The Effect of Inbound Open Innovation on Firm Performance in Japanese Manufacturing Firms: Comparative Study between Research Center and Business Unit

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URL http://hdl.handle.net/10097/00125265
The importance and benefits of open innovation are widely accepted, as Chesbrough coined this new paradigm in 2003. The concept has received increasing attention in literature for many scholars. Exploring and leveraging external knowledge have become critical for firms when applying open innovation practices.

Yet, even though scholars have screened inbound open innovation as one kind of open innovation from different angles of analysis, firms are mainly consisted of the research center and business unit. The role of the research center refers to the basic and applied research, providing the latest scientific research knowledge, while for the business unit it refers to experimental development, prototyping, and production development. Few researchers have addressed similarities and differences between the research center and the business unit with inbound open innovation and even fewer quantitative research has been conducted.

Meanwhile, two forms of open innovation are inbound and outbound knowledge transfer, where innovative ideas flow in and out of the firm (Bianchi et al., 2011; Dahlander and Gann, 2010; Gassmann and Enkel, 2004; van de Vrande et al., 2009; West and Bogers, 2010), and thus, open innovation should not be considered as a dichotomy but as a continuum with different degrees of openness (Dahlander and Gann, 2010). Here, this study focuses specifically on inbound open innovation, or the integration of external inputs into the firm (Chesbrough and Crowther, 2006) because it tends to focus on the firm’s core new product technologies (Chesbrough and Garman, 2009). Much empirical evidence suggested that highlight inbound open innovation to be the dominant mode in practice, the advantageous for a firms’ efforts to introduce process and product, and is critical to a variety of positive outcomes. (Chesbrough, 2003a; Chesbrough and Crowther, 2006; Laursen and Salter, 2006; Dahlander and Gann, 2010; Chiaroni et al., 2010; West and Bogers, 2014). These findings indicated that European and US firms import inputs from external sources were greatly more frequent than the exporting ones. Importantly, researchers and managers
seem much more concerned about inbound open innovation and its potential effects, compared to outbound component. Indeed, their spontaneous focus was finding ways to improve innovation processes for the ultimate outcome of financial gains (Sisodiya et al., 2013). Thus, this study considers inbound open innovation is consistent with previous studies, and based on recent literature on open innovation, Japanese open innovation policy is to perform external collaboration-oriented systems, which contribute to the firm’s internal R&D (Motohashi, 2011). However, there is no empirical evidence of whether and how the research center and the business unit may benefit firms that implement inbound open innovation.

Moreover, the internal R&D strategy and activities are necessary to complement to the open innovation, using external ideas and knowledge in conjunction with internal R&D strategy and activities to achieve and sustain innovation (Gassmann, 2006). In addition, the high degree of product technological newness required an active acquisition of external technology because firms are unable to cover all technological developments by means of internal R&D (Cesaroni, 2004). It means that rapid technological change increases a firm’s possibilities to profit from inbound open innovation. Therefore, this study discusses the relationship between inbound open innovation and firm performance with respect to the moderating influences of internal R&D and the degree of product newness.

Further, since the financial crisis of 2008 has substantially reduced the willingness of firms to invest in R&D (Archibugi et al., 2013). Inbound open innovation could be used as one of the instruments to overcome the financial crisis of 2008. However, as the change in the performance of manufacturing firms in Japan, there is few study on inbound open innovation that considers different time periods.

The purpose of this study is to explore the relationship between inbound open innovation and firm performance in different time periods across different organizations. This study focuses on revealing the similarities and differences between different organizations regarding the impacts of inbound open innovation and changes in internal R&D on firm performance with quantitative analysis. At the same time, before and after the financial crisis of 2008, two time periods are considered in this study as the 2002-2007 and 2012-2017.

To accomplish the purpose of the study, a conceptual model is developed based on previous researches. It consists of contextual factors, the higher degree of the newness of market and technology; internal R&D, internal R&D strategy, internal R&D activities; inbound open innovation; and firm performance that has innovation performance and financial performance. The model is tested using data from collected from Japanese manufacturing firms and completed in 2008 (141 usable samples out of 500 respondents with a response rate of 28.2%) during the period 2002-2007. From the usable samples, 71 research
center projects and 70 business unit projects are obtained. Data from the research center and the business unit of Japanese manufacturing firms included 1,000 firms observe for the period 2012 to 2017. A total number of 188 respondents that represented 18.8% of response rate is collected. 171 of these datasets are valid for the analysis. From the usable samples, 102 research center projects and 69 business unit projects are obtained. Structural equation modeling (SEM) technique is used to test the model.

The first major finding is that this study emphasizes the importance of inbound open innovation because of acquisition and leveraging of external resources strategies significantly contribute to firm performance. It means that Japanese manufacturing firms comprehend the benefits from sourcing and acquiring ideas and knowledge as well as technologies in the pursuit of inbound innovation. This result is surprising because theoretical arguments based on transaction cost logic point to positive and negative effects (Arora et al., 2001). In the current state of open innovation, however, the positive effects prevail. Accordingly, firms should not exclusively focus on their established closed innovation strategies. Instead, this study provides good reasons for practitioners in both organizations to integrate the external knowledge, technology licensing-in, and acquisition or joint development of their firms.

In particular, considering organization types, differences between the research center and the business unit are noticed in terms of the inbound open innovation. Regardless of time differences, regarding the research center, due to they focus on the basic and applied research, they are beneficial from sourcing such as collaborations with universities and ANALOGY. While, as the business unit is more connected to the market, the acquiring such as strategic alliance, M&A with venture business and licensing-in are contribute to firm performance positively in the business unit. Hence, it is vital to understand which kind of practices of inbound open innovation should be implemented and integrated with their own capabilities in order to maximise their interactive effects on firm performance.

Meanwhile, the comparison of the research center and the business unit before the financial crisis results reveal that, inbound open innovation contribute to firm performance of both organizations and after the financial crisis of 2008 results reveal that, inbound open innovation has a positive impact on innovation performance of both organizations in 2012-2017.

The study’s second major finding is that the internal R&D is closely linked to the ability to use external sources of technology (Arora and Gambardella, 1994). However, regardless of organization and economic circumstances differences, internal R&D strategy not contribute to inbound open innovation because of the high costs and risks associated with external sources. In addition, the inappropriate roles and evaluation methods of internal R&D activities led firms may have difficulties
in capturing value from external technology for the business unit. As a consequence, an insignificant effect on firm performance.

Thus, in order to benefit from inbound open innovation, both organizations need to have a clear understanding of the firm’s internal core capabilities and the technology they receive from their supplier. Meanwhile, the efficient internal R&D activities related to inbound open innovation, not intensifying isolated R&D efforts. Practitioners have to ensure that their firms developed the particular managerial competences for inbound open innovation. On this basis, both organizations also need to manage their R&D portfolios flexible which are based on the newness strived from the market, portfolio planning needs to be fluid in order to quickly reallocate resources from external partners, and find the right balance between the the scope and depth of the external search and its internal technologies, in order to maximise their interactive effects on firm performance. Further, because uncertainty cannot be resolved early in the research activities, the research center needs to be comfortable with a relatively higher level of uncertainty and risk taking than the business unit.

Finally, the high degree of the newness of market and technology help firms to increase the effectiveness of internal R&D strategy and foster inbound open innovation.

This study contributes to the empirical literature on inbound open innovation by improving understanding of the forces driving the research center and the business unit in Japanese manufacturing firms. In addition, the results are helpful for internal R&D strategy design aiming at defining inbound open innovation to encourage internal R&D activities.

This study also helps practitioners to avoid failures in inbound open innovation because it points to different internal R&D strategy should be designed under different organization of the firms. These results are crucially important to practitioners in the research center and the business unit because they show under what conditions the positive effects of integrating external inputs into research and development phases are particularly high. These insights are essential in light of a currently increasing interest of academics and practitioners to understand inbound open innovation.