



# The effect of inbound open innovation on firm performance: Evidence from high-tech industry



Chun-Hsien Wang, Ching-Hsing Chang\*, George C. Shen

College of Management, National Chiayi University, Taiwan, ROC, No. 580, Sinmin Rd., Chiayi City 600, Taiwan, ROC

## ARTICLE INFO

### Article history:

Received 20 August 2014

Received in revised form 2 July 2015

Accepted 7 July 2015

Available online xxxx

### Keywords:

Open innovation

External knowledge

Technology acquisition

Horizontal technology collaboration

Vertical technology collaboration

## ABSTRACT

Academics and practitioners have demonstrated that open innovation is critical to superior performance; firms thereby connect their in-house R&D functions with external partners to enhance their innovation activities. This study extends the open innovation theory and the knowledge-based view to explain how a firm's external knowledge resource acquisition influences its innovation deployment as well as its performance. Specifically, we argue that technology scouting plays an important role as an antecedent to collaboration with horizontal and vertical technology acquisitions. Furthermore, the horizontal technology collaboration and vertical technology collaboration play mediators in determining firm performance returns from executing such acquisitions. Based on a large-scale survey of high-tech firms, the study finds that the ability to build well-developed external connection channels increases the efficacy of inbound open innovation in achieving superior performance.

© 2015 Elsevier Inc. All rights reserved.

## 1. Introduction

The sourcing of external knowledge is crucial to firm innovation activities (Cohen and Levinthal, 1990; Laursen and Salter, 2006; Powell et al., 1996). Indeed, scholars practicing in innovation management have long been interested in how firms acquire external resources. A central theme of the innovation process concerns what drives inbound openness innovation. To determine how firms access external knowledge and technology, one stream of research highlights the role of inbound open innovation (Chesbrough, 2003a; Parida et al., 2012; Sisodiya et al., 2013), in which external collaborative partners can complement in-house R&D activities and, in turn, increase firm performance (Cohen and Levinthal, 1990; Ahuja, 2000; Stuart, 2000; Powell et al., 1996). Moreover, many studies have shown that inbound open innovation is critical to a variety of positive outcomes, including greater in-house R&D, innovativeness, and performance (e.g., Chesbrough, 2003a; Laursen and Salter, 2006; Garriga et al., in press). Obviously, scholars have regarded inbound open innovation, which is often considered a key driver of firms' innovation, as a reflection of the variety of knowledge, technologies, and ideas among external partners. Thus, inbound open innovation can be defined as an outside-in process to access knowledge and technology that often resides beyond a firm's boundaries to complement the firm's internal innovation base.

While much of the prior literature focuses on inbound open innovation and has found evidence that extramural knowledge obtained from other various partners is beneficial to the focal firm's performance, Parida et al. (2012) identify horizontal technology collaborations (HTCs) and vertical technology collaborations (VTCs) as the crucial source of external knowledge resources for supporting innovation performance. Numerous studies on open innovation explain why these types of sources provide significant and valuable contributions (Belderbos et al., 2004; Brockhoff, 2003; Gassmann, 2006; Pisano, 1991). However few studies have explored the role of HTCs and VTCs as mediators in the development of inbound open innovation, which represents an important gap in the extant literature. Moreover, few theoretical and empirical studies of innovation have accounted for the conditions under which external knowledge partners boost innovation outcomes.

To address these gaps in the literature, we use the knowledge-based view (KBV) of firms (Grant, 1996; Grant and Baden-Fuller, 2004) to leverage and extend the research on inbound open innovation (Parida et al., 2012; Chesbrough and Crowther, 2006), and we specify the conditions under which the external knowledge resources of HTCs and VTCs can be especially beneficial by establishing important fundamental and distinct components to guide research on sources of inbound open innovation. Studies have highlighted the fact that external technology acquisition has gradually become a key driver of firms' innovation performance (Chesbrough et al., 2006; Laursen et al., 2015; Moreira, 2014; Stuart, 2000; Van De Vrande et al., 2009). This study posits that, while the inbound open innovation role of a firm's innovation base necessarily depends on the amount of external knowledge, firms must

\* Corresponding author.

E-mail addresses: [chwang@mail.ncyu.edu.tw](mailto:chwang@mail.ncyu.edu.tw) (C.-H. Wang), [chc@mail.ncyu.edu.tw](mailto:chc@mail.ncyu.edu.tw) (C.-H. Chang).

create well-developed instruments to access the value of external knowledge.

This study makes several theoretical contributions to innovation research. First, the study offers an integrative model that examines the influence exerted by technology scouting and horizontal and vertical technology collaboration on firm performance. This influence has led to an obvious result: increasing high-technology firms' ability to enhance their internal innovation and performance allows the firms to engage in openness strategies focused on external collaboration with different types of collaborators. As such, this study is one of the first to concurrently consider the relative contributions of the KBV and open innovation on these outcomes. Second, drawing on the KBV, this study enriches inbound open innovation theory by distinguishing between horizontal collaborative partners and vertical collaborative partners. This distinction is important because horizontal and vertical collaborative partners allow for the acquisition of two distinct facets of external knowledge and technology. In doing so, it potentially contributes to clarifying the elusive but important connection between external resources acquisition and firm performance. Many previous studies highlight the important role of external knowledge in innovation activities (Cohen and Levinthal, 1990; Chesbrough et al., 2006; Laursen et al., 2015; Moreira, 2014; Stuart, 2000; Van De Vrande et al., 2009), confirming the view that abundant external knowledge can provide benefits for innovation (e.g., Moreira, 2014; Schilling and Phelps, 2007). Third, relying on previous studies, this study specifies a measurement model of the determinants of inbound open innovation sources. Thus, we may contribute and link the open innovation perspective (Chesbrough, 2003a, 2003b) to the KBV theory (Grant, 1996; Grant and Baden-Fuller, 2004) in capturing useful and valuable knowledge resources. Specifically, very little research has attempted to conceptualize and empirically analyze inbound open innovation when different external knowledge-acquiring channels are used.

## 2. Theoretical background and hypotheses

### 2.1. Technology scouting and HTC

Technology scouting refers to a firm's innovation resource scanning and acquisition process; it implies both searching for technology acquisition channels and supporting the process of innovation efforts. Technology scouting characterizes an innovation process whereby external actors are involved as sources for ideas, new and crucial knowledge, technical solutions and acquisitions, or even discovery opportunities. For innovation processes, a firm that cannot fully develop its own knowledge and technologies often sources from outside its boundaries (Chesbrough, 2003b). Thus, the aim of technology scouting is to assist firms in building search mechanisms to identify opportunities and discover potential technologies in the external environment (Rohrbeck, 2012). According to Chesbrough (2003a) and Laursen and Salter (2006), external ideas, knowledge, and technology are valuable to internal innovation development. These arguments redefine innovation deployment between a firm and its surrounding environment, making firms more porous and embedded in collaboration with different competitors. This process allows for movement toward the creation of new solutions to current problems.

By undertaking searches for available external sources, technology scouting by firms can play a crucial role in feeding innovation capability. In response to limitations in the capacity of complementary and advanced technological resources, a firm makes use of well-developed external technology searching instruments that allow the firm to exploit innovation resources by opting for different external sources. The rationale behind obtaining an external technology scouting advantage is that innovating more quickly than other firms permits the focal firm to discover and acquire crucial technological resources as rapidly as possible. The continued accumulation of complementary and advanced technologies from both allies and competitors (Pisano, 1991) is a viable way to

improve the effect of innovation deployment on the development of new products/services. Furthermore, firms can use complementary and advanced technologies to develop their own innovation by relying on co-operative or co-developed capabilities (HTCs) with multiple partners. In doing so, HTCs can help firms to further strengthen the effect of their in-house technology development over competitors and external partners (Hamel et al., 1989) and thus discover new opportunities, especially when such opportunities are viewed as outside the realm of competition (Tether, 2002). The crux of the above argument is that a firm's decision to acquire external sources of technology and capability through HTCs involves pooling complementary resources with external partners and competitors to jointly develop innovation resources that they would be unable to produce internally. Therefore, HTC refers to a firm's ability to collaborate and connect with external partners and competitors, from which the firm can acquire new knowledge and technologies to spawn its own innovation efforts.

A firm that possesses advanced scouting mechanisms is likely to search for new technologies from a wide variety of external sources that can be considered likely to aid the firm's innovation capabilities (Parida et al., 2012; Laursen et al., 2010). Hence, technology scouting reflects the importance of a firm's external technology monitoring ability (Laursen et al., 2010) to build, seek, sustain, exchange, and collaborate with external partners in the innovation process. However, without a well-defined technology scouting ability, the efforts of HTC mechanisms will not result in effective searching and monitoring of external knowledge that can be reflected in innovation input. Accordingly, we expect firms that draw deeply from HTCs with advanced competitors to be more innovative because they are able to acquire novel ideas that can lead to the development of new products/services. Consistent with the KBV, collaboration with external partners can deploy existing knowledge and thus create value (Grant and Baden-Fuller, 2004); however, the process requires a great deal of effort in identifying and acquiring the appropriate knowledge. Moreover, reliance on horizontal collaborations with competitors allows firms to tap into advanced technology, thereby providing a preemptive advantage that accelerates firms' innovation capabilities and allows for the monitoring of competitors' technology levels. This argument leads to the following hypothesis:

**Hypothesis 1.** Technology scouting is positively related to horizontal technology collaboration.

### 2.2. Technology scouting and VTC

A growing body of research demonstrates that firm collaboration with customers is an important method of improving innovation efforts (Brockhoff, 2003; Gassmann, 2006; Von Hippel et al., 1999). Innovation ideas originate from the customer perspective of the value chain (Von Hippel, 1988) and have been declared one of most important openness strategies for firms (Chesbrough, 2007; Prahalad and Ramaswamy, 2004). Collaboration with customers enables firms to extract innovative ideas and novel knowledge from their customers to improve products/services during R&D and innovation processes. Scholars have demonstrated that collaboration with customers may yield significant benefits, such as improvement of existing core competencies, identification of market trends, and the ability to monitor technological development directions (Shaw, 1994; Von Hippel, 1988; Chesbrough et al., 2006). Firms that collaborate with customers have two distinguishing features. First, collaboration with customers allows a firm to develop appropriate technologies and customer-based innovation while allowing for improved interactions with the external customers who are embedded in the innovation development processes. Customers are often considered especially valuable and novel knowledge sources because their specific demands may anticipate the contribution of innovation efforts (Lukas and Ferrell, 2000;

Download English Version:

<https://daneshyari.com/en/article/7256485>

Download Persian Version:

<https://daneshyari.com/article/7256485>

[Daneshyari.com](https://daneshyari.com)