



Entrepreneurial orientation and new product development performance in SMEs: The mediating role of business model innovation

José Luis Ferreras-Méndez, Julia Olmos-Peñuela, Andrés Salas-Vallina, Joaquín Alegre *

University of Valencia, Spain

ARTICLE INFO

Keywords:

Business model innovation
NPD performance
Entrepreneurial orientation

ABSTRACT

In the current business context, entrepreneurial orientation (EO) has been highlighted as key to improving firm performance. Despite the overall positive evidence on the association between EO and firm performance, scholars have stressed the importance of taking into account and properly managing intermediate capabilities. The present study analyses the link between EO and New Product Development (NPD) performance, considering Business Model Innovation (BMI) as a mediating variable. A sample of 400 Spanish SMEs is used to test the proposed research model through structural equation modelling and partial least squares analyses. Results reveal that EO contributes to BMI and NPD performance. Moreover, BMI is found to have a partial mediating role between EO and NPD performance. This study makes a novel contribution to the EO and BMI literatures as it finds evidence that business model innovation is an effective way to funnel the firm's entrepreneurial orientation into its innovation processes and to increase the success of new product development. Some suggestions for managers and future lines of research are proposed.

1. Introduction

Successful new product development (NPD) is crucial for firms. Firms need to periodically review, update and change their product range. In the current competitive context, where product life cycles are constantly shortened, entrepreneurial orientation (EO) has been depicted as a key ingredient to enhance relevant firm-level outcomes such as business performance (Casillas and Moreno, 2010; Lechner and Gudmundsson, 2014; Moreno and Casillas, 2008), global competitiveness (Lee and Peterson, 2000) or corporate entrepreneurship (Dess and Lumpkin, 2005). An important argument behind the performance consequences of EO is that it does not only reflect a top-management orientation, but also a strategic posture of multiple layers of management which promotes individual initiative and dispersed entrepreneurship within the firm (Birkinshaw, 1997; Bouncken et al., 2020; Covin et al., 2020; Hughes et al., 2018).

Despite the overall positive evidence on the association between EO and firm performance, some scholars have observed that this relationship is far from being monotonic and universal (Ireland et al., 2003; Rauch et al., 2009; McKenny et al., 2018). In fact, some authors have cautioned that EO might be a necessary but insufficient condition for the

success of NPD. Thus, high levels of EO could lead to innovation failure if companies do not have adequate resources' endowments to cope with the inherent uncertainty of developing a strategy characterised by high risk taking, proactiveness and innovativeness (Patel et al., 2015). As a matter of fact, extant literature suggests that the relationship between EO and innovation outcomes is contingent on the development of internal capabilities such as organisational learning (Alegre and Chiva, 2013; Bouncken et al., 2016b), absorptive capacity (Patel et al., 2015) or organisational change (Wales, 2016). However, following the Resource-Based View (RBV) of the firm (George and Bock, 2011), a better understanding of the internal capabilities under which EO enhances NPD performance requires further attention.

In this sense, one important internal issue is the business model of the firm. A business model can be defined as the "design or architecture of the value creation, delivery, and capture mechanisms" of the firm (Teece, 2010). Foss and Saebi (2017) underscore that this is a widely accepted definition. Business models have attracted increasing attention in both entrepreneurship and innovation management literature (Bouncken and Fredrich, 2016; Foss and Saebi, 2015; Morris et al., 2005). In order to be competitive, firms change and improve their business models over time. Business model innovation (BMI) is

* Corresponding author.

E-mail addresses: j.luis.ferreras@uv.es (J.L. Ferreras-Méndez), julia.olmos@uv.es (J. Olmos-Peñuela), andres.salas@uv.es (A. Salas-Vallina), joaquin.alegre@uv.es (J. Alegre).

<https://doi.org/10.1016/j.technovation.2021.102325>

Received 25 February 2020; Received in revised form 29 April 2021; Accepted 19 June 2021

Available online 5 July 2021

0166-4972/© 2021 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

considered a specific form of innovation that helps to improve business performance (Bucherer et al., 2012). The literature addressing ways of achieving business model changes (or BMI) has mainly analysed the effects of the firm's external antecedents, such as environmental and technological changes, on BMI (Wirtz et al., 2010), but less attention has been paid to understanding internal antecedents. An advantage of focusing on internal factors (as opposed to external factors) is the control that firms have over them and the possibility this offers to firms to promote BMI through internal managerial practices. Drawing on the dynamic capability perspective, in this study we embrace the stream of the literature that emphasise the role of internal factors in BMI and respond to calls that have recently been made to do more research on the internal drivers of BMI (Foss and Saebi, 2017; Frankenberger and Sauer, 2019; Martins et al., 2015; Saebi and Foss, 2015) and on the performance implications of BMI in entrepreneurial firms (Foss and Saebi, 2017).

The aim of this study is to examine NPD performance from an internal perspective in the context of SMEs. To dig into this issue, we look at the connection between EO and NPD performance while integrating the role played by BMI in this relationship at the organisational level. In doing so, we make two main contributions: (1) we underscore the usefulness of BMI as a success factor for NPD performance in SMEs, and (2) we put forward a better understanding on the EO–NPD performance relationship that highlights the role of internal variables such as BMI and strengthen the connection between entrepreneurship and business models literatures in SMEs.

2. Theory and hypotheses

2.1. Entrepreneurial orientation and new product development

EO has received a great deal of research attention in recent years. It refers to the propensity of a firm to act autonomously, take risks and be proactive when confronted with market uncertainties (Covin and Slevin, 1986; Lumpkin and Dess, 1996). Although there have been different definitions of EO, much of the existing research has conceptualised EO at the firm-level as an aggregate of three core sub-dimensions: innovativeness, risk taking and proactiveness (Bouncken et al., 2016a; Patel et al., 2015). The first refers to firms' tolerance of new ideas, experimentation and creativity as a source of competitive advantage; the second refers to firms' willingness to make large and risky resource commitments; and the third captures the propensity of a firm to take the initiative to compete aggressively against its competitors (Green et al., 2008). Following the RBV of the firm, the concept of EO has related to different performance dimensions such as sales growth and market share (Altinay et al., 2016; Casillas and Moreno, 2010; Jantunen et al., 2005; Lumpkin and Dess, 2001), profitability (Baker and Sinkula, 2009; Zahra, 1996) or stakeholder satisfaction (Yoo, 2001). Although existing literature suggests that EO promotes innovative activities that enhance the introduction and implementation of product innovation within firms, there is still few explicit empirical evidence involving its influence on NPD performance (Moreno-Moya and Munuera-Aleman, 2016, p. 754). The literature review conducted to identify previous empirical research on the relationship between EO and NPD performance evidence the lack of studies that assess the role of BMI in shaping EO–NPP performance connection. Table 1 puts forward the major studies on this connection, including key information of these studies, such as the EO dimensions' conceptualisation, EO operationalisation, NPD performance indicator, context in which the studies have been conducted (industry, firms' size), the intermediary variable included (as mediator or moderator of the EO–NPD performance relationship) and the main findings and conclusions. We draw upon this literature review to articulate and justify the expected positive effect of EO on NPD performance.

Because the benefits of EO can only be obtained through some specific activities (Arzubiaga et al., 2018), understanding how EO contributes to the success of a firm's NPD is a vital managerial concern (Mu

et al., 2017). According to previous studies, NPD cover from highly novel product developments to slight modifications of existing products (Bouncken et al., 2016a; Griffin, 1997). NPD provides firms with a competitive advantage in the marketplace as it enhances external visibility and legitimacy, allows for first-mover advantage leading to market pre-emption, and increases the likelihood of survival (Acur et al., 2012; Sheng et al., 2013). In this sense, high NPD performance has been connected with long term growth and financial independence of firms (Wiklund et al., 2011).

A successful NPD strategy requires resources' deployments promoted by the firm's EO. Indeed, an entrepreneurially-oriented firm would be expected to configure a set of capabilities to recognise the threats and opportunities in their environment and to develop new products in response to those opportunities (Kraus et al., 2012; Moreno-Moya and Munuera-Aleman, 2016). However, although large firms normally have the resources required to engage in entrepreneurial activities to enhance their NPD performance, it is not clear to what extent that applies to SMEs (Moreno-Moya and Munuera-Aleman, 2016).

In this paper, we argue that SMEs may be able to cope with resource limitations and improve the success of their NPD performance due to the adoption of an entrepreneurial orientation. Each dimension of EO has its own unique benefits that may provide SMEs with capabilities to enhance NPD performance and to set firms apart from low-EO firms in terms of NPD (Alegre and Chiva, 2013; Morgan et al., 2015). For instance, proactiveness refers not only to first-movers' actions but also to the ability to seize new opportunities, even if a firm has not been the first to enter the market (Lumpkin and Dess, 1996). By seeking new opportunities that may or may not be related to the present line of operations, firms may strategically eliminate operations that are in the mature or declining stages of their life cycle and move resources to support new products and brands ahead of competition (Shan et al., 2016). In this context, firms may set explicit time metrics to motivate teams to rethink the structure, activities, and perspective of the entire NPD process to achieve their project goals (Kessler and Chakrabarti, 1996). EO also implies willingness to take risks and to support new ideas. These competences are necessary to ensure a proactive and aggressive focus on programmes to create innovative products that satisfy upcoming and unarticulated customer needs. Without such focus, innovative new products may be rather limited and new markets may develop more slowly (Morgan et al., 2015).

Because EO enhances an organisation's attention to opportunities, firms with strong EO tend to invest in the development of the competences to constantly scan and monitor the environment in order to identify new opportunities and to enter markets early enough with new products or services (Mu et al., 2017). In the same line, Jiménez-Jiménez et al. (2014) suggest that EO allows mitigating the difficulties of radical innovation's projects because it facilitates the generation of organisational structures and factors that enhance the use and combination of alternate technologies or substantial cost-saving technologies.

Further still, Bouncken et al. (2016a) suggest that firms with high levels of EO will be able to build on their dynamic capabilities and have a more proficient product innovation development. According to this study, EO stimulates an atmosphere where new ideas are developed, the complementarity of firms' resources is explored and exploited, new combinations are proactively pursued, and risks are proactively taken and shared (Bouncken et al., 2016a, p. 387).

Based on the above, we put forward the following hypothesis:

H1. *Entrepreneurial orientation has a positive impact on new product development performance.*

2.2. The mediating role of business model innovation

Despite the increasing growth that research on business models has witnessed in the last decades, scholars have not yet reached a complete consensus of what conceptually constitutes a business model (for a

Table 1

Major studies on EO and new product development performance.

Author name (year)	Dimensions of EO	Measurement scale of EO	NPD performance indicator	Size of firms	Industries	Mediator/Moderator	Findings & implications
Clausen and Korneliusen (2012)	Second order construct integrating Innovativeness, proactiveness, risk taking	9 items adapted from Covin and Slevin (1986, 1989)	New product speed to the market	Small start-up firms	Mix		EO demonstrates to be a positive and significant predictor of speed to the market for small incubator firms.
Frishammar and Hörte, (2007)	Innovativeness, proactiveness, risk taking (Covin and Slevin, 1986; Miller, 1983)	9 items adapted from Covin and Slevin (1986, 1989)	New product development performance	Mid-Size firms	Manufacturing firms		There is a positive association between innovativeness and NPD performance. Risk taking and proactiveness didn't show any effect on NPD performance. Entrepreneurial SMEs develop and market new products more quickly than nonentrepreneurial firms, given their overriding focus on risk seeking and experimentation in product innovation.
Moreno-Moya and Munuera-Aleman, 2016,	One dimension	Four items (Naman and Slevin, 1993)	New product performance	SMEs	Manufacturing firms		EO demonstrates to be a positive related to new product development performance. The results also show that absorptive capacity is a key contingency for firms seeking to enhance NPD efforts (the degree to which a new product is perceived to have achieved its market share, sales growth, customer use, and profit objectives) through customer participation and new product innovativeness.
Morgan et al. (2018)	Innovativeness	4 items adapted from Atuahene-Gima (1995)	New product development performance	Mix	Mix	Absorptive capacity	EO demonstrates to be a positive impact on new product development performance, but the effects are reduced when firms simultaneously implement a market orientation philosophy. Findings & implications
Morgan et al. (2015)	Second order construct integrating Innovativeness, proactiveness, risk taking	9 items adapted from (Covin and Slevin (1986, 1989)	New product development performance	Mid-Size firms	Manufacturing firms	Market orientation	The study shows that EO has a positive impact on new product development performance, but the effects are reduced when firms simultaneously implement a market orientation philosophy. Findings & implications
Author name (year)	Dimensions of EO	Measurement scale of EO	NPD performance indicator	Size of firms	Industries	Mediator/Moderator	Findings & implications
Mu and Di Benedetto (2011)	One dimension	5 items adapted from Hult and Ketchen (2001)	New product newness, new product advantage	Large	Mix	Organisational learning	EO has a positive direct effect on new product newness, new product advantage. Furthermore, firms with a strong entrepreneurial orientation are more likely to engage in effective organisational learning, which in turn leads to enhanced new product commercialization. The study suggests that EO is most apt to influence a firm's new product commercialization when the environment is in a state of flux, whereas when the environment is relatively stable, their influence is decreased.
Mu et al. (2017); Mu and Di Benedetto (2011)	One dimension	5 items adapted from Hult and Ketchen (2001)	New product newness, new product advantage	Large	Mix	Environmental dynamism	EO has a positive direct effect on new product development performance. This relationship is positively moderated by network capability and ability.
Mu et al. (2017)	Second order construct integrating Innovativeness, proactiveness, risk taking	9 items adapted from (Covin and Slevin (1986, 1989)	New product development performance	Large	Mix	Network capability and ability	EO has a positive direct effect on new product development performance. This relationship is positively moderated by network capability and ability.
Rivas et al. (2020)	Second order construct integrating Innovativeness, proactiveness, risk taking	Seven items adapted from (Chen et al., 2012; Merz and Sauber, 1995)	New product development learning/New product development programs/New	Large	Electronics manufacturing firms	Alliance orientation	The study shows that EO in combination with alliance orientation (AO) can help firms achieve better NPD learning and NPD programs, but EO and AO do not necessarily enhance

(continued on next page)

Table 1 (continued)

Author name (year)	Dimensions of EO	Measurement scale of EO	NPD performance indicator	Size of firms	Industries	Mediator/Moderator	Findings & implications
			product development succes				each other's effect on new product success. From a timing perspective, the benefits of EO and AO infirms require longer time horizons and may not lead to product-marketperformance outcomes in the short term. Findings & implications
Author name (year)	Dimensions of EO	Measurement scale of EO	NPD performance indicator	Size of firms	Industries	Mediator/Moderator	
(Srivastava et al., 2013)	One dimension	three items from Zhou et al. (2005)	New product development program performance	Mix	Mix		The results of this study show that entrepreneurial orientation (EO) is a significant mediator that connects proactive market orientation (MO) and technological orientation to NPD program performance. Thus, EO fully mediates the technological orientation to NPD performance and proactive MO to NPD performance relationships.
Wong (2014)	Innovativeness, proactiveness, risk taking (Covin and Slevin, 1986; Miller, 1983)	9 items adpated from (Covin and Slevin (1986, 1989)	New product success	Mix	Electronics manufacturing firms	Enviromental turbulence	Results revealed that the three dimensions of EO (innovativeness, proactiveness and risk-taking) drive new product succes (NPS). Innovativeness, which was found to be most effective in driving NPS in the EO and NPS relationship, was relatively less responsive to environmental turbulence than proactiveness. The study confirmed the postulated role of environmental turbulence in inducing the EO behaviors of a firm, signaling environmental turbulence, if tactfully leveraged, can play a positive role in new product development (NPD).
Wong (2014)	Innovativeness, proactiveness, risk taking (Covin and Slevin, 1986; Miller, 1983)	9 items adpated from (Covin and Slevin (1986, 1989)	New product success	Mix	Electronics manufacturing firms	Enviromental turbulence	Results revealed that the three dimensions of EO (innovativeness, proactiveness and risk-taking) drive new product succes (NPS). Innovativeness, which was found to be most effective in driving NPS in the EO and NPS relationship, was relatively less responsive to environmental turbulence than proactiveness. The study confirmed the postulated role of environmental turbulence in inducing the EO behaviors of a firm, signaling environmental turbulence, if tactfully leveraged, can play a positive role in new product development (NPD).
Bouncken et al. (2016a)	Second order construct integrating Innovativeness, proactiveness, risk taking	9 items adpated from Covin and Slevin (1986, 1989)	Joint product innovation	SMEs	Manufacturing firms	Inlearning	EO act as a crucial determinant to joint product in vertical alliances. Furthermore, EO increases joint product innovation under high inlearning, wheras the relationship is negative under low inlearning. Consequently, firms fail to utilize their potential of EO when they do not absorb and integrate knowledge from their vertical partners.

review see Foss and Saebi, 2015, 2018). Its conceptual ambiguity has been evidenced by its definitional variety and the lack of cumulative theory applied to its understanding (Foss and Saebi, 2018). However, most of extant definitions converge in defining the business model as firms' logic for creating and delivering value based on different core elements such as firms' resources and capabilities for value creation, propositions for customers, revenue model, cost structures, etc. (Chesbrough, 2010; Teece, 2010; Saebi and Foss, 2015). These core elements may be collapsed into value creation, value proposition and value capture components (Baden-Fuller and Mangematin, 2013; Bouncken et al., 2016a; Clauss, 2017; Clauss et al., 2019). Specifically, value creation refers to the way in which the firm creates value along the value chain on the basis of its idiosyncratic resources and capabilities (Achtenhagen et al., 2013); value proposition describes the proposition offered by the firm to address customers' needs (Johnson et al., 2009); and value capture relates to the firm's revenue model that covers the costs of the value creation process and ensure profits to guarantee the firm's survival (Teece, 2010).

Following this conceptual approach, business model innovation (BMI) is interpreted as the opportunity for existing firms to reinvent their business model by changing or redesigning the way they create, propose and capture value through the different interrelated firm's core elements (Amit and Zott, 2012). BMI may be understood, from a dynamic perspective, as the process of reconfiguring one or more interrelated core elements underlying the firm's logic for creating and delivering value, thus representing a dynamic capability that may help firms to sense new opportunities and seize them to maintain or improve firms' performance and competitiveness (Ciampi et al., 2021; Heider et al., 2020).

Many studies identify organisational inertia as one of the main barriers to BMI in existing firms; organisation inertia inhibits firms from innovating, thus hampering changes in the business model (Chesbrough, 2010; Huang et al., 2013). However, innovativeness and risk-taking intrinsic to EO attitudes contribute to overcome inertia and promote BMI. Business models take shape through a process of experimentation (McGrath, 2010), trial-and-error learning (Sosna et al., 2010), turning experimentation into a potential source of BMI (Achtenhagen et al., 2013; Andries and Debackere, 2013). Thanks to innovativeness and risk-taking attitude the firm is able to experiment, that is to explore new ideas and exploit them successfully (innovate) in uncertain and risky contexts in which success is not guaranteed.

Likewise, the proactiveness characteristic of EO contributes to detect opportunities, which requires taking rapid decisions and seizing these opportunities. These decisions may involve changes and strategic adjustments of firms' core elements, resulting on BMI allowing the firm to stay ahead of their competition (Asemokha et al., 2019; Teece, 2012).

The EO-BMI connection is currently attracting lots of interest by scholars. Bouncken et al. (2016a) conducted an empirical study on a sample of 299 German service firms and found that EO was a driver of BMI, especially in highly uncertain contexts. Recently, Asemokha et al. (2019) also found evidence of a positive connection between EO and BMI in a sample of 148 internationalising Finish SMEs from different sectors.

As a result, we expect a positive connection between EO and BMI and we put forward the following hypothesis:

H2. Entrepreneurial orientation has a positive impact on business model innovation.

When firms innovate in their business model, they respond better to the competitive or institutional environment, and help the organisation to cope with different external or internal contingencies. In this sense, how firms create and capture value from BMI sits at the top of the agenda for both management literature and industrial companies (Bouncken and Fredrich, 2016; Sjödin et al., 2020).

BMI is considered crucial for firm differentiation (Bucherer et al., 2012), and leads to sustainable competitive advantages (Amit and Zott,

2012). However, there still remain important issues regarding how it influences organisational performance (Foss and Saebi, 2017). Mixed results can be found on BMI literature. While some authors found a positive relationship between BMI and firm performance (Futterer et al., 2018; Pang et al., 2019), others underlined that although BMI can lead to greater value creation, it does not automatically result in superior performance (Desyllas and Sako, 2013; Patzelt et al., 2008), and even revealed a negative effect of BMI on performance (Halecker et al., 2014). Given the inconclusiveness of previous studies regarding the connection between BMI and firms' performance, we shed light on this issue by addressing and theoretically defending the potential connection between BMI and a relatively less explored type of firm performance: NPD.

Business model innovation can represent a useful opportunity for product innovation (Kastalli and Van Looy, 2013), since both the process to create and deliver value followed by firms to compete have effects on new product success (Evanschitzky et al., 2012). When business models are innovative, they provide benefits to the customer such as novel distribution solutions (Velu, 2015). When companies are capable to make visible the advantages of their products in the eyes of the customer, for example through product innovation, the positive impact of BMI on innovation success is higher.

In the light of the above, we propose a direct and positive effect between BMI and NPD performance as a third hypothesis:

Hypothesis 3. Business model innovation has a positive impact on new product development performance.

Although BMI has become a central element to create competitive advantage (Visnjic et al., 2016), research on these topic has rarely explored the joint effect of being entrepreneurially-oriented and fostering BMI when explaining performance differences on new product development. In this regard, relatively few studies examine BMI as a mediating strategic mechanism (Clauss et al., 2019). We propose that BMI acts as a key intermediary mechanism connecting EO and NPD performance. For sensing the need for business model innovation, firms need to have some mechanism in place (Foss and Saebi, 2015). In this process, dynamic capabilities assist the firm in creating and capturing value by encompassing the activities, processes, and leadership skills by which (1) the need for changing/innovating existing business models is recognised, and (2) the necessary assets are (a) accessed and (b) orchestrated in the pursuit of new value creation (Leih et al., 2015, p. 7). Following previous studies, we suggest EO as the internal dynamic capability that foster the development of BMI. For instance, Futterer et al. (2018) suggest that autonomous entrepreneurial behaviour can result in a permanent rethinking of the business strategy (Covin and Miles, 2007), leading to a change in the intended business models. Specifically, EO may shape firms effort to invest in creating the conditions to support innovation processes (Collins and Reutzel, 2017).

In turn, business models allow firms to generate the sources of new value creation and competitive advantage (Chesbrough, 2010; Voelpel et al., 2005). Certain business models that are oriented towards value creation (Casadesus-Masanell and Ricart, 2010), can create commercial opportunities (George and Bock, 2011), promote competitive interactions (Casadesus-Masanell and Zhu, 2010), strengthen position value in the value chain (Sabatier et al., 2010, p. 442), and specify the firm's business logic (Osterwalder et al., 2005). Amit and Zott (2012) suggest that BMI facilitates value creation through an improvement in novelty, efficiency and complementarity.

In particular, BMI solutions help firms to adapt to market requirements, hence they commercialise their products by selecting the appropriate combination of value suggestion, market segment, or cost structure (Chesbrough and Rosenbloom, 2002). In this vein, BMI may act as the internal mechanisms necessary to support the creation of value in the new products and services introduced to the market, and to increase NPD performance. Based on the above, we argue that BMI might serve as a conduit through which entrepreneurial behaviours (Velu, 2015) impact on NPD performance, which leads us to the following

hypothesis:

Hypothesis 4. Business model innovation is a mediating variable in the positive relationship between entrepreneurial orientation and new product development performance.

The research model and hypotheses are depicted in Fig. 1.

3. Data and methods

3.1. Data collection

Our target population consists of SMEs from four major industries in Spain: biotechnology, ceramic tiles, toys, and footwear industries. The advantage of focusing on firms with different levels of technology is that we can control for the technology factor, which plays a relevant role in firms' NPD performance. The data was collected from December 2014 to April 2015. To obtain a representative sample of firms from the four industries, we used the databases of the business associations of those industries. We contacted the firms randomly, requesting their participation to answer some questions through a personal or telephone interview. From the 1217 firms identified, 417 firms agreed to take part, which yielded a final sample of 400 fully completed questionnaires. To ensure that our study is not affected by non-respondent bias, we compared our sample with the population of each industry in terms of revenues and sales. The results of the analysis revealed no significant differences between the groups.

The survey was addressed to two key respondents in each firm. The CEO answered the entrepreneurial orientation questions. The R&D manager, technical expert or equivalent answered the questions dealing with business model innovation and NPD performance. This procedure increases the reliability of our study and avoids the problem of common method variance bias. Once the database was collected, a report comparing the firm's answers with the average answers of whole population was offered to each participant firm. Table 2 offers descriptive information about the sample in terms of the number of companies surveyed in each industry and number of employees.

3.2. Variables

New Product Development performance. We assess NPD performance at an overall organisational level. Following Shan et al. (2016), we measure NPD performance through three items in which respondents rate their new product development programmes on a seven-point scale in relation to competitors (See Appendix).

Entrepreneurial orientation. We use the construct developed by Covin and Slevin (1986). It is conceived as a second order construct formed by three dimensions: innovativeness, proactiveness and risk taking (See Appendix). Previous studies have satisfactorily used this measurement scale in their empirical analyses (Covin et al., 2006; Fernández-Mesa and Alegre, 2015; Green et al., 2008).

Table 2

Sample distribution by industry and firm size.

Sectors	Micro firms (<10)	Small firms (10–49)	Medium firms (50–249)	Total
Ceramic	13	43	63	119
Footwear	59	54	8	121
Biotechnology	38	32	21	91
Toy	40	20	9	69
Total	150	149	101	400

Business model innovation. We use an adapted version of the items developed by Clauss (2017) and Bouncken et al. (2016a). Items are available in the Appendix. BMI refers to changes in how a firm creates, proposes and captures value.

Control variables. Our study included three control variables. Firms' size may affect the endowment of significant inputs for improving the business model, such as financial resources, people, and facilities, and may determine the performance difference between firms. As a result, we included two control variables dealing with size: the number of full-time employees and the sales turnover. Additionally, we included the industry to which the firm belonged as a third control variable.

4. Analysis and results

4.1. Psychometric properties of the measurement scales

The correlations between the variables included in the empirical analysis and the descriptive statistics are displayed in Table 3.

Following previous studies, we considered five criteria to assess the constructs of the research model: content validity, construct dimensionality, composite reliability, average variance extracted (AVE) and discriminant validity (Hair et al., 2016). The measurement items included in the study were selected from validated scales available in the literature. Furthermore, to ensure that the items were understandable in the context of the industries analysed we conducted a pre-test with four experts from each of those industries. The pre-test interviews revealed that the items were clear and understandable, therefore ensuring content validity. Table 4 shows that construct dimensionality, reliability and validity indices appear in order and above accepted thresholds (Chin, 2010; Ford and Schellenberg, 1982; Fornell and Larcker, 1981; Henseler et al., 2009).

Finally, to ensure that each construct measures a different reality of the studied phenomenon we assess the discriminant validity using the Fornell-Larcker criterion. According to this, the AVE of the latent variable must be higher than the squared correlation between the constructs (Henseler et al., 2009). The values shown in Table 5 confirm that this condition is met in all the cases. Finally, to further test the robustness of this criterion, we also included the heterotrait-monotrait (HTMT) ratio. In line with accepted protocols (Henseler et al., 2009), Table 6 shows that heterotrait correlations are smaller than the monotrait correlations in all cases.

4.2. Evaluation of the structural model

We tested our research model using SmartPLS 3 and employed the bootstrapping technique to generate standard error and t-statistics. We estimate two models: Model 1 is the direct effect model that assesses the impact of EO on NPD performance; Model 2 is the indirect effect model and assesses the mediating role of BMI on the relationship between EO and NPD performance. The bootstrapping estimates used to assess these two models are based on 5000 bootstrap samples (Chin, 2010). Given that all the constructs of the study are reflective, we performed three different types of analysis to evaluate the inner path: the R2 of the endogenous latent variables, the estimates for path coefficients, and the prediction relevance (Hair et al., 2016).

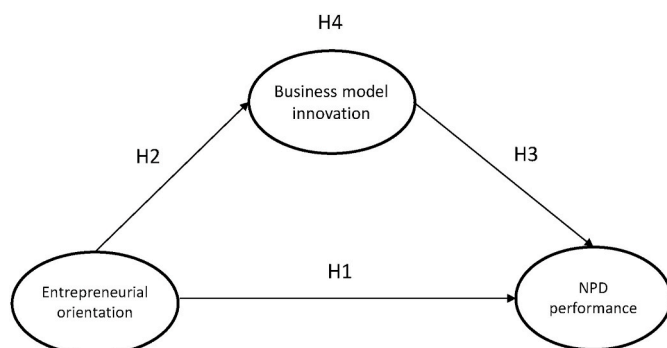


Fig. 1. Research model and hypotheses.

Table 3
Means, standard deviations and correlations among study variables.

Variables	Mean	s.d	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Entrepreneurial orientation	4.350	1.203	1111	6556														
2 Business model innovation	4.361	1.313	1	6833	0.4848**	1												
3 NPD performance	5.053	1.293	1	7	0.3743**	0.4276**	1											
4 Ceramic	0.296	0.457	0	1	0.2945**	0.1266*	0.1221*	1										
5 Footwear	0.299	0.458	0	1	-0.3704*	-0.2147**	-0.0602	-0.0573	1									
6 Biotechnology	0.232	0.423	0	1	0.1741**	0.1014*	-0.0573	-0.3567**	-0.3589**	1								
7 N°. Employees <10	0.375	0.485	0	1	-0.3177**	-0.1697**	-0.2110**	-0.1532**	0.1532**	0.0477	1							
8 N°. Employees (10-49)	0.373	0.484	0	1	0.0713	0.059	0.0784	-0.015	0.1005*	-0.0234	-0.5968**	1						
9 N°. Employees (50-99)	0.180	0.385	0	1	0.1933**	0.0462	0.1286*	0.4068**	-0.2094**	-0.099*	-0.3629**	-0.3610**	1					
10 N°. Employees (100-149)	0.048	0.213	0	1	0.1772*	0.1100*	0.0386	0.0346	-0.1471**	0.1031*	-0.1730**	-0.1721**	-0.1046*	1				
11 Sales (<5)	0.593	0.492	0	1	-0.3722*	-0.2198**	-0.1930**	-0.4815**	0.3215*	0.0782	0.5171**	0.042	-0.4974**	-0.2495**	1			
12 Sales (5-14.9)	0.206	0.405	0	1	0.1738*	0.1078*	0.0874	0.0834	-0.091	-0.0141	-0.2788**	0.1745**	-0.0842	-0.6148**	1			
13 Sales (15-24.9)	0.103	0.304	0	1	0.1544*	0.1042*	0.0825	0.3283**	-0.2046**	-0.0682	-0.2330**	-0.1238*	0.4070**	-0.4090**	-0.1726**	1		
14 Sales (25-34.9)	0.055	0.229	0	1	0.1986**	0.0732	0.0895	0.2804**	-0.1589**	-0.0283	-0.1907**	-0.1637**	0.2340**	0.4096**	-0.1232*	-0.082	1	
15 Sales (35-45)	0.017	0.132	0	1	0.1063*	0.0393	0.0243	0.0824	-0.0463	0.0173	-0.0975	-0.0096	0.0506	0.1655**	-0.1615**	-0.0682	-0.0453	1

Table 4

Measurement model results.

Factors	Factor loading	SE	t-value	α	CR	AVE
<i>Entrepreneurial orientation</i>				0.83	0.90	0.75
Innovation	0.864***	0.02	57.46			
Proactiveness	0.865***	0.02	51.74			
Risk taking	0.860***	0.02	46.65			
<i>Business model innovation</i>				0.82	0.87	0.53
IBM01	0.772***	0.02	33.58			
IBM02	0.478***	0.06	8.19			
IBM03	0.780***	0.02	33.67			
IBM04	0.789***	0.02	33.85			
IBM05	0.727***	0.03	23.28			
IBM06	0.785***	0.02	37.91			
<i>NPD performance</i>				0.80	0.88	0.71
NPD01	0.853***	0.02	41.52			
NPD02	0.830***	0.03	30.92			
NPD03	0.841***	0.02	46.02	1.00	1.00	1.00

Note: +p ≤ 0,1 *p ≤ 0,05 **p ≤ 0,01 ***p ≤ 0,001; t-values for n = 5000 subsamples.

SE, standard error; CR, composite reliability; α , Alpha de Cronbach.

Table 7 presents the values of the R^2 and the Stone-Geisser Q2 statistic for the mediated model (Model 2). The R^2 shows that the model introduced explains 25 percent of the variance of NPD performance and 25 percent of the variance of business model innovation. Both values confirm that more than 10 percent of the construct variability is explained by the proposed model (Falk and Miller, 1992). Finally, to ensure the predictive relevance of the proposed model, we used the Stone-Geisser Q2 statistic (Hair et al., 2016). The value of this statistic is greater than zero for NPD performance as well as for BMI; the predictive relevance of the proposed model is therefore confirmed.

The values and the significance levels of the path coefficients are shown in **Table 8** for the direct effect model (Model 1) and the mediated model (Model 2). Results for Model 1 confirm a positive and significant relationship between EO and NPD performance, which supports Hypothesis 1.

Hypothesis 4 suggests that the linear relationship between EO and NPD performance is mediated by the introduction of BMI. To test the mediating effect, we applied the approach recommended by Preacher and Hayes (2008). In Model 2, we controlled for the effect of BMI in the relationship between EO and NPD performance. The results displayed in **Table 8** show that EO still presents a significant effect on NPD performance after controlling for BMI, which suggests a partial mediating effect. Hypothesis 2 is supported by the direct effect of EO on BMI, which is significant and different from zero. Likewise, BMI has a positive and significant effect on NPD performance, which supports **Hypothesis 3**. These results confirm the possibility of a partial mediation effect of BMI in our model. The result of the indirect effect of EO on NPD performance through BMI confirms the mediation effect of BMI, as the zero is not included in the confidence interval of the relationship (see **Table 8**). Therefore, following Preacher and Hayes (2008) conditions, **Hypothesis 4** is supported.

To further assess the mediation effect of BMI we evaluate the strength of the effect of entrepreneurial orientation on NPD performance using Cohen (1988) f^2 index. This index calculates the R^2 as the proportion of variance of the endogenous latent variable that remains unexplained; f^2 of 0.02, 0.15, and 0.35 correspond to small, medium and large effect sizes, respectively (Cohen, 1988). The values obtained from the analysis show that both EO ($f^2 = 0.05$) and BMI ($f^2 = 0.11$) have low predictive power on NPD performance; however, the contribution of BMI is twice as high as the effect of EO on NPD performance.

Finally, as part of a robustness check, we test how BMI mediates the direct relationship between each of the dimensions of EO (innovativeness, proactiveness and risk taking) and NPD performance. The results

Table 5
Discriminant validity analysis.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Entrepreneurial orientation	(0.79)														
2 Business model innovation	0.49	(0.67)													
3 NPD performance	0.38	0.43	(0.75)												
4 Ceramic	0.28	0.11	0.12	1.00											
5 Footwear	−0.38	−0.22	−0.07	−0.41	1.00										
6 Biotechnology	0.20	0.13	−0.04	−0.37	−0.37	1.00									
7 N°. Employees <10	−0.33	−0.18	−0.21	−0.34	0.17	0.01	1.00								
8 N°. Employees (10–49)	0.05	0.04	0.07	0.00	0.11	−0.06	−0.57	1.00							
9 N°. Employees (50–99)	0.18	0.04	0.12	0.41	−0.20	−0.12	−0.35	−0.35	1.00						
10 N°. Employees (100–149)	0.17	0.11	0.04	0.04	−0.14	0.09	−0.17	−0.17	−0.10	1.00					
11 Sales (<5)	−0.38	−0.23	−0.20	−0.45	0.34	0.01	0.53	0.07	−0.47	−0.24	1.00				
12 Sales (5–14.9)	0.16	0.10	0.08	0.09	−0.08	−0.04	−0.26	0.18	0.17	−0.08	−0.58	1.00			
13 Sales (15–24.9)	0.14	0.10	0.08	0.33	−0.20	−0.08	−0.22	−0.11	0.41	0.12	−0.39	−0.17	1.00		
14 Sales (25–34.9)	0.23	0.08	0.09	0.24	−0.17	0.03	−0.20	−0.18	0.20	0.37	−0.30	−0.13	−0.09	1.00	
15 Sales (35–45)	0.10	0.03	0.02	0.07	−0.05	0.04	−0.10	−0.02	0.04	0.15	−0.16	−0.07	−0.05	−0.04	1.00

Note: Diagonal elements (in parenthesis) are the AVE; off-diagonal elements are the square correlations among constructs in the inner mode.

Table 6
Heterotrait-Monotrait analysis.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Entrepreneurial orientation														
2 Business model innovation	0.58													
3 NPD performance	0.46	0.53												
4 Biotechnology	0.19	0.11	0.06											
5 Ceramic	0.32	0.14	0.14	0.36										
6 Footwear	0.41	0.27	0.08	0.36	0.42									
7 Sales (<5)	0.40	0.24	0.22	0.08	0.48	0.32								
8 Sales (5–14.9)	0.19	0.13	0.10	0.01	0.08	0.09	0.62							
9 Sales (15–24.9)	0.17	0.11	0.09	0.07	0.32	0.20	0.41	0.17						
10 Sales (25–34.9)	0.22	0.08	0.10	0.03	0.28	0.16	0.29	0.12	0.08					
11 Sales (35–45)	0.12	0.05	0.03	0.02	0.08	0.05	0.16	0.07	0.05	0.03				
12 N°. Employees <10	0.35	0.19	0.24	0.05	0.36	0.15	0.51	0.28	0.23	0.19	0.09			
13 N°. Employees (10–49)	0.08	0.08	0.09	0.02	0.02	0.10	0.04	0.17	0.12	0.16	0.01	0.60		
14 N°. Employees (50–99)	0.21	0.06	0.14	0.10	0.41	0.21	0.49	0.16	0.40	0.23	0.05	0.36	0.36	
15 N°. Employees (100–149)	0.19	0.14	0.11	0.10	0.03	0.15	0.25	0.08	0.12	0.41	0.15	0.17	0.17	0.11

Table 7
R² of endogenous latent variables and the predictive relevance.

Factor	R ²	Q ²
NPD performance	0.23	0.16
Business model innovation	0.24	0.12

obtained are aligned with the one included in the present study. Specifically, the results confirm that BMI partially mediates the contribution of innovativeness and proactiveness on NPD performance and fully mediates the effect of risk-taking on NPD performance.¹

5. Discussion

5.1. Theoretical implications

Recent studies have been calling for an extensive analysis of intermediate drivers in the relationship between EO and firm performance (McKenny et al., 2018; Patel et al., 2015) and for a deeper examination of internal drivers of BMI (Foss and Saebi, 2017; Martins et al., 2015). As a result, both innovation management and entrepreneurship scholars

are suggesting investigating the prerequisites for BMI using entrepreneurial research approaches (Spieth et al., 2014; Wiklund et al., 2011).

This study provides a more profound examination of the effects of EO on NPD performance as well as its interplay with an important internal variable such as BMI. Although EO is usually considered to have a positive impact on the firm's overall performance, as recommended by Ray et al. (2004), this study focuses on the performance of a single organisational process: NPD. Our analysis puts forward several academic contributions.

First, our findings make a significant contribution to the business model and NPD literatures. Previous studies suggest that BMI is beneficial for firm performance. We have found an additional advantage of BMI: it is a trigger to funnel the entrepreneurial orientation of the firm into its innovation processes, the final outcome being the success of NPD.

Second, in examining the EO and NPD performance connection, we have looked at the mediating role played by BMI. Our results suggest that EO enhances NPD performance both directly and indirectly through the mediation of BMI. In this indirect path, we have found that EO enhances BMI, which in turn enhances further NPD performance. Hence, BMI acts as a significant partial mediator between EO and NPD performance.

Further still, our findings shed light to the EO–performance research stream looking at the intermediate steps between these two variables (Rauch et al., 2009). We have found that EO is a determinant of NPD

¹ Results available upon request.

Table 8
Effect on NPD performance and business model innovation.

	Model 1		Model 2		Direct effect (c')	t-value	Indirect effect (a. b)	Percentile	
	Total effect (c)	t-value	Total effect (c)	t-value				Lower	Upper
Entrepreneurial orientation ->NPD performance	0.406***	7.375	0.403***	7.206	0.249***	4.081	0.154***	0.091	0.219
Entrepreneurial orientation->Business model innovation			0.465***	8.473	0.465***	8.473			
Business model innovation ->NPD performance			0.331***	5.794	0.331***	5.794			
Control variables									
Biotechnology ->NPD performance	-0.145*	2178	-0.144*	2.139	-0.133*	2.1	-0.011	-0.05	0.026
Footwear ->NPD performance	0.02	0.264	0.02	0.268	0.048	0.73	-0.029	-0.075	0.018
Ceramic ->NPD performance	-0.118	1666	-0.118	1.62	-0.094	1.397	-0.024	-0.07	0.02
Sales (<5) -> NPD performance	-0.217	1112	-0.219	1.206	-0.176	1.041	-0.043	-0.135	0.064
Sales (5–14.9) ->NPD performance	-0.167	1027	-0.168	1.112	-0.153	1.09	-0.015	-0.088	0.071
Sales (15–24.9) ->NPD performance	-0.093	0.75	-0.094	0.812	-0.096	0.877	0.002	-0.052	0.07
Sales (25–34.9) ->NPD performance	-0.052	0.532	-0.049	0.553	-0.036	0.426	-0.013	-0.066	0.042
Sales (35–45) ->NPD performance	-0.058	0.706	-0.058	0.747	-0.048	0.714	-0.01	-0.054	0.03
Nº. Employees <10 -> NPD performance	-0.068	0.313	-0.074	0.377	-0.038	0.219	-0.036	-0.124	0.064
Nº. Employees (10–49) ->NPD performance	0.024	0.114	0.019	0.098	0.049	0.291	-0.03	-0.11	0.066
Nº. Employees (50–99) ->NPD performance	0.039	0.23	0.034	0.222	0.087	0.622	-0.053	-0.127	0.029
Nº. Employees (100–149) ->NPD performance	-0.034	0.331	-0.039	0.415	-0.027	0.319	-0.012	-0.061	0.039
Biotechnology ->Business model innovation			-0.033	0.564	-0.033	0.564			
Footwear ->Business model innovation			-0.087	1.207	-0.087	1.207			
Ceramic ->Business model innovation			-0.072	1.06	-0.072	1.06			
Sales (<5) -> Business model innovation			-0.13	0.663	-0.13	0.663			
Sales (5–14.9) ->Business model innovation			-0.045	0.282	-0.045	0.282			
Sales (15–24.9) ->Business model innovation			0.006	0.051	0.006	0.051			
Sales (25–34.9) ->Business model innovation			-0.041	0.392	-0.041	0.392			
Sales (35–45) ->Business model innovation			-0.031	0.457	-0.031	0.457			
Nº. Employees (<10) -> Business model innovation			-0.108	0.569	-0.108	0.569			
Nº. Employees (10–49) ->Business model innovation			-0.092	0.493	-0.092	0.493			
Nº. Employees (50–99) ->Business model innovation			-0.16	1.049	-0.16	1.049			
Nº. Employees (100–149) ->Business model innovation			-0.037	0.396	-0.037	0.396			

Note: * $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$; t-values for $n = 5000$ subsamples; CR, composite reliability; SE, standard error; AVE, average variance extracted.

performance. However, in regards with the classic EO–performance relationship, [Rauch et al. \(2009\)](#) highlight that there is a substantial amount of variation in such connection. We suggest that this variation might be due to some extent to the mediating role of BMI, especially in the case of SMEs. Our findings put forward a likely explanation on why some firms might have a poor NPD performance even though their organisations are clearly entrepreneurially oriented: the BMI link may be missing. This is a contribution to the entrepreneurship and business models literatures.

Finally, our findings represent an important input for the RBV and its subsequent development on the dynamic capabilities' perspective of the firm. An adequate connection between the firm's EO and BMI is able to boost NPD performance, and thereby firm's performance. As a result, the connection between EO and BMI is a significant factor in explaining why some firms outperform others in a particular context ([Alegre and Chiva, 2013](#); [Easterby-Smith and Prieto, 2008](#)).

5.2. Implications for practitioners

Unlike most research, which commonly takes BMI as a stand-alone variable ([Spieth et al., 2014](#)), this study underlines BMI as a key conduit through which EO impacts on NPD performance. If the firm's management fails to innovate with its business model, the positive influence of EO on NPD performance would be partially lost. [Mintzberg \(1994\)](#) first argued that entrepreneurial orientation promotes a repeated reframing of the business strategy. Changing the business model by adding new activities, linking activities in different ways, or changing the parties that do these activities will increase the positive effects of EO on NPD performance. In light of our results, managers should institutionalise regular experimentation on issues such as providing value to

customers, sales and distribution strategies or business cost structures if they are to fully exploit their entrepreneurial initiatives and improve their NPD performance. This experimentation would generate new valuable knowledge on each of the business model components. Experimenting could be considered as a training for decision makers. With such a training organisational change would be much more agile.

Additionally, we want to underscore the usefulness of the internal perspective of this study when it comes to practice. Some previous studies have found that EO is likely to provide more advantages in certain specific environments or external situations ([Aragón-Correa and Sharma, 2003](#); [McKenny et al., 2018](#)) and this is useful for facilitating organisational adaption to the environment. However, organisational decisions are unlikely to significantly change any external variables such as the environment hostility or market growth. Our internal analysis provides a number of internal variables, namely the components of the business model, into which managerial action can have significant effects over the success of NPD of the firm.

Therefore, BMI, that is the ability to change each of the business model components, is to be regarded as a critical success factor for SMEs that can be triggered by managerial action when required.

5.3. Limitations and future research directions

Finally, it is important to underscore this study's limitations when interpreting our findings. First, we have focused on BMI as an intervening middle step between EO and NPD performance. As BMI is a partial mediator, other organisational issues could be taken into account and, if properly justified, incorporated in our research model. Future research initiatives could look at the role of these additional organisational issues on the EO–NPD performance connection. Further

interesting ways of complementing the picture would be to include antecedents of EO (Pittino et al., 2017; Rodrigo-Alarcón et al., 2018), as well as to take into account the eventual effects of the digital transformation process that so many SMEs are undertaking at present (Li, 2020).

Second, this study is cross-sectional. All the data concerning independent and dependent variables were gathered at the same time. When interpreting our results, we assume that the behaviour of our research variables will remain essentially the same within the reasonable amount of time required by independent variables to have a significant effect on dependent variables. Future research could explore the significance of such an assumption as well as propose what this reasonable amount of time could be. Further still, conducting a longitudinal or a time lagged study could allow researchers to test the influence of NPD performance on subsequent BMI in the following period. Excellent outcomes in NPD would certainly reinforce BMI for the following period. From a dynamic point of view, we would expect a virtuous circle between NPD and BMI over time.

Third, our database is made from Spanish cases. While our concepts, hypotheses and measurements are generalist, our data could have a cultural or regional bias. Further research is required to corroborate our findings with different sets of cases or to identify eventual cultural and regional factors that could have a relevant role in our research model.

Finally, this study has been completely designed at the firm level.

APPENDICES.

A.1 Questionnaire items for entrepreneurial orientation

Please circle the number in the following scales that best describes the orientation of your business unit. Circle number 1 if the statement on the left-hand side of the scale best describes your reaction to the item. Circle number 7 if the statement on your right-hand side of the scale best describes your reaction to the item. Choose from numbers 2 to 6 to indicate your best estimate of an intermediate position.

In general, the top managers of my business unit favour ...								
1. A strong emphasis on the marketing of tried and true products or services	1	2	3	4	5	6	7	A strong emphasis on R&D, technological leadership and innovation
How many new lines of products or services has your business unit marketed during the past three years?								
2. No new lines of product or services	1	2	3	4	5	6	7	Very many new lines of products or services
3. Changes in product or service lines have been mostly of a minor nature	1	2	3	4	5	6	7	Changes in product or service lines have usually been quite radical
In dealing with its competitors, my business unit ...								
4. Typically responds to actions which competitors initiate	1	2	3	4	5	6	7	Typically initiates actions to which competitors then respond
5. Is very seldom the first business to introduce new products/services, administrative techniques, operating technologies, etc.	1	2	3	4	5	6	7	Is very often the first business to, introduce new products/services, administrative techniques, operating technologies, etc.
6. Typically seeks to avoid competitive clashes, preferring a "live-and-let-live" posture	1	2	3	4	5	6	7	Typically adopts a very competitive, "undo-the-competitors" posture
In general, the top managers of my business unit have ...								
7. A strong proclivity for low risk projects (with normal and certain rates of return)	1	2	3	4	5	6	7	A strong proclivity for high risk projects (with chances of very high returns)
In general, the top managers of my business unit believe that ...								
8. Owing to the nature of the environment, it is best to explore it gradually via cautious, incremental behaviour	1	2	3	4	5	6	7	Owing to the nature of the environment, bold, wide-ranging acts are necessary to achieve the firm's objectives
When confronted with decision-making situations involving uncertainty, my business unit ...								
9. Typically adopts a cautious, "wait-and-see" posture in order to minimise the probability of making costly decisions	1	2	3	4	5	6	7	Typically adopts a bold, aggressive posture in order to maximise the probability of exploiting potential opportunities

A.2 Questionnaire items for business model innovation

Clauss (2017), Bouncken et al. (2016a).

Please indicate your level of agreement with the following statements about your organisation.

1. Our organisation regularly changes the way in which we provide value to our customers.
2. We regularly look for new sales strategies to generate revenues.
3. We experiment with new business models in our markets.
4. We regularly use new distribution and sales channels.

Our explained variable, NPD performance, has been set at the organisational level and focuses on the NPD performance of the firm. Our explanatory variables, EO and BMI, have also been set at the organisational level. However, a firm's NPD includes a number of NPD projects that are carried out by a specific team of individuals. Individuals' EO plays an important role in designing and undertaking entrepreneurial activities (Bouncken et al., 2020; Covin et al., 2020; Hughes et al., 2018). These activities are determinant in order to achieve BMI and NPD. By focusing on the organisational level, we have analysed the organisational manifestations of individuals' and teams' organisational dynamics. Future research could undertake multilevel analyses including the role of organisational EO as well as team EO and individual EO. In such a multilevel approach, assessing the moderating role of top managers' personality traits as recently analysed by Bouncken et al. (2020) on the connection between EO and NPD performance could also be a promising future research avenue.

Note

The authors acknowledge the finance received from the Spanish Ministry of Science, Innovation and Universities (PGC 2018-097981-B-I00) and the Spanish Ministry of Economics and Competitiveness (ECO 2015-69704-R) to do this research.

5. We often change the cost structure (fixed and variable costs) within our organisation.
6. Our organisation changes aspects of our business model on a regular basis.

A.3 Questionnaire items for new product development performance

Dyer and Song (1997); Shan et al. (2016)

Please indicate your level of agreement with the following statements about your organisation.

1. The overall performance of our new product development programme has met our objectives.
2. From an overall profitability standpoint, our new product development programme has been successful.
3. Compared with our major competitors, our overall new product development programme is far more successful.

Note: All the items were evaluated on a 7-point Likert scale.

References

- Achtenhagen, L., Melin, L., Naldi, L., 2013. Dynamics of business models – strategizing, critical capabilities and activities for sustained value creation. *Long range planning, managing business models for innovation. Strategic Change and Value Creation* 46, 427–442. <https://doi.org/10.1016/j.lrp.2013.04.002>.
- Acur, N., Kandemir, D., Boer, H., 2012. Strategic alignment and new product development: drivers and performance effects. *J. Prod. Innovat. Manag.* 29, 304–318.
- Alegre, J., Chiva, R., 2013. Linking entrepreneurial orientation and firm performance: the role of organizational learning capability and innovation performance. *J. Small Bus. Manag.* 51, 491–507.
- Altinay, L., Madanoglu, M., De Vita, G., Arasli, H., Ekinci, Y., 2016. The interface between organizational learning capability, entrepreneurial orientation, and SME growth. *J. Small Bus. Manag.* 54, 871–891. <https://doi.org/10.1111/jsbm.12219>.
- Amit, R., Zott, C., 2012. Creating value through business model innovation. *MIT Sloan Manag. Rev.* 53, 41–49.
- Andries, P., Debackere, K., 2013. Business model innovation: propositions on the appropriateness of different learning approaches. *Creativ. Innovat. Manag.* 22, 337–358. <https://doi.org/10.1111/caim.12033>.
- Aragón-Correa, J.A., Sharma, S., 2003. A contingent resource-based view of proactive corporate environmental strategy. *Acad. Manag. Rev.* 28, 71–88. <https://doi.org/10.5465/amr.2003.8925233>.
- Arzubiaga, U., Kotlar, J., De Massis, A., Maseda, A., Iturralde, T., 2018. Entrepreneurial orientation and innovation in family SMEs: unveiling the (actual) impact of the Board of Directors. *J. Bus. Ventur.* 33, 455–469.
- Asemokha, A., Musona, J., Torkkeli, L., Saarenketo, S., 2019. Business model innovation and entrepreneurial orientation relationships in SMEs: Implications for international performance. *J. Int. Entrepr.* 17, 425–453. <https://doi.org/10.1007/s10843-019-00254-3>.
- Atuahene-Gima, K., 1995. An exploratory analysis of the impact of market orientation on new product performance—A contingency approach. *J. Product Innov. Management.* 12 (4), 275–293. [https://doi.org/10.1016/0737-6782\(95\)00027-Q](https://doi.org/10.1016/0737-6782(95)00027-Q).
- Baden-Fuller, C., Mangematin, V., 2013. Business models: a challenging agenda. *Strat. Organ.* 11, 418–427.
- Baker, W.E., Sinkula, J.M., 2009. The complementary effects of market orientation and entrepreneurial orientation on profitability in small businesses*. *J. Small Bus. Manag.* 47, 443–464. <https://doi.org/10.1111/j.1540-627X.2009.00278.x>.
- Birkinshaw, J., 1997. Entrepreneurship in multinational corporations: the characteristics of subsidiary initiatives. *Strat. Manag. J.* 18, 207–229.
- Bouncken, R., Cesinger, B., Tiberius, V., 2020. Narcissism, Machiavellianism, and psychopathy of top managers: can Entrepreneurial Orientation secure performance? *Int. J. Entrepreneurial Ventur.* 12, 273–302.
- Bouncken, R.B., Fredrich, V., 2016. Business model innovation in alliances: successful configurations. *J. Bus. Res.* 69, 3584–3590. <https://doi.org/10.1016/j.jbusres.2016.01.004>.
- Bouncken, R.B., Lehmann, C., Fellnhöfer, K., 2016a. The role of entrepreneurial orientation and modularity for business model innovation in service companies. *Int. J. Entrepreneurial Ventur.* 8, 237–260.
- Bouncken, R.B., Plüschke, B.D., Pesch, R., Kraus, S., 2016b. Entrepreneurial orientation in vertical alliances: joint product innovation and learning from allies. *Review of Managerial Science* 10, 381–409. <https://doi.org/10.1007/s11846-014-0150-8>.
- Bucherer, E., Eisert, U., Gassmann, O., 2012. Towards systematic business model innovation: lessons from product innovation management. *Creativ. Innovat. Manag.* 21, 183–198.
- Casadesus-Masanell, R., Ricart, J.E., 2010. From strategy to business models and onto tactics. *Long Range Planning, Business Models* 43, 195–215. <https://doi.org/10.1016/j.lrp.2010.01.004>.
- Casadesus-Masanell, R., Zhu, F., 2010. Strategies to fight ad-sponsored rivals. *Manag. Sci.* 56, 1484–1499.
- Casillas, J.C., Moreno, A.M., 2010. The relationship between entrepreneurial orientation and growth: the moderating role of family involvement. *Enterpren. Reg. Dev.* 22, 265–291. <https://doi.org/10.1080/08985621003726135>.
- Chen, Y.C., Li, P.C., Evans, K.R., 2012. Effects of interaction and entrepreneurial orientation on organizational performance: Insights into market driven and market driving. *Industr. Market. Manag.* 41, 1019–1034. <https://doi.org/10.1016/j.indmarman.2012.01.017>.
- Chesbrough, H., 2010. Business model innovation: opportunities and barriers. *Long. Range Plan.* 43, 354–363.
- Chesbrough, H., Rosenbloom, R.S., 2002. The role of the business model in capturing value from innovation: evidence from Xerox Corporation's technology spin-off companies. *Ind. Corp. Change* 11, 529–555. <https://doi.org/10.1093/icc/11.3.529>.
- Chin, W.W., 2010. How to write up and report PLS analyses. In: Esposito Vinzi, V., Chin, W.W., Henseler, J., Wang, H. (Eds.), *Handbook of Partial Least Squares: Concepts, Methods and Applications*, Springer Handbooks of Computational Statistics. Springer Berlin Heidelberg, Berlin, Heidelberg, pp. 655–690. https://doi.org/10.1007/978-3-540-32827-8_29.
- Ciampi, F., Demi, S., Magrini, A., Marzi, G., Papa, A., 2021. Exploring the impact of big data analytics capabilities on business model innovation: the mediating role of entrepreneurial orientation. *J. Bus. Res.* 123, 1–13. <https://doi.org/10.1016/j.jbusres.2020.09.023>.
- Clausen, T., Korneliusen, T., 2012. The relationship between entrepreneurial orientation and speed to the market: The case of incubator firms in Norway. *Technovation* 32, 560–567. <https://doi.org/10.1016/j.technovation.2012.05.004>.
- Clauss, T., 2017. Measuring business model innovation: conceptualization, scale development, and proof of performance. *R&D Management* 47, 385–403.
- Clauss, T., Abebe, M., Tangpong, C., Hock, M., 2019. Strategic agility, business model innovation, and firm performance: an empirical investigation. *IEEE Trans. Eng. Manag.* 68 (3), 767–784.
- Cohen, J., 1988. *Statistical Power Analysis for the Behavioral Sciences*. L. Erlbaum Associates, Hillsdale, N.J.
- Collins, J.D., Reutzel, C.R., 2017. The role of top managers in determining investment in innovation: the case of small and medium-sized enterprises in India. *Int. Small Bus. J.* 35, 618–638. <https://doi.org/10.1177/0266242616658507>.
- Covin, J.G., Green, K.M., Slevin, D.P., 2006. Strategic process effects on the entrepreneurial orientation–sales growth rate relationship. *Enterpren. Theor. Pract.* 30, 57–81. <https://doi.org/10.1111/j.1540-6520.2006.00110.x>.
- Covin, J.G., Miles, M.P., 2007. Strategic use of corporate venturing. *Enterpren. Theor. Pract.* 31, 183–207.
- Covin, J.G., Rigtering, J.P.C., Hughes, M., Kraus, S., Cheng, C.-F., Bouncken, R.B., 2020. Individual and team entrepreneurial orientation: scale development and configurations for success. *J. Bus. Res.* 112, 1–12. <https://doi.org/10.1016/j.jbusres.2020.02.023>.
- Covin, J.G., Slevin, D.P., 1986. The development and testing of an organizational-level comparative study of US and Japanese firms. *J. Int. Business Stud.* 28 (3), 467–493.
- Easterby-Smith, M., Prieto, I.M., 2008. Dynamic capabilities and knowledge management: an integrative role for learning? *Br. J. Manag.* 19, 235–249. <https://doi.org/10.1111/j.1467-8551.2007.00543.x>.
- Evanschitzky, H., Eisend, M., Calantone, R.J., Jiang, Y., 2012. Success factors of product innovation: an updated meta-analysis. *J. Prod. Innovat. Manag.* 29, 21–37. <https://doi.org/10.1111/j.1540-5885.2012.00964.x>.
- Falk, R.F., Miller, N.B., 1992. *A Primer for Soft Modeling*. University of Akron Press, Akron.
- Fernández-Mesa, A., Alegre, J., 2015. Entrepreneurial orientation and export intensity: examining the interplay of organizational learning and innovation. *Int. Bus. Rev.* 24, 148–156. <https://doi.org/10.1016/j.ibusrev.2014.07.004>.
- Ford, J.D., Schellenberg, D.A., 1982. Conceptual issues of linkage in the assessment of organizational performance. *Acad. Manag. Rev.* 7, 49–58. <https://doi.org/10.5465/amr.1982.4285450>.
- Fornell, C., Larcker, D.F., 1981. Structural equation models with unobservable variables and measurement error: algebra and statistics. *J. Market. Res.* 18, 382–388. <https://doi.org/10.1177/002224378101800313>.
- Foss, N.J., Saebi, T., 2018. Business models and business model innovation: between wicked and paradigmatic problems. *Long. Range Plan.* 51, 9–21.

- Foss, N.J., Saebi, T., 2017. Fifteen years of research on business model innovation: how far have we come, and where should we go? *J. Manag.* 43, 200–227. <https://doi.org/10.1177/0149206316675927>.
- Foss, N.J., Saebi, T., 2015. *Business Model Innovation: the Organizational Dimension*. OUP, Oxford.
- Frankenberger, K., Sauer, R., 2019. Cognitive antecedents of business models: exploring the link between attention and business model design over time. *Long. Range Plan.* 52, 283–304.
- Frishammar, J., Hörte, S.A., 2007. The role of market orientation and entrepreneurial orientation for new product development performance in manufacturing firms. *Technol. Anal. Strat. Manag.* 19, 765–788. <https://doi.org/10.1080/09537320701711231>.
- Futterer, F., Schmidt, J., Heidenreich, S., 2018. Effectuation or causation as the key to corporate venture success? Investigating effects of entrepreneurial behaviors on business model innovation and venture performance. *Long. Range Plan.* 51, 64–81. <https://doi.org/10.1016/j.lrp.2017.06.008>.
- George, G., Bock, A.J., 2011. The business model in practice and its implications for entrepreneurship research. *Enterpren. Theor. Pract.* 35, 83–111.
- Green, K.M., Covin, J.G., Slevin, D.P., 2008. Exploring the relationship between strategic reactivity and entrepreneurial orientation: the role of structure-style fit. *J. Bus. Ventur.* 23, 356–383. <https://doi.org/10.1016/j.jbusvent.2007.01.002>.
- Griffin, A., 1997. The effect of project and process characteristics on product development cycle time. *J. Market. Res.* 34, 24–35.
- Hair, J.F., Hult, G.T.M., Ringle, C., Sarstedt, M., 2016. *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. SAGE Publications.
- Halecker, B., Bickmann, R., Hölzle, K., 2014. Failed Business Model Innovation - A Theoretical and Practical Illumination on a Feared Phenomenon (SSRN Scholarly Paper No. ID 2449211). Social Science Research Network, Rochester, NY.
- Heider, A., Gerken, M., van Dinther, N., Hülsbeck, M., 2020. Business model innovation through dynamic capabilities in small and medium enterprises – evidence from the German Mittelstand. *J. Bus. Res.* 130, 635–645. <https://doi.org/10.1016/j.jbusres.2020.04.051>.
- Henseler, J., Ringle, C.M., Sinkovics, R.R., 2009. The use of partial least squares path modeling in international marketing. *Adv. Int. Market.* 20, 277–319. [https://doi.org/10.1108/S1474-7979\(2009\)0000020014](https://doi.org/10.1108/S1474-7979(2009)0000020014).
- Huang, H.-C., Lai, M.-C., Lin, L.-H., Chen, C.-T., 2013. Overcoming organizational inertia to strengthen business model innovation: an open innovation perspective. *J. Organ. Change Manag.* 26, 977–1002. <https://doi.org/10.1108/JOCM-04-2012-0047>.
- Hughes, M., Rigtering, J.P.C., Covin, J.G., Bouncken, R.B., Kraus, S., 2018. Innovative behaviour, trust and perceived workplace performance: innovative workplace behaviour, trust and performance. *Br. J. Manag.* 29, 750–768. <https://doi.org/10.1111/1467-8551.12305>.
- Hult, G.T.M., Ketchen, D.J., 2001. Does market orientation matter? A test of the relationship between positional advantage and performance. *Strateg. Manag. J.* 22, 899–906. <https://doi.org/10.1002/smj.197>.
- Ireland, R.D., Hitt, M.A., Sirmon, D.G., 2003. A model of strategic entrepreneurship: the construct and its dimensions. *J. Manag.* 29, 963–989. [https://doi.org/10.1016/S0149-2063\(03\)00086-2](https://doi.org/10.1016/S0149-2063(03)00086-2).
- Jantunen, A., Puimalainen, K., Saarenketo, S., Kyläheiko, K., 2005. Entrepreneurial orientation, dynamic capabilities and international performance. *J. Int. Enterpren.* 3, 223–243.
- Jiménez-Jiménez, D., Cegarra-Navarro, J.G., Gattermann Perin, M., Sampaio, C.H., Lengler, J.B., 2014. Entrepreneurial capacities as antecedents of business performance in Brazilian firms. *Can. J. Adm. Sci. Rev. Canad. Sci. Adm.* 31, 90–103. <https://doi.org/10.1002/cjas.1281>.
- Johnson, G., Scholes, K., Whittington, R., 2009. *Exploring Corporate Strategy*. Pearson Education.
- Kastalli, I.V., Van Looy, B., 2013. Servitization: disentangling the impact of service business model innovation on manufacturing firm performance. *J. Oper. Manag.* 31, 169–180. <https://doi.org/10.1016/j.jom.2013.02.001>.
- Kessler, E.H., Chakrabarti, A.K., 1996. Innovation speed: a conceptual model of context, antecedents, and outcomes. *AMR (Adv. Magn. Reson.)* 21, 1143–1191. <https://doi.org/10.5465/amr.1996.9704071866>.
- Kraus, S., Rigtering, J.P.C., Hughes, M., Hosman, V., 2012. Entrepreneurial orientation and the business performance of SMEs: a quantitative study from The Netherlands. *Review of Managerial Science* 6, 161–182. <https://doi.org/10.1007/s11846-011-0062-9>.
- Lechner, C., Gudmundsson, S.V., 2014. Entrepreneurial orientation, firm strategy and small firm performance. *Int. Small Bus. J.* 32, 36–60. <https://doi.org/10.1177/0266242612455034>.
- Lee, S.M., Peterson, S.J., 2000. Culture, entrepreneurial orientation, and global competitiveness. *J. World Bus.* 35, 401–416. [https://doi.org/10.1016/S1090-9516\(00\)00045-6](https://doi.org/10.1016/S1090-9516(00)00045-6).
- Leih, S., Linden, G., Teece, D.J., 2015. Business model innovation and organizational design. In: Foss, N.J., Saebi, T. (Eds.), *Business Model Innovation*. Oxford University Press, pp. 24–42. <https://doi.org/10.1093/acprof:oso/9780198701873.003.0002>.
- Li, F., 2020. The digital transformation of business models in the creative industries: a holistic framework and emerging trends. *Technovation* 92–93, 102012. <https://doi.org/10.1016/j.technovation.2017.12.004>.
- Lumpkin, G.T., Dess, G.G., 2001. Linking two dimensions of entrepreneurial orientation to firm performance: the moderating role of environment and industry life cycle. *J. Bus. Ventur.* 16, 429–451. [https://doi.org/10.1016/S0883-9026\(00\)00048-3](https://doi.org/10.1016/S0883-9026(00)00048-3).
- Lumpkin, G.T., Dess, G.G., 1996. Clarifying the entrepreneurial orientation construct and linking it to performance. *Acad. Manag. Rev.* 21, 135–172. <https://doi.org/10.2307/258632>.
- Martins, L.L., Rindova, V.P., Greenbaum, B.E., 2015. Unlocking the hidden value of concepts: a cognitive approach to business model innovation. *Strategic Entrepreneurship Journal* 9, 99–117. <https://doi.org/10.1002/sej.1191>.
- McGrath, R.G., 2010. Business models: a discovery driven approach. *Long Range Planning, Business Models* 43, 247–261. <https://doi.org/10.1016/j.lrp.2009.07.005>.
- McKenny, A.F., Short, J.C., Ketchen, D.J., Payne, G.T., Moss, T.W., 2018. Strategic entrepreneurial orientation: configurations, performance, and the effects of industry and time. *Strategic Entrepreneurship Journal* 12, 504–521. <https://doi.org/10.1002/sej.1291>.
- Merz, G.R., Sauber, M.H., 1995. Profiles of managerial activities in small firms. *Strateg. Manag. J.* 16 (7), 551–564. <https://doi.org/10.1002/smj.4250160705>.
- Miller, D., 1983. The correlates of entrepreneurship in three types of firms. *Manag. Sci.* 29, 770–791.
- Mintzberg, H., 1994. Rethinking strategic planning part II: new roles for planners. *Long. Range Plan.* 27, 22–30. [https://doi.org/10.1016/0024-6301\(94\)90186-4](https://doi.org/10.1016/0024-6301(94)90186-4).
- Moreno, A.M., Casillas, J.C., 2008. Entrepreneurial orientation and growth of SMEs: a causal model. *Enterpren. Theor. Pract.* 32, 507–528. <https://doi.org/10.1111/j.1540-6520.2008.00238.x>.
- Moreno-Moya, M., Munuera-Aleman, J.-L., 2016. The differential effect of development speed and launching speed on new product performance: an analysis in SMEs. *J. Small Bus. Manag.* 54, 750–770. <https://doi.org/10.1111/jsbm.12170>.
- Morgan, T., Anokhin, S., Kretinin, A., Frishammar, J., 2015. The dark side of the entrepreneurial orientation and market orientation interplay: a new product development perspective. *Int. Small Bus. J.* 33, 731–751. <https://doi.org/10.1177/0266242614521054>.
- Morgan, T., Obal, M., Anokhin, S., 2018. Customer participation and new product performance: Towards the understanding of the mechanisms and key contingencies. *Res. Pol.* 47, 498–510.
- Morris, M., Schindehutte, M., Allen, J., 2005. The entrepreneur's business model: toward a unified perspective. *J. Bus. Res.* 58, 726–735. <https://doi.org/10.1016/j.jbusres.2003.11.001>.
- Mu, J., Di Benedetto, C.A., 2011. Strategic orientations and new product commercialization: mediator, moderator, and interplay. *R&D Manag.* 41, 337–359. <https://doi.org/10.1111/j.1467-9310.2011.00650.x>.
- Mu, J., Thomas, E., Peng, G., Di Benedetto, A., 2017. Strategic orientation and new product development performance: the role of networking capability and networking ability. *Ind. Market. Manag.* 64, 187–201. <https://doi.org/10.1016/j.indmarman.2016.09.007>.
- Naman, J.L., Slevin, D.P., 1993. Entrepreneurship and the concept of fit: A model and empirical tests. *Strateg. Manag. J.* 14, 137–153. <https://doi.org/10.1002/smj.4250140205>.
- Osterwalder, A., Pigneur, Y., Tucci, C.L., 2005. Clarifying business models: origins, present, and future of the concept. *Commun. Assoc. Inf. Syst.* 16, 1.
- Pang, C., Wang, Q., Li, Y., Duan, G., 2019. Integrative capability, business model innovation and performance: contingent effect of business strategy. *Eur. J. Innovat. Manag.* 22, 541–561. <https://doi.org/10.1108/EJIM-09-2018-0208>.
- Patel, P.C., Kohtamäki, M., Parida, V., Wincent, J., 2015. Entrepreneurial orientation-as-experimentation and firm performance: the enabling role of absorptive capacity: Entrepreneurial Orientation-as-experimentation and Firm Performance. *Strat. Manag. J.* 36, 1739–1749. <https://doi.org/10.1002/smj.2310>.
- Patzelt, H., Knyphausen-Aufseß, D.Z., Nikol, P., 2008. Top management teams, business models, and performance of biotechnology ventures: an upper echelon perspective*. *Br. J. Manag.* 19, 205–221. <https://doi.org/10.1111/j.1467-8551.2007.00552.x>.
- Pittino, D., Visintin, F., Lauto, G., 2017. A configurational analysis of the antecedents of entrepreneurial orientation. *Eur. Manag. J.* 35, 224–237. <https://doi.org/10.1016/j.emj.2016.07.003>.
- Preacher, K.J., Hayes, A.F., 2008. Assessing mediation in communication research. *The Sage sourcebook of advanced data analysis methods for communication research* 13–54.
- Rauch, A., Wiklund, J., Lumpkin, G.T., Frese, M., 2009. Entrepreneurial orientation and business performance: an assessment of past research and suggestions for the future. *Enterpren. Theor. Pract.* 33, 761–787. <https://doi.org/10.1111/j.1540-6520.2009.00308.x>.
- Ray, G., Barney, J.B., Muhanna, W.A., 2004. Capabilities, business processes, and competitive advantage: choosing the dependent variable in empirical tests of the resource-based view. *Strat. Manag. J.* 25, 23–37.
- Rivas, A.A., Chen, Y.C., Yang, T.K., 2020. Entrepreneurial and alliance orientation alignment in new product development. *Technol. Forecast. Soc. Chang.* 153, 119916. <https://doi.org/10.1016/j.techfore.2020.119916>.
- Rodrigo-Alarcón, J., García-Villaverde, P.M., Ruiz-Ortega, M.J., Parra-Requena, G., 2018. From social capital to entrepreneurial orientation: the mediating role of dynamic capabilities. *Eur. Manag. J.* 36, 195–209. <https://doi.org/10.1016/j.emj.2017.02.006>.
- Sabatier, V., Mangematin, V., Rousselet, T., 2010. From recipe to dinner: business model portfolios in the European biopharmaceutical industry. *Long range planning. Business Models* 43, 431–447. <https://doi.org/10.1016/j.lrp.2010.02.001>.
- Saebi, T., Foss, N.J., 2015. Business models for open innovation: matching heterogeneous open innovation strategies with business model dimensions. *Eur. Manag. J.* 33, 201–213. <https://doi.org/10.1016/j.emj.2014.11.002>.
- Shan, P., Song, M., Ju, X., 2016. Entrepreneurial orientation and performance: is innovation speed a missing link? *J. Bus. Res.* 69, 683–690. <https://doi.org/10.1016/j.jbusres.2015.08.032>.
- Sheng, S., Zhou, K.Z., Lessassy, L., 2013. NP speed vs. innovativeness: the contingent impact of institutional and market environments. *J. Bus. Res.* 66, 2355–2362. <https://doi.org/10.1016/j.jbusres.2012.04.018>.

- Sjödin, D., Parida, V., Jovanovic, M., Visnjic, I., 2020. Value creation and value capture alignment in business model innovation: a process view on outcome-based business models. *J. Prod. Innovat. Manag.* 37, 158–183. <https://doi.org/10.1111/jpim.12516>.
- Sosna, M., Treviño-Rodríguez, R.N., Velamuri, S.R., 2010. Business model innovation through trial-and-error learning. *Long. Range Plan.* 43, 383–407. <https://doi.org/10.1016/j.lrp.2010.02.003>.
- Spieth, P., Schneckenberg, D., Ricart, J.E., 2014. Business model innovation – state of the art and future challenges for the field. *R&D Management* 44, 237–247. <https://doi.org/10.1111/radm.12071>.
- Teece, D.J., 2012. Dynamic capabilities: routines versus entrepreneurial action. *J. Manag. Stud.* 49, 1395–1401. <https://doi.org/10.1111/j.1467-6486.2012.01080.x>.
- Srivastava, P., Yoo, J., Frankwick, G.L., Voss, K.E., 2013. Evaluating the relationship of firm strategic orientations and new product development program performance. *J. Market. Theory Pract.* 21, 429–440. <https://doi.org/10.2753/MTP1069-6679210406>.
- Teece, D.J., 2010. Business models, business strategy and innovation. *Long range planning. Business Models* 43, 172–194. <https://doi.org/10.1016/j.lrp.2009.07.003>.
- Velu, C., 2015. Business model innovation and third-party alliance on the survival of new firms. *Technovation* 35, 1–11. <https://doi.org/10.1016/j.technovation.2014.09.007>.
- Visnjic, I., Wiengarten, F., Neely, A., 2016. Only the brave: product innovation, service business model innovation, and their impact on performance. *J. Prod. Innovat. Manag.* 33, 36–52.
- Voelpel, S., Leibold, M., Tekie, E., von Krogh, G., 2005. Escaping the red queen effect in competitive strategy: sense-testing business models. *Eur. Manag. J.* 23, 37–49. <https://doi.org/10.1016/j.emj.2004.12.008>.
- Wales, W.J., 2016. Entrepreneurial orientation: a review and synthesis of promising research directions. *Int. Small Bus. J.: Researching Entrepreneurship* 34, 3–15. <https://doi.org/10.1177/0266242615613840>.
- Wiklund, J., Davidsson, P., Audretsch, D.B., Karlsson, C., 2011. The future of entrepreneurship research. *Enterpren. Theor. Pract.* 35, 1–9. <https://doi.org/10.1111/j.1540-6520.2010.00420.x>.
- Wirtz, B.W., Schilke, O., Ullrich, S., 2010. Strategic development of business models. *Long. Range Plan.* 43, 272–290. <https://doi.org/10.1016/j.lrp.2010.01.005>.
- Wong, S.K.S., 2014. Impacts of environmental turbulence on entrepreneurial orientation and new product success. *Eur. J. Innov. Manag.* 17, 229–249. <https://doi.org/10.1108/EJIM-04-2013-0032>.
- Yoo, S.-J., 2001. Entrepreneurial orientation, environmental scanning intensity, and firm performance in technology-based SMEs. *Frontiers of entrepreneurship research* 356–367, 2001.
- Zahra, S.A., 1996. Governance, ownership, and corporate entrepreneurship: the moderating impact of industry technological opportunities. *Australas. Mark. J.* 39, 1713–1735. <https://doi.org/10.5465/257076>.
- Zhou, K.Z., Yim, C.K., Tse, D.K., 2005. The effects of strategic orientations on technology- and market-based breakthrough innovations. *J. Market.* 69, 42–60.