The extended dynamic capabilities model: A meta-analysis

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ABSTRACT

This paper investigates, from meta-analytic approach, some topics that were unexplored in others dynamic capabilities meta-analysis. Hence, our research advances to identify and test the main antecedents of dynamic capabilities, the possible moderation effects of economic and cultural contexts in the relationship between dynamic capabilities and firm performance and the mediation effects between the antecedents of dynamic capabilities and firm performance. (1) The elements that stimulate dynamic capabilities development are resources, knowledge and learning, alliances and environmental dynamism. However, entrepreneurial orientation has no direct relationship with dynamic capabilities. (2) Dynamic capabilities play a mediating role between resources, knowledge and learning, alliances and firm performance. Curiously, entrepreneurial orientation is not mediated by dynamic capabilities in relation to performance. (3) Economic and cultural moderation affect the relation between dynamic capabilities and performance. Surprisingly, we detected that an Eastern orientation, presenting a high level of power distance and a low level of individualism, promotes stronger effects in the relationship between dynamic capabilities and firm performance than a Western orientation. Thus, our main contribution is to broaden the previous research on dynamic capabilities and to propose a future research agenda. In addition, this study adds new empirical evidence to the study of dynamic capabilities, which reduces the heterogeneity of previous results.

1. Introduction

The dynamic capabilities (DC) approach analyses the sources of wealth creation and captures that generate sustained competitive advantages in firms (Teece, Pisano, & Shuen, 1997). For more than 20 years, this has been a fundamental question in the field of strategic management. During this period, the empirical development of DC studies was related to several other concepts in the strategy area, to understand how and why some companies develop competitive advantages (Pezeshkan, Fainshmidt, Nair, Lance Frazier, & Markowski, 2016; Schilke, 2014; Stadler, Helfat, & Verona, 2013; Teece, 2007). These relationships sought to explain the successes and failures of firms as seen through the lens of DC. Thus, a knowledge base was constructed in the strategy studies field to better understand organisational performance (Teece, 2014).

Despite the rapid growth of the literature on DC during this period, empirical evidence regarding relationships remains unclear (Pezeshkan et al., 2016; Schilke, 2014). There is divergence and ambiguity in the empirical literature about which are the antecedent factors and the consequences of the DC, as well as in the form and sign of detected relations (e.g. Kor & Mahoney, 2005; Menguc, 2006; Wu, 2010; Drnevich & Kriauciunas, 2011; Lee, Naylor, & Chen, 2011; Cheng & Chen, 2013; Arend, 2014; Li & Liu, 2014).

Some recent studies have been conducted to promote more in-depth understanding about the DC construct (e.g. Fainshmidt, Pezeshkan, Lance Frazier, Nair, & Markowski, 2016; Fallon-Byrne & Harney, 2017; Karna, Richter, & Riesenkampff, 2016; Kurtmollaiev, 2017; Pezeshkan et al., 2016; Schilke, Hu, & Helfat, 2018; Zou, Ertug, & George, 2018). These studies achieve a qualitative and quantitative synthesis, but they also show some limitations and fail to investigate some important areas. For example, the qualitative approaches adopted by Fallon-Byrne and Harney (2017) and Kurtmollaiev (2017) and the systematic reviews conducted by

Pezeshkan et al. (2016) and Schilke et al. (2018) promoted excellent understanding of the state of the art of the DC construct and provided a guide for future agendas. However, the results found were not generalised (Fern & Monroe, 1996; Hunter & Schmidt, 2015).

Nevertheless, we found two meta-analytical approaches that cover the generalisation gap (Fainshmidt et al., 2016; Karna et al., 2016; Zou et al., 2018). Fainshmidt et al. (2016) analysed the effects of DC on firm performance and the technological moderation of these relationships. Karna et al. (2016) investigated the influence of ordinary and dynamic capability of financial performance on different environmental conditions, and Zou et al. (2018) investigated only the effect of absorptive capabilities on firm performance and the mediation effects of innovation and knowledge transfer.

However, it is also possible to identify some opportunities that remain unexplored. For example, these meta-analyses did not investigate the antecedents of DC. These kinds of constructs could be interesting for understanding how DC might be explained. Fainshmidt et al. (2016) mentioned some potential moderating factors that were not investigated in their study. Hence, we incorporated a moderation analysis for economic and cultural contexts. These types of investigations were cited by Malik and Kotabe (2009) and Vanpoucke, Vereecke, and Wetzels (2014), and mentioned by Schilke et al. (2018), as an important agenda for the investigation of DC. Our study also proposes some mediation effects that are not presented in the other meta-analyses. This investigation converges with that of Schilke et al. (2018) in its suggestions for future research.

We propose a theoretical model that is tested using a meta-analytical approach. Thus, in this article, we provide insights guided by the following three research questions. (*i*) *What are the antecedent and consequent effects of the DC construct? (ii) What is the mediating role of the DC to lead to the firm performance? (iii) What are the moderators that affect the relationship between DC and performance?* Our main contribution is to extend the previous research on DC and propose a future research agenda. In addition, this study adds new empirical evidence to the study of DC, thereby reducing the heterogeneity of the results.

2. The need for a meta-analysis to understand the effects of dynamic capabilities

DC are understood as the ability of a firm to integrate, build and reconfigure internal and external skills in turbulent environments (Teece et al., 1997). In this way, DC refer to the standard and systematic state of the collective activities of a firm. These capabilities can generate and modify the routines and practices of a firm, seeking to improve organisational effectiveness (Zollo & Winter 2002).

In its classic Definition, the term DC emphasise two important aspects of achieving competitive advantage: dynamics and capabilities. The term 'dynamic' refers to the shifting character of the environment, highlighting the central role of innovation when timing is critical. The term 'capabilities' emphasise the key role of strategic management in appropriately adapting, integrating and re-configuring internal and external organisational and competences toward changing environment (Teece & Pisano, 1994). There are rapid changes in market forces that exert strong effects (Teece et al., 1997).

On this view, an organisation that has DC establishes a process for using resources that seeks to understand and create changes in the market. Thus, this construct refers to the ability of a firm to change its own capabilities, such as the process of developing new products (Zahra, Sapienza, & Davidsson, 2006).

Historically, the DC approach emerges from the concepts developed by Penrose (1995) and consolidated in publications in the 1990s. After consolidation, this approach emerged as one of the most influential theoretical lenses in the study of strategic management. However, despite its great appeal in academic and marketing studies, it has been criticised for its ill-defined border conditions (Schilke, 2014; Zollo & Winter 2002). Moreover, this approach has received direct criticism resulting from its confusing discussion regarding the effects of DC (Arend & Bromiley, 2009).

In addition to these two criticisms, studies on the subject have revealed some conflicting results, mainly regarding the analysis of the consequent and antecedent constructs of DC. Environmental dynamism is an antecedent that has shown conflicting results in recent literature. Research has shown positive (Menguc, 2006), neutral (Schilke, 2014) and even negative relationships (Arend, 2014). Likewise, in the performance construct, the findings are also diverse. Wilden, Gudergan, Nielsen, and Lings (2013) found a negative relationship, Menguc (2006) and Lee et al. (2011) noted a positive relationship and Arend (2013) found a neutral influence among the constructs. Various assumptions may explain these inconsistencies, such as the different methodologies applied in terms of size (Hedges & Olkin, 2014), sample type (Pan & Zinkhan, 2006) and cultural influences (Hofstede & Minkov, 2010).

These inconsistencies and conflicts in the relations of the DC construct indicate the need for a more rigorous systematic review (Pezeshkan et al., 2016). Thus, there is a need to perform a meta-analysis with the intention of collecting, organising and analysing the quantitative articles regarding the existing relationships of the DC construct. A better understanding of these relationships will enable us to consolidate and generalise the articles published on the theme, even if they are expressed using different statistical coefficients (Fern & Monroe, 1996; Hunter & Schmidt, 2015).

Thus, we propose a conceptual model of DC. In our conceptual model, we analyse the main elements that influence DC (development and results) pointed out in the literature review and also in quantitative models published since 1997, as detailed in section 3.

The main antecedents of DC are: a) resources, b) knowledge management and learning, c) alliances, d) entrepreneurial orientation and e) environment dynamism. We also suggest that DC may affect firm performance (consequence). Furthermore, we stress the possible mediation effect of DC between the aforementioned antecedents and firm performance. Additionally, we investigate the relevance of the moderators of DC, such as the methodological characteristics of the studies (sample and type of publication) and the economic (level of economic development and hemisphere) and cultural (cultural orientation, power distance, individualism and uncertainty avoidance) contexts of the countries of origin of the studies. Fig. 1 shows the theoretical model tested in this article, considering the different factors pointed out in other studies.

2.1. Antecedents of dynamic capabilities

Resources: This construct concerns the tangible and intangible resources of the company that are used to obtain competitive advantage, for example, people, intellectual property and marketing resources (Arend, 2014). The resources construct is recognised as an important antecedent of DC (Fallon-Byrne & Harney, 2017; Schilke et al., 2018) because it is a key element for creating and sustaining competitive advantage (Teece et al., 1997). This is because DC seek to use resources to understand and create changes in the market (Kurtmollaiev, 2017). Accordingly, if the value of DC "for competitive advantage lies in the resource configuration that they create" (Eisenhardt & Martin, 2000, p. 1106), the variability and quantity of resources ought to leverage the DC potential and development. Therefore, we suspect that:

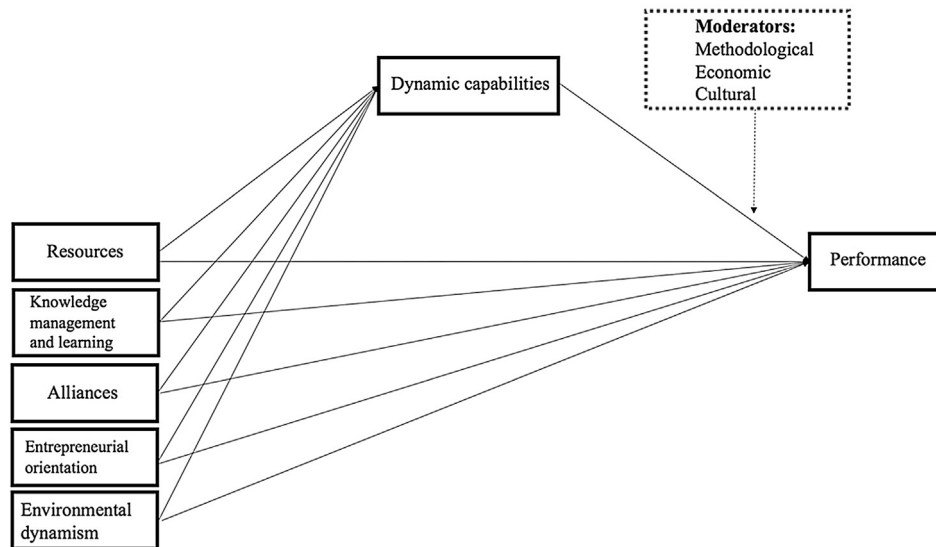**H1.** *Firm resources have a positive effect on dynamic capabilities.*

Fig. 1. Theoretical model.

Knowledge management and learning: This concerns strategies of the company that focus on the generation, diffusion and response to the market. These strategies refer to the current and future needs of customers, competitors and distribution channels (Morgan, Vorhies, & Mason, 2009). Knowledge management and learning enable the firms to promote new ideas (Easterby-Smith et al., 1992; Schilke et al., 2018). Therefore, this construct tends to present a positive relationship with DC because it leads the firm to learn about new routines and incentivises collective learning among employees and replication of solutions in new contexts (Zollo & Winter 2002). As Foray (2004, p 16) claimed, knowledge can be used to create new knowledge "and thus to broaden the spectrum of possible future actions." Therefore, we suppose that:

H2. *Knowledge management and learning have a positive effect on dynamic capabilities.*

Alliance development: This construct consists in the firm's ability to establish strategic partnerships to gain knowledge and ensure more effective management (Kale & Singh, 2007). This construct is important in improving DC because a firm's own resources are limited (Pfeffer & Salancik, 2003). Some studies (e.g. Danilovic & Winroth, 2005; Wu, 2007) have pointed out that firms use alliances to gain complementary resources and capabilities. Alliances may also foster the outgrowth of valuable, rare, imperfectly imitable and non-substitutable resources, which are forged within the alliance relationship (Dyer and Singh, 1998). Hence, we suppose that:

H3. *Alliance development has a positive effect on dynamic capabilities.*

Entrepreneurial orientation: Entrepreneurial orientation consists in the implementation of new products or strategies to reach new markets (Sáenz, Revilla, & Knoppen, 2014). Firms that show entrepreneurial orientation tend to promote competitive advantage because they pioneer the discovery of new markets (Engelen, Kube, Schmidt, & Flatten, 2014) and, consequently, can create high financial returns during the period when competitors have not yet entered these new markets/segments (Zahra, Hayton, Neubaum, Dibrell, & Craig, 2008). Therefore, this construct tends to present a positive effect on DC because it promotes understanding of market complexity and stimulates the process of developing new

things (Zahra et al., 2006). Hence, we suspect that:

H4. *Entrepreneurial orientation has a positive effect on dynamic capabilities.*

Environmental dynamism: This construct is considered an important antecedent to DC (Schilke et al., 2018). It consists of the changes in the competitive environment that affect how the company will compete with others and how it will respond to changing consumer needs, together with its development process in the industry (Drnevich & Kriauciunas, 2011). Considering DC as helping to "integrate, build and reconfigure internal and external competencies to address rapidly changing environments" (Teece et al., 1997, p. 516), it may be expected that the faster the environment changes, the more a firm relies on its DC to develop new and improved goods better and faster. Accordingly, environmental dynamism should probably push firms to invest, develop and enhance their DC because DC enhance the possibility of understanding new sources of competitive advantage (Wu, 2010). This assumption is reinforced by Karna et al. (2016) meta-analysis that found a positive effect of environmental dynamism in the DC. In this case, they demonstrated that in changing environments, DC were found to be significantly more strongly associated with firm performance than in relatively stable environments. Therefore, we suppose that:

H5. *Environmental dynamism has a positive effect on dynamic capabilities.*

2.2. Consequences of dynamic capabilities

Performance: The firm's performance consists in the achievement of the organisation's tangible and intangible objectives, for example, increased sales, product success, competitive advantage, efficiency, quality and profitability (Menguc, 2006). This construct is most strongly related to DC (Pezeshkan et al., 2015; Schilke et al., 2018). Studies have pointed out that DC have positive effects on performance (e.g. Eisenhardt & Martin, 2000; Karna et al., 2016; Teece et al., 1997). This probably occurs because, as the authors pointed out, DC are a key element for promoting a competitive advantage through new routines and practices (Zollo & Winter 2002) and, consequently, lead firms to outperform firms lacking

such capacities (Pezeshkan et al., 2015). Environmental dynamism induces inter alia, the shrinking of the product life cycle, fiercer competition among market agents and faddish consumer behaviours, all of which raise risk and uncertainty perceptions in enterprises. As described previously, enterprises empowered with DC cope with fast-changing environment hazards through their competences, to perceive opportunities better and faster, adapt to required new conditions and seize the perceived opportunities (Teece et al., 1997). Hence, we suspect that:

H6. *Dynamic capabilities have a positive effect on firm performance.*

2.3. Possible mediators in the theoretical model

We identified five possible equations that could mediate the firm performance. Below, we detail each expected mediation effect. In the first relationship, DC will mediate the relationship between resources and performance. DC are organisational routines that affect changes in the company's existing resource base (Teece et al., 1997). The DC approach indicates that the search for a better competitive advantage is derived from the firm's ability to combine its resources (Helfat & Peteraf, 2003). A company that has a market orientation based on positive performance tends to invest in DC as a resource-transformation link (Menguc, 2006). Moreover, considering that firms translate market needs into goods through DC, even the possession of strategic resources would be potentially worthless in the absence of DC. In this sense, the DC could be a mediator of the relationship between resources and performance as it plays an important role in the transformation of resources and static competences into innovative products or processes (Makkonen, Pohjola, Olkkonen, & Koponen, 2014). Thus, DC lead the resources of the firm to achieve better performance. Some researches reinforce these arguments. For example, Arend (2014) demonstrated that smaller SMEs benefit less in firm performance from having DC. One of the main reasons was because smaller SMEs present few employments and resources (Amit, Glosten, & Muller, 1990; Aguinis, Dalton, Bosco, Pierce, & Dalton, 2011). In the Wu (2006) research, the results obtained from 244 Taiwanese IT firms demonstrated that resources influence performance through exercising DC. On the other hand, if resources are tested in direct way with performance, the results are not supported. Therefore, we suppose that:

H7a. *Dynamic capabilities mediate the relationship between resources and firm performance.*

Some studies have pointed to a positive effect of knowledge management and learning on firm performance (e.g. Easterby-Smith & Prieto, 2008; Lee & Choi, 2003). This tends to occur because knowledge management and learning promote improvements in processes and people development, and this supports firm performance (Daud & Yusoff, 2010). Some results have reinforced this argument, for example the study of Marqués and Simón (2006) showing a positive effect of knowledge management on firm performance in the Spanish biotechnology and telecommunications sectors, and that of Darroch (2005) that applied the author's research to New Zealand firms with more than 50 employees. We propose that this relationship is mediated by DC. This could occur because DC are considered to be the result of learning to shape operational capabilities (Winter, 2003), and consequently, the process of knowledge management is a central element in the creation and renewal of DC (Easterby-Smith & Prieto, 2008). Therefore, the firm's DC could be the cause of a positive relationship where knowledge/learning promotes people's capabilities and this supports firm performance. This assumption is related to empirical evidence that linked knowledge management and learning with performance because the companies access the DC (e.g. Easterby-Smith & Prieto, 2008). In this line, the knowledge management and learning incorporate by DC will promote competitive advantage to organisation (Danneels, 2002) and, consequently, impacts on firm performance (Danneels, 2002; Easterby-Smith & Prieto, 2008). Hence, we propose that:

H7b. *Dynamic capabilities mediate the relationship between knowledge management and learning and firm performance.*

We also suppose that DC mediate the relationship between alliance development and firm performance. Alliances tend to promote DC because the cooperation facilitates the firm's access to complementary resources (Danilovic & Winroth, 2005; Gulati, 1999). In this way, the resources provided by alliance development trigger the resource needs in DC to create new value-creating strategies (Pisano, 1994) that will promote firm performance (Pezeshkan et al., 2016; Wu, 2007). Without DC, firms may fail to sense market needs and, thus, may lack understanding of which resources are strategic and valuable for creating goods that satisfy market desires. Poor understanding of market needs may be associated with underutilised alliances, which, in turn, weakens firm performance. On the other hand, if the alliance is linked to DC, the firm is better able to acquire, reconfigure and integrate knowledge with innovative and will impact on the firm's performance (Pezeshkan et al., 2016). In this line, Wu et al. (2007) demonstrated that DC enhance the relationship between relationship capital and innovative performance. Therefore, we suspect that:

H7c. *Dynamic capabilities mediate the relationship between organisational alliances and firm performance.*

Entrepreneurial orientation is based on three main characteristics: (a) innovativeness, (b) proactiveness and (c) risk-taking (Wiklund & Shepherd, 2005). These characteristics tend to promote firm performance by encouraging the recognition of new opportunities in different segments and by obtaining competitive advantages (Lumpkin & Dess, 1996). However, the entrepreneurial orientation assumes more risk because the task actions are related to new products or services and the consumers' responses are unknown (Covin, Green, & Slevin, 2006). Hence, we can imagine that DC could mediate this relationship because this ability could support early detection of problems in innovative products or services, allowing prompt corrections to be made (Liao et al., 2003; Engelen et al., 2014).

Thus, we may suspect that the entrepreneurial orientation should be focused on the development of DC, and then, the company will be able to generate performance. This assumption was confirmed by Wu (2007). This case demonstrated that start-ups in high-tech contexts present better performance when they developed DC. So, without DC to transform entrepreneurial resources into future advantages, entrepreneurial resources do not translate into star-up performance (Wu, 2007, p. 551). Hence, we suppose that:

H7d. *Dynamic capabilities mediate the relationship between entrepreneurial orientation and firm performance.*

2.4. Possible moderators in the theoretical model

We also investigated some moderation relationships between DC and firm performance. This investigation is important because methodological (Hedges & Olkin, 2014), cultural (Minkov, 2001) and economic (Zarantonello, Jedidi, & Schmitt, 2013) contexts may

play a role in the inconsistencies between DC and firm performance. This analysis was performed as for other meta-analyses (e.g. Santini et al., 2018a,b; Rosario, Sotgiu, De Valck, & Bijmolt, 2016). In Table 1, we present the moderating variables, their descriptions, the form of codification and the expected relations. These moderators allow for a more robust understanding of the production of effect sizes.

As presented in Table 1, we analysed two possible methodological moderation effects: (a) sample size and (b) type of publication. The sample size can play a significant role in producing variance in effect sizes in the studies (Fern & Monroe, 1996). Small samples are more homogeneous (Fern & Monroe, 1996) and therefore tend to overestimate the effect sizes of the relationships (Rosenthal & Rubin, 1982). Based on our systematic review, we found studies including 72 (Ettlie & Pavlou, 2006) to 2747 (Wilden et al., 2013) respondents. We suppose that studies with smaller

samples promote stronger effect sizes than studies with larger samples. Therefore, we present the hypothesis H8a.

H8a. *In the small (large) sample sizes studies, the relationship between dynamic capabilities and firm performance is increased (reduced).*

The type of publication is another element that can cause variations in effect sizes (Lipsey & Wilson, 1993). In this case, we find some criticisms regarding top publications (Rosenthal & Rubin, 1982). The critics point out that top journals tend to prioritise publications with overestimated effects (Rosenthal & Rubin, 1982; Lipsey & Wilson, 1993). Based on this assumption, it is expected that studies published in top journals will tend to promote stronger effect sizes than studies published in other journals (H8b).

H8b. *In the top journal (non-top journal) publication, the*

Table 1
Constructs of hypothesised relationships.

Constructs analysed in the meta-analysis		
Variable	Description	Coding/Examples
Resources	Tangible and intangible resources of the company that are used to obtain competitive advantages (Arend, 2014).	Measures that are related to tangible and intangible resources (e.g. intellectual property, marketing resources, machinery, technological resources)
Knowledge management and learning	Strategies that focus on learning and knowledge generation and diffusion, and the way that companies respond to the market demands. (Morgan et al., 2009).	Measures that emphasise the learning process (e.g. interorganisational learning, marketing learning, learning culture, intelligence dissemination and generation)
Alliances	Ability to establish strategic partnerships (Kale & Singh, 2007).	Measures that support organisational partnerships (e.g. alliance coordination, alliance portfolio size, alliance transformation, alliance performance)
Entrepreneurial orientation	Strategies for developing new businesses considering market necessities. (Miller, 1983).	Measures that include entrepreneurial characteristics (e.g. leadership style, action regarding leadership)
Environmental dynamism	Level of competition in the industry environment (Drnevich & Kriauciunas, 2011).	Measures that encourage dynamism (e.g. market turbulence, competitive intensity, technological turbulence, environment hostility)
Firm performance	Achievement of the organisation's tangible and intangible objectives (Menguc, 2006)	Measures that are linked with firm outcomes (e.g. financial performance, market performance, export performance, quality performance and profitability)

Moderators analysed in the meta-analysis		
Variable	Description	Coding
Sample size	We classified samples in two groups: small or large. From the sample number declared in each study, we adopted the median of the sample sizes as the cut-off point.	0 = small 1 = large
Type of publication	We identified the studies that were published in top journals or other journals. This ranking was based on the journal's position in the SCImago Journal & Country Rank® system. Top journals were those present in the top 20 positions in the strategy area. The others were considered not to be top journals.	0 = non-top journals 1 = top journals
Level of economic development	We checked whether the studies came from developed, emerging or undeveloped countries. This information was extracted from the methodology of the studies. The parameters for identifying the classification of the countries were based on the study by Zarantonello et al. (2013).	0 = developed 1 = emerging economies 2 = not developed
Hemisphere	We classified the geographical hemisphere of origin of the investigation of the phenomenon as northern or southern. This information was obtained from the extracted works (method — place of application of the research).	0 = northern 1 = southern
Culture	We identified the country of origin of the firms investigated, considering Western and Eastern cultures, based on the parameters of Hofstede and Minkov (2010).	0 = Western 1 = Eastern
Power distance	We classified the level of power distancing (low vs high). This separation was taken from the origin of the study and was based on the parameters established by Hofstede and Minkov (2010) obtained from the median of the indices of each country.	0 = low power distance 1 = high power distance
Individualism	The degree of individualism (low vs high) was identified. The separation followed the same procedures mentioned in the power distance item.	0 = low degree of individualism 1 = high degree of individualism
Uncertainty avoidance	We identified the groups associated with a low level of uncertainty aversion and a high level of uncertainty aversion. The procedure followed the logic established and quoted in the power distance dimension.	0 = low level of uncertainty aversion 1 = high level of uncertainty aversion

relationship between dynamic capabilities and firm performance is increased (reduced).

We also analysed a possible moderation effect regarding economic context. In this case, we investigated two moderation variables: (a) level of economic development and (b) hemisphere. The level of economic development can promote different levels of management practices that could impact in different ways on firm performance (Bloom & Van Reenen, 2010). Economic development leads to more investments in management practices (Bloom & Van Reenen, 2006). Therefore, we may expect that firms in countries with a high level of economic development tend to promote stronger effect sizes than firms in countries with low economic development (H_{8c}).

H8c. *In developing country (emerging and not developed economies), the relationship between dynamic capabilities and firm performance is increased (reduced).*

The location of countries can also cause differences in the effect sizes. This could occur because some theoretical lines posit a single positive correlation with the geographical location and the level of economic development (Gallup, Sachs, & Mellinger, 1998). In this case, northern countries tend to show a higher gross domestic product and higher individual per capita income than southern countries (Gallup et al., 1998). Based on this assumption, we suppose that countries located in the northern hemisphere tend to present stronger effect sizes than countries located in the southern hemisphere (H_{8d}).

H8d. *In the northern (southern) hemisphere studies, the relationship between dynamic capabilities and firm performance is increased (reduced).*

Finally, we investigated four national cultural elements that could cause variation in the effect sizes analysed: (a) cultural orientation, (b) power distance, (c) individualism level and (d) uncertainty avoidance. The national cultural elements are recognised as key indicators of people's values and beliefs that impact on their behaviour (Hofstede & Minkov, 2010). Thus, cross-cultural investigations into different areas, such as management (Kemper, Engélen, & Brettel, 2011), finance (Lau & Tan, 1998) and marketing (Malhotra, Agarwal, & Peterson, 1996), are very common. This type of analysis is also performed in meta-analytical studies (e.g. Rubera & Kirca, 2012; Santini et al., 2018a,b).

Cultural orientation is divided into Western or Eastern. The Western culture tends to promote more autonomy for employers, and the knowledge and learning process have horizontal dissemination (Kemper et al., 2011; Rubera & Kirca, 2012). These characteristics are key elements in promoting effective DC in organisations (Teece et al., 1997). Therefore, we can expect stronger effect sizes in studies carried out in Western countries than those in Eastern countries (H_{8e}).

H8e. *In the Western (Eastern) cultures, the relationship between dynamic capabilities and firm performance is increased (reduced).*

The power distance cultural dimensions are related to the levels of social inequality in a country (Yoo et al., 2001). This is linked with the degree of tolerance for hierarchical relationships (Kollmann, Christofor, & Kuckertz, 2007). We suppose that low power distance tends to produce stronger effect sizes in the relationships analysed. This situation may occur because employers in a low power-distance culture exhibit more initiative (Kirca, Jayachandran, & Bearden, 2005) and show trust (Doney et al., 1998) and solidarity with colleagues (Doney et al., 1998; Kemper et al., 2011) and less opportunistic behaviour (John, 1984). Consequently, they promote better conditions for the development of managerial ties (Kemper et al., 2011; Kirca et al., 2005). Hence, we suppose that:

H8f. *In the low (high) power–distance cultures, the relationship between dynamic capabilities and firm performance is increased (reduced).*

Another cultural dimension investigated was the level of individualism. This dimension is associated with the level of concern about the individual and the level of influence of others on the individual's behaviour (Hofstede & Minkov, 2010). People in cultures with a low level of individualism view themselves as a part of a group. Therefore, the collective goals are more important than individual goals (Minkov, 2010). Cultures with a low individualism level place less emphasis on individual group membership and more importance on creating relationships characterised by trust (Triandis, 1994). These characteristics are important for improving the achievement of DC goals (Zahra et al., 2006). Therefore, we expect that research conducted in countries with a low individualism level will present stronger effect sizes than that conducted in cultures with a higher individualism level (H_{8g}).

H8g. *In the low (high) individualism cultures, the relationship between dynamic capabilities and firm performance is increased (reduced).*

Finally, we investigated uncertainty avoidance. This cultural dimension is related to the degree of restlessness of a society in the face of an uncertain future (Hofstede & Minkov, 2010). In the management context, this cultural dimension can be linked with employee preferences for structured or unknown situations (Kemper et al., 2011). In this case, manager information reduces the feeling of uncertainty (Park & Luo, 2001). Managers in cultures with a high level of uncertainty aversion tend to keep uncontrollable situations to themselves and thus to inhibit the collaboration and exchange of knowledge necessary for the development of DC (Kemper et al., 2011). On the other hand, team collaboration is essential for organising DC (Grant, 1996). Therefore, we expect stronger effect sizes in cultures with a low level of uncertainty avoidance than those with a higher level (H_{8h}).

H8h. *In the low (high) uncertainty avoidance cultures, the relationship between dynamic capabilities and firm performance is increased (reduced).*

3. Methodological design

This research followed the procedures suggested by Moher, Liberati, Tetzlaff, Altman, and PRISMA Group (2009) and described in the PRISMA protocol. The steps for the construction of the methodological procedures involved were: (i) registration protocol and eligibility criteria, (ii) Definition of sources of information, (iii) collection process and researched variables and (iv) methods of data manipulation and combination of results.

Registration protocol and eligibility criteria: In our meta-analysis, we followed a recommendation from Rosenthal and DiMatteo (2001). Thus, we considered as valid for the analysis, scientific papers that deal with the proposed theme (DC) written in English and in the form of articles, published or not, in scientific journals in the area of management. After this search process, we considered for this meta-analysis only those quantitative results that provide sufficient statistical information for effect size calculations, as described below.

Definition of sources of information: We performed the literature search following the systematic review undertaken by Pezeshkan et al. (2016) and performed the meta-analysis using the articles

included in the study. The data were obtained using the ABI/ INFORM, EconLit, SAGE, Wiley and Springer databases, together with the references used in the Easterby-Smith, Lyles, and Peteraf (2009), Barreto (2010) and Li and Liu (2014) reviews. We also conducted manual searches in relevant journals of management, business and entrepreneurship. In this case, for our analysis, we considered articles that were published in peer review Journals. This procedure is usually used in others meta-analysis (e.g. Fainshmidt et al., 2016).

Collection process and researched variables: We used key terms to identify valid studies for use in this meta-analysis. The expressions used were 'dynamic capabilities' and 'dynamic capability'. These terms were used separately in the search process, making it possible to undertake a global search of DC study, as suggested by Cooper (2010). We considered the studies available since 1997, when the seminal paper by Teece et al. (1997) was published. This procedure is similar to that adopted in the Fainshmidt et al. (2016) meta-analysis. We excluded studies that applied qualitative methods, those that presented insufficient analysis for the meta-analysis tests and those that did not test the DC construct. After applying these procedures, we analysed 101 papers, resulting in 659 observations.

In the process of coding the information used for this meta-analysis, a spread sheet containing the following information from each of the extracted articles was developed: (i) article number, (ii) title of the paper, (iii) title of the journal, (iv) country of application of the study, (v) sample number, (vi) type of sample (e.g. manager and CEO), (vii) type of data collection, (viii) name of the DC measurement scale, (ix) number of items in the scale, (x) alpha of the scale used, (xi) type of relationship found with DC (e.g. antecedent or consequent), (xii) name of the relational construct, (xiii) force of the effect size and (xiv) research segment. The authors coded all the studies according to the definitions and criteria mentioned in Table 1. The coding procedure was undertaken by two independent researchers who analysed and codified the content of the papers, as recommended by Rust and Cooil (1994). The judges agreed on 96% of the content. In cases where there was no consensus, a third author served as an additional judge. In this situation, the dubious elements were analysed together in group meetings.

Methods of data manipulation and combination of results: In performing the manipulation and combination of results, we followed the procedures suggested in previous meta-analytical research (Kim & Peterson, 2017; Babic-Rosario et al., 2016). Specifically, the analysis was performed considering the Pearson's correlation coefficient (r). Some effect sizes were extracted directly, when the studies reported this correlation, whereas others were extracted indirectly, by converting the reported Student's t-test and F-ratio statistics through formulas suggested by Hunter and Schmidt (2015) or by converting the reported standardised beta, according to the recommendations of Peterson and Brown (2005). These statistical conversion procedures are commonly used in meta-analytical research (e.g. Kim and Peterson, 2007; Santini et al., 2017).

Once the effect sizes of each relation were assembled, they were corrected in relation to the reliability of the scales and the sample size (Hedges & Olkin, 2014), after which the random effect of the effect size was applied, as suggested by Hunter and Schmidt (2015). In this sense, the correlations were transformed with regard to Fisher's Z-distribution. The upper and lower confidence interval indexes were also analysed at the 95% level, which resulted in an estimate of the mean range of corrected weighted correlations (Hunter & Schmidt, 2015).

The direct analysis was performed through structural equation models (SEM) in Amos 19.0. We followed the same procedure as for other meta-analyses (e.g. Karna et al., 2016; Rubera & Kirca, 2012; Zablah, Franke, Brown, & Bartholomew, 2012). Hence, as mentioned in the study by Zablah et al. (2002), we set error terms equal to one minus the mean reliability value obtained in the meta-analysis (ranging from 0.70 to 0.92). This procedure also uses the harmonic mean of the correlations' total sample sizes (194) as the sample size for estimation purposes. This procedure is recommended by Viswesvaran and Ones (1995) and Cheung (2015).

The mediation effects also use the SEM model and follow the procedure recommended by Iacobucci, Saldanha, and Deng (2007), which is also applied in other meta-analytic studies (e.g. Rubera & Kirca, 2012; Zablah et al., 2012). Finally, the moderation analysis was obtained from a hierarchical linear meta-analysis (HiLMA). This analysis uses a regression-based multivariate format (Geyskens, Krishnan, Steenkamp, & Cunha, 2009) for the variables included in the model. This analysis is also widely used in meta-analytic research (e.g. Babic-Rosario et al., 2016).

4. Results

The meta-analysis results are divided into four sections: (i) the size effects of the antecedents and consequences of DC tested in the theoretical model, (ii) analysis of the theoretical model by SEM, (iii) analysis of mediating relationships and (iv) analysis of moderating relationships.

4.1. Size effects of antecedents and consequences of dynamic capabilities

Table 2 presents a synthesis of the results found in the antecedents and consequences of DC. In this case, the systematic review indicated five antecedents: (i) knowledge management and learning, (ii) alliance development, (iii) environmental dynamism, (iv) entrepreneurial orientation and (v) resources. In addition, we identify through systematic review the consequence of firm performance.

This analysis procedure was based on the study by Hunter and Schmidt (2015). Table 2 presents the number of studies in the analysis (k); the number of observations taken from the analysis of the studies (o); the number of accumulated samples of the assessed studies (N); the minimum and maximum simple correlations found in the studies (ES); the weighted average effect, corrected by the sample and the alpha obtained in the studies ($M_{N\alpha}$); the significance level of the effect size (Sig_1); the lower confidence interval (ICI); the upper confidence interval (ICS); the test for heterogeneity at the individual and the aggregate levels (Q); the significance level of Q (Sig_s); the number of items needed for a false result according to the Rosenthal parameter (FSN*) and the number of items needed for a false result according to the Orwin parameter (FSN).

The results show that all antecedents and consequences are significant with respect to the DC construct. Regarding the antecedents, we highlight the high consistent relationship with knowledge management and learning ($r = .405$; $FSN_{Rosenthal} = 10,446$; $FSN_{Orwin} = 254$), resources ($r = 0.384$; $FSN_{Rosenthal} = 8820$; $FSN_{Orwin} = 222$) and alliance development ($r = 0.361$; $FSN_{Rosenthal} = 5293$; $FSN_{Orwin} = 85$). We also note a positive and significant relationship between environmental dynamism and DC ($r = 0.122$; $FSN_{Rosenthal} = 2119$; $FSN_{Orwin} = 85$) and entrepreneurial orientation and DC ($r = 0.334$; $FSN_{Rosenthal} = 1354$ $FSN_{Orwin} = 89$).

Finally, we evaluated the most discussed relationship in the DC literature (Pezeshkan et al., 2016), which is its effect on firm performance. The results obtained from 72 surveys with 142 observations showed a positive ($r = .384$), significant ($p < .001$) and consistent ($FSN_{Rosenthal} = 39,363$; $FSN_{Orwin} = 689$) relationship. Thus, we confirm the theoretical studies that identify DC as a mechanism

Table 2
Results of meta-analysis: antecedents and consequences.

Constructs	(k)	(o)	N	ES_ra	M_Na	Sig_1	ICI (95%)	ICS (95%)	Q	Sig_2	FSN*	FSN**
1. Knowledge management and learning	17	31	3794	.369	.405	.000	.298	.502	802.13	.000	10,446	254
2. Alliance development	13	22	9521	.342	.361	.000	.245	.467	790.01	.000	5293	85
3. Environmental dynamism	22	44	5236	.120	.122	.000	.075	.169	315.51	.000	2119	85
4. Entrepreneurial orientation	10	14	2604	.331	.334	.000	.229	.450	156.00	.000	1354	89
5. Resources	19	41	4065	.316	.337	.000	.228	.436	888.31	.000	8220	222
6. Performance	72	142	28,229	.356	.384	.000	.337	.429	4856.4	.000	39,363	689

Note: NC = Not calculated because the effect size was not significant (p > .05).

for integrating, reconfiguring, gaining and launching the necessary resources to obtain competitive advantage, and consequently, market performance (Eisenhardt & Martin, 2000; Teece et al., 1997).

4.2. Analysis of direct relations

We tested the theoretical model using the SEM. The results are presented in Table 3. We observed that almost all antecedents showed significant relationships. The first hypothesis was that firm resources have a positive effect on DC. This assumption is confirmed ($\beta = .265$; $p < .001$).

We also note the positive and significant effects of knowledge management and learning on DC. These results ($\beta = .336$; $p < .001$) confirmed hypothesis H_2. The third hypothesis suggests a positive effect of alliance development on DC. Again, the SEM demonstrated the significance and positive effects of this construct ($\beta = .260$; $p < .001$). These results confirmed hypothesis H_3.

Hypothesis H_4 proposed a positive effect of entrepreneurial orientation on the DC. In this case, we did not find a significant relationship ($p = .267$). Hypothesis H_4 is therefore not confirmed.

We also noted that environmental dynamism impacts on the DC ($\beta = .121$; $p < .05$). Thus, we also confirmed hypothesis H_5. Finally, we tested the direct effects of DC on the firm performance. Again, we noted positive and significant effects ($\beta = .121$; $p < .05$), confirming hypothesis H_6.

4.3. Analysis of mediating relations

Table 4 presents the mediating effects in the theoretical model. For the mediation to be tested, it is necessary to have a significant relationship between the mediating variable (e.g. DC) and the independent variable (e.g. Resources). In addition, when incorporating the mediating variable into the model, it should eliminate or reduce the relationship between the independent variable (e.g. DC) and the dependent variable (e.g. performance) (Baron & Kenny, 1986) (see Table 5).

It was expected that the relationship between resources and performance could have been mediated by DC. First, we observed the conditions necessary for testing the mediation. Thus, we observed that the relationship between resources and DC was positive and significant ($\beta = .265$; $p < .001$), as was the relationship

between resources and performance ($\beta = .315$; $p < .001$). The results allowed the mediation test to proceed. Incorporating the construct of DC into the relationship in the model tested, we observed a decrease in the relationship between resources and performance ($\beta = .209$; $p < .001$). In this case, the results suggest partial confirmation of hypothesis H_{7a}.

We also tested the possible mediation effect of DC in the relationship between knowledge management and learning and performance. First, we noted that the assumptions were achieved. Then, we tested the cited mediation analysis. In this case, we observed that the relationship between knowledge management and learning and performance was not significant ($\beta = .107$; $p > .05$) when DC was incorporated into the model tested. In this way, we confirmed the full mediation effect of DC. Therefore, a positive relationship between knowledge management and learning and performance exists because of the DC of the firm. This result confirms hypothesis H_{7b}.

The next test was performed to analyse the possible mediation effect of DC in the relationship between alliances and firm performance. First, we detected a positive direct effect of alliances and firm performance ($\beta = .386$; $p < .001$) and alliances and DC ($\beta = .260$; $p < .001$). When the DC were tested for mediation, the relationship between alliances and performance was decreased ($\beta = .284$; $p < .001$). Hence, we detected a partial mediation effect for this relationship (H_{7c}).

Finally, we tested the mediation effects of DC in the relation between entrepreneurial orientation and firm performance (H_{7d}). In this case, we cannot test this mediation effects because the direct relationship of entrepreneurial and DC was not significant (Baron & Kenny, 1986). Therefore, the H_{7d} was not confirmed.

4.4. Analysis of moderating relations

As presented previously, several moderators were considered to identify possible influences on the relationships tested. Of these, we list moderators linked to methodological aspects (sample size and journal type), economic moderators (developmental level and continent) and cultural moderators (cultural orientation, distancing of power, level of individualism and level of aversion to uncertainty). The modelling was performed only for the relationship between DC and performance as the numbers of observations made in the other relationships were insufficient to carry out the analyses

Table 3
Testing of direct relationships.

Independent Variable		Dependent Variable	Beta	Error	Critical value	p-value	R²
Main Effect							
Resources	→	Dynamic capabilities	.265	.053	4.789	.000	66%
Knowledge mgmt and learning	→	Dynamic capabilities	.336	.053	6.064	.000	
Alliances	→	Dynamic capabilities	.260	.055	4.685	.000	
Entrepreneurial orientation	→	Dynamic capabilities	.062	.047	1.110	.267	
Environmental dynamism	→	Dynamic capabilities	.121	.052	2.176	.030	
Dynamic capabilities	→	Firm performance	.368	.063	6.108	.000	85%

Table 4
Mediation testing.

Relationships			Beta
Resources →	Performance		.315***
	Dynamic capabilities	→ Performance	.313***
	Resources	→ Performance	.209***
Knowledge management and learning →	Performance		.219***
	Dynamic capabilities	→ Performance	.267***
	Knowledge management and learning	→ Performance	.107[ns]
Alliances →	Performance		.386***
	Dynamic capabilities	→ Performance	.261***
	Alliances	→ Performance	.284***
Entrepreneurial orientation →	Performance		NC
	Dynamic capabilities	→ Performance	NC
	Entrepreneurial orientation	→ Performance	NC

***$p < .001$; ns = not significant; NC = Not calculated.

(Hunter & Schmidt, 2015) (See Table 5).

The moderator sample size had no significant effect. The relationship forces did not change in relation to this variable ($\beta = .365$; $M_{small} = .325$; $M_{large} = .383$). Similarly, there was also no significant relationship for the moderating effect of type of publication in the relationship tested ($\beta = .403$; $M_{non\_top\_journal} = .351$; $M_{top\_journal} = .381$). These results do not confirm the assumptions of hypotheses H_{8a} and H_{8b}.

In the analysis of the economic dimension, we detect a significant moderating effect for developed and emerging countries ($\beta = .308$; $M_{developed} = .419$; $M_{emerging\ economies} = .286$; $p = .001$). These results confirmed hypothesis H_{8c}. We also observed a significant moderating effect of hemisphere on the relationship between DC and performance ($\beta = .425$; $M_{north} = .370$; $M_{south} = .252$; $p < .05$). Therefore, we confirm hypothesis H_{8d} and the theoretical assumption that suggests that management practices are more developed in the developed countries of the northern hemisphere (Kemper et al., 2011).

Regarding the research on the cultural moderators, we initially analysed the Western and Eastern orientations of the companies included in the analysis. The expectation was that the relationship between DC and performance would be stronger in Western countries. This relationship was not verified and in fact showed a force opposite to that expected ($\beta = .316$; $M_{East} = .446$; $M_{West} = .294$; $p < .001$). Thus, hypothesis H_{8e} was not confirmed.

The research followed the dimensions established by Hofstede (2010). From the perspective of the power distance, the results present, again, opposite effects from the previous findings because cultures with a greater level of detachment presented stronger relationships than cultures with a low level of power distance ($\beta = .496$; $M_{low\ power\ distance} = .420$; $M_{high\ power\ distance} = .285$; $p < .001$). Thus, these findings did not confirm hypothesis H_{8f}.

We found that a stronger relationship existed between DC and performance in cultures with a low level of individualism ($\beta = .333$; $M_{low\ degree\ of\ individualism} = .395$; $M_{high\ degree\ of\ individualism} = .309$; $p < .05$). In this case, the results are congruent with prior expectations and hypothesis H_{8g} was confirmed.

Finally, the aversion to uncertainty dimension did not show a significant moderation effect as the difference in the groups was not statistically significant ($\beta = .489$; $M_{low\ level\ of\ uncertainty\ aversion} = .358$; $M_{high\ level\ of\ uncertainty\ aversion} = .419$), and therefore, hypothesis H_{8h} was not confirmed.

5. Conclusions and implications

5.1. Theoretical contribution and implications for future research

Meta-analysis directly measures sampling error deviations from the correct values. Thus, meta-analytic studies can correct mean values of distortions because of measurement error in several articles (Schmidt, 1996). Our research sought to analyse the size of the meta-analytic effect, thus defining a quantifiable measure of scientific explanations and the value of scientific knowledge regarding DC. Thus, this study combines multiple theoretical approaches to build a current picture of DC in the management field. Our meta-analysis quantifies the relationships between DC and other constructs associated with the creation and generation of firm performance.

This meta-analysis contributes to the strategic management literature because it reflects on the status of quantitative research on DC in different ways. We evaluate the body of knowledge regarding the relationships of DC through the effect sizes of our meta-analysis. In this way, we can compare research in several areas from administrative studies. We found that the existing relationships of the DC for achieving competitive advantage are fragmented and can increase or decrease depending on the existing construct.

The theoretical model tested in this meta-analysis provided

Table 5
Moderation testing.

Moderator	Level	Performance		
		ß	r^a	p-value
Sample	Intercept	.365		.000
	High	1	.325	
	Low	.075	.383	ns
Type of publication	Intercept	.403		.000
	Top	1	.351	
	Non-top	.025	.381	ns
Level of economic development	Intercept	.308		.000
	High	1	.419	
	Low	-.188	.286	.000
Hemisphere	Intercept	.425		.000
	Northern	1	.370	
	Southern	-.160	.252	.05
Culture	Intercept	.316		ns
	Eastern	1	.446	
	Western	.217	.294	.000
Power distance	Intercept	.496		.000
	High	1	.420	
	Low	-.189	.285	.000
Individualism	Intercept	.333		.000
	High	1	.309	
	Low	.135	.395	.000
Uncertainty avoidance	Intercept	.489		.000
	High	1	.419	
	Low	-.074	.358	ns

Notes: ($ß^a$) beta coefficient (r^a), correlation coefficient and (p-value) level of significance; ns = not significant.

interesting results. Four of five antecedents analysed impacted positively on the DC. In the first direct relationship tested, we consolidated the assumption that pointed to resources as an important antecedent of DC, as they are a key element for understanding the environment and proposing creative solutions to problems resulting from changes in the market (Kurtmollaiev, 2017; Teece et al., 1997). This result reinforces past studies that tested this relationship in different contexts and countries as, for example, the research developed by Wu (2006) with Taiwanese information technology and Arend (2014) with US SMEs. The second direct relationship tested demonstrated that knowledge management and learning impact positively on DC and are important in promoting new ideas (Schilke et al., 2018), stimulating sensing, seizing and transforming capabilities (Teece, 2007).

The theoretical model also confirmed the significant impact of alliance development on DC. These findings reinforce the importance to firms of establishing partners to promote complementary resources and capabilities (Gulati, 1999). These results are interesting because promoted empirical generalisation in past researches that were developed in South (Drnevich & Kriauciunas, 2011) and North America (Kale & Singh, 2007), Europe (Schilke, 2013) and Asia (Zhan and Luo, 2008). We also find that environmental dynamism showed positive impacts on the DC. In this case, we reinforce the theoretical lines (e.g. Drnevich & Kriauciunas, 2011; Karna et al., 2016; Teece et al., 1997) that regard the DC as an effective construct for adapting and responding to changes in consumer needs in a competitive context (Drnevich & Kriauciunas, 2011).

As we mentioned before, the entrepreneurial orientation was the only antecedent that did not had direct impact on DC. This result is interesting because it could lead to new insights about the relationship between entrepreneurial orientation and DC. For example, we may suppose that new markets and enterprises that are linked with entrepreneurial orientation (Engelen et al., 2014) do not necessarily support DC because of a lack of experience, resources and long-term motivation (Helfat & Peteraf, 2003). We may also suppose that new markets and segmentations could mitigate DC characteristics because the long-term investments might be minimised because of high uncertainty regarding ROI (Caves, 1998). A third possibility is imperfect timing between entrepreneurial orientation and DC. Entrepreneurial orientation was described as the implementation of new products or strategies to reach new markets (Sáenz et al., 2014), which suggests a focus on exploring an existing idea rather than sensing the market and adapting to seize opportunities. Thus, entrepreneurial orientation may be disconnected from DC because of shifts from implementation stages to opportunity-seeking stages, similar to the cycles between exploitation and exploration capabilities in ambidextrous firms, as described by Gupta, Smith and Shalley (2006).

In the last direct analysis tested, we confirmed the positive effect of DC on a firm's performance. Therefore, we reinforce the theoretical line that points to DC as a mechanism for generation of competitive advantage and therefore greater profitability (Eisenhardt & Martin, 2000; Teece et al., 1997). This result is important because it consolidates the results found in other DC meta-analyses (Fainshmidt et al., 2016) and explains the conflicting results published in some primary studies. Hence, we can generalise this main relationship (Fern & Monroe, 1996).

From the mediation analysis perspective, we found partial mediation effects of DC in the relationships between resources and firm performance and alliances and firm performance. In all these cases, we noted that the direct relationship was diminished when DC was tested as a mediator of the relationship. Hence, we can affirm that DC could help to transform resources and competences into new products and processes, and then leverage firm performance (Makkonen et al., 2014). This is justified by the fact that DC emphasises the reconfiguration of resources, which impacts on performance (Helfat & Peteraf, 2009). Thus, we can partially affirm that DC lead the resources of the firm to achieve greater performance.

The partial mediation effects of DC on the relationship between alliances and firm performance suggest that DC play an important role in linking cooperative facility access to complementary resources (Danilovic & Winroth, 2005; Gulati, 1999) and therefore promote firm performance (Pezeshkan et al., 2016). In this case, the results prove, partially, that only if the alliances are orientated to develop DC, the firm is able to improve performance. These results are interesting to promote another's investigation to consolidate this relationship, for example with primary studies, and open the possibility to analysed others characteristics of firm's strategic partners that can mediate the relationship between alliance and firm performance.

The results also show a full mediation effect of DC on the relationship between knowledge management and learning and firm performance. In this case, we demonstrated that the firm's DC stimulates a positive relationship with knowledge/learning and firm performance. Therefore, we may suppose that DC are a result of learning to shape operational capabilities (Winter, 2003) and that knowledge management and learning are key elements in creating and renewing DC (Easterby-Smith & Prieto, 2008), based on sensing, seizing and transforming (Teece, 2007) it to impact positively on firm performance (Daud & Yusoff, 2010).

We also highlighted interesting results from the moderation analysis. The methodological moderation did not affect the relationship between DC and firm performance. Therefore, the conflicting results existing with regard to the effect of DC on firm performance are not caused by sample characteristics or type of publication. However, we found a moderation effect of economic and country contexts. In this case, we found that developed economies and countries located in the northern hemisphere showed a stronger relationship between DC and firm performance than emerging economies and southern countries. These findings lead to the assumption that these kinds of economies tend to have more robust management policies (Kemper et al., 2011) and therefore more active DC (Gallup et al., 1998; Bloom & Van Reenen, 2006) that may impact in more effective ways on firm performance.

Finally, we detected a moderation effect of cultural context. In this case, some surprising results were found. We found that an Eastern orientation with a high level of power distance and a low level of individualism (Hofstede & Minkov, 2010) promotes stronger effects in the relationship between DC and firm performance than a Western orientation. These findings highlight the fact that the level of team cooperation linked with the level of individualism relating to a culture with an Eastern orientation (Hofstede & Minkov, 2010) can be regarded as significant and may promote DC (Grant, 1996; Kemper et al., 2011), thus promoting firm performance. These results are interesting because, in the case of power distance, we found opposite effects from some traditional lines (e.g. Kirca et al., 2005; Wang et al., 2011). On the other hand, the find is congruent with others researches that did not fully confirmed the expected negative moderation effect of power distance to promote more effective DC (Kemper et al., 2011).

One explanation about this finding could be linked to the fact that DC are context-dependent and culture has a central role in understanding DC. In high power-distance cultures, tasks and routine are characterised by centralised-control and less autonomy by employees. These may indicate that DC are translated into routines and tasks-oriented to improve performance, having an operational perspective (Smith and Prieto, 2008). In this way, Easterby-Smith and Prieto (2008), when investigating the relation

between DC and performance, pointed out that function capabilities promote routines, which leads to general DC. The same authors also affirm that routines and function procedures themselves embody DC. In this line, firm's hierarchy (Teece, 2016) and organisational routines (Amit & Schoemaker, 1993) are important to be efficient in performed the tasks.

We also found another explanation in others researches fields. For example, in the sales context, some meta-analysis found that behaviour-based control system is more efficient than outcome-based control to evoke firm financial performance (Samaraweera & Gelb, 2015; Santini, Vieira, Sampaio, & Perin, 2016 the behaviour-based control system is a method for regular monitoring for salespeople's activities (Oliver & Anderson, 1994). Finally, it is important to highlight the fact that our collected data included a number of studies undertaken in China and Taiwan (39 studies). Nevertheless, these Eastern countries are increasingly recognised as capitalist economies, similar to Western countries.

5.2. Practical implications and limitations

For managers, our meta-analysis promotes the generalisation of the effects found in other empirical studies, as it goes beyond the limitations commonly found in field studies, promoting accurate estimates of the effect sizes in all respects (Lipsey & Wilson, 2001; Hunter & Schmidt, 2015). Thus, this study provides important directions for the management and strategy area, identifying the elements that significantly affect the formation of DC and the repercussions on performance.

In this way, some important management direction can be extracted from the results of this study. *First*, investments in knowledge and learning processes, alliances and resources were strategically justified in many firms to promote the DC. However, managers need attempt to build and explore these capabilities to promote firm performance by the DC integration (Schilke, 2014). *Second,* managers that coordinate firm that are inserted in competitive environment guide their investments and attentions in place DC. This should occur because DC will enhance the possibility of understanding new sources of competitive advantage in volatile and turbulent conditions (Wu, 2010; Karna, 2016). *Third,* this paper confirms that DC promote positive impacts on firm performance. So, these results re-affirm others meta-analysis made in the DC context (e.g. Fainshmidt et al., 2016; Karna et al., 2016; Zou et al., 2018) and so, consolidate the assumption that investments made in the DC impact on firms positive outcomes.

Fourth, investments to promote resources, alliances and knowledge and learning processes should be integrated into DC strategies to leverage firm performance. In this case, the empirical results demonstrated that without DC the relationship between resources and firm performance, and alliance and firm performance will be weakened, thus hindering the relationship between knowledge and learning processes and firm performance. Thus, the DC coordination with these antecedent elements is critical to evoke better firm performance. *Fifth,* multinational firms may invest in flexible policies to cope with economic differences among countries. In this way, multinationals inserted in developed countries may invest in DC to create more sources of competitive advantage and then use these channels to explore the same advantages in alternative contexts.

Finally, the results show that a high level of power distance and a low level of individualism are cultural values that moderate positively the relationship between DC and firm performance. Regarding the power distance dimension, the management application suggests that firm's hierarchy and organisational routines that are linked to the higher power distance culture characteristics (Kollmann et al., 2007) are important to be efficient (Amit &

Schoemaker, 1993; Teece, 2016) as the case of our consequent construct investigation (firm performance). In relation to individualism level, the results are important for managers to promote the "team spirit." In this case, each employee view themselves as a part of a group (Hofstede & Minkov, 2010) that will promote relationship characterised by trust (Triandis, 1994), which will improve the achievement of DC goals (Zahra et al., 2006) and, consequentially, the firm performance.

Despite the contributions of this study, there are some limitations as well. It was restricted to the relationships of DC within the perspective suggested by Pezeshkan et al. (2016). Additionally, within this scope, only quantitative studies were considered. Thus, many qualitative studies were not analysed, mainly because of the specificity of the techniques used. We suggest that new studies may incorporate qualitative investigations based on methodologies distinct from the meta-analysis technique. One of the problems of this type of analysis is the clipping of adverse concepts existing in the secondary data used. Therefore, we emphasise that as the empirical data are from different authors, such data may be adverse.

As a suggestion for future research, we recommend the investigation of possible antecedents and consequences not investigated in this meta-analysis, for example, marketing scope, efficiency and sales growth. The analysis of these constructs was not performed in the present study because of the fact that few empirical relationships were found in the publications on DC (fewer than three), which represents a gap for future research. Finally, the present article aims to generate insights for researchers and academics to improve research on the approach to DC and their antecedents and consequences.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.emj.2019.04.007.

References

Aguinis, H., Dalton, D. R., Bosco, F. A., Pierce, C. A., & Dalton, C. M. (2011). Meta-analytic choices and judgment calls: Implications for theory building and testing, obtained effect sizes, and scholarly impact. *Journal of Management, 37*(1), 5–38. https://doi.org/10.1177/0149206310377113.
Amit, R., Glosten, L., & Muller, E. (1990). Entrepreneurial ability, venture investments, and risk sharing. *Management Science, 36*(10), 1232–1245. https://doi.org/10.1287/mnsc.36.10.1233.
Amit, R., & Schoemaker, P. J. (1993). Strategic assets and organizational rent. *Strategic Management Journal, 14*(1), 33–46. https://doi.org/10.1002/smj.4250140105.
Arend, R. J. (2013). Ethics-focused dynamic capabilities: A small business perspective. *Small Business Economics, 41*(1), 1–24. https://doi.org/10.1007/s11187-012-9415-2.
Arend, R. J. (2014). Entrepreneurship and dynamic capabilities: How firm age and size affect the 'capability enhancement–SME performance' relationship. *Small Business Economics, 42*(1), 33–57. https://doi.org/10.1007/s11187-012-9461-9.
Arend, R. J., & Bromiley, P. (2009). Assessing the dynamic capabilities view: Spare change, everyone? *Strategic Organization, 7*(1), 75–90. https://doi.org/10.1177/1476127008100132.
Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173–1182.
Barreto, I. (2010). Dynamic capabilities: A review of past research and an agenda for the future. *Journal of Management, 36*(1), 256–280. https://doi.org/10.1177/0149206309350776.
Bloom, Nick, & Van Reenen, J. (2006). *Measuring and explaining management practices across Firms and countries (No. w12216)*. Cambridge, MA: National Bureau of Economic Research. https://doi.org/10.3386/w12216.

Bloom, Nicholas, & Van Reenen, J. (2010). Why do management practices differ across firms and countries? *The Journal of Economic Perspectives, 24*(1), 203–224. https://doi.org/10.1257/jep.24.1.203.

Cheng, C. C. J., & Chen, J. (2013). Breakthrough innovation: The roles of dynamic innovation capabilities and open innovation activities. *Journal of Business & Industrial Marketing, 28*(5), 444–454. https://doi.org/10.1108/08858621311330281.

Cheung, M. W.-L. (2015). metaSEM: an R package for meta-analysis using structural equation modeling. *Frontiers in Psychology, 5*. https://doi.org/10.3389/fpsyg.2014.01521.

Covin, J. G., Green, K. M., & Slevin, D. P. (2006). Strategic process effects on the entrepreneurial orientation-sales growth rate relationship. *Entrepreneurship: Theory and Practice, 30*(1), 57–81. https://doi.org/10.1111/j.1540-6520.2006.00110.x.

Danilovic, M., & Winroth, M. (2005). A tentative framework for analyzing integration in collaborative manufacturing network settings: A case study. *Journal of Engineering and Technology Management, 22*(1–2), 141–158. https://doi.org/10.1016/j.jengtecman.2004.11.008.

Danneels, E. (2002). The dynamics of product innovation and firm competences. *Strategic Management Journal, 23*(12), 1095–1121. https://doi.org/10.1002/smj.275.

Darroch, J. (2005). Knowledge management, innovation and firm performance. *Journal of Knowledge Management, 9*(3), 101–115. https://doi.org/10.1108/13673270510602809.

Daud, S., & Yusoff, W. F. W. (2010). Knowledge management and firm performance in SMEs: The role of social capital as a mediating variable. *Asian Academy of Management Journal, 15*(2), 135–155.

Drnevich, P. L., & Kriauciunas, A. P. (2011). Clarifying the conditions and limits of the contributions of ordinary and dynamic capabilities to relative firm performance. *Strategic Management Journal, 32*(3), 254–279. https://doi.org/10.1002/smj.882.

Easterby-Smith, M., Lyles, M. A., & Peteraf, M. A. (2009). Dynamic capabilities: Current debates and future directions. *British Journal of Management, 20*, S1–S8. https://doi.org/10.1111/j.1467-8551.2008.00609.x.

Easterby-Smith, M., & Prieto, I. M. (2008). Dynamic capabilities and knowledge management: An integrative role for learning? *British Journal of Management, 19*(3), 235–249. https://doi.org/10.1111/j.1467-8551.2007.00543.x.

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal, 21*(10–11), 1105–1121. https://doi.org/10.1002/1097-0266(200010/11)21:10/11%3c1105::AID-SMJ133%3e3.0.CO;2-E.

Engelen, A., Kube, H., Schmidt, S., & Flatten, T. C. (2014). Entrepreneurial orientation in turbulent environments: The moderating role of absorptive capacity. *Research Policy, 43*(8), 1353–1369. https://doi.org/10.1016/j.respol.2014.03.002.

Ettlie, J. E., & Pavlou, P. A. (2006). Technology-based new product development partnerships*. *Decision Sciences, 37*(2), 117–147. https://doi.org/10.1111/j.1540-5915.2006.00119.x.

Fainshmidt, S., Pezeshkan, A., Lance Frazier, M., Nair, A., & Markowski, E. (2016). Dynamic capabilities and organizational performance: A meta-analytic evaluation and extension: Dynamic capabilities and organizational performance. *Journal of Management Studies, 53*(8), 1348–1380. https://doi.org/10.1111/joms.12213.

Fallon-Byrne, L., & Harney, B. (2017). Microfoundations of dynamic capabilities for innovation: A review and research agenda. *Irish Journal of Management, 36*(1), 21–31. https://doi.org/10.1515/ijm-2017-0004.

Fern, E. F., & Monroe, K. B. (1996). Effect-size estimates: Issues and problems in interpretation. *Journal of Consumer Research, 23*(2), 89. https://doi.org/10.1086/209469.

Gallup, J. L., Sachs, J., & Mellinger, A. (1998). *Geography and economic development (No. w6849)*. Cambridge, MA: National Bureau of Economic Research. https://doi.org/10.3386/w6849.

Geyskens, I., Krishnan, R., Steenkamp, J.-B. E. M., & Cunha, P. V. (2009). A review and evaluation of meta-analysis practices in management research. *Journal of Management, 35*(2), 393–419. https://doi.org/10.1177/0149206308328501.

Grant, R. M. (1996). Prospering in dynamically-competitive environments: Organizational capability as knowledge integration. *Organization Science, 7*(4), 375–387. https://doi.org/10.1287/orsc.7.4.375.

Gulati, R. (1999). Network location and learning: The influence of network resources and firm capabilities on alliance formation. *Strategic Management Journal, 20*(5), 397–420. https://doi.org/10.1002/(SICI)1097-0266(199905)20:5%3c397::AID-SMJ35%3e3.0.CO;2-K.

Hedges, L. V., & Olkin, I. (2014). *Statistical methods for meta-analysis*. Saint Louis: Elsevier Science. Retrieved from http://qut.eblib.com.au/patron/FullRecord.aspx?p=1901162.

Helfat, C. E., & Peteraf, M. A. (2003). The dynamic resource-based view: Capability lifecycles. *Strategic Management Journal, 24*(10), 997–1010. https://doi.org/10.1002/smj.332.

Helfat, C. E., & Peteraf, M. A. (2009). Understanding dynamic capabilities: Progress along a developmental path. *Strategic Organization, 7*(1), 91–102. https://doi.org/10.1177/1476127008100133.

Hofstede, G. (2010). The GLOBE debate: Back to relevance. *Journal of International Business Studies, 41*(8), 1339–1346. https://doi.org/10.1057/jibs.2010.31.

Hofstede, G., & Minkov, M. (2010). Long- versus short-term orientation: New perspectives. *Asia Pacific Business Review, 16*(4), 493–504. https://doi.org/10.1080/13602381003637609.

Hunter, J. E., & Schmidt, F. L. (2015). *Methods of meta-analysis: Correcting Error and Bias in research findings. 1 Oliver's yard, 55 city Road London EC1Y 1SP*. SAGE

Publications, Ltd. https://doi.org/10.4135/9781483398105.

Iacobucci, D., Saldanha, N., & Deng, X. (2007). A meditation on mediation: Evidence that structural equations models perform better than regressions. *Journal of Consumer Psychology, 17*(2), 139–153. https://doi.org/10.1016/S1057-7408(07)70020-7.

John, G. (1984). An empirical investigation of some antecedents of opportunism in a marketing channel. *Journal of Marketing Research, 21*(3), 278. https://doi.org/10.2307/3151604.

Kale, P., & Singh, H. (2007). Building firm capabilities through learning: The role of the alliance learning process in alliance capability and firm-level alliance success. *Strategic Management Journal, 28*(10), 981–1000. https://doi.org/10.1002/smj.616.

Karna, A., Richter, A., & Riesenkampff, E. (2016). Revisiting the role of the environment in the capabilities–financial performance relationship: A meta-analysis. *Strategic Management Journal, 37*(6), 1154–1173. https://doi.org/10.1002/smj.2379.

Kemper, J., Engélen, A., & Brettel, M. (2011). How top management's social capital fosters the development of specialized marketing capabilities: A cross-cultural comparison. *Journal of International Marketing, 19*(3), 87–112. https://doi.org/10.1509/jimk.19.3.87.

Kim, Y., & Peterson, R. A. (2017). A meta-analysis of online trust relationships in E-commerce. *Journal of Interactive Marketing, 38*, 44–54. https://doi.org/10.1016/j.intmar.2017.01.001.

Kirca, A. H., Jayachandran, S., & Bearden, W. O. (2005). Market orientation: A meta-analytic review and assessment of its antecedents and impact on performance. *Journal of Marketing, 69*(2), 24–41. https://doi.org/10.1509/jmkg.69.2.24.60761.

Kollmann, T., Christofor, J., & Kuckertz, A. (2007). Explaining individual entrepreneurial orientation: Conceptualisation of a cross-cultural research framework. *International Journal of Entrepreneurship and Small Business, 4*(3), 325. https://doi.org/10.1504/IJESB.2007.013255.

Kor, Y. Y., & Mahoney, J. T. (2005). How dynamics, management, and governance of resource deployments influence firm-level performance. *Strategic Management Journal, 26*(5), 489–496. https://doi.org/10.1002/smj.459.

Kurtmollaiev, S. (2017). Dynamic capabilities and where to find them. *Journal of Management Inquiry*, 105649261773012 https://doi.org/10.1177/1056492617730126.

Lau, C. M., & Tan, J. J. (1998). The impact of budget emphasis, participation and task difficulty on managerial performance: A cross-cultural study of the financial services sector. *Management Accounting Research, 9*(2), 163–183. https://doi.org/10.1006/mare.1998.0074.

Lee, H., & Choi, B. (2003). Knowledge management enablers, processes, and organizational performance: An integrative view and empirical examination. *Journal of Management Information Systems, 20*(1), 179–228. https://doi.org/10.1080/07421222.2003.11045756.

Lee, R. P., Naylor, G., & Chen, Q. (2011). Linking customer resources to firm success: The role of marketing program implementation. *Journal of Business Research, 64*(4), 394–400. https://doi.org/10.1016/j.jbusres.2010.10.004.

Li, D., & Liu, J. (2014). Dynamic capabilities, environmental dynamism, and competitive advantage: Evidence from China. *Journal of Business Research, 67*(1), 2793–2799. https://doi.org/10.1016/j.jbusres.2012.08.007.

Lipsey, M. W., & Wilson, D. B. (1993). The efficacy of psychological, educational, and behavioral treatment. Confirmation from meta-analysis. *American Psychologist, 48*(12), 1181–1209.

Lipsey, Mark W., & Wilson, D. B. (2001). *Practical meta-analysis*. Thousand Oaks, Calif: Sage Publications.

Lumpkin, G. T., & Dess, G. G. (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of Management Review, 21*(1), 135. https://doi.org/10.2307/258632.

Makkonen, H., Pohjola, M., Olkkonen, R., & Koponen, A. (2014). Dynamic capabilities and firm performance in a financial crisis. *Journal of Business Research, 67*(1), 2707–2719. https://doi.org/10.1016/j.jbusres.2013.03.020.

Malhotra, N. K., Agarwal, J., & Peterson, M. (1996). Methodological issues in cross-cultural marketing research: A state-of-the-art review. *International Marketing Review, 13*(5), 7–43. https://doi.org/10.1108/02651339610131379.

Malik, O. R., & Kotabe, M. (2009). Dynamic capabilities, government policies, and performance in firms from emerging economies: Evidence from India and Pakistan. *Journal of Management Studies, 46*(3), 421–450. https://doi.org/10.1111/j.1467-6486.2008.00817.x.

Marqués, D. P., & Simón, F. J. G. (2006). The effect of knowledge management practices on firm performance. *Journal of Knowledge Management, 10*(3), 143–156. https://doi.org/10.1108/13673270610670911.

Menguc, B. (2006). Creating a firm-level dynamic capability through capitalizing on market orientation and innovativeness. *Journal of the Academy of Marketing Science, 34*(1), 63–73. https://doi.org/10.1177/0092070305281090.

Miller, D. (1983). The correlates of entrepreneurship in three types of firms. *Management Science, 29*(7), 770–791. https://doi.org/10.1287/mnsc.29.7.770.

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & PRISMA Group.. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine, 6*(7), e1000097. https://doi.org/10.1371/journal.pmed.1000097.

Morgan, N. A., Vorhies, D. W., & Mason, C. H. (2009). Market orientation, marketing capabilities, and firm performance. *Strategic Management Journal, 30*(8), 909–920. https://doi.org/10.1002/smj.764.

Pan, Y., & Zinkhan, G. M. (2006). Determinants of retail patronage: A meta-analytical perspective. *Journal of Retailing, 82*(3), 229–243. https://doi.org/10.

1016/j.jretai.2005.11.008.

Park, S. H., & Luo, Y. (2001). Guanxi and organizational dynamics: Organizational networking in Chinese firms. *Strategic Management Journal, 22*(5), 455–477. https://doi.org/10.1002/smj.167.

Penrose, E. (1995). *The theory of the growth of the firm*. Oxford University Press. https://doi.org/10.1093/0198289774.001.0001.

Pezeshkan, A., Fainshmidt, S., Nair, A., Lance Frazier, M., & Markowski, E. (2016). An empirical assessment of the dynamic capabilities–performance relationship. *Journal of Business Research, 69*(8), 2950–2956. https://doi.org/10.1016/j.jbusres.2015.10.152.

Pfeffer, J., & Salancik, G. R. (2003). *The external control of organizations: A resource dependence perspective*. Stanford, Calif: Stanford Business Books.

Pisano, G. P. (1994). Knowledge, integration, and the locus of learning: An empirical analysis of process development. *Strategic Management Journal, 15*(S1), 85–100. https://doi.org/10.1002/smj.4250150907.

Rosario, A. B., Sotgiu, F., De Valck, K., & Bijmolt, T. H. A. (2016). The effect of electronic word of mouth on sales: A meta-analytic review of platform, product, and metric factors. *Journal of Marketing Research, 53*(3), 297–318. https://doi.org/10.1509/jmr.14.0380.

Rosenthal, R., & DiMatteo, M. R. (2001). Meta-analysis: Recent developments in quantitative methods for literature reviews. *Annual Review of Psychology, 52*, 59–82.

Rosenthal, R., & Rubin, D. B. (1982). A simple, general purpose display of magnitude of experimental effect. *Journal of Educational Psychology, 74*(2), 166–169. https://doi.org/10.1037/0022-0663.74.2.166.

Rubera, G., & Kirca, A. H. (2012). Firm innovativeness and its performance outcomes: A meta-analytic review and theoretical integration. *Journal of Marketing, 76*(3), 130–147. https://doi.org/10.1509/jm.10.0494.

Rust, R. T., & Cooil, B. (1994). Reliability measures for qualitative data: Theory and implications. *Journal of Marketing Research, 31*(1), 1. https://doi.org/10.2307/3151942.

Sáenz, M. J., Revilla, E., & Knoppen, D. (2014). Absorptive capacity in buyer-supplier relationships: Empirical evidence of its mediating role. *Journal of Supply Chain Management, 50*(2), 18–40. https://doi.org/10.1111/jscm.12020.

Samaraweera, M., & Gelb, B. D. (2015). Formal salesforce controls and revenue production: A meta-analysis. *Journal of Personal Selling and Sales Management, 35*(1), 23–32. https://doi.org/10.1080/08853134.2014.977796.

Santini, F. de O., Ladeira, W. J., Sampaio, C. H., & Pinto, D. C. (2018). The brand experience extended model: A meta-analysis. *Journal of Brand Management, 25*(6), 519–535. https://doi.org/10.1057/s41262-018-0104-6.

Santini, F., Vieira, V. A., Ladeira, W. J., & Sampaio, C. H. (2018). Behaviour-based and outcome-based control systems: A meta-analytic study. *Canadian Journal of Administrative Sciences - Revue Canadienne des Sciences de l Administration*. https://doi.org/10.1002/cjas.1486.

Santini, F. de O., Vieira, V. A., Sampaio, C. H., & Perin, M. G. (2016). Meta-analysis of the long- and short-term effects of sales promotions on consumer behavior. *Journal of Promotion Management, 22*(3), 425–442. https://doi.org/10.1080/10496491.2016.1154921.

Schilke, O. (2014). On the contingent value of dynamic capabilities for competitive advantage: The nonlinear moderating effect of environmental dynamism: On the Contingent Value of Dynamic Capabilities. *Strategic Management Journal, 35*(2), 179–203. https://doi.org/10.1002/smj.2099.

Schilke, O., Hu, S., & Helfat, C. E. (2018). Quo vadis, dynamic capabilities? A content-analytic review of the current state of knowledge and recommendations for future research. *The Academy of Management Annals, 12*(1), 390–439. https://doi.org/10.5465/annals.2016.0014.

Schmidt, F. L. (1996). Statistical significance testing and cumulative knowledge in psychology: Implications for training of researchers. *Psychological Methods, 1*(2), 115–129. https://doi.org/10.1037/1082-989X.1.2.115.

Stadler, C., Helfat, C. E., & Verona, G. (2013). The impact of dynamic capabilities on resource access and development. *Organization Science, 24*(6), 1782–1804.

https://doi.org/10.1287/orsc.1120.0810.

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and micro-foundations of (sustainable) enterprise performance. *Strategic Management Journal, 28*(13), 1319–1350. https://doi.org/10.1002/smj.640.

Teece, D. J. (2014). The foundations of enterprise performance: Dynamic and ordinary capabilities in an (economic) theory of firms. *Academy of Management Perspectives, 28*(4), 328–352. https://doi.org/10.5465/amp.2013.0116.

Teece, D. J. (2016). Dynamic capabilities and entrepreneurial management in large organizations: Toward a theory of the (entrepreneurial) firm. *European Economic Review, 86*, 202–216. https://doi.org/10.1016/j.euroecorev.2015.11.006.

Teece, D., & Pisano, G. (1994). The dynamic capabilities of firms: An introduction. *Industrial and Corporate Change, 3*(3), 537–556.

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal, 18*(7), 509–533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7%3c509::AID-SMJ882%3e3.0.CO;2-Z.

Triandis, H. C. (1994). *Culture and social behavior*. New York: McGraw-Hill.

Vanpoucke, E., Vereecke, A., & Wetzels, M. (2014). Developing supplier integration capabilities for sustainable competitive advantage: A dynamic capabilities approach. *Journal of Operations Management, 32*(7–8), 446–461. https://doi.org/10.1016/j.jom.2014.09.004.

Viswesvaran, C., & Ones, D. S. (1995). Theory testing: Combining psychometric meta-analysis and structural equations modeling. *Personnel Psychology, 48*(4), 865–885. https://doi.org/10.1111/j.1744-6570.1995.tb01784.x.

Wiklund, J., & Shepherd, D. (2005). Entrepreneurial orientation and small business performance: A configurational approach. *Journal of Business Venturing, 20*(1), 71–91. https://doi.org/10.1016/j.jbusvent.2004.01.001.

Wilden, R., Gudergan, S. P., Nielsen, B. B., & Lings, I. (2013). Dynamic capabilities and performance: Strategy, structure and environment. *Long Range Planning, 46*(1–2), 72–96. https://doi.org/10.1016/j.lrp.2012.12.001.

Winter, S. G. (2003). Understanding dynamic capabilities. *Strategic Management Journal, 24*(10), 991–995. https://doi.org/10.1002/smj.318.

Wu, L.-Y. (2006). Resources, dynamic capabilities and performance in a dynamic environment: Perceptions in Taiwanese IT enterprises. *Information & Management, 43*(4), 447–454. https://doi.org/10.1016/j.im.2005.11.001.

Wu, L. Y. (2007). Entrepreneurial resources, dynamic capabilities and start-up performance of Taiwan's high-tech firms. *Journal of Business Research, 60*(5), 549–555. https://doi.org/10.1016/j.jbusres.2007.01.007.

Wu, L.-Y. (2010). Applicability of the resource-based and dynamic-capability views under environmental volatility. *Journal of Business Research, 63*(1), 27–31. https://doi.org/10.1016/j.jbusres.2009.01.007.

Zablah, A. R., Franke, G. R., Brown, T. J., & Bartholomew, D. E. (2012). How and when does customer orientation influence frontline employee job outcomes? A meta-analytic evaluation. *Journal of Marketing, 76*(3), 21–40. https://doi.org/10.1509/jm.10.0231.

Zahra, S. A., Hayton, J. C., Neubaum, D. O., Dibrell, C., & Craig, J. (2008). Culture of family commitment and strategic flexibility: The moderating effect of stewardship. *Entrepreneurship: Theory and Practice, 32*(6), 1035–1054. https://doi.org/10.1111/j.1540-6520.2008.00271.x.

Zahra, S. A., Sapienza, H. J., & Davidsson, P. (2006). Entrepreneurship and dynamic capabilities: A review, model and research agenda*. *Journal of Management Studies, 43*(4), 917–955. https://doi.org/10.1111/j.1467-6486.2006.00616.x.

Zarantonello, L., Jedidi, K., & Schmitt, B. H. (2013). Functional and experiential routes to persuasion: An analysis of advertising in emerging versus developed markets. *International Journal of Research in Marketing, 30*(1), 46–56. https://doi.org/10.1016/j.ijresmar.2012.09.001.

Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science, 13*(3), 339–351. https://doi.org/10.1287/orsc.13.3.339.2780.

Zou, T., Ertug, G., & George, G. (2018). The capacity to innovate: A meta-analysis of absorptive capacity. *Innovation, 20*(2), 87–121. https://doi.org/10.1080/14479338.2018.1428105.