The effect of supply chain strategy on the relationship between innovation capabilities and business performance. A theoretical model

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Abstract: Although the relationship between supply chain (SC) and innovation has attracted attention from researchers in recent years, the relationship between innovation capabilities and SC strategies is a subject that has not yet been explored extensively. The main objective of this paper is to examine how SC strategies affect the relationship between innovation capabilities and business performance. The paper, characterised as a conceptual paper with the aim of contributing to theory building, is based on the concept of fit and on the principles of the contingency theory and the resource-based view. Further, a literature review and a theoretical discussion, a theoretical model and a set of research propositions are presented. The theoretical rationale shows the potential for improvement in performance through the relationship between innovation and SC and can be used to boost empirical research on the topic.

Keywords: supply chain strategies; lean strategies; agile strategies; innovation capabilities; business performance; fit; theoretical model.

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1 Introduction

The importance of innovation as a driver of a company's performance and a source of competitive advantage has been recognised in the academic business literature (Borjesson and Elmquist, 2011; Saunila et al., 2014; Mir et al., 2016; Ribau et al., 2019). Innovation is a complex topic and may be understood differently (Lawson and Samson, 2001; Guan and Ma, 2003). As companies are differently endowed, innovation is affected by a variety of different resources and contingencies and its success depends on the best use of companies' innovation capabilities, which are composed of the skills and assets that underpin their ability to develop and explore new ideas successfully (Borjesson and Elmquist, 2011; Calantone et al., 2002; Guan and Ma, 2003).

Study of the way innovation impacts on supply chains (SCs) has been gaining grounds in recent years (Primus and Stavrulaki, 2017; Mikkelsen and Johnsen, 2018; Zimmermann et al., 2019). However, the relationship between innovation capabilities and SC strategies is a subject that has not yet been explored extensively (Zimmermann et al., 2016). SC strategies reflect the nature of the SC and should be aligned with the product's characteristics, with the competitive strategy adopted and with the environment where companies compete (Qi et al., 2009).

The concept of fit is very important in strategic management. Among other aspects, it deals with the effort most companies need to make in matching the company's internal characteristics/resources to the contingencies of the environment (Ensign, 2001). As one of the oldest ideas in strategic management it also deals with the alignment of strategic choices and critical contingencies of two or more units or functional areas within companies (Venkatraman and Camillus, 1984). Fit indicates consistency between two or more factors, and it is believed that the higher the degree of fit the higher the performance (Venkatraman, 1989; Peng et al., 2011). Fit is the adjustment of one or more variables in relation to another, in such a way that the combination gives rise to the best results for the company (Venkatraman and Camilus, 1984; Wu et al., 2014).

Taking into account the relationship between innovation and SC (Zimmermann et al., 2016), the aim of this paper is to discuss how the fit between innovation capabilities (ICs) and SC strategies influences business performance and then to model this relationship. As such, the following research question is addressed: how can SC strategies affect the relationship between ICs and business performance?

After analysing the effects of fit among the different types of ICs and SC strategies on business performance, this paper brings a new perspective to the topic and makes several key contributions to the literature. By focusing on the strategic view of SC and innovation capabilities, the paper enhances understanding of the strategic importance of these two functional areas, and their relationship, for business performance. According to Zimmermann et al. (2016), prior studies have focused on a more operational perspective and have been looking at the different forms of the relationship between the focal company and its SC partners.

This conceptual paper is a first step towards discussing the effect of SC strategies on the relationship between innovation capabilities and business performance and seeks to contribute to theory building. Ketchen and Hult (2011) highlight the importance of using theory building in supply chain management (SCM) research, and claim that theory provides, not just scholarly value, but also practical value. For Rindova (2011, p.19), the challenge is to "connect stand-alone ideas into a network of concepts and relationships among them, which constitute theory."

Finally, this paper also offers practical suggestions for companies seeking substantial improvement in their overall performance through innovation and SC. In doing so, this study highlights the importance of aligning both areas and particularly SC strategies and innovation capabilities.

The remainder of the paper is organised as follows. Section 2 presents the study's theoretical background and the concept of fit. Section 3 presents a literature review about innovation capabilities, SC strategies and business performance. Section 4 presents the theoretical discussion, the research propositions and the theoretical model. Finally, Section 5 presents the conclusions of the research, including the limitations of the work and recommendations for future research.

2 Theoretical background and the concept of fit

This article is based on both the concept of fit and the principles of the resource-based view (RBV) and the contingency theory (CT). The concept of fit has gained ground in the literature over the last few years (Acur et al., 2012; Wu et al., 2014) as it is a fundamental element for constructing theory in a wide range of different areas (Venkatraman, 1989).

The concept of fit combines the meaning of consistency and harmony between two or more variables. In business, it is believed that the better the fit between the company's resources and the external economic environment, the better the impact on performance (Peng et al., 2011; Venkatraman, 1989). The concept of fit has been applied to examine many internal and external factors "such as organizational climate, (innovation) strategy, technology, environment, management style, and organizational structure and the implication of fit or misfit toward an efficient, effective, and viable organization" [Strese et al., (2016), p.1152]. Peng et al. (2011, p.486) claim that "researchers adopting a fit perspective investigate consistency among subsystems within a firm (internal fit) and fit among the organizational structure, strategy and the external environment (external fit)." This paper focuses on the internal fit between SC strategies and innovation capabilities.

The concept of fit is strongly related to the CT, which looks at how the fit between context, structure and processes influences performance (Drazin and Van de Ven, 1985; Acur et al., 2012). Drazin and Van de Ven (1985) state that fit is a key concept for CT. Under the contingency approach, the conditional association of two or more independent variables (in this case the ICs and SC strategies) and the influence they exert on a dependent variable (in this case business performance) can be studied (Prajogo, 2016). Therefore, consistent with CT, our theoretical model proposes that the specific nature of the innovation capabilities and SC strategies – as well as the features that influence the relationship between them – produce different effects on business performance.

According to the RBV, companies' resources and their heterogeneity determine the possibility of obtaining sustainable competitive advantages (Barney, 1991). The RBV helps us to understand how competitive advantage is achieved and how this advantage might be sustained over time. The definitions of SC strategies and ICs reflect the resources available, which also influence the relationship between them. Thus, in this paper, the use of the RBV underpins the understanding of the relationship linking the two fields. In this sense, the RBV supports this study as it offers the foundation for the assertion that ICs and SC strategies serve as strategic resources and thus influence key outcomes, such as business performance (Craighead et al., 2009).

Additionally, the RBV is widely used both in SCM (Huang et al., 2016; Lin, 2017) and innovation management literature (Yang, 2015; Tsinopoulos et al., 2018).

3 Literature review

3.1 Innovation capabilities

Several theories and concepts – namely the RBV, the knowledge-based view and the concept of core competency – have been used to explain companies' growth by means of capabilities, abilities or assets. Typically, the term capability is normally associated to what a company is (un)able to do (Borjesson and Elmquist, 2011). Capabilities are often seen as the ability to apply the resources available to achieve the results expected.

Although there are no clear cut definitions or understanding of innovation capabilities, mainstream and newstream innovation (Lawson and Samson, 2001), incremental and radical IC (Menguc et al., 2014), innovation capacity (Oura et al., 2016), institutionalising, implementing and stimulating innovation (Djoumessi et al., 2019), among other terms that generally refer to innovation capabilities (Calantone et al., 2002; Guan and Ma, 2003; Mir et al., 2016; Ngo and O'Cass, 2012; Ribau et al., 2019). It has been tacitly accepted that they support the generation of new ideas and their deployment throughout the organisation brings about competitive advantage and increased performance (Guan and Ma, 2003; Menguc et al., 2014; Ribau et al., 2019). One thing is clear: a great variety of assets, resources, and capabilities are necessary for the success of innovation (Guan and Ma, 2003; Oura et al., 2016).

Table 1 The main characteristics of the seven dimensions of innovation capabilities

Dimension	*Characteristics*
Learning capability	The capacity to identify, assimilate and exploit new knowledge essential for a company's competitive success.
R&D capability	Supports the company in embracing novel technologies and approaches when developing new products, processes and assets.
Manufacturing capability	Refers to the ability to transform R&D results into products, which meet market needs, in accordance with demand. It also deals with the intricacies of shop floor management and the manufacturing process.
Marketing capability	Is the capacity to publicise and sell the products on the basis of understanding consumers' current and future needs, customers' behaviours, and intelligence concerning competitors.
Organisational capability	Is the capacity to constitute a well-established organisational structure, direct the work of all activities towards shared objectives, and influence the speed of innovation processes through the infrastructure it creates for developmental projects.
Resource exploiting capability	Represents a company's ability to mobilise and expand its technological, human and financial resources.
Strategic capability	Is the capacity to adopt different types of strategies that can adapt to changes in the environment to excel in the highly competitive environments.

Source: Adapted from Guan and Ma (2003)

Guan and Ma's (2003) classification of innovation capabilities is going to be used in this paper, which is based on seven dimensions: manufacturing; research and development (R&D); marketing; learning; organisational; resource exploiting; and strategic. Table 1 presents the main characteristics of these seven dimensions. This classification complements previous studies (Lawson and Samson, 2001) regarding the needs for companies to transform knowledge and ideas into new products, processes and systems.

Finally, innovation capabilities are constructed through managerial decisions taken over time (Borjesson and Elmquist, 2011; Ngo and O'Cass, 2012) from the identification, development and integration of routines and processes that guide the behaviour of people and processes towards innovation. According to Guan and Ma (2003), the relevance and degree of importance of each dimension of innovation capabilities may vary according to a company's resources and strategies and should be suitable to both the market conditions and the competitive environment.

Guan and Ma (2003), based on the definition by Teece et al. (1997) of dynamic capabilities, divide innovation capabilities into two groups: core and supplementary innovation capabilities. While core ICs are composed of manufacturing, R&D and marketing capabilities, supplementary ICs are composed of learning, organisational, resource-exploiting and strategic capabilities.

Both groups of ICs influence a company's performance in different ways and in different situations with consequences to the fit with SC strategies. Core ICs are not only understood as the ability to generate and transform innovative opportunities and ideas into marketable products through R&D, manufacturing and marketing process (Teece et al., 1997; Guan and Ma, 2003), but are also closely related to intellectual property (Teece, 1986).

Complementarily, supplementary ICs are related to the particular ways in which companies deploy their organisational culture, use their technological and human resources, envision their strategies and internalise the knowledge generated. As such, in markets where imitation and entry barriers are relatively low, supplementary ICs play a key, differentiating role in a company's performance and competitiveness (Teece, 1986). According to Teece (1986, p.285), "when imitation is easy, markets don't work well, and the profits from innovation may accrue to the owners of certain complementary assets, rather than to the developers of the intellectual property." Guan and Ma (2003) also highlight the role of supplementary ICs in supporting and harmonising core ICs and improving their effectiveness.

3.2 SC strategies

Competitiveness and competitive advantage have been two important topics in the field of strategic management, for both academics and practitioners alike (Porter, 1996; Pisano, 2015). A unique strategy reflects the distinctive perspective deployed by companies to outcompete their rivals. For that, it is mandatory to configure a SC able to accommodate business and operations activities so that competitors fail to carry them out providing the same added value (Porter, 1998). In order to compete successfully, by creating unique, valuable SC strategies, strategic positioning helps companies to deploy their activities differently from their competitors, or carry out similar activities, but differently (Porter, 1998). As such, a winning SC strategy needs a set of coherent and mutually supportive activities, policies and behaviours, which provides customers with superior added value to enhance a company's competitiveness and outcompete rivals.

SCM plays an important role in companies' strategic plans. However, although SCM is recognised as a source of competitive advantage, companies do not always explicitly define their SC strategies (Qi et al., 2009; Qrunfleh and Tarafdar, 2014; Zimmermann et al., 2020). Managing the flow of materials from the supply sources to the final customers effectively represents a major challenge for managers. Companies need a clearly defined plan to be able to organise their activities, resources and communications for this complex process (Qi et al., 2009). For Lee (2002) and Qrunfleh and Tarafdar (2014), SC strategies need to be tuned to the nature of the SC and to define clearly their objectives and goals, taking into account the particularities of each company's SC. Moreover, SC strategies should also be aligned with both the product's characteristics and the environment where the company competes as this has consequences in terms of the company's SC performance (Zimmermann et al., 2020).

The model proposed by Fisher (1997) in his important and influential article published in the Harvard Business Review paved the way to our understanding of two types of SC strategy: lean – equivalent to Fisher's Efficient strategy – and agile – equivalent to Fisher's Market-responsive strategy (Christopher and Towill, 2002; Qi et al., 2009; Qrunfleh and Tarafdar, 2014). Some authors have complemented this typology of SC strategy by adopting a new category – lean/agile, or leagile – that is a combination of the lean and agile approaches (Mason-Jones et al., 2000; Zimmermann et al., 2020). Table 2 presents the main characteristics of the Lean and Agile strategies.

Table 2 Main characteristics of lean and agile SC strategies

SC strategy	*Lean*	*Agile*
Objective	• Reduction of cost-driven activities • Introduction of incremental improvements in existing products • Elimination of waste and non-value-added activities across the SC	• Close interaction with the market to track and understand customer requirements • Product customisation with short lead times • Demand-driven production volume, i.e., not based on optimal capacity utilisation • Market-driven interaction to supply a wide variety of markets
Inventory strategy	• High stock turnover to minimise inventory throughout the SC;	• Allows the stock of parts to accumulate sufficiently to keep up with the requirements of a highly responsive and unpredictable market
Lead time focus	• Priority of delivery or |inventory costs over reduction of lead-time;	• Priority of reduction of lead times to customer specifications and requirements
Manufacturing focus	• Focus on high average capacity utilisation rate	• Allows buffer capacity to ensure that raw material/components are available to manufacture according to market requirements
Product design strategy	• Focus on production cost reduction	• Modular designs allow a limited number of basic components and processes that can be assembled into different products

Source: Qrunfleh and Tarafdar (2014)

One can claim that SCM is a process that goes through constant changes and, as a result, the choice of SC strategy is also a dynamic process. Besides this, the differences in a company's products should be considered, which means that an organisation can apply different strategies at the same time, which mirrors what Christopher and Towill (2002) and Zimmermann et al. (2019) claim: lean and agile are not opposing philosophies; they are merely suited to different contexts.

3.3 Business performance

Business performance has been analysed and measured in a great variety of ways (Rauch et al., 2009; Richard et al., 2009). There are several different dimensions to measure performance, which may differ among business managers and researchers, and a consensual model does not exist (Franco-Santos et al., 2007). Business Performance is

considered one of the most relevant constructs in various research fields, such as management and operations management and is often used as the main dependent variable (Richard et al., 2009). A measure of business performance can be understood as a set of metrics used to quantify both the efficiency and effectiveness of a company's actions (Franco-Santos et al., 2007; McAdam and Bailie, 2002; Neely et al., 1995).

The literature on business performance distinguishes between financial and non-financial measures (Rauch et al., 2009). Non-financial measures normally include satisfaction and global success ratings, while financial measures include factors such as sales growth and return on investments. Gonzalez-Benito (2007), for example, measures business performance using two sets of items: one refers to ratios based on accounting data, related to economic and financial benefits and productivity, and another set that contains items that measure the commercial success of the firm.

4 A theoretical model of the relationship between SC strategies and innovation capabilities and their impact on business performance

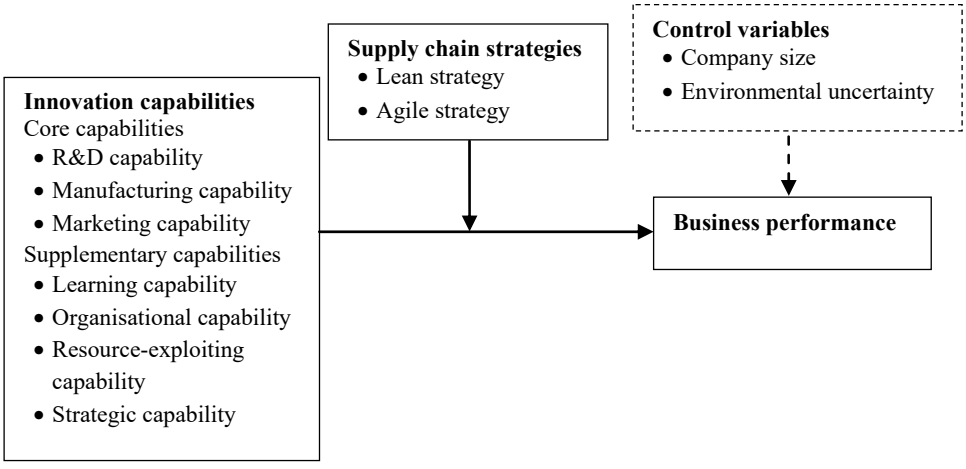
The aim of this paper is to discuss and to present a model of the relationship between innovation capabilities and SC strategies and their impact on business performance. On one hand, lean and agile SC strategies are used to show how SC strategies are deployed, as they are the most widely used in the literature and are consistent with the objectives of this paper. Moreover, they represent two different approaches as lean strategies prioritise cost reduction and waste, while agile SCM is about adaptability to changing environments. On the other hand, the set of innovation capabilities that are used to study the relationship with the SC strategies is based on Guan and Ma's (2003) seven ICs: manufacturing; R&D; marketing; learning; organisational; resource exploiting; and strategic. These capabilities best represent the differences between companies when it comes to the characteristics of the innovation process and are best aligned with the objectives of this work as they support a company's unique assets in generating and sustaining competitive advantages in terms of scientific core and supplementary ICs to respond to (un)expected opportunities. Figure 1 shows the theoretical model of the study.

This paper is based on a set of three main research propositions according to the objectives referred to above, which are complemented by a set of another seven propositions on how lean and agile SC strategies influence the relationship of each IC with business performance.

The primary relationship that helps to understand and support the theoretical framework we propose is between ICs and business performance. Although this relationship is not new (Borjesson and Elmquist, 2011; Calantone et al., 2002; Mir et al., 2016; Saunila et al., 2014), it is central to understanding the overall context of this study and the relationship between two of the main variables. According to Saunila et al. (2014) and Calantone et al. (2002), for instance, companies that have a higher level of ICs have been found to have higher levels of productivity and economic growth. Thus, the first research proposition is as follows:

RP 1 Innovation capabilities affect business performance.

Figure 1 Theoretical model of the effect of SC strategies on the relationship between innovation capabilities and business performance



The second proposition introduces SC strategies as a moderating variable and helps us to understand the overall relationship between ICs, SC strategies and business performance. The second research proposition is as follows:

RP2 SC strategies affect the relationship between innovation capabilities and business performance.

The relationships between ICs, SC strategies and business performance become more complex as we consider the different types of ICs and SC strategies and their different natures, following the principles of the CT. Thus, to complement RP2, the characteristics of each one of the variables, SC strategies and ICs, and their expected results on business performance are subsequently discussed.

As shown in Table 2, adopting lean strategies tries to create efficient SCs, in terms of costs. In order to be efficient, companies need to focus their improvement processes on the elimination of waste and non-added value activities. Lean strategies fit well with both stable, competitive environments and predictable demand of products and processes that satisfy the current customers' needs (Christopher and Towill, 2002; Qi et al., 2009; Qrunfleh and Tarafdar, 2014). It is this stable environment and predictable demand that allows companies to have a high average capacity utilisation rate to support their improvement in efficiency. As such, ICs are tuned to the exploitation of innovation activities in which new products and processes need to be adapted to the demand, which favours incremental innovation.

Agile SC strategies are intended to guarantee the flexibility and adaptability of the SC given the constant changes in customers' needs and the unstable competitive environment, using rapid, dynamic and continuous responses (Christopher and Towill, 2002; Qi et al., 2009; Qrunfleh and Tarafdar, 2014). The objective of agile SC strategies is to adapt the organisation by developing new products and processes to unique market characteristics, in order to generate and retain new competitive advantages. It is the unpredictable demand for new products and the constantly changing environments that create the conditions for companies to develop new responses to track and understand customer requirements, shorten lead times and to develop close interaction with changing

customer and market needs. Therefore, companies aim to develop products and services to cope with the change imposed by the dynamic context (Qi et al., 2009). In this sense, this strategy is expected to have a better fit with most of the ICs.

Although all the ICs proposed by Guan and Ma (2009) are related to the capacity to create new or significantly improved products or processes, constantly changing environments may have different consequences on a company's ICs as well as on the SC performance. In fact, some companies are more likely to have a better fit between the stability and predictability of their environments and their lean SC strategies, whereas others are more adjusted to contextual flexibility and adaptability through the use of agile SC strategies.

R&D capabilities are developed by means of investing in R&D, acquiring new technologies and employing qualified industrial experts. These capabilities support companies by embracing many novel technologies and approaches when developing new technological assets, resulting in the recognition of technologically-endowed products (Guan and Ma, 2003). However, it is expected that R&D capabilities are tuned to both agile and lean SC strategies for different reasons: firstly, R&D capabilities are a better fit with agile SC strategies when companies acquire the ability to generate unique new products and processes according to constantly changing environments; and secondly, R&D capabilities are also tuned to lean SC strategies when companies favours the development of products and processes that need to be continuously adapted to the constant changes in the demand. On one hand, a company's exploration of innovative activities needs to be tuned to agile SC strategies and, on the other hand, their exploitation of innovative activities is more tuned to companies that deploy lean SC strategies. In both SC strategies, lean and agile, business performance is supported by R&D capabilities. In this sense we propose the following research proposition:

RP 2.1 Companies with high levels of R&D capabilities tend to obtain good business performance by adopting an agile or a lean SC strategy.

Manufacturing capabilities refer to the ability to transform R&D results into products that meet the market's needs in accordance with demands. They are also related to the type of advanced technologies employed and to the consistency of the product's quality *vis-à-vis* the main competitors (Guan and Ma, 2003). As manufacturing capabilities and an agile SC require understanding customer requirements and developing brand new products according to the future needs of the market, based on exploratory-based innovation, a good fit is expected. Complementarily, manufacturing capabilities and lean SC strategies favour the development of short-term, exploitation-based innovation activities, which are themselves based on incremental improvements in existing products and processes. As such, it is expected that business performance will be positively affected by the relationship between manufacturing capabilities and lean SC strategies. Therefore, we reach the following research proposal:

RP 2.2 Companies with high levels of manufacturing capabilities tend to obtain a good business performance by adopting an agile SC strategy or a lean SC strategy (especially incremental innovation).

Marketing capabilities demonstrate a company's capacity to segment, position and target specific markets and to utilise marketing tools (product design, pricing, advertising) to differentiate products on the basis of understanding the consumers' current and future needs and the customers' purchasing habits and its competitors' actions and strategies.

Thus, companies exploring future market needs tend to develop unique products and processes tuned to particular market characteristics in which marketing capabilities play a critical role in generating new competitive advantages. SC strategies need to be tuned to marketing capabilities just as the needs of the market, the characteristics of the market segment and the scope of the product's portfolio will have consequences in the SC. As a result of this relationship, agile SC strategies need to be deployed to accommodate brand new product and market requirements throughout the SC. Complementarily, companies tuned to exploitation innovation activities, which normally require them to be focused on incremental improvements in products and processes to respond to evolutionary but stable market needs properly, tend to favour lean SC strategies. This leads to the following research proposal:

RP 2.3 Companies with high levels of marketing capabilities tend to obtain a good business performance by adopting an agile or a lean SC strategy.

The organisational culture plays an important role when sharing knowledge and harmonising resources and capabilities throughout the company. Therefore it is important that companies develop learning capabilities so that they can promote the development and sharing of innovation within the company (Kamasak et al., 2017). Learning capabilities are important to successfully internalise external knowledge in companies' innovation processes and to share internal knowledge throughout the company (Steinmo and Rasmussen, 2016). Organisational learning is considered as a likely key antecedent to innovation development and performance (Hurley and Hult, 1998; Sheng and Chien, 2016). Learning capabilities are heavily dependent on the learning culture of the company to identify and assimilate new knowledge crucial to deploying innovation competencies that enable the competitive success of the firm. Those learning capabilities also underpin the identification of new trends within the industry and the development and acquisition of the new and necessary skills or technologies to develop new products (Guan and Ma, 2003).

Exploratory innovation activities are more directed at developing unique products and processes based on constantly changing environments, which require companies to adopt an outward, opportunity-based perspective in order to keep abreast of developments in future markets. Besides, exploitation innovation activities are more linked to a company's current performance, in which learning capabilities are easier to accommodate than in the previous case. In this sense, it is expected that learning capabilities will have a better fit with lean SC strategies, as they presuppose understanding and adapting to customer requirements and can accommodate a certain degree of flexibility, when compared to agile SC strategies. Based on this, the following research proposal was prepared:

RP2.4 Companies with high levels of learning capabilities tend to obtain better business performance by adopting an agile SC strategy as opposed to a lean SC strategy.

Resource exploiting capabilities represent the ability to mobilise and expand a company's technological, human and financial resources, by combining internally and externally developed technologies (e.g., technologies developed by business partners) while maintaining a continuous flow of financial and managerial resources for the introduction of new products onto the market. It also means being skilled in the allocation of personnel and continually striving to improve existing products and processes. Exploration innovation activities are riskier than exploitation innovation ones as the

former are tuned to the capacity of a company to generate new competitive advantages for the future needs of the market, as opposed to what occurs when companies wish to improve their existing product portfolio to exploit existing market needs. Moreover, exploration innovation activities also involve long-term, riskier partnerships and technologies, whereas exploitation innovation activities focus on the development of short-term, less riskier technologies. Thus, the following proposition is put forward:

RP 2.5 Companies with high levels of resource exploiting capabilities tend to obtain better business performance by adopting an agile SC strategy as opposed to a lean SC strategy.

Organisational capability is related to the ability: to constitute a well-established organisational structure; to coordinate all activities and individuals towards the achievement of shared objectives; and to influence the speed of innovation processes through the organisational infrastructure. It includes: the adoption of a flexible organisational structure to adjust to new projects focused on product or process innovation; granting managers autonomy in the innovation process; project coordination between technical (e.g., engineering, projects), sales and manufacturing departments; the implementation of new management techniques to improve routines and work practices and to facilitate the use and exchange of information, knowledge and skills within the company; and the implementation of new organisational methods to distribute responsibilities and decision-making tasks better. In this sense, flexibility and adaptability tend to be key organisational capabilities among successful companies that adopt agile SC strategies and stability and predictability are characteristics that tend to be valued among those that seek to deploy lean SC strategies. Accordingly, exploration innovation activities demand more complex organisational capabilities as companies are not only tuned to long-term technological settings, but also need flexible organisational structures to generate originality for those new environments. In the case of exploitation innovation activities, companies need organisational capabilities directed at accommodating change. The following research proposal is based on this point:

RP2.6 Companies with high levels of organisational capabilities tend to obtain better business performance by adopting an agile SC strategy as opposed to a lean SC strategy.

Strategic capabilities are related to a company's ability to adopt different types of strategies when coping with the business environment. The more strategically endowed companies are, the more they can thrive in highly competitive environments. Exploration innovation activities demand that they are directed towards long-term, riskier perspectives, with a strong entrepreneurial intent in which managers are able to envision external factors and future scenarios and to anticipate the movements of outstanding competitors and craft strategies to preempt those changes while incorporating bold manoeuvres to adopt new products and processes and reconfigure the SC strategies. In the case of exploitation innovation activities, companies need to internalise change based on the adaptation of their product portfolio and adjust strategies to adapt to those changes. Although there is a strong connection between innovation and the customers' recognition of the product's value in both situations, it is expected that strategic capabilities fit better with an agile SC strategy, as both presuppose a solid understanding of customers' evolving requirements and the ability to face external environmental changes. This leads to the following research proposal:

RP2.7 Companies with a high level of strategic capabilities tend to obtain better business performance by adopting an agile SC strategy as opposed to a lean SC strategy.

Finally, this paper also considers the influence of company size and environmental uncertainty in the relationship between innovation capabilities and SC strategy.

The size of a company can have an impact on the resources it has available to implement initiatives, as well as on its profitability (Gligor, 2016).

Environmental uncertainty is measured taking into account three dimensions (Aldrich, 1979; Dess and Beard, 1984): environmental munificence; environmental dynamism; and environmental complexity. Environmental munificence reflects the extent to which the external environment where companies compete, supports sustained growth on the part of the company. Environmental dynamism reflects the extent to which the external environment is characterised by unpredictable changes. The more dynamic the environment is, the more uncertainty and change the management team is expected to experience. Environmental complexity reflects the extent that the environment in which the company competes is characterised by great uncertainty and great information-processing requirements (Dess and Beard, 1984).

Environmental uncertainty is an important variable in understanding the impact business environment has on a company and the way SC strategies and ICs are affected, which also influences the fit between both. One can expect that the more uncertain an environment is the more it will influence SC strategies and the relationship between ICs and business performance. The last research proposition is:

RP3 The effect of SC strategies on the relationship between innovation capabilities and business performance is influenced by environmental uncertainty and the size of the company.

5 Implications and conclusions

By identifying and collating SC strategies and ICs and by analysing the possibilities for aligning them, this study helps advance research on strategy and SCM. It also provides some insights for managers who wish to implement effective improvements in business performance.

We have identified possible combinations between ICs and SC strategies and discussed the expected effects of these combinations in this paper. The research propositions reveal the complexity of the relationship between the areas of innovation and SC, and especially between SC strategies and innovation capabilities. Based on the research propositions shown, it is plausible that new theories could be proposed on the subject based on empirical evidence.

The CT and the RBV are explored in this article and provide the theoretical foundations for the discussion and development of a theory related to the effect that SC strategies have on the relationship between innovation capabilities and business performance. This theoretical model helps us to understand the relationship between the main variables used in the study and to explain the effect that the fit between innovation capabilities and SC strategies has on business performance.

In general, one can conclude that innovation capabilities play an important role as an important antecedent of business performance. More importantly, SC strategies are

expected to influence the relationship between innovation capabilities and business performance. However, due to the valuable, rare, difficult to imitate and difficult to substitute unique characteristics of the supplementary innovation capabilities – learning, resource exploiting, organisational and strategic – it is expected that the business performance of companies adopting agile SC strategies outperform those that adopt lean SC strategies.

As shown throughout the research propositions, agile SC strategies support the development of exploration-based innovative activities in a special way. On the other hand, the adoption of a lean SC strategy tends to favour exploitation-based innovation characteristics that embrace the stability and predictability of the environment. This happens because, in general, exploitation-based innovations require less flexibility and less ability to adapt to market changes, since they are related to the refinement of existing products, processes, technologies and methods.

5.1 Limitations and future research

The main limitation of this study relates to the limitations imposed by the nature of the work; in other words, carrying out a literature review and a theoretical discussion with the goal of developing a theoretical model. However, as this is the first step in developing a theory of the relationship between innovation capabilities and SC strategies, we believe that it represents a significant contribution to the literature.

For future research, we recommend testing the research propositions put forward in this paper empirically. Finally, the concept of ambidexterity and the trade-off between exploration and exploitation could be tested in future research.

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