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Technology commercialization, incubator and venture capital, and new venture performance

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Abstract

This study examines the effects of technology commercialization, incubator and venture capital supports on new venture performance from the resource-based view. This study uses regression analysis to test the hypotheses in a sample of 122 new ventures. The findings highlight the role of technology commercialization as a mediator between organizational resources, innovative capabilities, and new venture performance. Also, the empirical evidence indicates that incubator and venture capital supports moderate the effects of technology commercialization on the performance of new ventures. Finally, this study discusses managerial implications and highlights future research directions.

Keywords: New venture; Technology commercialization; Incubator; Venture capital; Organizational resource; Innovative capability

1. Introduction

New venture, especially high-tech new venture, receives wide recognition of its important contributions to the economy (Drucker, 1985; Hayton, 2005). Over the last 25 years, two-thirds of the net new jobs and 95% of the radical innovations have come from these entrepreneurial businesses (Allen, 1999; Timmons and Spinelli, 2003). However, high-tech new ventures face greater problems than other firms, including lack of adequate knowledge of their environments, new product development experience as well as financial resources (Feeser and Willard, 1990; Shan, 1990; Zahra and Covin, 1993). High-tech new ventures are highly vulnerable and easy to fail with less than half of them lasting for five years (Li and Atuahhene-Gima, 2002; O'Shea and Stevens, 1998). Owing to the increasing importance and high failure rate, managers and scholars show considerable interest in discovering a recipe for successful high-tech new ventures (Zahra and Nielsen, 2002).

Prior studies discuss the direct effects of resources and capabilities on the competitive advantage and performance of the firms (Hall, 1993; Yeoh and Roth, 1999). From a resource-based perspective, organizations are heterogeneous in relation to their resources and capabilities (Barney, 1991; Mahoney, 1995; Teece et al., 1997). Resources and capabilities determine organizational competence. Technology commercialization is such an important kind of competence. Technology commercialization competence (TC competence) refers to the competence of the firms to use technologies in products across a wider range of markets, incorporate a greater breadth of technologies in products, and get products to market faster (Nevens et al., 1990). Successful technology commercialization is crucial for the survival of firms in light of quick changes in the business environment (Cooper, 2000). Businesses, especially new ventures, rise and fall depending on whether or not they can discipline their commercialization efforts (Nevens et al., 1990). This logic implies that TC competence may play as a mediator in the relationships between resources and capabilities, and performance of new ventures. However, literature examining this mediating issue is scarce (Zahra and Nielsen, 2002). Accordingly, the present study attempts to examine the research issue by adopting the resource-based view to investigate the relationships among organizational resources, innovative capabilities, TC competence, and performance of new ventures.

Secondly, this study examines how incubator and venture capital supports affect the relationships between TC competence

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and new venture performance. Few new ventures make themselves through their early years mainly due to management problems and under-capitalization (Roure and Keeley, 1990). Incubators and venture capital firms represent two popular and controversial intervention approaches to assist new start-ups to solve these critical problems. Many prior studies increase understanding of the roles of incubators and venture capital firms in the development of new ventures (Allan and Bazan, 1990; Barry et al., 1990; Colombo and Delmastro, 2002; MacMillan et al., 1989; Mian, 1996). However, prior researches provide mixed results. From the perspective of resource-based view, the internal competence, such as TC competence, may influence the extent of external resources upon which the new venture is dependent. No prior research in the literature takes this perspective to examine the fits of venture capital and incubator supports with TC competence in influencing the new venture performance. Therefore, the present study also examines the moderating roles of incubator and venture capital supports in affecting new venture performance from the resource-based viewpoint.

Accordingly, this study examines the mediating effects of TC competence and the moderating effects of incubator and venture capital supports on the performance of new ventures. Fig. 1 presents the research model of this study. The rest of the paper is set out as follows. The next section reviews the previous literature and sets out the hypotheses of this study. Following that is the methodology for the study. Then, the paper presents the empirical results to test the hypotheses. The last section provides discussion of the findings and the managerial and scholarly implications.

2. Background

2.1. Organizational resources

Organizational resources are the financial, physical, human, technological, and organizational endowments that allow a company to create value for the customers (Hill and Jones, 2004). From the resource-based view, a firm needs to develop the organizational resources to strengthen its TC competence (Mahoney, 1995; Yeoh and Roth, 1999). Organizational resources include three types: human, tangible, and intangible resources (Grant, 1998). The human resource usually includes the knowledge, expertise, talents, creativity, and skills of a firm's personnel (Cohen and Zysman, 1988; Davenport, 1992). From the resource-based viewpoint, a firm should maintain strong internal human resources in order to gain competence in technology commercialization (Zahra and Nielsen, 2002). Firms can recruit and maintain a well-trained labor force whose knowledge, skills, and experience can serve as a driving force for strengthening the competence in technology commercialization (Ettlie and Vellenge, 1979; Leonard-Barton, 1995). Recruitment gives the firm access to new technologies and knowledge which can facilitate rapid product development and accelerates technology commercialization (Zahra and Nielsen, 2002). Moreover, experienced and well-trained employees can implement changes more effectively in the internal processes, systems, and technologies for successful technology commercialization (Dertouzos et al., 1988).

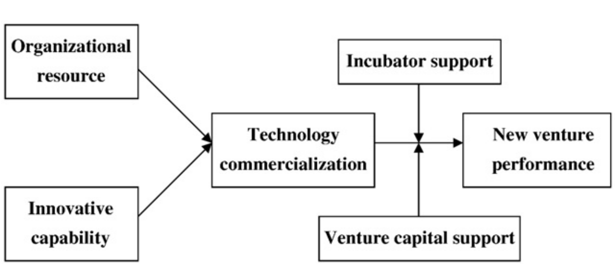

Fig. 1. The research model.

From the resource-based viewpoint, tangible resources can be sources of TC competence as well (Yeoh and Roth, 1999; Zahra and Nielsen, 2002). Tangible resources are something physical including financial resources and physical assets (Hill and Jones, 2004). Financial resources and physical assets act as the blood of new ventures. All the functions such as R&D and marketing within new ventures need these tangible resources to maintain their efforts in technology commercialization. For example, a substantial level of R&D investment is necessary for developing new technologies in a timely manner (Capon et al., 1992; Yeoh and Roth, 1999) and a great level of marketing spending is necessary for understanding how to develop customized products for different market segments (Cooper and Kleinschmidt, 1990). Accordingly, sufficient tangible resources increase the likelihood of improving TC competence.

While tangible resources are important, intangible resources are a more durable source of TC competence. Intangible resources are non-physical entities including brand names and the intellectual property (Grant, 1998). Unlike tangible resources can be acquired through market transactions from outside, intangible resources are characterized by imperfect mobility and need to be accumulated within the firms (Peteraf, 1993). Intellectual property rights can facilitate the development of new products and protect them from competitor's imitation while brand names are helpful for new ventures to promote their new products by establishing positions in geographical space as quickly as possible. Overall, this study expects that organizational resources would have a positive effect on TC competence of new ventures. These observations underpin the following hypothesis.

Hypothesis 1. Organizational resources relate positively to TC competence of new ventures.

2.2. Innovative capabilities

The focus now turns to innovative capabilities within the new ventures. Innovative capabilities refer to firm's capabilities, grounded in the processes, systems, and organizational structure, which can be applicable to the product or process innovation activities. The resource-based view suggests that a company with strong capabilities, especially innovative capabilities, can lead to superior competence, such as TC competence, over their rivals. Innovative capabilities tend to