Knowledge Forms and Enterprise Innovation Performance: An Evidence from the Dimensions of Stock and Flow

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ABSTRACT

Enterprises cannot innovate without knowledge, but the relationship between different knowledge forms and enterprise innovation performance remains unclear. Using data from hi-tech firms in Biolake of Optics Valley in China, this article explores the mechanism of knowledge forms and enterprise innovation performance. Results show that (1) knowledge stock has an inverse U-shaped relationship with enterprise innovation performance; (2) knowledge flows from internal R&D efforts and external collaborative innovation are positively correlated with enterprise innovation performance; (3) knowledge stock plays a positive moderating effect on knowledge flow from internal R&D efforts and enterprise innovation performance and a negative moderating effect on knowledge flow from external collaborative innovation and enterprise innovation performance. Suggestions about knowledge accumulation strategies and the knowledge resource loop in knowledge management practices are proposed.

KEYWORDS

Collaborative Innovation, Enterprise, Independent Innovation, Innovation Performance, Knowledge Flow, Knowledge Form, Knowledge Stock

INTRODUCTION

Successful innovation relies on an enterprise’s efficient utilization of valuable knowledge resources required for enterprise innovation, which are delivered, obtained and stored in various forms (Nerkar & Paruchuri, 2005). The way to properly manage various forms of knowledge in the network environment to improve an enterprise’s knowledge utilization efficiency has become an important issue in knowledge management practice (Xie, Mao, & Zhang, 2011).

According to previous studies, there are two forms of knowledge resources: stock and flow (Wu & Shanley, 2009). Specifically, knowledge stock involves business resources owned by firms accumulated over a period of time and available as a knowledge base for future R&D activities (Cammarano, Michelino, Lamberti, & Caputo, 2017). It represents existing knowledge resources that can be used for innovation. Knowledge flow represents the knowledge obtained through various R&D efforts (such as joint R&D activities, R&D outsourcing and in-house R&D activities) and other method (Todo, 2006). Compared with knowledge stock, knowledge flow is a kind of ‘new’ knowledge that has stronger stability and cannot be easily transferred with static properties (Yongping, Yanzheng,
Therefore, knowledge flow characterizes ‘new’ and ‘dynamic’ features, whereas knowledge stock characterizes ‘existing’ and ‘static’ features from the knowledge base perspective. Many studies have researched the relationship between knowledge forms (knowledge stock and knowledge flow) and enterprise innovation performance. For knowledge stock, based on knowledge management theory and resource-based perspectives, many scholars claim that a firm’s knowledge stock has a positive relationship with its enterprise innovation performance. For example, Brouwer and Kleinknecht (1999) found that the number of patents a firm possesses will have a significant positive relationship with that firm’s innovation outputs. Park and Park (2006) noted that patent stocks will promote a firm’s innovation performance. However, there is a negative effect for enterprise innovation performance when firms rely too much on knowledge stock to innovate because of a path dependence effect. Thrane, Blaabjerg, and Møller (2010) found that firms will be locked into an innovation path when they innovate using only their patent stock. In fact, relying too much on knowledge stock will generate core rigidities and path dependency through which knowledge stock will negatively influence innovation performance (Leonard-Barton, 1992; Levinthal & March, 1993). For knowledge flow, from the perspectives of open innovation theory and networking embeddedness theory, many scholars stress that knowledge flow from external sources has a positive relationship with enterprise innovation activities (Geldres-Weiss, Uribe-Bórquez, Coudouaris, & Monreal-Pérez, 2016; Jin & Li, 2012; Užienė, 2015). Bathelt, Malmberg, and Maskell (2004) claim that firms will promote their innovation performance by embedding themselves in ‘global pipelines’ to obtain new knowledge and overcome lock-in. Not only external knowledge but also new knowledge from firms’ internal R&D activities promote innovation performance (Fan, Shao, Tang, & Wang, 2010; Konno, 2016; Wei & Zhen, 2010). However, the relationship between knowledge flow and innovation performance will be negative when search myopia exists (Levinthal & March, 1993). Indeed, there is an intense argument about the relationship among knowledge stock, knowledge flow and innovation performance and how to maintain a balance between knowledge stock and knowledge flow for innovation. This paper uses knowledge flow with ‘new’ and ‘dynamic’ features and knowledge stock with ‘existing’ and ‘static’ features to explore how to influence firms’ innovation trajectories and investigate the relationship between knowledge stock, knowledge flow and enterprise innovation from the knowledge base perspective. By constructing the ‘knowledge stock—knowledge flow—enterprise innovation performance’ research framework and using a regression model to analyse panel data, this paper discusses the relative impact of knowledge flow and knowledge stock on enterprise innovation performance and the relationship between knowledge stock and knowledge flow; identifies the interactive mechanism of knowledge stock, knowledge flow and enterprise innovation activities; and explains improvement ideology and optimization programmes with respect to enterprise innovation performance from the perspective of knowledge forms, contributing to our understanding of knowledge management practice.

**LITERATURE REVIEW AND RESEARCH HYPOTHESES**

**Knowledge Stock and Enterprise Innovation Performance**

A firm’s innovation activity is a change that may bring economic and social benefits to the enterprise; this change is based on the recombination of business knowledge resources (Weitzman, 1998). Knowledge stock involves the knowledge resources owned by an enterprise over a period of time and stored in various forms, such as enterprise personnel, patents and equipment assets, as a result of the accumulation of different kinds of knowledge related to business operation. Knowledge stock is a source of innovative proprietary knowledge for an enterprise (Carnabuci & Bruggeman, 2009). Tzabbar, Aharonson, Amburgey, and Al-Laham (2008) found that knowledge stock is positively correlated with technology leadership, and an increase in knowledge stock promotes an enterprise’s technological innovation performance. Cao (2009) reported that the increase of enterprise knowledge stock will promote an enterprise’s technological competency to achieve business competitiveness.
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