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Reasons for outsourcing innovations and its effect on firm performance: Evidence from highly innovative firms from twenty countries

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Abstract. Innovative products have become crucial as firms vie for consumer attention in a saturated market. One important strategy is the use of external innovation providers. This study investigates reasons for outsourcing innovations (OI) and their relationship with firms' performance. The results should assist firms in ascertaining how the reasons for OI affect firm performance. First, the conceptual framework of reasons for OI and related firm performance was synthesized from the open innovation literature. Then, highly innovative firms from twenty countries were surveyed and analysed using statistical tools. The results provided support for a conceptual framework with a positive relationship between five reasons for OI and firms' overall performance. An implication for managers is that, if Contract Research Organisation (CRO) country's environment is the only reason for entering into an OI contract, it might not be a good decision in terms of the respective firms' overall performance.

Keywords. Outsourcing; innovation; open innovation; product development; firm performance.

1. Introduction

Innovativeness is the key to growth for any firm in the present era. Previous studies have proven that there is a positive effect of innovations on firms' overall performance (Gunday et al. 2011). But the relationship between innovations introduced by firms and the growth rate of firms is no longer as simple as it seems (Rosenbusch et al. 2011). Highly competitive markets have made it very difficult for individual firms to bring innovations and innovative products to the market (Rosenberg & Kline 2009). In the recent past, open innovation and OI from third parties in developing new products have received much attention (Zafar 2019). Thus, in every OI contract, there can be many reasons to explain the shift towards such an R&D-related collaborative environment (Berchicci 2013). Hence, such a scenario forces companies to work in an open innovation environment and favour OI. Every similar setting obviously has its impact on innovative product performance and in turn a firm's overall performance (Huizingh 2011). Innovative product performance refers to the success rate or the financial success of an innovative product in the given market, which is developed in an open innovation environment (Jimenez-Jimenez & Sanz-Valle 2011). So, as a simple rule, the higher the number of innovative products, the greater the chances of positive firm growth (Artz et al. 2010).

However, for a better understanding, it is important to know the difference between general outsourcing and OI; the former has been in use for many decades, while the latter has only been

popular in the last 20 years (Weigelt & Sarkar 2011). The major difference is the specialized nature of OI, which refers to the outsourcing of core technologies for building new products (Martinez et al. 2013). Although general outsourcing has an impact on overall firm performance, OI can have a direct impact on the R&D departments of firms and in turn overall firm performance (Laursen & Salter 2006). That said, many companies have different reasons for OI, which can vary on a case by case basis (Stanko & Calantone 2011). Thus, the reasons for outsourcing can be different in each OI contract, with each reason differently affecting overall firm performance (Dodgson et al. 2006).

Moreover, several emerging trends in the industry, such as sky-high customer expectations and progress in technology, have made markets highly competitive for most companies (Priem et al. 2012). All companies are trying to survive and grow in this highly competitive era (Velu 2015), it is almost impossible for them to innovate independently and grow in the market as was the case three decades ago (Vrande et al. 2009). In light of this everlasting competition, companies have started to work together and somehow adopted the open innovation model proposed by Chesbrough (2003). This means that companies now prefer an open innovation model rather than supporting a closed model (Nordman & Tolstoy 2016).

The literature shows that there are many different reasons for adopting the open innovation model and starting OI (Dahlander & Gann 2010). Most of these reasons involve parent company and outsourcing provider characteristics and working styles (Handley & Benton 2012). Some studies have emphasized reasons such as the viability of innovation providers (Hartley et al. 2013), pre-evaluation of the pros and cons of the open innovation contract (Henkel et al. 2014), the cost-effectiveness of the provider (Teece 2010), speedy product development (Chen et al. 2010) and the acceptability of open innovation contracts in the provider's home country (Zhu et al. 2012). But there has been no study that has determined the effect of these reasons on overall firm performance in the short and long term.

The current study aims to deepen the knowledge about the specific reasons for OI, such as the viability of innovation providers in the market, the evaluation of pros and cons prior to an open innovation contract, the cost-effectiveness of the provider, speedy product development and the provider country's characteristics in relation to open innovation contracts. Therefore, the current study clarifies the impact of the aforementioned reasons on innovative product performance (the product's financial success), which in turn directly relates to a firm's overall performance in the given market. With a thorough understanding of the relationship between these reasons, innovative product performance and firm performance should help to formulate managerial guidelines, which can be helpful in OI and working in an open innovation environment.

The core research question guiding this study can be stated as follows:

"Why do companies outsource innovations in product development and how do the reasons for outsourcing affect firm performance?"

More specifically, the study aimed to achieve the following research objectives:

- To determine the reasons for outsourcing that compel companies to enter into OI contracts
- To determine whether these reasons influence the performance of the outsourced product
- To establish the relationship between the reasons for OI, outsourced innovative product and a firm's overall performance.

Previous studies have revealed that the concept of OI was used in a way to describe either its benefits or risks in terms of the overall process (Huizingh 2011). This approach resulted in confusion about this valuable concept. In this study, we were not only determining the most important reasons for OI but also the impact of these reasons on a firm's performance. Thus,

the unit of analysis was a respondent (employee, scientist, manager, professional or researcher) and the sampling unit was each involved company. The final realized sample consisted of 112 usable questionnaires, representing a 43% response rate.

The paper has four parts. The first part reviews the existing literature relevant to the reasons for OI, the open innovation concept and the impact of these reasons on a firm's overall performance. The article then describes the data collection methods, research instrument, data analysis techniques and research methodology. Next, the findings of the research are presented. The paper concludes with the reasons for OI and their impact on product and firm performance, as well as highlights the theoretical and managerial implications and further research possibilities.

2. Research background

The literature is very rich in terms of analysing the relationship between new product development (NPD) and firm performance (Wang 2012). The best products always have a positive impact on a firm's overall performance in the market (Gunday et al. 2011). In the last two decades, innovativeness in product development has become the key for classifying whether a product is a best-performing product on the market (McNally et al. 2010). But introducing a successful innovative product to the market is a real challenge for firms, due to the highly competitive environment in the market (Kline & Rosenberg 2009). Thus, the smaller the number of innovative products introduced by a firm to the market, the slower the firm's growth and overall performance in that market (Ahlstrom 2010).

This competitive environment in the industry has compelled companies to look for partners in the market, in order to introduce innovative products (Dziallas & Blind 2019), improve firm performance and thus compete in the market (Gassmann et al. 2010). This market situation has given more value and puts more trust in Chesbrough's open innovation model (2004). Chesbrough defined open innovation as "the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively. [This paradigm] assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as they look to advance their technology" (Chesbrough 2006). This definition has provided the basis for the OI concept, which can be described as "the strategy in which external suppliers are being engaged in the (a) ideas of making new products/services (b) developing effective strategies to bring these ideas to the given market. It is the type of process outsourcing which is more focused on the development of new products and introducing innovations" (Lacity & Willcocks 2013).

Additionally, it was believed that outsourcing has been used mostly to get the work done in a cost-effective manner, thus implying TCE (Reitzig & Wagner 2010). This also implies that, if firms can decrease transaction costs while OI, it could help them to build cheaper products (Crook et al. 2013). On the other hand, the literature also explains the best utilization of the internal resources of the firm before entering into any kind of partnership with an external provider, based on the RBV (Rodriguez & Robaina 2006). But the concept of the RBV does not negate a healthy partnership with providers whenever that is needed (Mowery et al. 1998). It suggests that resources should exhibit VRIO (valuable, rare, costly to imitate, organized to capture value) attributes to provide any firm with a competitive advantage in the market (Rothaermel 2013). Although the RBV always emphasizes using partnership resources to their fullest (Rodriguez & Robaina 2006), in many cases, company owners and managers disturb the balance between the TCE and RBV concepts by forcefully exerting their own views in order to manage such partnerships (Maduka et al. 2012). This influence has been explained by Principal Agent Theory (PAT) in the literature (Schneeweiss 2003). According to PAT, a principal or an

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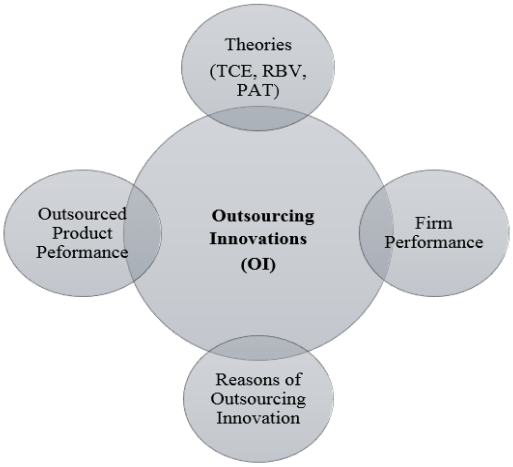
agent will try to enforce partnership contracts single-handedly, which affect the company's performance in the long run (Munoz-Bullon & Sanchez-Bueno 2011).

The literature also briefly discusses various reasons that push companies towards OI (Huizingh 2011). These reasons are the basis or starting point for OI contracts. The most important and apparent reason for such outsourcing is that, when a firm is unable to bring innovative products to market, those products can give the firm a competitive edge (Chesbrough et al. 2010). However, if investigated a little deeper, there are many other reasons, such as the reputation/viability of a contract research organization (CRO) in the market, as well as supporting arguments, which explain the reasons for OI (Hartley et al. 2013). Researchers have also highlighted the importance of evaluating the pros and cons for OI and the susceptibility of a CRO's host country environment towards possible open innovation contracts (Henkel et al. 2014). Many studies have also given much consideration to cost-effectiveness and speedy product development as major reasons why OI contracts have flourished in the industry (Teece 2010).

Figure 1: Conceptual framework



Researchers have also tried to explain the open innovation and OI concepts with the help of TCE and the RBV in different studies (Bogers 2011). There are also a few studies describing the role of PAT in contracting and the risks associated with it (Hypko 2010). Other studies have highlighted the reasons for OI (Gassmann et al. 2010). However, there is no single study currently available connecting TCE, the RBV and PAT with reasons for OI and outsourced product performance, nor establishing their relationship with a firm's overall performance. The main research gap in previous studies is that none has directly been able to measure the relationship between the reasons for OI and a firm's overall performance (Ferreras-Méndez et al. 2016). Figure 1 shows the four main pillars (theories or literature, reasons for OI, outsourced product performance, firm performance) of the current study, which are used to explain OI.

3. Research framework and hypotheses

The performance of an outsourced innovative product is always dependent on the effectiveness of the relationship between the parent company and the outsourcing provider (Im & Workman 2004). The effectiveness of the relationship is also connected to the reasons for OI, which directly affects the outsourced product's performance and in turn the firm's overall performance (Berchicci 2013). Many reasons have been given previously about why companies outsource (Huizingh 2011); but this paper investigates six of the most important reasons for OI, which results in open innovation contracts and explains the relationship between these reasons and the firm's overall performance. The following are the six hypotheses described in detail:

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H1. The performance of an intensive innovation-dependent firm is always directly dependent on the performance of its innovative products in the given market (Gunday 2011). When entering into an open innovation contract, all companies focus on producing the best-possible innovative product with high expected future performance in their respective market. But product performance is somehow dependent on the reputation and viability of the innovation provider (Hartley et al. 2013). Meanwhile, there is no direct study available that establishes the relationship between the performance of the outsourced product and the viability of the provider, although it seems to be one of the important reasons for entering into an OI contract.

Hypothesis 1. The performance of an outsourced product is directly proportional to the CRO's reputation/characteristics/viability in the overall outsourcing process.

H2. Miscellaneous reasons for OI always have an impact on newly created products and their market performance (Nieto & Rodriguez 2012). This impact can be due to the individual or collective reasons for OI. In general outsourcing, these reasons always have an impact on firm performance (Huizingh 2011). In a similar way, it is expected that the reasons for OI can have an impact on product performance and in turn the firm's overall performance.

Hypothesis 2. The performance of an outsourced product is directly proportional to the reasons for outsourcing.

H3. Whenever two firms enter into any kind of partnership, it is very important to evaluate the pros and cons of such a contract beforehand (Henkel 2014). But, when any firm plans to draft an open innovation contract, the evaluation of pros and cons can be more important because of the core technologies involved in such a partnership (Chiaroni et al. 2011). Some studies have measured the evaluation of pros and cons in general partnerships (Das & Teng 2003), but there is no study available describing the relationship between outsourced product performance and the importance of evaluating the pros and cons as an important reason.

Hypothesis 3. The performance of an outsourced product is directly proportional to the collective effects of the pros and cons of OI.

H4. In general outsourcing contracts, cost-effectiveness is considered as one of the most important reasons in the literature (Teece 2010). But, when we talk about specialized outsourcing, such as the outsourcing of technology and innovations, its importance is not fully elaborated in the literature. This study explores whether the relationship between the performance of an outsourced product and cost-effectiveness is the main reason for such a partnership.

Hypothesis 4. The performance of an outsourced product, which is directly proportional to cost-effectiveness, is the main reason for OI.

H5. Faster delivery of a newly developed product to the market mostly impacts firm performance positively (Zhu et al. 2019). Companies try to form a partnership with OI providers, so that they can speed up the product development process and market their products quickly (Zahra et al. 2000). There is no direct study available evaluating whether the relationship with speedy product development is the main reason why the performance of an outsourced product and later firm performance are enhanced.

Hypothesis 5. The performance of an outsourced product is directly proportional to the speed of the new product's development process.

H6. Many companies prefer outsourcing with firms originating from business-friendly countries (Grossman & Helpman 2005). However, the business environment of the provider country is very important in the case of OI and open innovation contracts (Kshetri 2007). There are very few studies that have given attention to the business environment of the provider's host country (Jissink et al. 2019). In this paper, we will also analyse the relationship between product performance, the country environment of a CRO and its impact on firm performance.

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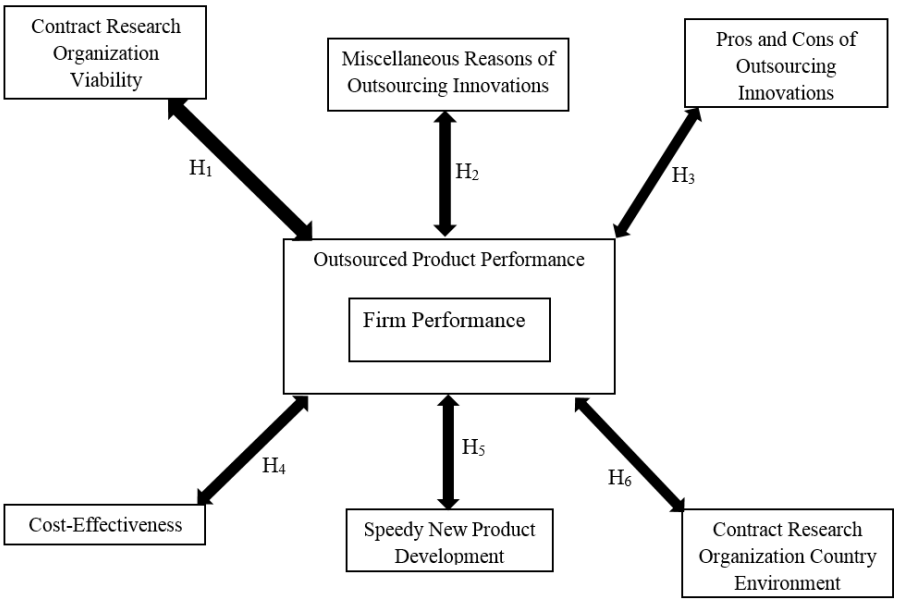
Hypothesis 6. The performance of an outsourced product is directly proportional to the country environment characteristics of outsourcing providers/hosts/partners and their influence on the overall process. All hypotheses are presented in Figure 2.

Figure 2 Relationship between firm performance and reasons for OI



4. Method

The population sample for this study comprised, among others, employees, scientists, managers, professionals and researchers. All these respondents had good experience of working in an open innovation environment and OI. The respondents came from 20 different countries and belonged to 60 different firms from around the world. The survey was conducted in 2016-2017 within a one-year time span. The unit of analysis was a respondent (employee, scientist, manager, professional or researcher) and a sampling unit was each involved company. The final realized sample consisted of 112 usable questionnaires, representing a 43% response rate. Additionally, up to 10 interviews were conducted in person and on the phone using selective parts of the same questionnaire. There were also open-ended questions in survey to provide their feedback about each step or overall process of outsourcing innovations. So, the data have covered the qualitative and quantitative aspects for this research. The respondents were working in either Finland, Sweden, Denmark, Germany, Spain, Netherlands, Switzerland, Cyprus, USA, Canada, UK, Singapore, Malaysia, Taiwan, India, Pakistan, UAE, KSA, Oman or Egypt at the time of data collection. The selection criterion for participating firms was based on their degree of alignment with the open innovation concept.

The data were collected from 10 industrial segments, namely, the pharmaceutical industry, the ICT industry, life sciences, engineering services, financial services, robotics, logistics, telecommunications, the chemical industry and the automotive industry. The main reason for selecting these 10 industrial segments was that all of them have similar needs and patterns in terms of OI. Another reason was that these represent the top 10 industrial segments pursuing OI internationally (Friedman 2015). The selection of candidates was dependent on their level of experience in an open innovation environment and their association with similar R&D projects. Appointments for survey purposes were made by phone and official emails in order to select individuals who met the above-mentioned criteria. Most questionnaires were completed

in electronic form, but some were also completed via phone calls. Data collection was performed by the corresponding author.

The final realized sample of 112 responses was analysed. Firm spending on R&D varied from USD 1 million up to USD 1 billion, but only 67 respondents replied to this specific question due to company policy. The huge variation in spending was due to huge demographic variations and the currency value in the given region. Respondents were also asked about the number of open innovation projects they had participated in, with 45 respondents answering this question and stating that, altogether, they had been involved in 458 OI projects.

The initial survey form was pretested with a convenience sample of 10 respondents involved in similar R&D fields, using the collaborative participant pretesting method as explained by Cooper and Schindler (2006). As previously stated, earlier data were collected over a one-year time period from 2016 to 2018. The main reason for a longer data collection time was that the collection involved 20 countries, while many respondents also took a longer time to obtain permission to give out sensitive information about their firm's R&D department. The electronic survey form was used for most of the data collection; but, in some cases, the survey was completed in person or by mail. No participatory incentive was offered to respondents. Due to the privacy policy of companies, all the data were handled confidentially. A Likert scale was used to formulate seven-point statements. All the scale points of these questions were labeled ranging from 1 (strongly disagree) to 7 (strongly agree).

The questions and their multiple-choice answers were designed, based on the relevant literature and theories. Although this paper is part of a bigger research project, which is completed and published, the scope of this paper is only limited to reasons for OI in product development and their impact on firm performance. The section related to reasons for OI in the survey has a total of five questions, while two questions also have five sub questions (Zafar & Kantola 2018). Answers to all questions were scaled on a Likert scale as described above.

Empirical analysis has been performed in terms of the relation between outsourced product performance and the six main reasons as described previously. Survey questions were based on the potential reasons for OI, which were extracted from the literature and three theories (TCE, RBV, PAT). All the reasons acted as variables. The collected data from the survey were grouped to form different variables, which were tested vs. outsourced product performance and in turn overall performance of the firm. Similar research was conducted by Gunday et al. in 2011, in which they measured firm performance vs. firm innovativeness. However, in the current research, we have measured firm performance vs. six main reasons for OI. Consequently, the scope of this paper is to measure the relationship between firm performance and six reasons for outsourcing.

4. Analysis of findings

The data were collected from ten industrial segments, as described in the method chapter, with help from the self-designed survey form and transcription of conducted interviews. The six hypotheses were tested by running a correlation and regression analysis on IBM SPSS 24. Qualitative data, collected from interviews and open-ended questions in surveys, were analysed using NVivo 11. The six nodes were developed in NVivo based on reasons of OI and qualitative data, grouped under each relevant corresponding node. NVivo functions, such as the hierarchy chart and simple chart, have been used to test the importance of each node in qualitative data for firm performance.

In the quantitative data analysis (IBM SPSS 24), five of the hypotheses were validated by empirical analysis, while one of them showed a non-significant relationship. Table 1 shows all six hypotheses (H1 to H6). In the qualitative data analysis (NVivo 11), five reasons have shown nearly equal and high relevance while one has shown the least relevance in OI. The qualitative

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results of NVivo 11 helped to cross-validate the results of the quantitative data of SPSS 24 and vice versa, with one exception.

In the first hypothesis (H1), it was proposed that the performance of an outsourced product is directly dependent on the reputation and viability of a CRO. This was validated by statistical analysis ($p < 0.01$). H2 and H3 indicated that the performance of an outsourced product is directly dependent on reasons for OI and the pros and cons of OI, with both hypotheses validated due to the significant relationship ($p < 0.01$) between them. The performance of an outsourced product and cost-effectiveness (H4) and speedy product development (H5) also have a significant relationship ($p < 0.01$). However, there is a non-significant relationship ($p < 0.05$) between outsourced product performance and the country environment of the CRO.

Table 1 shows that hypotheses H1, H2, H3, H4 and H5 are supported once the statistical analysis is performed. On the other hand, H6 is not supported. Findings show that firm performance is positively affected by the viability of the CRO, the reasons for OI, the pros and cons of OI, cost-effectiveness and speedy product development. But there is no direct impact from the country environment of the CRO on outsourced product performance leading to firm's performance.

Table 1. Analysis of the hypotheses using correlation function in SPSS

Hypo.	Reasons	Pearson correlation	Relationship sign.	p-value	Results
H_1	Viability of the CRO	0.267**	0.004**	$p < 0.01$	Supported
H_2	Reasons for OI	0.282**	0.003**	$p < 0.01$	Supported
H_3	Pros and cons of OI	0.270**	0.004**	$p < 0.01$	Supported
H_4	Cost-effectiveness	0.422**	0.000**	$p < 0.01$	Supported
H_5	Speedy NPD	0.434**	0.000**	$p < 0.01$	Supported
H_6	CRO country environment	0.091	0.339**	$p > 0.05$	Not supported

**Correlation is significant at the 0.01 level

Additionally, to address the original research question i.e., why do companies outsource innovations in product development and how do the reasons for outsourcing affect firm performance, a multiple linear regression analysis was conducted. This was done to evaluate the prediction of firm's performance from the viability of the CRO, reasons of OI, pros and cons of OI, cost-effectiveness, speedy NPD and CRO country environment. The results of multiple linear regression analysis revealed reasons for OI as a whole, and CRO country environment, were not significant predictors to the model. However, the results of multiple linear regression analysis revealed four significant predictors of firm performance i.e., the viability of the CRO, pros and cons of OI, cost-effectiveness and speedy NPD. The strongest predictor is speedy new product development for a firm's overall performance. The model does not prove that this relation is causal, but it seems reasonable that improving the speed of NPD (0.415) will cause slightly higher overall firm performance in comparison to cost-effectiveness (0.381), the viability of the CRO (0.299) and pros and cons (0.126) of OI respectively.

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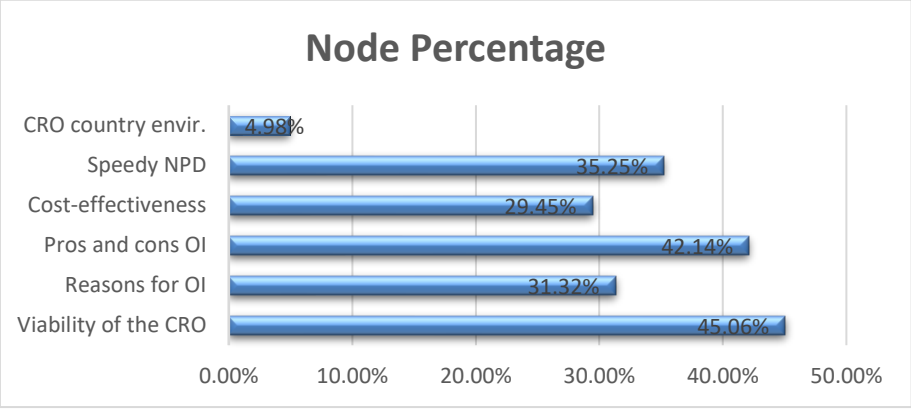
Table 2: Analysis of the hypotheses using regression function in SPSS

Hypo.	Reasons	B	SE B	β
	Constant	1.016	0.815	
H_1	Viability of the CRO	0.299	0.168	0.200
H_2	Reasons for OI	-0.230	0.159	-0.170
H_3	Pros and cons of OI	0.126	0.144	0.083
H_4	Cost-effectiveness	0.381	0.094	0.367
H_5	Speedy NPD	0.415	0.110	0.419
H_6	CRO country environment	-0.276	0.143	-0.205

For cross-validation of the quantitative analysis, NVivo 11 was used to analyse the qualitative data collected from surveys and interviews. The data were organised in usable form and coding was done in NVivo 11. The coding was done in the form of nodes and each node was represented by the name of each of the six variables. The six nodes were named as the viability of the CRO, reasons of OI, pros and cons of OI, cost-effectiveness, speedy NPD and CRO country environment. After the name, the nodes in all qualitative data were coded in respective nodes. After completion of the data coding in nodes, Simple Chart and Hierarchy Chart Functions in NVivo 11 were run to see the relevance of each node or variable in the overall data.

The simple chart function resulted in the data, which is represented in figure 1.

Figure 1: Node percentage against qualitative data



The simple chart function resulted in the data, which is represented in Figure 1.

The simple chart function of NVivo has shown that the highest percentage of qualitative data was found in the viability of the CRO node (45.06%). Pros and cons of OI (42.14%), speedy NPD (35.25%), reasons for OI (31.32%), cost-effectiveness (29.45%) have followed the percentage respectively. The least percentage of data was found under CRO country environment node (4.98%) making it the least concerning reason of OI for respondents.

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The hierarchy chart of nodes helps to compare the amount of coding; visualizing the prominent themes in the project and identifying areas that need further investigation. The hierarchy chart function gave the representation of data in the form of a segmented chart, represented in Figure 2.

Figure 2. Hierarchy chart of nodes comparing the amount of coding

Figure 2 represents a comparison of the amount of coding of qualitative data with respect to each node or reason. Five nodes, viability of the CRO, reasons of OI, pros and cons of OI, cost-effectiveness and speedy NPD have shown an approximately equal amount of coding. Figure 2 shows five nodes as the most prominent themes from overall qualitative data. The CRO country environment has shown the least amount of coding.

5. Discussion and conclusion

This study has investigated the possible relationship between firm performance and six main reasons for OI, which play important roles in encouraging companies to enter into open innovation contracts. Besides being mindful of the literature, this study connects the reasons for outsourcing, outsourced product performance and firms' overall performance. The analysis indicates that product performance is positively related to five main reasons (H1, H2, H3, H4, H5) for OI while showing a non-significant relationship with one other reason (H6). The analysis also showed the degree of effect and comparison within each reason and their impact on firm performance. Additionally, qualitative analysis helped to validate the relevance of different variable in the data. The five variables showed a similar pattern of coding in terms of percentage and hierarchy charts.

In light of the results, the five reasons, which were proposed in the hypotheses (H1, H2, H3, H4, H5), are aligned with the existing literature and have been shown to be statistically proven for the first time in this study. The remaining reason is not proven to play any significant role when entering into an open innovation contract; as such, it has a negative impact on firms' overall performance.

It was suggested earlier that the performance of an outsourced product has an impact on a firm's overall performance in the current market (Gunday 2011) but was not statistically proven. If we closely observe the findings of this study, we can easily describe the effect of the various reasons for OI on firms' overall performance. The performance of an outsourced product is

directly dependent on the viability and reputation of a CRO (H1). Thus, whenever the reputation and viability of a CRO are the main reasons for entering into an open innovation contract, this always helps to increase firms' performance. Similarly, according to the findings, firm performance is always affected positively by OI, cost-effectiveness and the evaluation of pros and cons in the case of a CRO (H2, H3, H4). Moreover, if speedy product development is the reason for entering into an OI contract with a provider (H5), this helps parent companies to improve their market performance. It has also been found that NPD has a greater impact on the firm's overall performance when compared with other factors (cost-effectiveness, the viability of CRO, pros and cons of OI).

However, it is also important to note that, if any parent company starts a partnership with an OI provider and only chooses the provider because of its country's overall good environment for business, this negatively affects the company's overall performance in the given market. It can also be said, to some extent, that reason (H6) for OI has an inverse effect on a firm's overall performance.

Five of the validated hypotheses (H1, H2, H3, H4, H5) are aligned with TCE, the RBV and PAT. According to TCE, it is important to analyse pre-contract, main contract and post-contract risks before entering into any OI contract, based on these four reasons (Teece 2010), as these can affect firms' overall performance. Similarly, the RBV also emphasizes the need for a company to evaluate its own resources in terms of VRIO; but, when a firm enters into an OI contract, due to these five reasons, all available resources on the part of the parent and the provider company should be fully utilized. PAT also plays a key role because, in the literature (Munoz-Bullon & Sanchez-Bueno 2011) and in the course of this study, it has been observed that a principal and an agent can both influence these reasons while decisions are made about an open innovation contract. Thus, these three theories collectively provide a better understanding of these five hypotheses (H1, H2, H3, H4, and H5) and, if implemented well, they can help to improve firm performance.

The one non-supported hypothesis (H6) emphasizes the inconsistencies in this study because the six original hypotheses were built on variables extracted from the literature and collected data. The rejection of this hypothesis contributes to the existing theories. If a CRO's host country environment fails to have a positive effect on a firm's performance, which means relying too much on resources and the business environment of the host country to form an open innovation partnership, this can result in reduced firm overall performance. Additionally, if this reason is enforced by the principal or the agent to establish an open innovation contract, this can diminish firm performance.

There could be many reasons why companies enter into open innovation partnerships. This study confirms five possible key reasons that can have a direct impact on firm performance. This information can play a key role when managers, who are involved in OI, make decisions about starting a new partnership. They can easily analyse the situation if it provides reasons (CRO viability, reasons for OI, the pros and cons of OI, cost-effectiveness, speedy NPD) why companies are pushed into OI binding. This means that a firm's overall performance will be improved because of such collaboration. Additionally, the rejected hypothesis also improves the decision-making power of OI managers. If a favourable CRO country environment compels them to draft an open innovation contract, it may not be a good decision for the company's overall performance in the given market. But, in order to deepen the knowledge about this concept, further research is needed.

6. Limitations and future research directions

There were also a few limitations to this study, which affected collecting data and interpreting results. The most important limitation of this study was the wide range of demographics for data collection purposes. The data were collected and analysed from both developing and

developed countries in a single study. This posed challenges due to the difference between the working and the cultural environments on both sides. Another potential reason for the inconsistency is the common method bias. The study used a single questionnaire to measure all reasons, factors and patterns. Thus, the significance of the relationship between different reasons for OI and firm performance was somewhat inflated. The third limitation of the study was related to the sample. Although the sample was acceptable, a larger sample would have provided us with a deeper understanding of the problem. Future researchers should keep in mind the above-mentioned limitations and avoid associated constraints in order to generate a more elaborated understanding of the problem. They should also narrow down the industrial segments and select limited segments to gain a deeper understanding of each segment. It will also be interesting to carry out a comparative study between developing and developed countries regarding this specific research problem.

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