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Product development success through cooperation: A study of entrepreneurial firms

Michael Dowling[a,*], Roland Helm[b,1]

[a]University of Regensburg, Management of Innovation and Technology, 93040 Regensburg, Germany
[b]Friedrich-Schiller-University Jena, Marketing and Business Administration, 07743 Jena, Germany

Abstract

In this paper we examine the moderating affect of age on the relationship between cooperation and new product success for entrepreneurial firms in the high technology region in and round Jena in the former East Germany. Cooperative strategy has already been shown in a variety of research settings to be an important strategic alternative for entrepreneurial firms to support growth strategies. We develop hypotheses that such cooperative relationships will also lead to higher new product development success; however, the type of successful cooperation will vary with the age of the start-up firm. Younger firms are shown to be more successful when they cooperate with other firms, while older firms will profit more from cooperation with research institutions. This study adds to a growing literature on the importance of cooperative strategy for entrepreneurial firms.
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Keywords: Entrepreneurial firms; High technology regions; Cooperative strategy

1. Introduction

The factors influencing the survival, performance, and development of high-technology entrepreneurial firms has been an important research theme in both the United States and Europe over the last twenty years (Bygrave and Hofer, 1991; Gartner, 1985; Shane and Venkataraman, 2000; Venkataraman, 1997). Some of the important characteristics of entrepreneurial firms are the lack of internal resources, and other handicaps, that have been described in the literature as the 'liability of newness' (Stinchcombe, 1965) and the 'liability of smallness' (Baum, 1996). These liabilities are particularly acute for high-technology firms attempting to enter industries that are dominated by large incumbents One way for high-technology entrepreneurial firms to overcome these liabilities is to develop partnerships and cooperative strategies.

Growth and firm performance from internal resources alone is difficult for most entrepreneurial firms. An important alternative is the use of external networks as an alternative model of organization (Richardson, 1972). In fact, a variety of empirical research has shown that networking can improve growth and success in such firms (Chell and Baines, 2000; Huggins, 2000; Jarillo, 1988, 1989). The research of Lechner and Dowling (2000, 2003) has shown the importance of networking for start-up companies in high-tech industries. Their studies were based on empirical analyses of the growth and development of the bio-technology region in the 1990s in the suburb of Martinsried/Munich, Germany, and the development of the cluster of computer firms in Munich in the 1980s and 1990s. In particular, this research showed how entrepreneurial firms use a different relational mix at different development stages, leading to the development of a richer theoretical framework of entrepreneurial firm growth.

The research reported here examines a related but different measure of firm success: the ability to generate marketable new products. Data is gathered and analyzed from the cluster of high technology entrepreneurial firms in the region in and around Jena, in the former East Germany. Jena has developed into one of the most successful high technology clusters in the former East German states.

* Corresponding author. Tel.: +49 941 9433226; fax: +49 941 9433230.
E-mail addresses: michael.dowling@wiwi.uni-regensburg.de (M. Dowling), roland.helm@wiwi.uni-jena.de (R. Helm).
URLs: http://www.wiwi.uni-regensburg.de/dowling/ (M. Dowling), http://www.wiwi.uni-jena.de/Marketing/docs/start.html (R. Helm).
[1] Tel.: +49 3641 943110; fax: +49 3641 943112.

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2. Theoretical development

The strategic use of external resources through co-operative strategies has been shown to be advantageous in many different industries, (Jarillo, 1989; Lorenzoni and Ornati, 1988; Powell, 1987). Other research has shown that cooperative networks of firms are often embedded in regional clusters (Boari and Lipparini, 2000; Lechner and Dowling, 2000). It has also been suggested that cooperative firm networks based on trust, play an important role in resource exchange and reducing costs (Larson, 1991, 1992; Lorenzoni and Lipparini, 1999; Powell, 1987, 1990; Richardson, 1972; Thorelli, 1986). Cooperative networks can be seen as an alternative organization structure between the extreme forms of pure markets or hierarchies with single firms (Di Maggio, 1986; Jarillo, 1993; Lorenzoni, 1992; Powell, 1990).

A variety of empirical research has also examined cooperative network strategy and firm performance particularly as measured by growth (Ardichvili and Cardozo, 2000; Chell and Baines, 2000; Hoang and Antoncic, 2003; Huggins, 2000; Jarillo, 1989; Sawyer et al., 2003; Zhao and Aram, 1995).

Cooperative strategy has also been shown to represent an important strategic alternative for entrepreneurial firms (Johannisson, 1998; Wassermann and Faust, 1994). In particular, liabilities of newness and smallness can be overcome through the strategic use of network relationships in order to access external resources (Aldrich, 1999; Dubini and Aldrich, 1991; Johannisson, 1995, 1998, 2000; Lipparini and Sobrero, 1997; Ostgaard and Birley, 1994; Starr and MacMillan, 1990).

Lechner and Dowling (2000, 2003) examined the importance of networking for start-up companies in high-tech industries based on empirical analyses of the growth and development of the bio-technology region in the 1990s in the suburb of Martinsried/Munich, Germany, and the development of the cluster of computer firms in Munich. They argued that the relational mix (that is the different types of networks) changes over time in order to enable firm growth. Their research showed that there is an association between the development and transformation of relationships, size and growth of firms in a network, and the growth of entrepreneurial firms, in particular in high-technology industries.

In the first study, Lechner and Dowling (2000) examined the bio-tech cluster in Martinsried, Germany, that was created through targeted industrial policy by the German federal government in the early 1990s. Money was awarded to this region in order to develop entrepreneurial firms, which led to a great growth in the number of firms and the relationships between each of these firms and also between large established players in the pharmaceutical industry. The second study (Lechner and Dowling, 2003) examined firms in the Munich IT cluster. This group of firms was not supported through targeted industrial policy, but rather grew organically over time due to the high quality of life in the Munich area and a concentration of leading universities. The most important result of these two studies was that cooperative relationships in a geographic network region are very important for the development of these firms and that the type and number of relations becomes increasingly complex over time. In particular, firms in their initial phases use 'reputation networks' to develop marketing ties to larger firms that enabled them to position themselves and to reach a stage of financial success more quickly. Over time, other networks become more important, such as 'co-opetition networks' with other competitors, and marketing information networks.

Taken together, these studies suggest that cooperative networks in high-tech regions are particularly important for the development and success of entrepreneurial firms and provide a significant source of competitive advantage. In particular, these network ties support innovative processes by transferring knowledge between firms. Most importantly, this research showed that different types of networks could provide different sources of competitive advantage at different stages of the start-up life cycle. In particular, it was suggested that reputation networks are particularly important to give new firms credibility. These reputation effects are most important when firms are attempting to place new products into markets (Buchanan et al., 1999) where there are established competitors. Therefore we suggest the following hypothesis:

H1: Younger firms will develop more marketable products if they cooperate with other companies.

As suggested by the work of Lechner and Dowling (2000, 2003), as firms age there is less emphasis on the network ties that directly affect product development and introduction. Other ties to promote growth long term become more important. For example, older firms will emphasize cooperative relationships with scientific institutions to better develop the overall technology of the firm. Therefore we suggest the following hypothesis:

H2: Older firms will have more marketable products if they cooperate with scientific institutions.

3. Methods

3.1. Data and sample

Jena is a city in Thuringia, one of the 'new' states of Germany (the former German Democratic Republic or as commonly called East Germany). In the Jena region there is an established university, a polytechnic college and other important research institutes for technology development of the Fraunhofer Society. Because this region has only recently developed into an innovation cluster, we contacted only younger companies located in the region of Jena which we knew to be in high-tech industries. We collected the names and addresses of the company heads from

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