



Network resource combinations in the international venturing of small biotech firms

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ABSTRACT

Integrating the resource-based view (RBV) with a network perspective on resources, this article contributes to the growing body of knowledge regarding the internationalization of smaller biotech firms. In particular, it looks at how these firms commercialize innovations by combining resources in their networks in order to enter new foreign markets with existing products and to enter existing foreign markets with new products. Six cases indicate that network resource combinations vary with the nature of the venture; whereas new international product ventures (NIPVs) exploit a broad set of network resources in concordance with the multifaceted challenges intrinsic to these endeavours (i.e., both redefining the product and redefining the market), new international market ventures (NIMVs) depend on a more narrow scope of network resources, deployed with the primary aim to expand and deepen the customer base in foreign markets. The article concludes by proposing a model of the components of network resource combination capability.

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1. Introduction

International venturing is often crucial to biotech firms since they belong to what may be described as an inherently global marketplace. For example, high cost of innovation in combination with increasing specialization and shorter product life cycles means that many biotech firms must make their products available to a wider customer base than offered by the home market, with as short a time-to-market as possible (Al-Laham and Souitaris, 2008; Rovira Nordman and Melén, 2008). Success, therefore, depends not only on the product as such, but on how skilful the firm is at commercialising it across countries.

Studies often argue that firms must be able to mobilize unique constellations or combinations of resources to be successful (e.g., Barney, 1991). That is, the resources under a firm's control should be combined in such a way that they provide a particular venture with an advantage over competing ventures (cf. Nelson and Winter, 1982). This is commonly referred to as the resource-based view (RBV). Penrose (1959) presents this as a dynamic interplay between firm-specific resources and market opportunities, where growth is achieved through an intertwined process of resource acquisition and opportunity exploitation; new resources generate

new unique resource constellations that, in turn, present new opportunities that may be exploited to the firm's benefit.

In the past few decades the major tenets of Penrose's framework and RBV have been incorporated into models of internationalization. It is analogically argued that resources accumulated within the firm drive the exploitation of opportunities in foreign markets (Johanson and Vahlne, 1977; Kogut and Zander, 1993; Autio et al., 2000; Peng, 2001). Exploitation of opportunities, in turn, may generate new resource constellations, underlying innovative international business solutions (Kirzner, 1973; Zahra et al., 2006).

Recent research on the internationalization of smaller firms, however, stands in sharp contrast to this "inward view" on resources constellations. It has been found that within their own organizations, smaller firms often cannot mobilize all the resources required for international venturing. Rather, empirical evidence reveals that resource constellations critical for global competitiveness often span across organizational boundaries (e.g., Sullivan Mort and Weerawardena, 2006). That is, the proprietary assumptions of the RBV concerning resource constellations should be relaxed to incorporate resource constellations that are leveraged through the network. This may be referred to as *network resources*, i.e. external resources embedded in a firm's network that affect business outcomes (Gulati and Singh, 1998; Gulati, 1999; Lavie, 2006). *Network resource combination*, therefore, means bringing together complementary resources from network relationships; resources whose value is enhanced by combination, providing the internationalizing firm with an

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advantage over other ventures (cf., Yli-Renko et al., 2001; Buckley and Carter, 2004).

In line with this argument, studies have addressed the importance of network resources in the internationalization of smaller firms and have found these to be of great significance (Bell, 1995), not least in the biotech industry (Gertler and Levitte, 2005). In fact, studies indicate that without drawing on resources in the network, many international ventures would never be exploited at all (Karra et al., 2008). There is still, however, relatively limited knowledge of how network resources are combined to enable international venturing in small biotech firms. More specifically, we do not know which network resources are used and if network resource combinations depend on the nature of the venture.

By integrating the resource-based view and the network perspective, this article answers a call for more research on the link between resources and the pursuit of opportunities in foreign markets (Rialp et al., 2005). More specifically, its main contribution is to investigate the association between network resource combinations and the exploitation of international ventures undertaken by smaller biotech firms.

The following section reviews the literature on network resource combinations and international venturing. The theoretical point of departure is that networks extend the resource base of firms and, thereby, act as engines of innovation. We then distil seven types of network resources important in the international venturing of small biotech firms. The subsequent theoretical platform is based on the rationale that resource combinations form the cornerstones of two types of international ventures: new market ventures and new product ventures. This logic justifies the selection of six ventures for empirical inquiry and subsequent analysis. Based on empirical observations it is found that, whereas the complexity of network resource combinations appears to vary depending on the nature of the venture, network resource combinations are crucial for all the studied ventures and particular network resource combination capabilities are required.

2. Network resource combinations—literature review

2.1. Resource combinations

The resource-based view is founded on the assumption that resources are heterogeneous in nature (Barney, 1991). For example, whilst some resources can be bought and sold, others are neither readily tradable nor easy to assess (Wernerfelt, 1984; Hall, 1992; Peteraf, 1993). Since resources can only be a source of sustained competitive advantage if they are difficult to substitute or imitate (Barney, 1991), the value of a resource increases if there is uncertainty about a firm's grounds for efficiency preventing presumptive imitators from knowing exactly what to benchmark and how to do it (Lippman and Rumelt, 1982).

The heterogeneity of resources also means that a firm's resource constellation, in at least some way, is unique. Unique resource combinations may, for example, enable a firm to produce with greater efficiency or to better satisfy customer needs than other firms (Peteraf, 1993). Emerging theory posits that in order for firms to create and sustain long-term competitive advantages, though, firms have to continually *recombine* resources to innovate in response to changes in the environment (Teece et al., 1997; Eisenhardt and Martin, 2000; Johnson et al., 2004; Zahra and Filatotchev, 2004; Newbert et al., 2008). This view is grounded in the notion that when resources are combined, they become embedded in a system that limits their transferability (Madhok, 1997). Resources that were previously conceived of as generic in

themselves can, thereby, be transformed into higher order competences that open up for the exploitation of new business opportunities.

2.2. Network resources

The formation of new market structures in modern business sectors such as the biotech industry has, to some extent, blurred traditional boundaries between competitors and collaborators (Audretsch, 2001). Business innovation is not only instigated within firms as a response to outside competitive forces, but increasingly takes the form of interorganizational collaboration as idiosyncratic resources are disseminated through business networks.

Powell et al. (1996) note that while the biotechnology industry went through rapid global development in the 1980s, it became clear that the full range of resources required to exploit business opportunities often could not be easily accumulated under one roof. Therefore, many biotech firms began exploring ways of leveraging resources controlled by partners in internationally dispersed networks. Although apparently there are no established, comprehensive frameworks of network resources, studies on biotech firms indicate that they may include technological, market, human, financial, reputational, and various physical resources (e.g., Powell et al., 1996; Ahn and Meeks, 2008; Gassel and Pascha, 2000).

Effective deployment of *technological resources* has proven to be important in the exploitation of international ventures among firms in various high-tech industries. Within this context, studies have revealed that technological resources often are leveraged in network relationships where synergetic competences are synthesized (Autio et al., 2000). Technological resources are often crucial for innovation and can lead to business breakthrough even when their market applicability is not readily apparent (cf., Abernathy and Utterback, 1978). These resources may include firms' knowledge about key technology as well as R&D capacity, and is sometimes consolidated by patents and trademarks (Coff, 2003).

Furthermore, *market resources* include the competences required to do business in a certain foreign market (Fang et al., 2007). For example, studies have found that market resources derived from network relationships can increase a firm's ability to exploit opportunities because they confer awareness of customer problems and preferences (Blomstermo et al., 2004; Johanson and Mattsson, 1988). Such knowledge about markets is often experiential and becomes embedded in firms and their networks through change in routines and procedures (Eriksson et al., 1997). In the biotech industry, market resources are often vital for the commercialization of technology as they contribute to the synchronization of science and business agendas (Ireland and Hine, 2007).

Gertler and Levitte (2005) claim that *human resources* are extremely important in the biotech industry where it is crucial to have access to highly educated people ("embodied knowledge") to be able to develop new business opportunities. Knowledge-based resources are, thus, not always integral to the firm as such, but are often directly related to individuals such as managers and staff (Thompson and Heron, 2005), or key scientists (Boardman, 2008). The development of *human resources* is also interconnected with the development of the venture, implying that individuals are difficult to replace (Ruzzier and Antoncic, 2007).

Furthermore, a firm's reputation in its network is essential for business because reputation may be a source of competitive advantage by enhancing firms' long-term ability to attract foreign customers (Galbreath, 2005; Suh and Lyn, 2007). Correspondingly, Rialp et al. (2005) assert that *reputational resources* constitute a

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