

THE ROLE OF CORPORATE RISK MANAGEMENT IN THE RELATIONSHIP BETWEEN OPEN INNOVATION AND ORGANIZATIONAL STRATEGY

O PAPEL DA GESTÃO DE RISCO CORPORATIVO NA RELAÇÃO ENTRE INOVAÇÃO ABERTA E ESTRATÉGIA ORGANIZACIONAL

EL PAPEL DE LA GESTIÓN DE RIESGO CORPORATIVO EN LA RELACIÓN ENTRE INNOVACIÓN ABIERTA Y ESTRATEGIA ORGANIZATIVA

 **Francisco Musiello-Neto**¹
 **Orlando Lima Rua**²
 **Mario Arias-Oliva**³
 **Mar Souto-Romero**⁴

Cite as – American Psychological Association (APA)

Musiello-Neto, F., Rua, O. L., Arias-Oliva, M., & Souto-Romero, M. (2022, Jan./Apr.). The role of corporate risk management in the relationship between open innovation and organizational strategy. *International Journal of Innovation - IJI*, São Paulo, 10(1), 6-29. <https://doi.org/10.5585/iji.v10i1.20703>.

Abstract

Objective of the study: This study aims to analyze the relationship between open innovation and organizational strategy. Additionally, the mediating effect of corporate risk management on it was assessed.

Methodology/approach: A quantitative study was conducted in Portugal based on a survey with 251 executive directors of SME hotels. Structural equations modeling was used in this study.

Originality/relevance: While other studies have analyzed the relationship between open innovation and organizational strategy, this study deepens the knowledge of the mediating effect of corporate risk management on it.

Main results: The results show that (1) open innovation improves corporate risk management and organizational strategy, (2) corporate risk influences organizational strategy, and (3) corporate risk management has a mediating effect on the relationship between open innovation and organizational strategy.

Theoretical/methodological contributions: This study provides a theoretical framework for understanding the relationships between three constructs (open innovation, corporate risk management and organizational strategy) in SMEs in the hospitality sector, not yet explored by academics.

Social/management contributions: This study will guide managers of SMEs in the hospitality sector in defining strategies to develop the relevant resources and contribute to the definition of effective government policies, programs and incentives to support the adherence or expansion of the open innovation model for companies in this sector.

Keywords: Open innovation. Organizational strategy. Corporate risk management. Hospitality sector. Structural equation modeling.

¹PhD Student in Humanistic Studies, University of Rovira I Virgili, Tarragona, Spain. musiello@mail.uft.edu.br

²PhD in Economics and Management, Center for Organisational and Social Studies (CEOS.PP), Porto School of Accounting and Business (ISCAP), Polytechnic of Porto (P.PORTO), Porto, Portugal. orua@iscap.ipp.pt

³PhD in Management, Complutense University of Madrid, Madrid, Spain. mario.arias@ucm.pt

⁴PhD in Economics and Management, International University of La Rioja, Logroño, Spain. mar.souto@unir.net

Resumo

Objetivo do estudo: O objetivo fundamental deste estudo é analisar a relação entre inovação aberta e estratégia organizacional. Além disso, tem como objetivo adicional estudar o efeito mediador da gestão de risco corporativo na referida relação.

Metodologia/abordagem: Um estudo quantitativo baseado em uma pesquisa com 251 diretores executivos de hotéis de PMEs foi realizado em Portugal.

Originalidade/relevância: Enquanto outros estudos analisaram a relação entre inovação aberta e estratégia organizacional, o presente aprofunda o estudo da mesma através do efeito mediador da gestão do risco corporativo.

Principais resultados: Os resultados mostram que (1) a inovação aberta melhora a gestão de risco corporativo e a estratégia organizacional, (2) o risco corporativo influencia a estratégia organizacional e (3) a gestão de risco corporativo tem um efeito mediador na relação entre a inovação aberta e a estratégia organizacional.

Contribuições teóricas/metodológicas: Este estudo fornece uma estrutura teórica para compreender as relações entre três construtos (inovação aberta, gestão de risco corporativo e estratégia organizacional) em PMEs no setor da hospitalidade, ainda não exploradas por acadêmicos.

Contribuições sociais/gerenciais: Este estudo orientará os gestores das PMEs do setor da hospitalidade na definição de estratégias para desenvolver os recursos relevantes e contribuirá para a definição de políticas governamentais eficazes, programas e incentivos para apoiar a adesão ou expansão do modelo de inovação aberta das empresas neste setor.

Palavras-chave: Inovação aberta. Estratégia organizacional. Gestão de riscos corporativos. Setor da hospitalidade. Modelo de equações estruturais.

Resumen

Objetivo del estudio: El principal objetivo de este estudio es analizar la relación entre innovación abierta y estrategia organizacional. Además, se estudia el efecto mediador de la gestión de riesgo corporativo en esta relación.

Metodología/enfoque: En Portugal se llevó a cabo un estudio cuantitativo basado en una encuesta a 251 directores ejecutivos de hoteles en PYMEs.

Originalidad/relevancia: Mientras que otros estudios analizaron la relación entre innovación abierta y estrategia organizacional, este profundiza su estudio a través del efecto mediador de la gestión de riesgos corporativos.

Principales resultados: Los resultados muestran que (1) la innovación abierta mejora la gestión del riesgo corporativo y la estrategia organizacional, (2) el riesgo corporativo influye en la estrategia organizacional y (3) la gestión del riesgo corporativo tiene un efecto mediador entre la innovación abierta y la estrategia organizacional.

Aportes teóricos/metodológicos: Este estudio proporciona un marco teórico para comprender las relaciones entre tres constructos (innovación abierta, gestión de riesgos corporativos y estrategia organizacional) en las PYMEs del sector de la hospitalidad, aún no explorado por académicos.

Contribuciones sociales/gerenciales: Este estudio guiará a los gestores de las PYMEs del sector de la hospitalidad en la definición de estrategias para desarrollar los recursos relevantes y contribuirá a la definición de políticas, programas e incentivos gubernamentales efectivos para apoyar la adhesión o expansión del modelo de innovación abierta de las empresas de este sector.

Palabras clave: Innovación abierta. Estrategia organizacional. Gestión de riesgo corporativo. Sector de la hospitalidad. Modelo de ecuaciones estructurales.

1 Introduction

Some authors (e.g., Almirall & Casadesus-Masanell, 2010; Leiponen & Helfat, 2010; Huizingh, 2011) support the existence of scarce studies published in the scientific literature on the benefits of the

implementation of the open *innovation model* in organizations, especially in small and medium enterprises (SMEs). The impact of this model on organizations is one of the major topics discussed in management at the beginning of this century (Huizingh, 2011). Two orders of magnitude justify it. First, value chain leverage enhances the firm's results to pursue strategic business objectives aligned through managerial innovation (West et al., 2014). Second, the intentional use of knowledge input and output flows accelerates internal innovation and expands markets to retain external knowledge (Chesbrough & Crowther, 2006).

For the European Commission (2003), companies that employ fewer than 250 people, have an annual turnover not exceeding 50 million euros and/or have a balance sheet total value not exceeding 43 million euros are considered SMEs. These companies are the predominant form of business in Europe, representing approximately 99.8% of all firms and 67% of total employment in the business fabric (Baumann-Pauly et al., 2013).

Large firms see stakeholder engagement increase their reputation and competitiveness with a more strategic and social approach towards SMEs (Cantele & Zardini, 2020; Kumar et al., 2020). SMEs' organizational growth should be measured in terms of sales and internal culture development, policies, and structure to support and encourage effective top management development (Gray & Mabey, 2005). On the other hand, large companies differ from SMEs in the way they view their social responsibility. This difference affects their social responsibility activities (Dias et al., 2019). When comparing the approaches of SMEs with large firms, Russo and Tencati (2009) observed that although SMEs did not correctly integrate their strategic processes, they identify the commitment to a social approach given the specific peculiarities that differentiate these approaches. These scholars also maintain that the sense of identity in SMEs tends to be stronger than in large firms, given the frequency of interactions of middle managers with top managers and operational employees. In addition, SMEs are, by definition, less diversified than large companies with fewer hierarchical levels (Baumann-Pauly et al., 2013).

Although there is a growing interest of researchers in exploring the open innovation, the conceptual applications and potential of the use of this model in the hospitality sector are rarely explored, because SMEs often have a dominant impact on national economies; therefore, their innovative potential should not be neglected (Vrgovic et al., 2012). The change in the innovation model (closed innovation to open innovation) emphasizes the managers' experience and it requires a more qualified workforce, especially on interpersonal skills, leading firms in this sector to adjust their strategies for attracting, retaining, and developing knowledge to offer a revised vision to customers (Reilly, 2018). For this strategic reorientation, open innovation can be considered an important management mechanism for SMEs in terms of knowledge (internal and external) and technology, since it is the best way to connect organizational boundaries that lead to better results on management performance (Krause & Schutte, 2015). These arguments would already be enough to justify the preparation and application of this study.

Milutinović, Stošić and Mihić (2015) state that SMEs innovation policy objectives still suffer substantial restrictions due to the lack of innovation in the marketing of the products/services they offer. The number of studies discussing this issue regarding SMEs is still scarce (Chesbrough & Brunswicker, 2014; Dahlander & Gann, 2010; Wikhamn & Wikhamn, 2013; Greco et al., 2015). Portugal is no exception, in 2018 the country had 1,294,037 SMEs (Pordata, 2021a,b), which corresponds to 99.9% of total companies.

Based on open innovation, this research was carried out with companies in the hospitality sector in Portugal. It is intended, thus, to generate theoretical and practical contributions to the field of study to find more effective solutions to the problems of SMEs in this sector within the innovation management, meeting the current needs (internal and external). Furthermore, it is expected that the theoretical contribution of this study may add mediating variables in the relationship between open innovation and organizational strategy, such as corporate risk management.

2 Theoretical framework

2.1 Open Innovation

Chesbrough (2003) perceived that the managerial innovation model was closed about new ideas and their diffusion in the market, arguing that the immobility of knowledge makes it impossible to keep the best research and development (R&D) talents given that these have a high cost for the organization. Firms need to look outside in search of alternative contents (ideas and conceptions) to generate innovation, share costs and benefits, and allow these transformations to be quickly exchanged in fast-changing environments and capitalized by firms (Lopes & De Carvalho, 2018). Thus, open innovation becomes part of a continuous flow, which can be the internal or external environment and vice versa, in a collaborative process (Chesbrough, 2003). The main areas with simultaneous emphasis are (1) *e-business* and the use of information technology for companies, (2) the strategy focused on value creation and competitive advantage, (3) innovation and technology management, and (4) the creation and acquisition of value by companies, based on the organization of their internal processes and external relationships with customers and suppliers (Zott et al., 2011).

The concept of open innovation has rapidly gained great prominence among the business community and as a theoretical concept intensively studied by researchers (Podmetina et al., 2018). The open innovation model highlights the need for firms to acquire valuable resources from third parties and share internal resources to develop new products and services (Teplov et al., 2019). However, this model does not clarify how and when a firm obtains external knowledge and shares internal knowledge (Kuo-Nan & Tidd, 2012). This issue leads to the definition of an innovative management conceptual model that confronts managers with the complex analysis and interpretation of the specificities of each firm and market, with specific management models (Kuo-Nan & Tidd, 2012).

According to Kreiser et al. (2021), theoretical and empirical evidence suggest that corporate entrepreneurship, as an organizational strategy, is the appropriate response to the increasing levels of environmental hostility through the expansion of knowledge frontiers, with reflections on the firm's performance. Innovation as an organizational strategy improves results, growth, learning, and new knowledge (Bierwerth et al., 2015; Cucculelli & Bettinelli, 2015). In addition, the knowledge produced and disseminated through the incidence of organizational strategy, has policy implications for the company, given the likelihood that this knowledge becomes a competitive advantage in organizations (Audretsch & Lehmann, 2006).

2.2 Organizational strategy

Firms need to create heterogeneity that increases the ability to exploit resources and implement innovation strategies (Erdil & Özdemir, 2016). The implications and consequences of implementing organizational strategies increasingly focus on the human factor, the management of new knowledge and best practices to expand business (Ostos et al., 2016). Therefore, there seems to be a reasonable degree of consensus on the effectiveness of the strategy concept and its implications as a guide for long-term organizational management (Wijethilake et al., 2018).

In dealing with the challenges of the organizational environment, firms should strengthen their R&D capabilities and promote innovative work cultures and teams (Huo et al., 2014). Thus, service firms should embrace technological innovation as an aid to the renewal of their core business model and internal processes; since this innovation may include new marketing approaches, new management practices (structural or technical) and new ways of organizing work processes, establishing alternative forms of human resource management that foster internal and external relationships (Kaše & Skerlavaj, 2016). Technological advances based on flexible information and communication technologies have changed the performance of existing firms and generated many new ventures with new businesses and new business models, where new technologies dissemination is granted (Roland & Schoormans, 2004).

The organizational strategy concentrates the resources to achieve the desired results; the strategic orientation is manifested in the firm's culture and serves as a backdrop for the organizational practices and decisions associated with the allocation of resources and the search for opportunities (Balodi, 2014). According to some scholars (e.g., Van de Vrande et al., 2009; Huizingh, 2011), some activities favor the firm to acquire new knowledge and technologies outside its boundaries. This situation enables an intentional knowledge flow that will capture and benefit from external sources of knowledge to improve current development. The acquired knowledge to learn from the successes and failures of organizational projects is vital to increase the firm's competitiveness as a management mechanism of innovative strategies (Slowak & Regenfelder, 2017).

This context leads us to postulate the following research hypothesis:

H1: Open innovation positively influences organizational strategy.

2.3 Corporate risk management

Risk is an essential component for project management and plays a key role as the number of firms that invest with inherent risks at different stages of projects increases (Bature et al., 2018). These authors identified risk as a manager's assignment, with a value and scale of priorities, continuously integrating actions and mechanisms to minimize risks. It is essential to ensure the survival of companies and create sustainable value, being especially relevant for SMEs that are more exposed to the harmful effects of risks due to limited resources and structural characteristics (Verbano & Venturini, 2013).

Risks may be related to the ownership and responsibility of third parties, a situation that leads risk managers to adapt, deploy, and reconfigure tools and to analyze the practices used so that they can interact and communicate with other managers (Acuña-Carvajal et al., 2019). In addition, risk assessment tools are imperfect and sometimes unavailable to managers who usually address this gap by applying a variant of the organizational planning framework (Bradley, 2018).

Innovation usually differentiates according to the degree of technological uncertainty, development time, and process complexity, creating new opportunities for SMEs and allowing them to establish a dominant position in the market, despite exposing them to a higher level of risk (Parida et al., 2012). Corporate risk management is simultaneously associated with known outcomes. The probability of recurrences is well calculated, and uncertainty about unknown variables makes corporate risk management different from uncertainty management (Teece et al., 2016). García-Sánchez et al. (2018) highlight the scarcity of literature associating corporate risk with management in SMEs, therefore, related corporate risk management with the open innovation model.

Open innovation has become one of the tools that have evolved the most in the search for accelerating the development and reducing the cost of creating a new product/service, aiming at the firm's superior performance (Temel & Venhaverbeke, 2020). Thus, the open innovation process forces suppliers to be more creative and innovative because the knowledge providers induce strategic partners to develop high value-added products (Chesbrough & Crowther 2006; Laursen & Salter 2006). This framework requires strategies to increase firms, universities, and research centres (Chesbrough & Bogers, 2014; Bogers et al., 2017). This approach involves a joint learning and mutual sharing of skills to accelerate the internal innovation process; the goal is to improve competitiveness in developing new technologies for external innovation (Brunswick & Vanhaverbeke, 2015; Temel & Venhaverbeke, 2020).

Adopting the open innovation model allows companies to integrate external technological and market knowledge at different stages of new venture creation to leverage the experience with partners and their commercialization channels for external exploitation of the business (Drechsler & Natter, 2012; Fey & Birkinshaw, 2005).

Eftekhari and Bogers (2015) found that startups operating within an innovation ecosystem, involving stakeholders in the definition of the business model, are characterized by an environment in which there is the ability to overcome resource constraints and enhance rapid growth. Therefore, it facilitates the initial development of resources and social and organizational capital. Mitchell et al. (2007) state that new ventures establish intra-organizational connections through electronic technologies that impact the performance of SMEs.

The literature thus suggests that a firm's ability to identify and control its risks depends mainly on how well it can adapt to environmental changes, accept changes and better execute its operations which are linked to its ability to capitalize on opportunities (Odor, 2019). Therefore, corporate risk assessment is considered one of top managers' most widely used strategies (Agarwal & Ansel, 2016). The limit of living with risk is to establish controlled risks to achieve effective and proactive governance (IRDA, 2017).

Thus, we aim to test the following research hypotheses empirically:

H2: Open innovation has a positive effect on corporate risk management.

H3: Corporate risk management has a positive effect on organizational strategy;

H4: Corporate risk management has a mediating effect on the relationship between open innovation and organizational strategy.

3 Methodology

3.1 Sample and data collection

The sample for this empirical study was drawn from Portuguese hotels. A questionnaire was used as the primary data source from October 28, 2018 to April 27, 2019. The identification of the companies was done through the database of the Association of Hotels, Restaurants and Similar Services of Portugal (AHRESP), which presents 1,727 hotels, of which 717 were disregarded for not having active *email*. Thus, in this study, we used non-probabilistic convenience sampling.

The elements under investigation in this study were hotel executive directors, and the unit of analysis is individual. 348 responses were received, of which 97 were eliminated because (1) the survey was not fully covered, (2) the hotel had no employee assigned for this purpose, and/or (3) the manager did not have time to respond to the survey. Thus, 251 completed and validated questionnaires were obtained, and the sample size is considered appropriate according to Krejcie and Morgan (1970). The response rate is 24.85% which is regarded as good given that the average response rates of top management surveys are in the range of 15%-20% (Menon & Bharadwaj, 1999). According to Hair et al. (2016), the sample size is considered adequate for data analysis using the structural equations model, with partial least squares (PLS-SEM), because it allows the analysis even with a relatively small sample.

3.2 Measures

The constructs of this study are measured with scales used in previous research. The two dimensions of open innovation, input and output, are assessed using 6 items from Sisodiya et al. (2013) and 5 items from Cheng and Huizingh (2014) respectively. Corporate risk management is analyzed according to the 3 items recommended by Covin and Slevin (1989). The three dimensions of organizational strategy, environmental dynamism, organizational structure and strategic posture, are measured using the 21 items proposed by Morgan et al. (2000). According to a 7-point Likert scale, all items are measured from “1 - Strongly Disagree” to “7 - Strongly Agree”.

We followed Brislin’s (1970) recommendations when translating the questionnaire from English into Portuguese. The original questionnaire was initially translated into Portuguese by a first translator. Later on, such translation was back-translated into English to compare versions to avoid discrepancies and differences. This process was ensured by the translation services of the Instituto Superior de Contabilidade e Administração do Porto (Portugal).

4 Results

4.1 Structural equation model: partial least squares (PLS-SEM)

We used *Partial Least Squares* (PLS-SEM) modeling to test the research hypotheses, using SmartPLS 3.0 software (Hair et al., 2016; Sarstedt et al., 2014). We believe that PLS-SEM is more suitable to estimate the research model since (1) this study focuses on predicting and explaining the variation of several constructs (in this case three), and (2) the relationship between open innovation and organizational strategy can be measured directly and indirectly through corporate risk management, and (3) the sample (n=251) is relatively small.

4.2 Results of the evaluation of the measurement model

Through Cronbach’s alpha stability and internal consistency, the reliability of the variables used in the research is calculated, with a minimum required level of 0.7 (Nunnally, 1978; Chin, 2010). The present study’s internal consistency levels achieved between 0.891 and 0.970 are considered excellent, as shown in Table 1 (Pestana & Gageiro, 2008). The results show that the measurement model meets all general requirements. First, all items have a loading greater than 0.707, which means that the reliability of the individual indicators (loadings) is greater than 0.5. Second, the reliability values of all components and Cronbach’s alpha values are greater than 0.70, which suggests a quite acceptable model reliability. Third, the average variance *extracted* (AVE) values of all constructs are greater than 0.50, indicating adequate convergent validity and implying that the set of indicators represents the same underlying construct (Hair et al., 2016).

The composite validity coefficient (CR) was also used to test the construct validity (Chin, 1998). As can be seen in Table 1, using the parameters of Gefen and Straub (2005) who advocate a minimum level of 0.6, the variables exponentially exceed the reference value. This study used the method proposed by Fornell and Lacker (1981), which suggests using the AVE with a minimum value of 0.5 to prove convergent validity. All constructs exceeded the required value.

Table 1

Loadings of the standardized factor analysis, AVE and CR

1st order constructs	Items	Loadings	CR	AVE	Mean	SD
<i>Open Innovation</i> ($\alpha = .957$)			,962	,698		
	OI_9	,903			4,74	1,482
	OI_10	,897			4,71	1,523
	OI_3	,892			4,84	1,653
	OI_2	,888			4,67	1,666
	OI_5	,884			4,68	1,653
	OI_8	,862			4,84	1,497
	OI_4	,716			5,03	1,535
	OI_7	,698			4,53	1,622
	OI_6	,690			4,65	1,671
	OI_11	,686			4,53	1,621
OI_1	,635			5,12	1,605	
<i>Risk management corporate</i> ($\alpha = .891$)			,932	,821		
	CR_3	,891			5,03	1,114
	CR_2	,846			4,80	1,341
	CR_1	,835			5,03	1,114
<i>Strategy organizational</i> ($\alpha = .970$)			,974	,650		
	OS_13	0,859			4,92	1,117
	OS_18	0,858			4,97	1,073
	OS_15	0,858			5,08	1,043
	OS_5	0,840			4,91	1,147
	OS_11	0,824			4,89	1,181
	OS_7	0,823			4,93	1,146
	OS_9	0,822			5,02	1,103
	OS_16	0,818			4,94	1,127
	OS_12	0,804			4,90	1,144
	OS_10	0,805			4,87	1,179
	OS_6	0,789			4,99	1,100
	OS_20	0,788			5,17	0,990
	OS_4	0,784			4,91	1,150
OS_2	0,726			4,88	1,145	
OS_21	0,744			5,03	0,998	

1st order constructs	Items	Loadings	CR	AVE	Mean	SD
	OS_8	0,723			4,85	1,142
	OS_1	0,691			4,88	1,169
	OS_3	0,690			5,03	1,110
	OS_19	0,657			5,11	0,907
	OS_14	0,652			5,04	0,906
	OS_17	0,633			5,12	1,201

Notes: OI - Open innovation; CR - Corporate risk management; OS - Organizational strategy.

Source: Data analysis based on SmartPLS 3 (2021).

Discriminant validity is determined by the construct and is related to the level at which it differs and stands out from the other constructs of the model; thus making it necessary not to have correlations with other latent variables, and can be gauged from the principle that all cross-loadings cannot be higher than a load of each indicator (Hair et al., 2016). Chin (1998) proceeded to separate the explanatory power between moderate and substantial. Satisfactory results were obtained regarding discriminant validity and, consequently, the constructs are significantly different (Table 2).

Table 2

Discriminant validity

FLC	1.	2.	3.
1. Corporate risk management	.907		
2. Open innovation	.535	.836	
3. Organizational strategy	.616	.532	.806

Source: Data analysis based on SmartPLS 3 (2021).

The Fornell-Larcker (1981) criterion (FLC) argues that the AVE should be greater than the variance between constructs of the same model. On the other hand, Henseler, Ringle, Sarstedt (2015) propose a new and advanced criterion - Heterotrait-Monotrait Ratio (HTMT) - to assess discriminant validity and agree that the FLC is one of the effective methods to evaluate this type of validity. However, FLC does not assess the lack of discriminant validity in various research situations. Therefore, HTMT was used to determine the discriminant validity of the constructs and its values are shown in Table 3. All of these were lower than 0.90, as recommended by Fornell-Larcker (1981); therefore, discriminant validity was also established for all constructs.

Table 3

HTMT

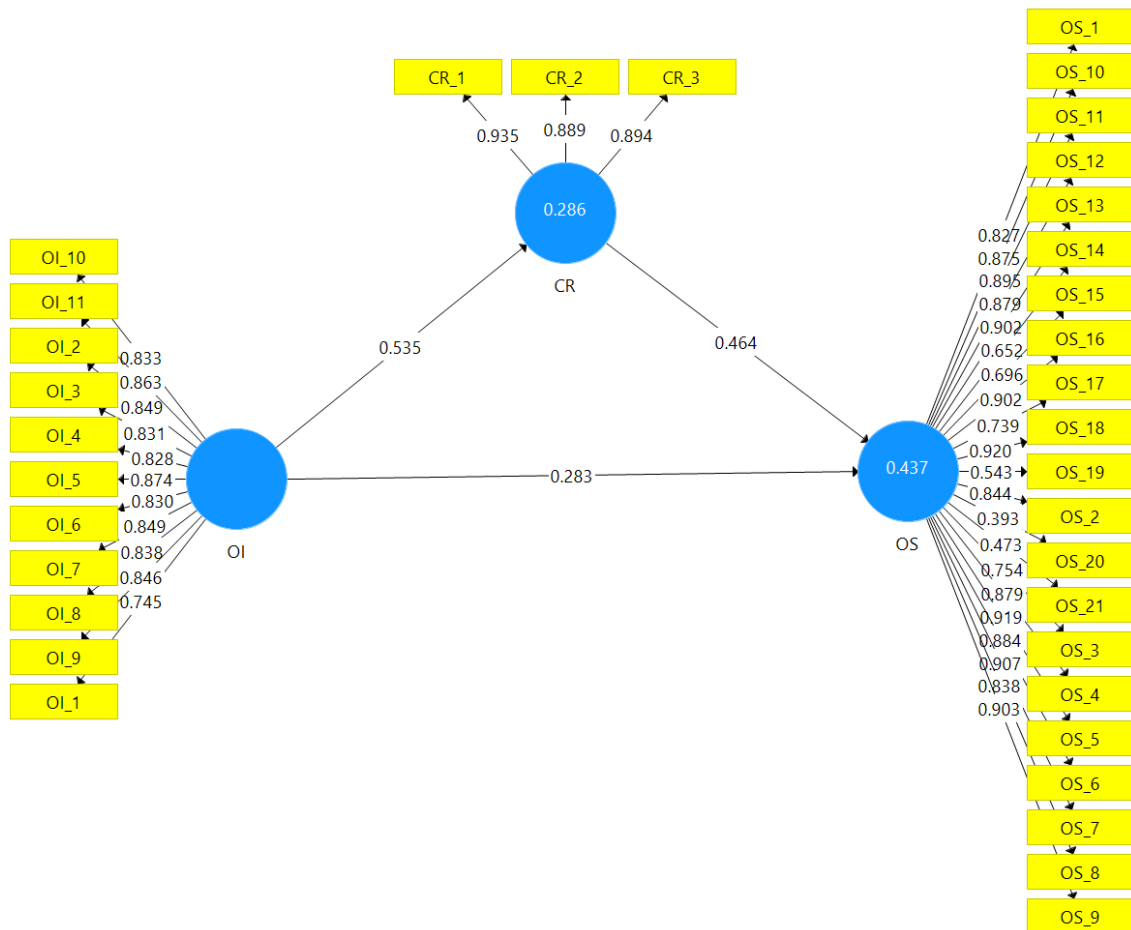
HTMT	1.	2.	3.
1. Corporate risk management			
2. Open innovation	.574		
3. Organizational strategy	.653	.547	

Source: Data analysis based on SmartPLS 3 (2021).

The measurement model is presented in Figure 1.

Figure 1

Evaluation of the measurement model



Source: Data analysis based on SmartPLS 3 (2021).

4.3 Results of the structural model evaluation

For this purpose, model significance was assessed based on path coefficients, *t-values* and standard errors. The hypotheses were tested for main and indirect effects by bootstrapping procedure

using Smart PLS 3 (Ringle et al., 2005). The PLS algorithm followed by *bootstrapping* techniques were used to calculate the relative strength of each exogenous construct.

According to Chin (1998), all hypotheses are significant, who advocates a minimum structural coefficient of 0.2. Open innovation has a significant and positive relationship with organizational strategy ($\beta=0.296$, $t=5.626$; LL=0.194, UL=0.399) and corporate risk management ($\beta=0.543$, $t=11.583$; LL=0.447, UL=0.630); thus, H1 and H2 were supported. Furthermore, corporate risk management has a significant and positive relationship with organizational strategy ($\beta=0.447$, $t=6.814$; LL=0.312, UL=0.567); thus, H3 was likewise supported. The lower and upper bounds included zero, thus indicating significant relationships (Table 4).

Table 4

PLS Structural model results

Hypotheses	Original sample (O)	Sample Average (M)	Standard Deviation (STDEV)	T-statistic (O/STDEV)	L.L.	U.L.	Result
H1: OI -> OS	0,296	0,296	0,053	5,626*	0.194	0.399	Supported
H2: OI -> CR	0,542	0,543	0,047	11,583*	0.447	0.630	Supported
H3: CR -> OS	0,447	0,446	0,066	6,814*	0.312	0.567	Supported
H4: HI -> CR -> OS	0,242	0,243	0,045	5,444*	0.159	0.330	Supported

Note: * $p < 0.001$.

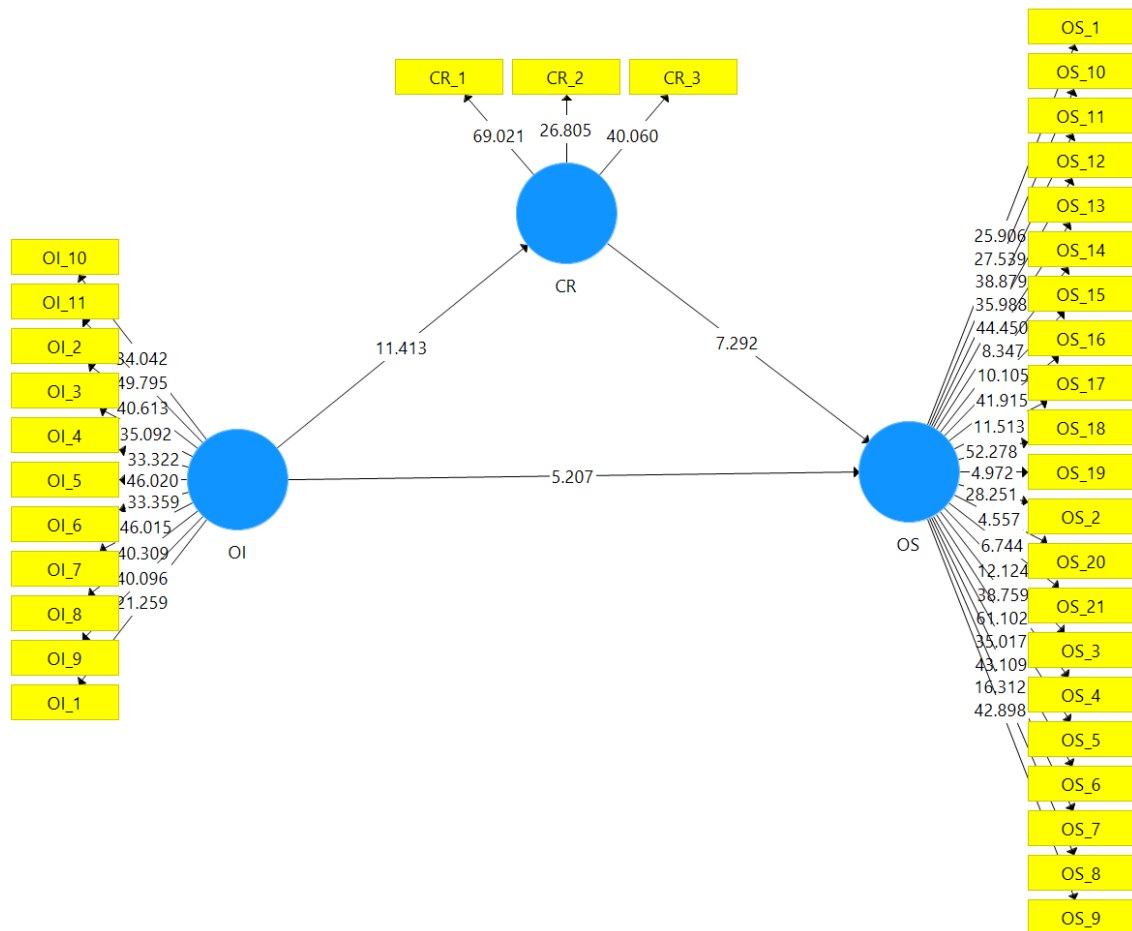
Source: Data analysis based on SmartPLS 3 (2021).

Corporate risk management exhibits a significant mediating effect on the relationship between open innovation and organizational strategy ($\beta=0.243$, $t=5.444$; LL=0.159, UL=0.330); consequently, H4 was also supported (Table 4).

In Figure 2, it is possible to observe the evaluation of the structural research model, considering both the direct and indirect effects.

Figure 2

Evaluation of the structural model



Source: Data analysis based on SmartPLS 3 (2021).

5 Discussion and conclusions

The positive and significant relationship between open innovation and organizational strategy expressed in hypothesis 1 was supported ($\beta=0.296$; $t=5.626$; $p<0.001$). The process of identifying open innovation as an organizational strategy has been an essential step to discover the risk factors to which companies are subjected (Chesbrough & Rosenbloom, 2002). The business model should indicate the degree or intensity that the organizational strategy can have as a competitive advantage so that its replication by competitors is difficult to conceptualize (Chesbrough & Rosenbloom, 2002). Therefore, the guiding element of the business model lies in the discovery of how to leverage innovation, i.e., where all the energy released in the development of new products should be combined with the development of a business model that defines the “going to market” and the “value capture” strategies (Denicolai et al., 2014). The role of the model is based on its ability to transform ideas into profits, in which companies that seek innovation should not be at the mercy only of internal knowledge; in other words, they should

not depend exclusively on the knowledge of their human resources, they should go beyond and seek external knowledge (partnerships) (Chesbrough, 2003).

Hypothesis 2 was supported by confirming the positive and significant relationship between open innovation and corporate risk management ($\beta=0.543$; $t=11.583$; $p<0.001$). Thus, the larger the field of research in open innovation, the more diverse the threats reside in this context, as collaboration between firms can lead to new risks and threats (Lee et al., 2010). These results are in line with the perspective that decision-making is the most critical moment of the organization, since it requires the allocation of irreversible, necessary and scarce resources in actions mediated by risks and uncertainties in which the results may affect the entire organizational structure, since the decision-making process is characterized by novelty, complexity and openness (Mintzberg et al., 1976). Innovation is a risky business, generates a high failure rate between the initial idea and the materialization of the launch of a product or service in the market unless the process is carefully managed (Tidd et al., 2009). In this sense, it is up to top management to identify how best to deal with the corporate risks that are presented to it in conducting the business, to achieve the organization's goals with greater security, where the performance of open innovation should be seen and discussed in the light of the degree of novelty created by the projects approved by top management (Lassen, 2017).

The results support hypothesis 3 ($\beta=0.447$; $t=6.814$; $p<0.001$), in which the causal relationship between corporate risk management and organizational strategy is analyzed, thus demonstrating a positive and significant relationship. Yilmaz and Flouris (2017) argue that an organization should develop different strategies to improve reputation and reduce risk, thus implementing corporate risk management policies indispensable to build a strategy. Corporate risk management practices are vital for financial performance and improve the non-financial performance of firms (Rasid et al., 2014). Consequently, top management is responsible for organizational strategy such as cost reduction and long-term planning and needs to be aware of corporate risk practices that influence organizational strategy (Meidell & Kaarbøe, 2017). Thus, the decision-making process is fundamental to creating value and improving the firm's image, increasing the reputation of strategic capability and responding successfully to new opportunities (Foroudi, 2016). The results converge with those of Acharyya and Mutenga (2013) because the risk manager is seen as a central function for various types of businesses to ensure opportunities based on decision-making as a proactive measure to ensure the organization's sustainability.

Hypothesis 4 was supported. The results confirm the mediating effect of corporate risk management on the relationship between open innovation and organizational strategy ($\beta=0.243$; $t=5.444$; $p<0.001$). Chesbrough and Crowther (2006) state that adopting open innovation tools is a choice of company strategy that provides arguments for collaboration with external partners. For business, corporate risk management as an organizational strategy is an informative source of open innovation and innovation platforms, becoming an essential part of the business model, especially in

digital changes (Chesbrough & Brunswicker, 2014). Open innovation practices differ across firms and across types of corporate risk, such as finding ways to increase turnover and develop new products (Chesbrough, 2003). Besides the direct impact on the firm's strategy, there are also additional opportunities for innovation practices, including access to external knowledge, resources, markets, or skills requirements, reduced product development time and cost, risk-sharing, and faster market launch (Chesbrough & Crowther, 2006). The corporate risks of open innovation include loss of knowledge, essential technologies and organizational skills, technological and market uncertainty and complexity of managing interactions with external partners (Chesbrough, 2003). In addition to the high degree of innovation, openness can lead to difficulties for firms in intellectual protection, ownership and appropriation of the benefits of innovation (Lazarenko, 2019). Reluctance to changing traditional organizational practices, particularly when sharing knowledge and intellectual property with external partners, also restricts open innovation practice. Most of the problems faced by firms in implementing the management model of open innovation lies in the activities of top management in addressing resistance to change from the organizational point of view and establishing a new corporate culture, often makes it difficult to change the management model in the organization (Lazarenko, 2019).

6 Conclusions

The research allowed to classify three specific objectives through the studied constructs to weigh the areas involved with open innovation and to understand to what extent (1) there is a positive relationship between open innovation, corporate risk management and organizational strategy and (2) the mediating interaction of corporate risk management in the relationship between open innovation and organizational strategy.

As for the first objective, some guiding points were highlighted as a contribution to the advancement of the theory on innovation. It was observed that the relationship between open innovation and organizational strategy operates predominantly in the innovation generation stage of the company, as well as the constant and systematic updates of the literature have printed greater robustness to the conceptual research model of the study and found relevant evidence of the external environment of technology input (e.g. information, ideas, knowledge, with open innovation output), in which the company often forms external partnerships with customers, competitors, research units, consultants, communities, open-source, suppliers, governments or service universities for research and development activities (user open innovation). For Hippel (2013), the generation of innovation takes place in corporate structures, particularly with R&D. From the user's point of view, the process of innovation generation can happen both for the individual (managers/employees) and for firms, which at times play the role of users. In this logic, the innovation generation process uses the term *open user innovation* to designate the innovation generated by users.

Regarding the second objective, it was observed that the corporate risk interferes with the organizational strategy. For Enkel, Gassmann and Chesbrough (2010), this relationship is consistent with the open innovation model. Therefore, the industries' external actors form innovation generating partnerships and play a key role in users. To achieve partnerships, firms need to develop absorptive capabilities (Hossain & Kauranen, 2015), which means the firm's ability to perceive, evaluate, assimilate and apply new knowledge, thus requiring firms to develop disruptive capabilities, which means the ability to exploit external knowledge. On the other hand, organizational strategy has proven relevant with management mechanisms (Oyewobi et al., 2016).

As for the third and last objective, there is a mediating effect of corporate risk in the relationship between open innovation and organizational strategy, from the open innovation model in SMEs. Hinteregger et al. (2018) list the difficulties these firms face when implementing the open innovation model; studies show that these firms are afraid to reveal their innovations and introduce their best practices of open innovation (partnerships). Hossain and Kauranen (2015) add in this dialogue that when connecting to a globalized market, SMEs are still very dependent on their R&D structure. In addition, the managers' skills, innovation practices and the firm's ability to attract government investments in R&D and technological development are barriers to the implementation of open innovation in SMEs.

It is important to highlight the **theoretical implications of the research**. This study provides a theoretical framework for understanding the relationships between three constructs (open innovation, corporate risk management and organizational strategy) in SMEs in the hospitality sector, not yet explored by academics, with the following contributions: (1) the research model comprises the use of different measurement scales to validate it with more robust measurement instruments for analysis; this study analyzes in depth the psychometric properties of all latent variables of the structural model (PLS-SEM), presenting the differentiated paths between endogenous and exogenous constructs and (2) the role of the open innovation model was emphasized, in the proportion that it can enhance or influence the attraction of resources needed for the development of the hospitality activity, that is, organizational and technological resources. Thus, we consider that this research allows us to fill existing gaps in the literature.

This study presents relevant **practical implications**. The results of this study contribute to the development of new instruments and programs to support SMEs in the hospitality sector. By identifying resources, technologies and dynamic capabilities that influence open innovation and organizational strategy, directly or indirectly, with the contribution of corporate risk management, this study is useful for top managers, stimulating entrepreneurial behavior and thus consubstantiating a factor of attracting resources and capabilities needed by the company and the involvement with other sectors of the economy, since the hospitality sector is important to improve the performance of companies.

The relationship between the constructs will allow top managers to strengthen the resources and business capabilities, thus promoting policies that promote the relationship between open innovation,

corporate risk management and organizational strategy in different contexts, creating causal links with an inductive effect on top management for the development of management capacity. Finally, this study will allow governments (national, regional and local) to create policies, programs and incentives that allow companies to join or deepen the model of open innovation, thus promoting the exchange of internal knowledge with the external, thus allowing to strengthen the dynamics of the entrepreneurial ecosystem.

Some limitations stand out in the course of this scientific study. Firstly, the sample size. Although the number of responses from firms is deemed significant (251), we believe that a more comprehensive sample would enable a more refined analysis of results. Furthermore, this is a non-probabilistic sample by convenience. Secondly, only hotel executive directors were surveyed, and the survey does not characterize whether this senior manager responded to this one. We also understand that assessing the different constructs based on a single person’s opinion may not accurately reflect the firm’s reality.

Authors’ contributions

Contribution	Musiello-Neto, F.	Rua, O.L	Arias-Oliva, M.	Souto-Romero, M.
Contextualization	X	X	X	X
Methodology	X	X	X	----
Software	X	X	X	----
Validation	X	X	X	----
Formal analysis	X	X	X	X
Investigation	X	X	----	----
Resources	X	----	----	----
Data curation	X	X	----	----
Original	X	X	----	----
Revision and editing	----	----	X	X
Viewing	----	----	X	X
Supervision	----	X	X	----
Project management	----	X	----	----
Obtaining funding	----	----	----	----

References

- Acuña-Carvajal, F., Pinto-Tarazona, L., López-Ospina, H., Barros-Castro, R., Quezada, L., & Palacio, K. (2019). An Integrated Method to Plan, Structure and Validate a Business Strategy Using Fuzzy DEMATEL and the balanced Scorecard. *Expert Systems With Applications*, 122, 351-368. <https://doi.org/10.1016/j.eswa.2019.01.030>
- Acharyya, M., & Mutenga, S. (2013). The benefits of implementing enterprise risk management: evidence from the non-life insurance industry. *Enterprise Risk Management*, 6(1), 22-24. <http://www.ermsymposium.org/2013/>
- Agarwal, R., & Ansell, J. (2016). Strategic Change in Enterprise Risk Management. *Strategic Change*, 25, 427-439. <https://doi.org/10.1002/jsc.2072>

- Almirall, E., & Casadesus-Masanell, R. (2010). Open Versus Closed Innovation: A Model of Discovery and Divergence. *Academy of Management Review*, 35(1), 27-47. <https://doi.org/10.5465/AMR.35.1.ZOK27>
- Audretsch, D. B., & Lehmann, E. (2006). Entrepreneurial access and absorption of knowledge spillovers: Strategic board and managerial composition for competitive advantage. *Journal of Small Business Management*, 44(2), 155-166. <https://doi.org/10.1111/j.1540-627X.2006.00161.x>
- Balodi, K. C. (2014). Strategic Orientation and Organizational Forms: An Integrative Framework. *European Business Review*, 26, 188-203. <https://doi.org/10.1108/EBR-08-2013-0106>
- Bature, A., Melville, L., Rahman, K. M., & Akhtar, J. (2018). An Investigation into the Effects of Risks and Risk Management of Bioenergy Projects. *E3S Web of Conferences*, 61. <https://doi.org/10.1051/e3sconf/20186100006>
- Baumann-Pauly, D., Wickert, C., Spence, L., & Scherer, A. (2013). Organizing corporate social responsibility in small and large firms: Size matters. *Journal of Business Ethics*, 115(4), 693-705. <https://doi.org/10.1007/s10551-013-1827-7>
- Bierwerth, M., Schwens, C., Isidor, R., Isidor, R., & Kabst, R. (2015). Corporate entrepreneurship and performance: A meta-analysis. *Small Business Economics*, 45, 255-278. <https://doi.org/10.1007/s11187-015-9629-1>
- Bogers, M., Zobel, A-K., Afuah, A., Almirall, E., Brunswicker, S., Dahlander, L., Frederiksen, L., Gawer, A., Gruber, M., Haefliger, S., Hagedoorn, J., Hilgers, D., Laursen, K., Magnusson, M. G., Majchrzak, A., McCarthy, I. P., Moeslein, K. M., Nambisan, S., Piller, F. T., Radziwon, A., Lamastra, C. R., Sims, J., & Anne L. J. Ter Wal. (2017). The open innovation research landscape: established perspectives and emerging themes across different levels of analysis. *Industry and Innovation*, 24(1), 8-40. <https://doi.org/10.1080/13662716.2016.1240068>
- Bradley, D. (2018). Applying the thira to Special Events: A Framework for Capabilities-Based Planning Adoption in Local Governments. *The Journal of the NPS Center for Homeland Defense and Security*, XVII. <https://www.hsaj.org/articles/14939>
- Brislin, R. W. (1970). Back-Translation for Cross-Cultural Research. *Journal of Cross-Cultural Psychology*, 1(3). <https://doi.org/10.1177/135910457000100301>
- Brunswicker, S., & Vanhaverbeke, W. (2015). Open Innovation in Small and Medium-Sized Enterprises: External Knowledge Sourcing Strategies and Internal Organizational Facilitators. *Journal of Small Business Management*, 53(4), 1241-1263. <https://doi.org/10.1111/jsbm.12120>
- Cantele, S., & Zardini, A. (2020). What drives small and medium enterprise towards sustainability? Role of interaction between pressures, barriers, and benefits. *Corporate Social Responsibility and Environmental Management*, 27(1), 126-136. <https://doi.org/10.1002/csr.1778>
- Chesbrough, H. W. (2003). *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Boston, MA: Harvard Business School Press. <https://hbsp.harvard.edu/product/2831-PBK-ENG>
- Chesbrough, H., & Bogers, M. (2014). Explaining Open Innovation: Clarifying an Emerging Paradigm for Understanding Innovation. In H. Chesbrough, W. Vanhaverbeke, J. West (Eds.), *New frontiers in open innovation* (pp. 3-28). Oxford University Press, Oxford. <https://doi.org/10.1093/acprof:oso/9780199682461.003.0001>

- Chesbrough, H. W., & Brunswicker, S. (2014). A fad or a phenomenon? The adoption of open innovation practices in large firms. *Research-Technology Management*, 57(2), 16- 25. <https://doi.org/10.5437/08956308X5702196>
- Chesbrough, H. W., & Crowther, A. K. (2006). Beyond high tech: early adopters of open innovation in other industries. *R&D Management*, 36(3), 229-236. <https://doi.org/10.1111/j.1467-9310.2006.00428.x>
- Chesbrough, H. W., & Rosenbloom, R. S. (2002). The Role of the Business Model in Capturing Value from Innovation: Evidence from Xerox Corporation's Technology Spin-Off Companies. *Industrial and Corporate Change*, 11(3), 529-555. <https://doi.org/10.1093/icc/11.3.529>
- Chin, W. W. (1998). The Partial Least Squares approach to structural equation modelling. In G. A. Marcoulides (Ed.), *Modern methods for business research* (pp. 295-336). Psychology Press. https://www.routledge.com/Modern-Methods-for-Business-Research/Marcoulides/p/book/9780805830934?utm_source=cjaffiliates&utm_medium=affiliates&cjevent=26f27f4990e411ec802fdfaa0a180514
- Chin, W. W. (2010). How to write up and report PLS analyses. In V. E. Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of partial least squares: Concepts, methods and applications in marketing and related fields* (pp. 655-690). Berlin: Springer. https://doi.org/10.1007/978-3-540-32827-8_29
- Cheng, C. C. J., & Huizingh, E. K. R. E., (2014). When Is Open Innovation Beneficial? The Role of Strategic Orientation. *Journal of Product Innovation Management*, 31(6), 1235-1253. <https://doi.org/10.1111/jpim.12148>
- Covin, J. G., & Slevin, D. P.. (1989). Strategic Management of Small Firms is Hostile and Benign Environments. *Journal Strategic of Management*, 10(1), 75-87. <https://doi.org/10.1002/smj.4250100107>
- Cucculelli, M., & Bettinelli, C. (2015). Business models, intangibles and firm performance: Evidence on corporate entrepreneurship from Italian manufacturing SMEs. *Small Business Economics*, 45(2), 329-350. <https://doi.org/10.5465/AMBPP.2014.16260abstract>
- Dahlander, L., & Gann, D. M. (2010). How Open Is Innovation? *Research Policy*, 39, 699-709. <https://doi.org/10.1016/j.respol.2010.01.013>
- Denicolai, S., Ramirez, M., & Tidd, J. (2014). Creating and capturing value form external knowledge: the moderating role of knowledge intensity. *R&D Management*, 44(3), 248-264. <https://doi.org/10.1111/radm.12065>
- Dias, A., Rodrigues, L. L., Craig, R., & Neves, M. E. (2019). Corporate social responsibility disclosure in small and medium-sized entities and large companies. *Social Responsibility Journal*, 15(2), 137-154. <https://doi.org/10.1108/SRJ-05-2017-0090>
- Drechsler, W., & Natter, M., (2012). Understanding a firm's openness decisions in innovation. *Journal of Business Research*, 65, 438-445. <https://doi.org/10.1016/j.jbusres.2011.11.003>
- Durst, S., Bruns, G., & Henschel, T. (2016). The Management of Knowledge Risks: What do We Really Know? *International Journal of Knowledge and Systems Science*, 7, 19-29. <https://doi.org/10.4018/IJKSS.2016070102>

- Eftekhari, N., & Bogers, M. (2015). Open for Entrepreneurship: How Open Innovation can Foster New Venture Creation. *Creativity and Innovation Management*, 24(4), 574-584. <https://doi.org/10.1111/caim.12136>
- Enkel, E., Gassmann, O., & Chesbrough, H. (2009). Open R&D and open innovation: exploring the phenomenon. *R&D Management*, 39(4), 311-316. <https://doi.org/10.1111/j.1467-9310.2009.00570.x>
- European Commission (2003). Concerning the definition of micro, small and medium-sized enterprises. Recommendation 2003/361/EC, European Commission, Brussels. https://europeanlaw.lawlegal.eu/definition-of-micro-small-and-medium-sized-enterprises/#Definition_of_micro_small_and_medium-sized_enterprises
- Fey, C. F., & Birkinshaw, J. (2005). External sources of knowledge, governance mode, and R&D performance. *Journal of Management*, 31(4), 597-621. <https://doi.org/10.1177/0149206304272346>
- Fornell, C., & Larcker, D. (1981). Evaluating structural equation models with unobserved variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50. <https://doi.org/10.1177/002224378101800104>
- Foroudi, P. (2019). Influence of brand signature, brand awareness, brand attitude, brand reputation on hotel industry's brand performance. *International Journal of Hospitality Management*, 76(Part A), 271-285. <https://doi.org/10.1016/j.ijhm.2018.05.016>
- García-Sánchez, E., García-Morales, V., & Martín-Rojas, R. (2018). Analysis of the Influence of the Environment, Stakeholder Integration Capability, Absorptive Capacity, and Technological Skills on Organizational Performance Through Corporate Entrepreneurship. *International Entrepreneurship and Management Journal*, 14(2), 345-377. <https://www.springerprofessional.de/en/analysis-of-the-influence-of-the-environment-stakeholder-integra/12060300>
- Gefen, D., & Straub, D. (2005). A practical guide to factorial validity using PLS-graph: Tutorial and annotated example. *Communications of the Association for Information Systems*, 16(1), 91-109. <https://aisel.aisnet.org/cais/vol16/iss1/5>
- Gray, C., & Mabey, M. (2005). Management Development: Key Differences between Small and Large Businesses in Europe. *International Small Business Journal: Researching Entrepreneurship*, 23(5), 467-48. <https://doi.org/10.1177/0266242605055908>
- Greco, M., Grimaldi, M., & Cricelli, L. (2015). Open innovation actions and innovation performance: A literature review of European empirical evidence. *European Journal of Innovation Management*, 18(2), 150-171. <https://doi.org/10.1108/EJIM-07-2013-0074>
- Hair, J., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. London, UK: Sage. <https://us.sagepub.com/en-us/nam/a-primer-on-partial-least-squares-structural-equation-modeling-pls-sem/book244583>
- Heine, I., Beaujean, P., & Schmitt, R. (2016). Conceptual Framework for analyzing the fit between organizational strategy and culture. *Procedia CIRP*, 51, 79-84. <https://doi.org/10.1016/j.procir.2016.05.096>

- Henseler, J., Ringle, C. M. & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43, 115-135. <https://doi.org/10.1007/s11747-014-0403-8>
- Hippel, E. V. (2005). Democratizing innovation: The evolving phenomenon of user innovation. *Journal für Betriebswirtschaft*, 1, 121-131. <https://doi.org/10.1007/s11301-004-0002-8>
- Hossain, M. , & Kauranen , I. (2016). Open innovation in SMEs: a systematic literature review. *Journal of Strategy and Management*, 9(1), 58-73. <https://doi.org/10.1108/JSMA-08-2014-0072>
- Huizingh , E. K. (2011). Open innovation: State of the art and future perspectives, *Technovation*, 31(1), 2-9. <https://doi.org/10.1016/j.technovation.2010.10.002>
- IRDA (2017, March 27, 2019). Indian Insurance Market. <https://www.ibef.org/industry/insurance-sector-india.aspx>
- Kaše, R., & Škerlavaj, M. (2016). Non-technological innovation research: evaluating the intellectual structure and prospects of an emerging field. *Scandinavian Journal of Management*, 32(2), 69-85. <https://doi.org/10.1016/j.scaman.2016.02.001>
- Krause, W., & Schutte, C. S. L. (2015). A perspective on Open Innovation in Small- and Medium-Sized Enterprises in South Africa, and Design Requirements for an Open Innovation Approach. *South African Journal of Industrial Engineering*, 26(1), 163-178. <https://doi.org/10.7166/26-1-997>
- Krejcie, R. V., & Morgan, D. W. (1970). Determining Sample Size for Research Activities. *Educational and Psychological Measurement*, 30(3). <https://doi.org/10.1177/001316447003000308>
- Kreiser, P. M., Kuratko, D. F., Covin, J. G., Irelan, D. R., & Hornby, J. S. (2021). Corporate entrepreneurship strategy: extending our knowledge boundaries through configuration theory. *Small Business Economics*, 56, 739-758. <https://doi.org/10.1007/s11187-019-00198-x>
- Kumar, K., Betra, R., & Boesso, G. (2020). Difference in stakeholder engagement approach of small & medium enterprises and large companies and its performance implications. *Corporate Social Responsibility and Environmental Management*, 28(3),1055-1065. <https://doi.org/10.1002/csr.2100>
- Laursen, K., & Salter, A (2006) Open for innovation: the role of openness in explaining innovation performance among U.K. manufacturing firms. *Strategic Management Journal*, 27(2), 131-150, 2006. <https://doi.org/10.1002/smj.507>
- Lassen, A. H. , & Laugen, B. T. (2017). Open innovation: on the influence of internal and external collaboration on degree of newness. *Business Process Management Journal*, 23(6), 1129-1143. <https://doi.org/10.1108/BPMJ-10-2016-0212>
- Lee, S., Park, G., Yoon, J., & Park, J. (2010), Open innovation in SMEs: An intermediated network model. *Research Policy*, 39, 290-300. <https://doi.org/10.1016/j.respol.2009.12.009>
- Leiponen, A., & Helfat, C. E. (2010). Innovation objectives, knowledge sources, and the benefits of breadth. *Strategic Management Journal*, 31(2), 224-236. <https://doi.org/10.1002/smj.807>

- Lopes, A. V. B. V., & De Carvalho, M. M. (2018). Evolution of the Open Innovation Paradigm: Towards a Contingent Conceptual Model. *Technological Forecasting & Social Change*, 132, 284-298. <https://doi.org/10.1016/j.techfore.2018.02.014>
- Meidell, A., & Kaarbae, K. (2017). How the enterprise risk management function influences decision-making in the organization: A field study of a large, global oil and gas company. *The British Accounting Review*, 49(1), 39-55. <https://doi.org/10.1016/j.bar.2016.10.005>
- Menon, A., Bharadwaj, S. G., Adidam, P. T. , & Edison, S. W. (1999). Antecedents and consequences of marketing strategy making: a model and a test. *Journal of Marketing*, 63(2), 18-40. <https://doi.org/10.1177/002224299906300202>
- Milutinović, R., Stošić, B., & Mihić, M. (2015). Concepts and Importance of Strategic Innovation in SME's: evidence from Serbia. *Management: Journal of Sustainable Business & Management Solutions in Emerging Economies*, 20(77), 35-42. <https://doi.org/10.7595/management.fon.2015.0030>
- Mintzberg, H., Raisinghani, D., & Theoret, A. (1976). The Structure of "Unstructured" Decision Processes. *Administrative Science Quarterly*, 21(2), 246-275. <https://doi.org/2392045>
- Mitchell, R. K., Busenits, L. W., Bird, B., Gaglio, C. M., McMullen, J. S., Morse, E. A., & Smith, J. B. (2007). The central question in entrepreneurial cognition research. *Entrepreneurship Theory and Practice*, 31(1), 1-27. <https://doi.org/10.1111/j.1540-6520.2007.00161.x>
- Morgan, P. M., Jeffrey , G. C., & Michael, B. H. (2000). The Relationship between Environmental Dynamism and Small Firm Structure, Strategy, and Performance. *Journal of Marketing Theory and Practice. The Marketing and Entrepreneurship Interface*, 8(2), 63-78. <https://doi.org/10.1080/10696679.2000.11501869>
- Nunnally, J. C. (1978). *Psychometric theory*. 2nd Edition. New York: McGraw-Hill. [https://www.scirp.org/\(S\(czeh2tfqyw2orz553k1w0r45\)\)/reference/ReferencesPapers.aspx?ReferenceID=453912](https://www.scirp.org/(S(czeh2tfqyw2orz553k1w0r45))/reference/ReferencesPapers.aspx?ReferenceID=453912)
- Pestana, M. H., & Gageiro, J. N. (2010). *Análise de dados para ciências sociais: a complementaridade do SPSS* (5a ed.). Lisboa: Edições Sílabo. <https://silabo.pt/catalogo/informatica/aplicativos-estatisticos/livro/analise-de-dados-para-ciencias-sociais/>
- Odor, H. A. (2019). Literature Review on Organisational Learning and Learning Organisations. *International Journal of Information, Business and Management*, 11(3), 281-295. <https://doi.org/10.1016/j.jbusres.2019.07.039>
- Ostos, J., Hinderer, H., & Bravo, E. (2016). Relationship between the Business Environment and Business Strategy Types: Evidence in Peruvian Companies. *Universidad & Empresa*, 19(32), 65-86. <https://doi.org/10.12804/http://revistas.urosario.edu.co/index.php/empresa/article/view/4716>
- Oyewobi, L., Windapo, A., Rotimi, J., & Jimoh, R. (2016). Relationship between competitive strategy and construction organisation performance. *Management Decision*, 54(9), 2340-2366. <https://doi.org/10.1108/MD-01-2016-0040>
- Parida, V., Westerberg, M., & Frishammar, J. (2012). Inbound open innovation activities in high-tech SMEs: the impact on innovation performance. *Journal of Small Business Management*, 50(2), 283-309. <https://doi.org/10.1111/j.1540-627X.2012.00354.x>

- Podmetina, D., Soderquist, K. E., Petraite, M., & Teplov, R. (2018). Developing a competency model for open innovation from the individual to the organisational level. *Management Decision*, 56(6), 1306-1335. <https://doi.org/10.1108/MD-04-2017-0445>
- Pordata (2021a). *Small and medium-sized enterprises: total and by size (2018)*. <https://www.pordata.pt/Portugal/Pequenas+and+m%c3%a9days+enterprises+total+and+by+sizes%c3%a3o-2927>
- Pordata (2021b). *Companies: total and by size (2018)*. <https://www.pordata.pt/Portugal/Empresas+total+and+by+dimensions%c3%a3o-2857>
- Rasid, A., Zaleha, S., Ismail, W, Khairuzzaman, W, Mohammad, N., & Choi, S. L. (2014). Assessing Adoption of Project Management Knowledge Areas and Maturity Level: Case Study of a Public Agency in Malaysia. *Journal of Management in Engineering*, 30, 264-271. [https://doi.org/10.1061/\(ASCE\)ME.1943-5479.0000200](https://doi.org/10.1061/(ASCE)ME.1943-5479.0000200)
- Reilly, P. (2018). Building Customer Centricity in the Hospitality Sector: the role of talent management. *Worldwide Hospitality and Tourism Themes*, 10(1), 42-56. <https://doi.org/10.1108/WHATT-10-2017-0068>
- Roland, J. O., & Schoormans, J. P. L. (2004). The pattern of development and diffusion of breakthrough communication technologies. *European Journal of Innovation Management*, 7(4), 292-302. <https://doi.org/10.1108/14601060410565047>
- Russo, A., & Tencati, A. (2009). Formal vs informal CSR strategies: Evidence from Italian micro, small, medium-sized, and large firms. *Journal of Business Ethics*, 85(2), 339-353. <https://doi.org/10.1007/s10551-008-9736-x>
- Sarstedt, M., Ringle, C. M., Smith, D., Reams, R., & Hair, J. F. (2014) Partial Least Squares Structural Equation Modeling (PLS-SEM): A Useful Tool for Family Business Researchers. *Journal of Family Business Strategy*, 5, 105-115. <https://doi.org/10.1016/j.jfbs.2014.01.002>
- Sisodiya, S. R., Johnson, J. L., & Grégoire, Y. (2013) Inbound open innovation for enhanced performance: Enablers and opportunities. *Industrial Marketing Management*, 42(5), 836-849. <https://doi.org/10.1016/j.indmarman.2013.02.018>
- Slowak, A. P., & Regenfelder, M. (2017). Creating value, not wasting resources: sustainable innovation strategies. *Journal Innovation: The European Journal of Social Science Research*, 30(4), 455-475. <https://doi.org/10.1080/13511610.2016.1192990>
- Spyropoulou, S., Katsikeas, C. S., Skarmeas, D., & Morgan, N. A. (2018). Strategic goal accomplishment in export ventures: the role of capabilities, knowledge. and environment. *Journal of the Academy of Marketing Science*, 46(1), 109-130. <https://doi.org/10.1007/s11747-017-0519-8>
- Teece, D. J., Pisano, G., & Leih, S. (2016). Dynamic Capabilities and Organizational Agility: Risk, Uncertainty, and Strategy in the Innovation Economy. *California Management Review*, 58(4), 13-35. [https://doi.org/10.1002/\(SICI\)1097-0266\(199708\)18:7<509::AID-SMJ882>3.0.CO;2-Z](https://doi.org/10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z)
- Temel, S., & Vanhaverbeke, W. (2020). Knowledge Risk Management During Implementation of Open Innovation. In S. Durst and T. Henschel (Eds.). *Knowledge Risk Management* (pp. 207-227). Springer. https://doi.org/10.1007/978-3-030-35121-2_12

- Teplov, R., Albats, E., & Podmetina, D. (2019). What Does Open Innovation Mean? Business Versus Academic Perceptions. *International Journal of Innovation Management*, 23(1), 805-811. <https://doi.org/10.1142/S1363919619500026>
- Tidd, J., Bessant, J., & Pavitt, K. (2005). *Managing Innovation: integrating technological, market and organizational change* (3th. Edition). England: John Wiley & Sons, Ltd. <https://www.scirp.org/reference/referencespapers.aspx?referenceid=983917>
- Van De Vrande, V., De Jong, J.P.J., Vanhaverbeke, W., & De Rochemont, M. (2009). Open innovation in SMEs: Trends, motives and management challenges. *Technovation*, 29(6-7), 423-437. <https://doi.org/10.1016/j.technovation.2008.10.001>
- Verbano, C., & Venturini, K. (2013). Managing Risks in SMEs: A Literature Review and Research Agenda. *Journal of Technology Management & Innovation*, 8(3), 186-197. <http://dx.doi.org/10.4067/S0718-27242013000400017>
- Vrgovic, P., Vidicki, P., Glassman, B., & Walton, A. (2012). Open innovation for SMEs in developing countries-an intermediated communication network model for collaboration beyond obstacles. *Innovation: Management. Policy & Practice*, 14(3), 290-302. <https://doi.org/10.5172/impp.2012.14.3.290>
- West, J., Salter, A.; Vanheverbeke, W., & Chesbrough, H. (2014). Open innovation: The next decade. *Research Policy*, 43(5), 805-811. <https://doi.org/10.1111/radm.12425>
- Wijethilake, C., Munir, R., & Appuhami, R. (2018). Environmental Innovation Strategy and Organizational Performance: Enabling and Controlling Uses of Management Control Systems. *Journal of Business Ethics*, 151(4), 1139-1160. <https://doi.org/10.1007/s10551-016-3259-7>
- Wikhamn, B.R., & Wikhamn, W. (2013). Structuring of the Open Innovation Field. *Journal of Technology Management & Innovation*, 8(3), 173-185. <https://doi.org/10.4067/S0718-27242013000400016>
- Yilmaz, A., & Flouris, T. (2017). Resource Dependency Risk Management. In: *Corporate Risk Management for International Business. Accounting, Finance, Sustainability, Governance & Fraud: Theory and Application*. Springer, Singapore. https://doi.org/10.1007/978-981-10-4266-9_2
- Zott, C., Amit, R., & Massa, L. (2011). The Business Model: Recent Development and Future Research. *Journal of Management*, 37(4), 1019-1042. <https://doi.org/10.1007/s10551-013-1827-7>