
Impact of Open Innovation on Firm Performance: A Literature Review

South Asian Journal of
Business Insights
2022,2(1), 51-72.
ISSN 2773-7012(print)
ISSN 2773-6997(online)
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Abstract

This study investigates how the open innovation paradigm influences firm performance by synthesizing the existing literature on open innovation and firm performance. This study provides a better understanding of the concept of open innovation based on the current literature. The selection criteria were executed by the PRISMA article selection process linking open innovation and firm performance, published in peer-reviewed journals from 2015 to June 2021. The search string was tailored by Ebsco host, Elsevier, Emerald Insight and Sage publishers considering the inclusion and exclusion criteria. The descriptive method was used to analyze the selected articles. Numerous studies investigated that open innovation positively impacts firm performance, and few researchers demonstrated that open innovation has a U-shaped relationship with firm performance. Some studies discovered negative and mixed results on open innovation and firm performance. Due to the contradictory findings, more investigations on open innovation and firm performance are needed and this review produces knowledge for both practitioners and policymakers to implement their roles effectively. Especially these findings are significant for future researchers to identify the key areas that need to be investigated in the field of open innovation.

Keywords: Firm performance, Impact, Literature review, Open innovation

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Introduction

Open innovation (OI) is a multifaceted phenomenon and an umbrella paradigm in the field of innovation (Rangus, Drnovsek, & Minin, 2016). The concept of OI was first coined by Henry Chesbrough in 2003, highlighting the importance of using external sources to stimulate the internal innovation process of the organization (Lu, Yu, Zhang, & Xu, 2021). However, the scholars have applied different concepts as complementary assets, absorptive capacity and exploration and exploitation to express the activities in OI using different terms in the past, these activities have become a label after Chesbrough's original work (Noh, 2015). This turn proliferated the concept of OI and provided the baseline for opening up the innovation process (Flor, Cooper, & Oltra, 2017). Access to external knowledge is recognized as a critical source of firm performance (FP) (Greco, Grimaldi, & Cricelli, 2016). The literature has declared OI as a winning strategy in improving FP as an overall business strategy (Ahn et al., 2016). Due to the importance of OI as a philosophy, this concept is becoming increasingly popular in both practice and academia (Oltra, Flor, & Alfaro, 2018).

OI is an interesting research area with over three thousand publications in the Scopus data set over the last decade (Moretti & Biancardi, 2020). During the last few years, researchers have been involved in finding the impact of OI on FP in various contexts (Nazeer, Khawaja, Qazi, Syed, & Shamim, 2021). However, when comparing the previous research findings, mixed results have been obtained due to the complexity and heterogeneity of OI (Ahn, Minshall, & Mortara, 2015). Many scholars argue that the implementation of OI have a positive impact on FP (Mazzola, Bruccoleri, & Perrone, 2016; Oltra et al., 2018; Popa, Acosta, & Conesa, 2017). Some scholars noted an inverted U-shaped relationship (Caputo, Lamberti, Cammarano, & Michelino, 2016) or even a negative effect on FP (Wang & Jiang, 2020). Due to the inconsistency and inconclusive arguments, there is incomplete literature and an ongoing debate on the OI and FP. Thus, considering the insufficient literature on OI and FP, more investigations on OI and FP are needed.

Recent literature reviews have been investigated OI in specific areas such as tourism and hospitality (Marasco, Martino, Magnotti, & Morvillo, 2018), family firms (Gjergji, Lazzarotti, Visconti, & Garcia-Marco, 2019), start-ups (Spender, Corvello, Grimaldi, & Rippa, 2017) and small and medium-sized enterprises (SMEs) (Hossain & Kauranen, 2016). Oberg (2016) has completed a study by exploring the issues of acquisition in the OI environment. Greco, Grimaldi, & Cricelli (2015) have published a review paper on OI actions and innovation performance in European countries. However, these reviews shedding light on some portions of the phenomenon do not provide a broad overview of the existing body of literature in the field of OI. When the field expands and diversifies, there is a need to review the existing body of knowledge to synthesize the state-of-the-art research (Marasco et al., 2018). These shreds of evidence show a lack of research on synthesizing the concept of OI descriptively across periods. These gaps in the literature limit the understanding of

the actual contribution of OI to FP. Hence, it is necessary to look at the impact of OI on FP using different angles.

This study investigates how the OI paradigm impacts FP by synthesizing the existing literature on OI and FP. Further, this study aims to provide research agenda for future avenues. Accordingly, the contribution of this study is two-fold. First, the study provides an original contribution to the ongoing discussion on OI by synthesizing the current body of knowledge on OI and FP while providing unique insights into how the OI paradigm descriptively influences the FP. It gives the reader a meaningful overview of what is already known and what should be known of OI in the future. Second, the review serves as a roadmap of literature for both academicians and practitioners to make decisions on OI. Each OI practice may be more or less open (Aliasghar, Rose, & Chetty, 2019). Therefore, it is crucial to recognize which model has the highest impact on FP. Hence, this study represents a guide for selecting the most suitable strategy for the organization. Moreover, the findings can be considered as a starting point to build the foundation for future research.

Study Design

A literature review is a transparent and replicable scientific process (Greco et al., 2015). Hence, it is necessary to follow a precise and reproducible set of procedures to improve the quality of the review process (Natalicchio, Ardito, Savino, & Albino, 2017). Accordingly, this study followed PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis) method followed by other studies (Priyashantha, De Alwis, & Welmilla, 2021; Sikandar & Abdul Kohar, 2021). The PRISMA consists of four steps: identification, screening, eligibility, and inclusion, and follow these steps to select the articles for review.

In the identification stage, decided the databases, search terms and search criteria. The study mainly utilized the Ebsco host, as well Elsevier, Emerald Insight, and Sage databases for searching the articles. These databases consist of rich articles with highly relevant and quality since these databases were applied by several researchers to ensure and enhance the completeness of the publications in this area (Marasco et al., 2018). The authors focused to search articles on OI and FP simultaneously with both themes because it allows them to identify the interaction between these two concepts (Spender et al., 2017), thus the search terms were identified as “open innovation” and “firm performance”. The search criteria were developed by combining the main terms with AND operative and similar words combined with OR operative. Accordingly, search terms were constructed into the first search string as [“open innovation” AND “firm performance”]. Further, the study identified articles by including synonyms of OI as “distributed innovation” and “openness” using OR operative. Based on the collected articles from databases prepared a worksheet including title, keywords, authors’ names, journal name, etc... Subsequently, the duplicates were searched and removed from the worksheet.

In the screening stage selected articles were matched with the inclusion and exclusion criteria. The inclusion criteria for the current study were the “empirical studies”, published in “peer-reviewed journals” in “English” on “open innovation and firm performance” during the “2015-2021” period. All searchers spanned from empirical studies because it was easy to generalize and compare the research findings (Kraus, Kailer, Dorfer, & Jone, 2020). Especially focused on peer-reviewed journal articles since it validates the knowledge with the highest scientific impact and reduces the risks of analyzing articles with limited internal validity (Greco et al., 2015). In terms of time framework, many review papers on OI analyzed the articles up to 2015 (Greco et al., 2015; Hossain & Kauranen, 2016; Marasco et al., 2018), and to the best of our knowledge, very few reviews (Bigliardi, Ferraro, Filippelli, & Galati, 2020) were analyzed the articles after the period of 2015. As well, experts in the field of OI predicted a tremendous growth of OI literature since 2015 with the combination of sustainable development goals (2015-2030) and OI (Bogers, Chesbrough and Moedas, 2018). Then, the authors went through the title and abstract of each article and eliminated the articles that did not reach the inclusion criteria. Accordingly, the authors excluded articles based on the exclusion criteria as “review”, “qualitative”, “books”, “book chapters”, “book parts”, “expert briefing”, “magazines”, “conference papers”, “non-English”, “non-relevance to the scope of the current study” and “articles published before 2015”.

In the eligibility stage, the remaining articles were analyzed based on the full text of each article. In this stage, the authors evaluated the methodological reporting since this study focused on empirical studies. Nevertheless, the importance of evaluating the methodology was justified by several scholarly works (Priyashantha et al., 2021; Meline, 2006). As a result, the current study evaluated the population, sample, methodology, methods, design and context. Accordingly, the authors identified some studies based on qualitative reviews, perspectives, and ambiguous methods and seek original information about the methodology from the authors. Consequently, the authors discarded irrelevant papers from the sample.

In the final stage, the authors included 30 articles for the review and descriptively analyzed each criteria using the categories as the published journal, context, and unit of analysis, type of OI (Independent variable), type of performance (Dependent variable), research findings and key areas for future research from existing studies.

Data Analysis

The broad range of criteria allows for categorizing the content of the manuscripts explicitly and rigorously (Marasco et al., 2018). Accordingly, the summary of selected articles was reported in this section.

Table 1: The Selected Articles on Open Innovation and Firm Performance

Author/s	Journal	Context	Unit of Analyze	Type of OI (Independent)	Type of FP (Dependent)	Findings
Lu et al., 2021	Chinese Management Studies	China	236 Managers in SME manufacturing enterprises	OI breadth OI depth	Innovation performance	OI breadth and depth positively relate to innovation performance
Wang & Jiang, 2020	European Journal of Innovation Management	China	211 Managers in emerging enterprises	Openness	Innovation performance	Openness has a negative effect on innovation performance
Lorenz, Benninghaus, Friedli, & Netland, 2020	International Journal of Operations & Production Management	Switzerland	151 Managers in manufacturing industries	OI breadth OI depth	Operational performance	OI breadth and depth positively relate to operational performance with the adaptation of digital technologies
Liao, Fu, & Liu, 2020	Journal of Business & Industrial Marketing	China	238 Managers in high- tech enterprises	Inbound Outbound	FP	The technological capability has a significant effect on inbound innovation and FP but not on outbound innovation

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Cheng & Shiu, 2020	Sustainability Accounting, Management and Policy Journal	Taiwan	232 Managers in manufacturing firms	OI	Eco-innovation performance	Environmental uncertainty has a positive and significant effect on inbound innovation and eco-innovation performance but not for outbound innovation
Hou, Hong, & Zhu, 2019	Journal of Asia Business Studies	China	143 Managers in technology-oriented start-up's	Exploration innovation Exploitation innovation	FP	Exploration and exploitation innovation have a positive impact on FP
Exposito, Serrano, & Linan, 2019	Journal of Organizational Change Management	Spanish	1424 Owner-managers in SME sector	OI practices	Innovation outcomes	OI has a significant effect on innovation outcomes
Zhou, Wang, Yao, & Huang, 2019	Management Decision	China	231 Managers in manufacturing firms	Inbound Outbound	Innovation performance	Inbound innovation positively relate to innovation performance and outbound innovation has an inverted U- shaped relationship with innovation performance
Hinteregger, Durst, Temel, & Yesilay, 2019	International Journal of Innovation Management	Turkey	4679 Turkish SME's	Inbound Coupled	Innovation performance	Inbound and coupled innovation positively influence innovation performance

Jeong, Chung, & Roh, 2019	Clothing and Textiles Research Journal	Korea	156 Korean exporting SME's	Inbound	Innovation performance	Inbound innovation has a positive effect on innovation performance with absorptive capacity
Aliasghar et al., 2019	Industrial Marketing Management	Iran	171 Managers in Auto component supply firms	Inbound	Innovation performance	Inbound innovation has a significant positive impact on innovation performance
Wang & Xu, 2018	Baltic Journal of Management	China	165 Managers in service enterprises	Inbound Outbound	Radical innovation	Inbound innovation has a significant positive impact on radical innovation. outbound innovation and radical innovation positively combine with exploitative learning
Oltra et al., 2018	Business Process Management Journal	Spanish	244 Managers in low and medium technology industries	Inbound Outbound Coupled	FP	Inbound, outbound and coupled innovation have a positive impact on FP
Zhou, Yao, & Chen, 2018	Chinese Management Studies	China	247 Managers in manufacturing industries	Inbound Outbound	Innovation performance	Inbound and outbound innovation positively relate to innovation performance
Shi & Zhang, 2018	Journal of Organizational Change Management	China	58 Patent owners in the smartphone industry	OI breadth OI depth	Radical innovation capability	OI breadth decreases the radical innovation capability and OI depth increases the radical innovation capability

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Natalicchio, Petruzzelli, Cardinali, & Savino, 2018	Management Decision	Italy	2836 Manufacturing firms	OI strategy	Innovation performance	OI positively influence the innovation performance
Zhang, Yang, Qiu, Bao, & Li, 2018	Journal of Engineering and Technology Management	China	203 Listed companies in the mechanical manufacturing industry	OI	Financial performance	Inverted U-shaped relationship between OI and FP
Kobarg, Stumpf-Wollersheim, & Welppe, 2018	Research Policy	Germany	218 Managers in innovation projects in manufacturing firms	OI breadth OI depth	Innovation performance (Radical, incremental)	Inverted U- shaped relationship between search breadth on radical innovation and search depth on incremental innovation
Xie, Wang, & Zeng, 2018	Journal of Business Research	China	376 Managers in high-tech firms	OI	Radical innovation	OI has a significant positive impact on radical innovation
Burcharth, Knudsen, & Sondergaard, 2017	Business Process Management Journal	Denmark	307 Research and Development (R&D) managers in manufacturing firms	Inbound Outbound	Innovation performance	Inbound innovation positively relate to product innovation and outbound innovation positively relate to innovation sales

Portila, Cagno, & Brown, 2017	Business Process Management Journal	Europe	45 Managers in specialized SME's	OI practices OI models	FP	OI practices and OI models have a positive effect on FP through innovativeness
Lazzarotti, Bengtsson, Manzini, Pellegrin, & Rippa, 2017	European Journal of Innovation Management	Italy Sweden Finland UK	477 R&D managers in manufacturing industries	OI breadth OI depth	Innovation performance	OI breadth and depth positively relate to innovation performance
Bahemia, Squire, & Cousins, 2017	International Journal of Operations & Production Management	UK	205 New product development projects in manufacturing firms	OI breadth OI depth Partner newness	Product competitive advantage	OI breadth and partner newness positively influence product competitive advantage and OI depth has a negative effect on product competitive advantage.
Roldan Bravo, Montes, & Moreno, 2017	Journal of Business & Industrial Marketing	Europe	286 Managers from manufacturing and service firms	Orientation of OI	FP	Orientation of OI positively influence FP through supply chain competancies
Bayona-Saez, Cruz-Cazares, Garcia-Marco, & Gercia, 2017	Management Decision	Spanish	4539 Managers in food and beverage firms	OI strategy	Innovation performance	Inverted U- shaped relationship between OI and innovation performance

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Flor et al., 2017	European Management Journal	Spanish	172 R&D managers in medium and large industrial firms	OI breadth OI depth	Radical innovation	Both OI breadth and OI depth has not a significant effect on radical innovation
Caputo et al., 2016	Management Decision	European and non-European countries	110 Bio-Pharmaceutical companies	Inbound Outbound	Innovation performance Financial performance	OI is not beneficial for innovation performance and financial performance except sales growth
Cheng & Shiu, 2015	Management Decision	Taiwan	304 Managers in cross-industry	Inbound Outbound	Innovation performance (Radical, Incremental)	Inbound innovation increases radical innovation and hinders incremental innovation, while outbound innovation improves the incremental innovation and hinders the radical innovation through knowledge learning and organizational capabilities
Noh, 2015	Management Decision	New York	671 Listed companies	OI	Financial performance	OI positively impacts the long term financial performance
Mendez, Newell, Mesa, & Alegre, 2015	Industrial Marketing Management	Spanish	102 Managers in Biotechnology firms	OI breadth OI depth	Innovation performance FP	OI breadth and depth do not positively impact innovation performance and FP

Source: Literature Review (2021)

The following section descriptively presents and discusses the articles selected for the review by clustering them into different categories.

The Sources Divided by Journals

Figure 1 analyzes the 17 peer-reviewed journals that were used in the sample. It allows identifying the journals involved more in the research subjects and the evolution of the literature over time (Omerzel, 2016). It includes Baltic Journal of Management (1), Business Process Management Journal (3), Chinese Management Studies (2), European Journal of Innovation Management (2), International Journal of Operations & Production Management (2), Journal of Asia Business Studies (1), Journal of Business & Industrial Marketing (2), Journal of Organizational Change Management (2), Management Decision (6), Sustainability Accounting, Management and Policy Journal (1), Journal of Engineering and Technology Management (1), International Journal of Innovation Management (1), Clothing and Textiles Research Journal (1), Industrial Marketing Management (2), Journal of Business Research (1), European Management Journal (1), and Research Policy (1). Among them, Management Decision has published the majority of the articles in the sample. Figure 1 indicates that the research area on OI and FP is widespread in the literature (Natalicchio et al., 2017).

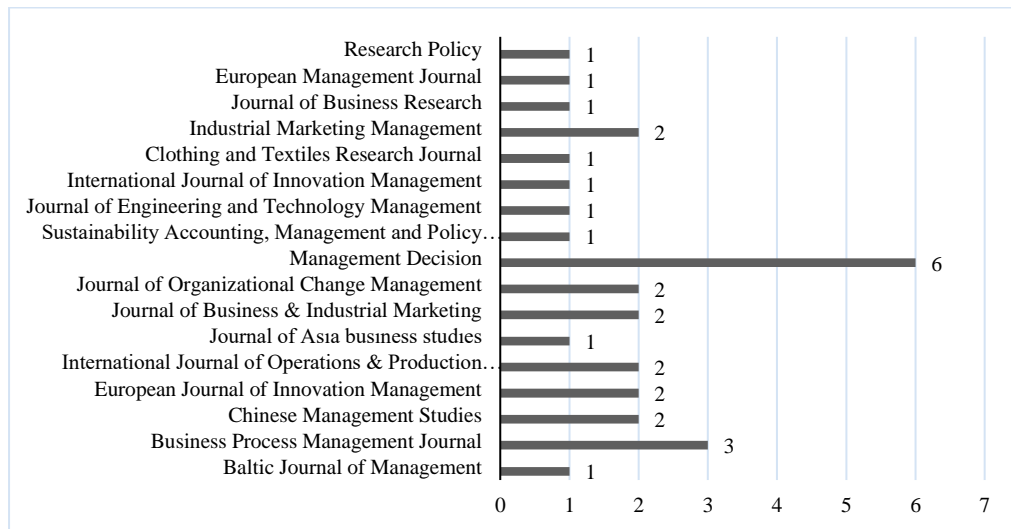


Figure 1: The Sources Divided by Journals

Context

Figure 2 reveals the context of the study covered by the 13 geographical areas as China (10), Spanish (5), Europe (3), Italy (2), Taiwan (2), Turkish (1), Korea (1), Iran (1), Denmark (1), Switzerland (1), UK (1), New York (1) and Germany (1). This evidence shows that studies of OI and FP have been covered by both developed and developing countries. However, the majority of publications have been done by China in this sample.

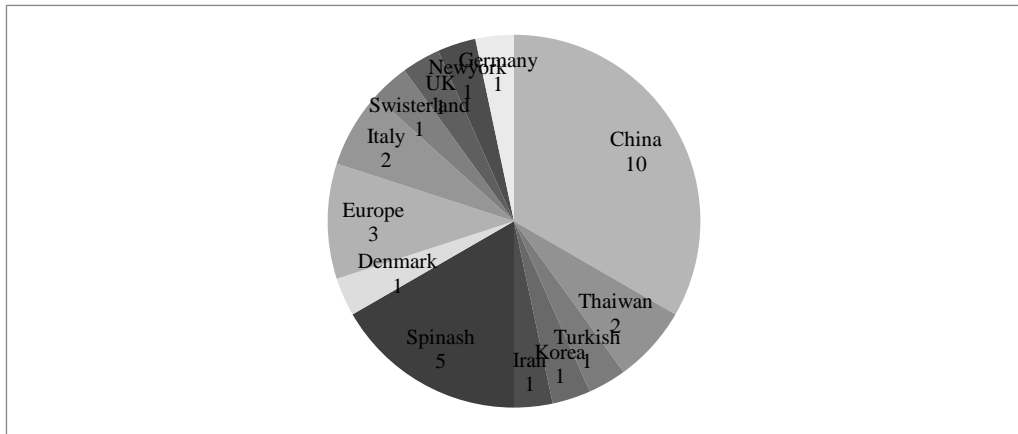


Figure 2: Context of the sample

Unit of Analysis

Among the sample, many studies (26) have used General Managers to collect data as respondents. Few studies (3) have used R&D Managers to gather information on OI practices. Only one study utilized Patent Owners to collect data. As reported in figure 3, many studies have gathered data from the general managers of the firms.

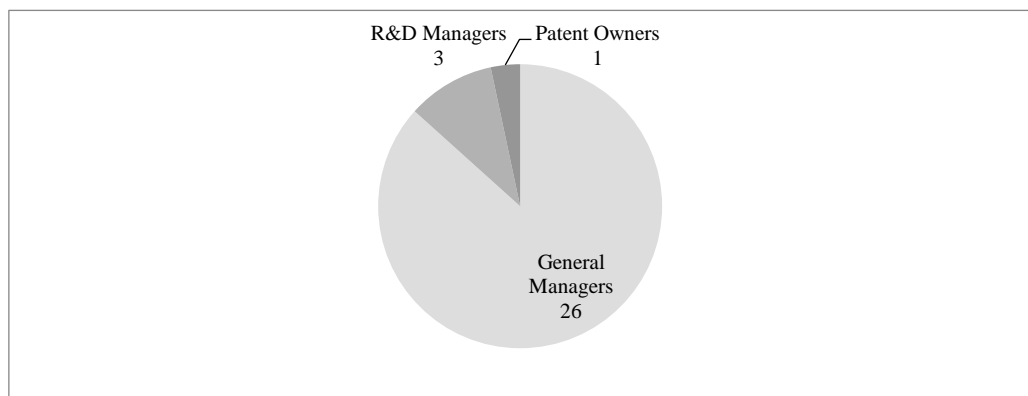


Figure 3: Unit of Analyze

Dimensions Used to Analyze the Open Innovation

Figure 4 indicates that scholars have used different dimensions to measure the concept of OI as Inbound (2), OI (4), OI Strategy (2), OI Practices (1), Orientation of OI (1), Breadth, Depth, and Partner Newness (1), Openness (1), OI Practices and OI Models (1), Search Breadth and Search Depth (7), Inbound, Outbound and Coupled (1), Inbound and Coupled (1) and Inbound and Outbound (8). Accordingly, the study has categorized the dimensions mentioned above into inbound, outbound, coupled, OI, and partner newness to identify the most critical dimension of OI within the sample.

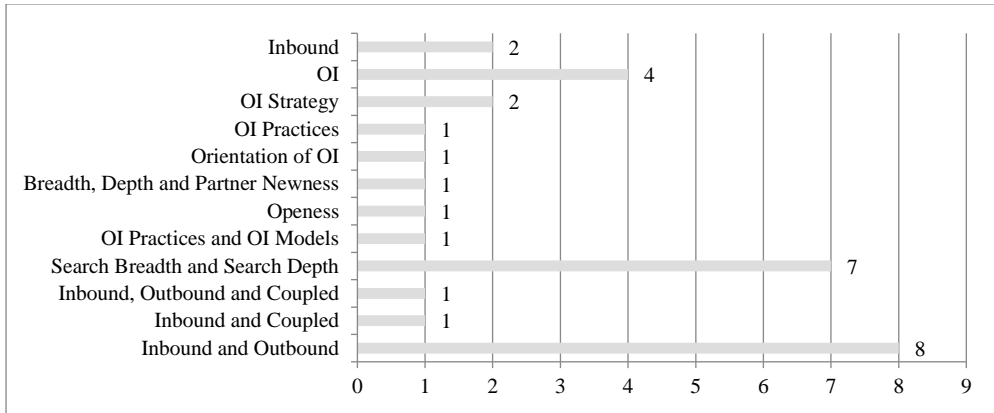


Figure 4: Dimensions Used to Analyze the Open Innovation

Mostly Used Dimensions of Open Innovation

Figure 5 demonstrates that researchers used Inbound (20), OI (10), Outbound (9), Coupled (2) and Partner Newness (1) to measure the concept of OI among the sample. Accordingly, figure 5 shows that majority of the studies used inbound innovation as a major dimension of OI.

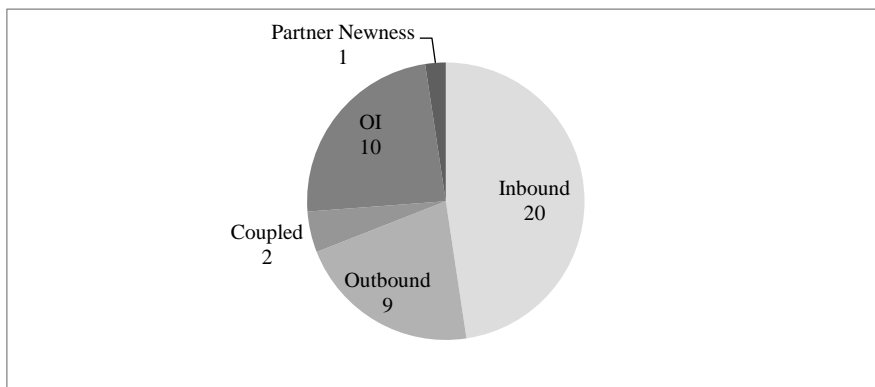


Figure 5: Mostly Used Dimensions of Open Innovation

Dimensions Used to Analyze the Firm Performance

In the selected sample, researchers have investigated FP based on the different dimensions as Eco-innovation Performance (1), Operational Performance (1), Innovation Performance & Financial Performance (2), Financial Performance (1), Innovation Performance (16), FP (5) and Radical Innovation (4). Figure 6 displays that the majority of the studies have used innovation performance to measure the FP.

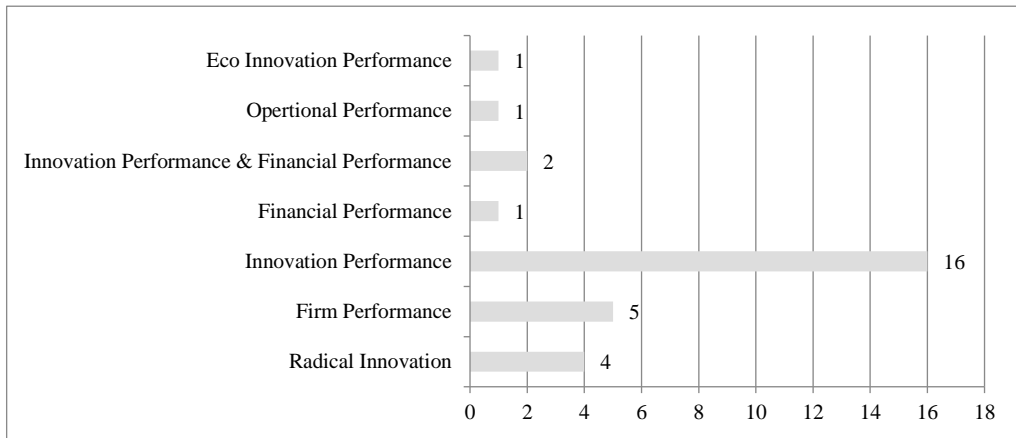


Figure: 6 Dimensions Used to Analyze the Firm Performance

Research Findings

According to table 1, previous studies found a positive relationship between inbound innovation and FP (Aliasghar et al., 2019; Jeong et al., 2019; Lazzarotti et al., 2017; Lorenz et al., 2020; Lu et al., 2021). As well, some scholars demonstrated that inbound and outbound innovation positively relates to FP (Burcharth et al., 2017; Hou et al., 2019; Wang & Xu, 2018; Zhou et al., 2018). OI as an aggregate concept numerous extant studies recorded positive results with FP (Expósito et al., 2019; Natalicchio et al., 2018; Noh, 2015; Portila et al., 2017; Roldán Bravo et al., 2017; Xie et al., 2018). Hinteregger et al. (2019) investigated that inbound and coupled innovation has a positive influence on FP and Oltra et al. (2018) explored that inbound, outbound and coupled innovation has a positive effect on FP.

In terms of negative results, Caputo et al. (2016) and Wang and Jiang (2020) pointed out that OI has a negative effect on FP. Further Flor et al. (2017) and Mendez et al. (2015) identified negative effects between inbound innovation and FP.

Some scholars found that inverted U-shape relationship between independent and dependent variables. In line with this, Bayona-Saez et al. (2017) and Zhang et al. (2018)

reported that OI has a U-shape relationship with FP and Kobarg et al. (2018) indicated a similar relationship between inbound innovation and FP.

Regarding the mixed results Liao et al. (2020) pointed out that technological capability has a significant effect on inbound innovation and FP. However technological capability has no significant effect on outbound innovation and FP. Cheng and Shiu (2020) also proved that environmental uncertainty significantly and positively influences the inbound innovation and FP but environmental uncertainty has not influenced the outbound and FP. As well Zhou et al. (2019) noted a positive relationship between inbound innovation and FP while the U-shape relationship with outbound innovation and FP. Further, Shi and Zhang (2018) indicated that OI breadth negatively influences radical innovation and deeper search positively influences radical innovation. Not only that Bahemia et al. (2017) examined that OI breadth and partner newness has a positive result on product innovativeness and negative results on OI depth and product innovativeness. Nevertheless Cheng and Shiu (2015) found that inbound innovation increase radical innovation and outbound innovation increases incremental innovation.

Key Areas for Future Research from Existing Literature

This study has identified the areas that the previous researchers considered in OI studies during the last seven years. Most of the scholars have focused on absorptive capacity (Aliasghar et al., 2019; Flor et al., 2017; Jeong et al., 2019), knowledge attributes (Wang & Jiang, 2020; Xie et al., 2018; Zhou et al., 2019), human resource practices (Burcharth et al., 2017; Natalicchio et al., 2018) and different capabilities like alliance management capability (Cheng & Shiu, 2020), functional capability (Lu et al., 2021), organizational capability (Cheng & Shiu, 2015) with OI and FP. Organizational learning (Wang & Xu, 2018) and innovativeness (Bahemia et al., 2017) have also gained much attention in previous studies. Adaptation of digital technology (Lorenz et al., 2020), R&D originality (Wang & Jiang, 2020), supply chain competence (Roldan Bravo et al., 2017), entrepreneurial orientation (Hou et al., 2019), partner opportunism (Zhou et al., 2018) and organizational inertia (Shi & Zhang, 2018) have been covered by the existing researchers.

Being focused on the future research arena based on existing literature the researchers were able to identify several uncovered areas where more future studies need to be considered. Many scholars suggested that knowledge management activities such as knowledge sharing (Wang & Xu, 2018), knowledge conversion (Wang & Jiang, 2020), and the mechanism of organizational knowledge (Zhou et al., 2018) need to be more analyzed. Further different capabilities such as relational capabilities (Bayona-Saez et al., 2017) and innovation capabilities (Roldan Bravo et al., 2017) need to be touched upon. Nevertheless, internal factors like organizational culture (Lu et al., 2021), intellectual capital (Jeong et al., 2019), informal communication and socialization (Oltra et al., 2018), internal R&D (Xie et al., 2018), network embeddedness (Shi & Zhang, 2018) and managerial roles (Portila

et al., 2017) need to be analyzed. Moreover, external factors like public support (Hinteregger et al., 2019), and environmental turbulence (Shi & Zhang, 2018) need to be considered by future researchers.

Conclusion

In this paper, seven years of recently published high-quality empirical evidence on the impact of OI on FP have been collected and analyzed. The literature review process considered articles from 2015 to June 2021 in Ebsco host, Elsevier, Emerald Insight, and Sage databases, of which 30 peer-reviewed journal articles were included in the sample. Based on the analysis, the study concludes that though the concept of OI was first invented in 2003 (Lu et al., 2021), there is still a value to investigate further. Some authors found that OI can be implemented in developed countries (Lu et al., 2021) or more suitable for developing countries (Jeong et al., 2019). Though some authors investigated OI practices in a specific region (Greco et al., 2016), this study demonstrates that OI is applicable for all geographical areas in the world. According to this study, many researchers used General Managers to collect data (Kobarg et al., 2018). However, OI research can be validated through R&D Managers who are more responsible for innovation activities than General Managers (Flor et al., 2017). Some studies collected data from patent owners, but patent owners ignore the innovativeness and underestimate the actual performance of the organizations (Shi & Zhang, 2018).

This study pointed out that many researchers used inbound innovation as their major dimension of OI. Plenty of researchers used outbound innovation. However, researchers do not pay much attention to coupled innovation because inbound innovation can be implemented more easily than outbound and coupled innovation, due to the new knowledge from customers, suppliers, competitors, government, research institutions and consultancy firms can be easily captured by the organization (Kobarg et al., 2018). Hence, it is necessary to examine the inbound, outbound and coupled innovation strategies by putting equal weight.

Regarding the FP, many studies in the sample have used innovation performance. Only one study has used financial performance. None of the researchers pay attention to economic performance and human capital performance. Thus, future studies need to concern with both financial variables and non-financial variables to measure the FP.

According to the research findings, most studies have revealed that OI has a significant positive impact on FP. Some studies have found that OI has a negative effect on FP. In addition to that, few studies revealed that OI has a U-shaped relationship with FP. Due to the contradictory findings (Flor et al., 2017), more examinations on the impact of OI on FP needed to be done, expanding the key research areas including internal knowledge creation mechanism, capabilities, internal and external factors. In contrast, the review acts as a mind mapping tool for future researchers to identify new research paradigms and get

an overview idea of the existing potentials and it would provide valuable insights for both practitioners and policymakers.

Implications

This study is based on the literature review process that highlights the empirical studies on OI and FP. This study reveals that many researchers have investigated inbound innovation and innovation performance with limited attention to outbound innovation and coupled innovation. Hence, future researchers need to pay much attention to these three aspects of OI considering the financial and non-financial aspects. Moreover, additional studies are essential for covering multiple countries, leading to conclusive results to shape the impact of OI on FP.

From a practical point of view, this study highlighted the importance of OI for enhancing FP. Thus, Managers and decision-makers need to view OI from a strategic perspective and facilitate the successful implementation of OI within the organization. Further, this paper reveals which OI strategy was most frequently effective for improving FP. Hence, Managers can develop their strategic plan by putting high weight on the particular OI approach (Omerzel, 2016) and they can invest to gain superior performance. Besides all these, this study provides a good signal for Managers to decide the firm direction based on collaborative partners. Thus, Managers need to build a strong relationship with industry parties to gain success. Hence, this study may have practical implications for practitioners in the industry.

Moreover, this study provides valuable insights into policy. Policymakers should encourage the entrepreneurial culture through collaborative innovations. Innovation public funding system enables the firms to intensively cooperate with partners (Spender et al., 2017). Diversified partners with specific and complementary competencies should involve with public-funded innovation projects. Accordingly, this study would have theoretical, practical and policy implications for future developments.

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