretically suitable lens to understand the ambidexterity phenomenon, since it considers that the development of ambidexterity occurs depending on the dynamism of the environment, i.e., the more dynamic the firm's business environment, the greater the need for ambidexterity (O'Reilly and Tushman, 2008). In stable environments, firms can survive using only exploitation. This is possible because exploitation can be used by a firm to achieve improvements in their resource base through cumulative incremental changes (Uotila, 2018) which allow them to adapt to predictable environment changes. However, in a dynamic environment, exploration is also needed. Therefore, the challenge for firms is to achieve an appropriate balance between exploitation and exploration to improve their resource base in the light of a frequently changing business environment. Finally, regenerative ambidexterity is found to occur in hyper-dynamic environments, where the development of a suitable balance, learning, integration, and reconfiguration between exploitation and exploration are critical issues to achieve this dynamic form of ambidexterity. In summary, exploitation, exploration, and ambidexterity need to be applied according to the business environment. Therefore, the ability of managers to perceive environmental dynamism is at the core of exploitation, exploration, and ambidexterity as dynamic capabilities.

In line with Uotila (2018), we noted that environmental contingencies also affect whether the organization follows a sequential or simultaneous mode of ambidexterity. In the ambidexterity literature, we identified five different modes of adaptation that firms can apply when faced with dynamic and hyper-dynamic environments. In dynamic environments, firms can survive by applying sequential, contextual, structural, leadership-based, and alliance-based modes. However, in a hyper-dynamic environment, since both balance and synergies

between exploitation and exploration are needed at the highest level, the sequential mode will make it difficult to achieve faster adaptation of a firm's resource base. Contextual, structural and leadership-based modes have to be used together and, according to the alliance-based mode, they should be focused on coordination and collaboration between supply chain members.

Rather than proposing that one mode is more effective than another, we follow Birkinshaw et al.'s (2016) idea that firms' adaptation to discontinuous changes might be more complex than commonly assumed. They found empirical evidence that shows the different capabilities required to apply sequential (focus-shifting capability), contextual (context-shaping capability), and structural (resource-linking capability) ambidexterity modes in dynamic environments and concluded that the challenge for firms is to make a decision about what mode is appropriate to its environmental context and organizational strategy, structure, and culture. However, how firms adapt to discontinuous changes typical of hyper-dynamic environments is still a "matter of speculation" (Birkinshaw et al. 2016), since empirical evidence from companies facing this kind of environment is scarce. We believe that with the increase of non-linear and discontinuous changes, the importance of internal collaboration across a firm's functional areas and external collaboration with supply chain partners will grow in importance, and ambidexterity will be achieved by combining different modes of adaptation with the help of suppliers and customers. For example, to share the high cost of exploration activities, a firm can involve suppliers and customers in new product development projects. Therefore, we encourage future research to study the critical aspects of each mode of adaptation in these kinds of environments.

This paper contributes to the organizational theory since we extend the understanding of ambidexterity as a dynamic capability. Although previous research has used this perspective before, the use in this paper of a contingency approach to analyze organizational ambidexterity considering three categories of dynamic capabilities allows us to shed additional light on the multi-level nature of exploitation, exploration, and ambidexterity, and on the business environment in which these organizational capabilities can be applied. Our conceptualization of exploitation as a first-level dynamic capability and exploration as a second-level dynamic capability gives us a better insight into their different nature and supports why firms focus more on developing exploitation. Additionally, by understanding ambidexterity as a regenerating dynamic capability, we highlight the importance of both balance and synergies between exploitation and exploration, responding to the calls made by Floyd and Lane (2000), Smith and Tushman (2005), Lubatkin et al. 2006), and O'Reilly and Tushman (2013) for more research that conceptualizes ambidexterity from a "synergistic" perspective, and provides managers with insights into which mode of adaptation to pursue when faced with different business environments. In our view, ambidexterity is a dynamic capability whose suitability depends on matching the perception managers have of their business environment with the real business environment to achieve balance, learning, integration, and reconfiguration between exploitation and exploration capabilities. Our main limitation is the lack of empirical evidence supporting our approach, so we encourage future research to develop empirical studies that consider ambidexterity as a regenerative dynamic capability and investigate whether some modes of adaptation are more suitable than others, depending on environmental turbulence. Additionally, a better understanding of how a firm's internal routines and practices transform exploration activities to exploitation activities, and

vice-versa, is required. We are convinced that the development of qualitative research is critical to clarify this organizational phenomenon. We hope this paper moves us closer to more accurate definitions of exploitation, exploration and ambidexterity as dynamic capabilities.

ACKNOWLEDGEMENTS

This research is part of the Project ECO2015-71380-R funded by the Spanish Ministry of Economy, Industry and Competitiveness and the State Research Agency. Co-financed by the European Regional Development Fund (ERDF).

REFERENCES

- Adler, P., Goldoftas, B. and Levine, D. (1999), “Flexibility Versus Efficiency? A Case Study of Model Changeovers in the Toyota Production System”, *Organization Science*, Vol. 10 No. 1, pp. 43–68.
- Ambrosini, V., Bowman, C. and Collier, N. (2009), “Dynamic capabilities: An exploration of how firms renew their resource base”, *British Journal of Management*, Vol. 20, pp. S9–S24.
- Atuahene-Gima, K. (2005), “Resolving the capability—rigidity paradox in new product innovation”, *Journal of Marketing*, Vol. 69 No. 4, pp. 61–83.
- Benitez, J., Castillo, A., Llorens, J. and Braojos, J. (2018), “IT-enabled knowledge ambidexterity and innovation performance in small US firms: The moderator role of social media capability”, *Information & Management*, Vol. 55 No. 1, pp. 131–143.
- Birkinshaw, J., Zimmermann, A. and Riasch, S. (2016), “How do firms adapt to discontinuous change? Bridging the dynamic capabilities and ambidexterity perspectives”, *California Management Review*, Vol. 58 No. 4, pp. 36–58.
- Blome, C., Schoenherr, T. and Kaesser, M. (2013), “Ambidextrous governance in supply chains: The impact on innovation and cost performance”, *Journal of Supply Chain Management*, Vol. 49 No. 4, pp. 59–80.
- Bowman, C. and Ambrosini, V. (2003), “How the resource-based and the dynamic capability views of the firm inform corporate-level strategy”, *British Journal of Management*, Vol. 14 No. 4, pp. 289–303.
- Cao, Q., Gedajlovic, E. and Zhang, H. (2009), “Unpacking organizational ambidexterity: Dimensions, contingencies, and synergistic effects”, *Organization Science*, Vol. 20 No. 4, pp. 781–796.
- De Clercq, D., Thongpapanl, N. and Dimov, D. (2013), “Shedding new light on the relationship between contextual ambidexterity and firm performance: An investigation of internal contingencies”, *Technovation*, Vol. 33 No. 4, pp. 119–132.
- Colbert, B. (2004), “The complex resource-based view: Implications for theory and practice in strategic human resource management”, *Academy of Management Review*, Vol. 29 No. 3, pp. 341–358.
- Denison, D., Hooijberg, R. and Quinn, R. (1995), “Paradox and performance: Toward a theory of behavioral complexity in managerial leadership”, *Organization Science*, Vol. 6 No. 5, pp. 524–540.
- Derbyshire, J. (2014), “The impact of ambidexterity on enterprise performance: Evidence from 15 countries and 14 sectors”, *Technovation*, Vol. 34 No. 10, pp. 574–581.

- Dolz, C., Safón, V., Iborra, M. and Dasí, A. (2014), “Antecedentes y dinamismo de la ambidestreza organizativa en las Pymes”, *Innovar. Revista de Ciencias Administrativas y Sociales*, Vol. 24 No. 53, pp. 1–14.
- Floyd, S. and Lane, P. (2000), “Strategizing throughout the organization: Managing role conflict in strategic renewal”, *Academy of Management Review*, Vol. 25 No. 1, pp. 154–177.
- Ghemawat, P. and Costa, J.R. (1993), “The organizational tension between static and dynamic efficiency”, *Strategic Management Journal*, Vol. 14 No. S2, pp. 59–73.
- Gibson, C. and Birkinshaw, J. (2004), “The antecedents, consequences, and mediating role of organizational ambidexterity”, *The Academy of Management Journal*, Vol. 47 No. 2, pp. 209–226.
- Gualandris, J., Legenvre, H. and Kalchschmidt, M. (2018), “Exploration and exploitation within supply networks: Examining purchasing ambidexterity and its multiple performance implications”, *International Journal of Operations & Production Management*, Vol. 38 No. 3, pp. 667–689.
- Han, M. and Celly, N. (2008), “Strategic ambidexterity and performance in international new ventures”, *Canadian Journal of Administrative Sciences*, Vol. 25 No. 4, pp. 335–349.
- He, Z. and Wong, P. (2004), “Exploration vs. Exploitation: An Empirical Test of the Ambidexterity Hypothesis”, *Organization Science*, Vol. 15 No. 4, pp. 481–494.
- Helfat, C., Finkelstein, S., Mitchell, W., Peteraf, M., Singh, H., Teece, D. and Winter, S. (2007), *Dynamic Capabilities: Understanding Strategic Change in Organizations*, John Wiley., Blackwell Publishing, Oxford.
- Helfat, C. and Winter, S. (2011), “Untangling dynamic and operational capabilities: Strategy for the (N)ever-changing world”, *Strategic Management Journal*, Vol. 32, pp. 1243–1250.
- Hsu, C., Lien, Y. and Chen, H. (2013), “International ambidexterity and firm performance in small emerging economies”, *Journal of World Business*, Vol. 48 No. 1, pp. 58–67.
- Jansen, J., Simsek, Z. and Cao, Q. (2012), “Ambidexterity and performance in multiunit contexts: Cross-level moderating effects of structural and resource attributes”, *Strategic Management Journal*, Vol. 33 No. 11, pp. 1286–1303.
- Jiang, X. and Li, Y. (2008), “The relationship between organizational learning and firms’ financial performance in strategic alliances: A contingency approach”, *Journal of World Business*, Vol. 43 No. 3, pp. 365–379.
- Junni, P., Sarala, R., Taras, V. and Tarba, S. (2013), “Organizational ambidexterity and performance: A meta-analysis”, *The Academy of Management Perspectives*, Vol. 27 No. 4, pp. 299–312.
- Katila, R. and Ahuja, G. (2002), “Something old, something new: A longitudinal study of search behavior and new product introduction”, *The Academy of Management Journal*, Vol. 45 No. 6, pp. 1183–1194.
- Kauppila, O. (2010), “Creating ambidexterity by integrating and balancing structurally separate interorganizational partnerships”, *Strategic Organization*, Vol. 8 No. 4, pp. 283–312.
- Kauppila, O. (2015), “Alliance management capability and firm performance: Using resource-based theory to look inside the process black box”, *Long Range Planning*, Vol. 48 No. 3, pp. 151–167.
- Kristal, M., Huang, X. and Roth, A. (2010), “The effect of an ambidextrous supply chain strategy on combinative competitive capabilities and business performance”, *Journal of*

- Operations Management*, Vol. 28 No. 5, pp. 415–429.
- Lee, K., Kim, Y. and Joshi, K. (2017), “Organizational memory and new product development performance: Investigating the role of organizational ambidexterity”, *Technological Forecasting and Social Change*, Vol. 120, pp. 117–129.
- Lee, K., Woo, H. and Joshi, K. (2017), “Pro-innovation culture, ambidexterity and new product development performance: Polynomial regression and response surface analysis”, *European Management Journal*, Vol. 35 No. 2, pp. 249–260.
- Lee, S. and Rha, J. (2016), “Ambidextrous supply chain as a dynamic capability: building a resilient supply chain”, *Management Decision*, Vol. 54 No. 1, pp. 2–23.
- Levinthal, D. and March, J. (1993), “The myopia of learning”, *Strategic Management Journal*, Vol. 14 No. S2, pp. 95–112.
- Lewin, A., Long, C. and Carroll, T. (1999), “The coevolution of new organizational forms”, *Organization Science*, Vol. 10 No. 5, pp. 535–550.
- Li, Y. and Huang, J. (2012), “Ambidexterity’s mediating impact on product development proficiency and new product performance”, *Industrial Marketing Management*, Elsevier Inc., Vol. 41 No. 7, pp. 1125–1132.
- Lin, H., McDonough, E., Lin, S. and Lin, C. (2013), “Managing the exploitation/exploration paradox: The role of a learning capability and innovation ambidexterity”, *Journal of Product Innovation Management*, Vol. 30 No. 2, pp. 262–278.
- Lin, L. and Ho, Y. (2015), “Institutional pressures and environmental performance in the global automotive industry: The mediating role of organizational ambidexterity”, *Long Range Planning*, Vol. 49 No. 6, pp. 764–775.
- Lin, Z., Yang, H. and Demirkan, I. (2007), “The performance consequences of ambidexterity in strategic alliance formations: Empirical investigation and computational theorizing”, *Management Science*, Vol. 53 No. 10, pp. 1645–1658.
- Lubatkin, M., Simsek, Z., Ling, Y. and Veiga, J. (2006), “Ambidexterity and Performance in Small-to Medium-Sized Firms: The Pivotal Role of Top Management Team Behavioral Integration”, *Journal of Management*, Vol. 32 No. 5, pp. 646–672.
- March, J. (1991), “Exploration and exploitation in organizational learning”, *Organization Science*, Vol. 2 No. 1, pp. 71–87.
- Moreno-Luzón, M. (2017), “Chapter 35: Innovation and Ambidexterity”, *Carayannis E (Eds) Encyclopedia of Creativity, Invention, Innovation and Entrepreneurship*, pp. 1–11.
- Moreno-Luzón, M., Gil-Marques, M. and Arteaga, F. (2014), “Driving organisational ambidexterity through process management. The key role of cultural change”, *Total Quality Management & Business Excellence*, Vol. 25 No. 9/10, pp. 1026–1038.
- Morgan, R. and Berthon, P. (2008), “Market orientation, generative learning, innovation strategy and business performance inter-relationships in bioscience firms”, *Journal of Management Studies*, Vol. 45 No. 8, pp. 1329–1353.
- Nonaka, I. (1994), “A dynamic theory of organizational knowledge creation”, *Organization Science*, Vol. 5 No. 1, pp. 14–37.
- Nosella, A., Cantarello, S. and Filippini, R. (2012), “The intellectual structure of organizational ambidexterity: A bibliographic investigation into the state of the art”, *Strategic Organization*, Vol. 10 No. 4, pp. 450–465.
- O’Reilly, C. and Tushman, M. (2013), “Organizational ambidexterity: Past, present and future”, *The Academy of Management Perspectives*, Vol. 27 No. 4, pp. 324–338.
- O’Reilly, C. and Tushman, M. (2004), *The Ambidextrous Organization.*, Harvard Business

Review.

- O'Reilly, C. and Tushman, M. (2008), "Ambidexterity as a dynamic capability: Resolving the innovator's dilemma", *Research in Organizational Behavior*, Vol. 28, pp. 185–206.
- Pertusa-Ortega, E. and Molina-Azorín, J. (2018), "A joint analysis of determinants and performance consequences of ambidexterity", *BRQ Business Research Quarterly*, pp. 1–15.
- Raisch, S. and Birkinshaw, J. (2008), "Organizational ambidexterity: Antecedents, outcomes, and moderators", *Journal of Management*, Vol. 34 No. 3, pp. 375–409.
- Raisch, S., Birkinshaw, J., Probst, G. and Tushman, M. (2009), "Organizational ambidexterity: Balancing exploitation and exploration for sustained performance", *Organization*, Vol. 20 No. 4, pp. 685–695.
- Rivkin, J. and Siggelkow, N. (2003), "Balancing Search and Stability: Interdependencies Among Elements of Organizational Design", *Management Decision*, Vol. 49 No. 3, pp. 290–311.
- Smith, W. and Tushman, M. (2005), "Managing Strategic Contradictions: A Top Management Model for Managing Innovation Streams", *Organization Science*, Vol. 16 No. 5, pp. 522–536.
- Teece, D. (2007), "Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance", *Strategic Management Journal*, Vol. 28 No. 13, pp. 1319–1350.
- Teece, D. (2014), "A dynamic capabilities-based entrepreneurial theory of the multinational enterprise", *Journal of International Business Studies*, Vol. 45 No. 1, pp. 8–37.
- Tippins, M. and Sohi, R. (2003), "IT competency and firm performance: Is organizational learning a missing link?", *Strategic Management Journal*, Vol. 24 No. 8, pp. 745–761.
- Tushman, M. and O'Reilly, C. (1996), "The ambidextrous organizations: Managing evolutionary and revolutionary change", *California Management Review*, Vol. 38 No. 4, pp. 8–30.
- Uotila, J. (2018), "Punctuated equilibrium or ambidexterity: Dynamics of incremental and radical organizational change over time", *Industrial and Corporate Change*, Vol. 27 No. 1, pp. 131–148.
- Vahlne, J. and Jonsson, A. (2017), "Ambidexterity as a dynamic capability in the globalization of the multinational business enterprise (MBE): Case studies of AB Volvo and IKEA", *International Business Review*, Vol. 26, pp. 57–70.
- Venkatraman, N., Lee, C. and Iyer, B. (2007), "Strategic ambidexterity and sales growth: A longitudinal test in the software sector", *Annual Meetings of the Academy of Management*, Vol. Unpublishe, Honolulu, Hawaii, pp. 1–45.
- Winter, S. (2003), "Understanding dynamic capabilities", *Strategic Management Journal*, Vol. 24 No. 10 SPEC ISS., pp. 991–995.
- Yalcinkaya, G., Calantone, R. and Griffith, D. (2007), "An Examination of Exploration and Exploitation Capabilities: Implications for Product Innovation and Market Performance", *Journal of International Marketing*, Vol. 15 No. 4, pp. 63–93.