The Resource – Based View of the Firm and Innovation: Identification of Critical Linkages

Konstantinos C. Kostopoulos

Doctoral Candidate, Management Sciences Laboratory, Athens University of Economics and Business, 47A Evelpidon & 33 Lefkados, GR 113 62 Athens, Greece. axion@aueb.gr

Yiannis E. Spanos

Lecturer, Management Sciences Laboratory, Athens University of Economics and Business

Gregory P. Prastacos

Professor, Director of the Management Sciences Laboratory, Athens University of Economics and Business

ABSTRACT

Over the last years the resource-based view (RBV) of strategic management has attracted wide academic and managerial attention. Drawing on RBV literature, this paper analyses the interrelationships between RBV and organizational innovation. We examine those aspects of RBV that critically determine the firm's capacity to innovate by integrating the relevant theoretical and empirical evidence. A number of contributions setting the ground for future empirical research are provided.

1. Introduction

The importance of the resource-based view (RBV) of strategic management is manifest in its rapid diffusion throughout the strategy literature (e.g., Wernerfelt, 1984; Rumelt, 1984; Barney, 1986, 1991; Dierickx & Cool, 1989; Mahoney & Pandian, 1992; Amit & Schoemaker, 1993; Peteraf, 1993; Maijoor & Witteloostuijn, 1996). Drawing on previous research in RBV, this study aims at illustrating the interrelationships between RBV and organizational innovation. Specifically, we focus on those aspects of RBV that critically determine the firm's capacity to innovate. We integrate the relevant theoretical and empirical evidence and we highlight a number of useful research contributions.

The remaining of this paper unfolds as follows: Section 2 briefly reviews the resource-based view and comments on RBV as a developmental process. The subsequent section presents those resources and capabilities that are critical for the firm's capacity to innovate. The paper concludes with the contributions that RBV brings to innovation research.

2. RBV: Theoretical background

The popularity of the resource-based view (RBV) of the firm has turned our focus on the black box of the firm. Theoretically, the central premise of RBV addresses the fundamental question of why firms are different and how firms achieve and sustain competitive advantage by deploying their resources. Clearly, these ideas are not new. During the last 50 years, many management academics have contributed to the development of this topic. For example, Selznick's (1957) idea of an organization's 'distinctive competence' is directed related to the RBV. Also, Chandler's (1962) notion of 'structure follows strategy', as well as Andrews' (1971) proposal of an internal appraisal of strengths and weaknesses, led to the identification of distinctive competencies.

However, the founding idea of viewing a firm as a bundle of resources was pioneered by Penrose in 1959. Penrose argued that it is the heterogeneity, not the homogeneity, of the productive services available from its resources that give each firm its unique character. The notion of firm's resources heterogeneity is the basis of the RBV. The significance of the resource perspective as a new direction in the field of strategic management was broadly recognized with the path-breaking article by Wernerfelt (1984). Wernerfelt (1984) suggested that evaluating firms in terms of their resources could lead to insights that differ form traditional perspectives.

In 1991, Barney presented a more concrete and comprehensive framework to identify the needed characteristics of firm resources in order to generate *sustainable* competitive advantage. These characteristics include whether resources are: valuable (in the sense that they exploit opportunities and/or neutralize threats in a firm's environment), rare among a firm's current and potential competitors, inimitable, and non-substitutable (Barney, 1991). In this respect, many authors (Amit & Schoemaker, 1993; Mahoney & Pandian, 1992; Peteraf, 1993; Rumelt, 1984; Dierickx & Cool, 1989) have adopted and even expanded Barney's view to include: resource durability, non-tradeability, and idiosyncratic nature of resources.

Over the last decade, much of the strategy literature has emphasized resources internal to the firm as the principal driver of firm profitability and strategic advantage. This transition in academic and managerial attention from an Industrial Organization (IO) economic view towards a resource-based view of strategy has occurred for several reasons.

First, the rate of change in terms of new products, new technology, and shifts in customer preferences has increased dramatically. Obviously, a static snapshot of a moving industry was not an adequate means for formulating strategy in an increasingly dynamic environment (Bettis & Hitt, 1995). Secondly, traditional industry boundaries are blurring as many industries converge or overlap, especially in information technology-related industries (Bettis & Hitt, 1995; Hamel & Prahalad, 1994). Yet, traditional IO strategic

thinking is based on stable industry, as are many strategic analysis tools, including competitor analysis, strategic groups, and diversification typologies. Finally, the increasing rate of change has put increasing pressure on firms to react more quickly, as time is often seen as source of competitive advantage (Stalk & Hout, 1990). All these reasons suggest that firms may look inwardly for strategic opportunities, while, at the same time, must reconceptualize how they think of industries and define competitors.

2.1. Resources and Capabilities

The central proposition of the resource-based research is that firms are heterogeneous in terms of the strategic resources they own and control. It is generally suggested that this heterogeneity is an outcome of resource-market imperfections (Barney, 1991), resource immobility (Barney, 1991), and firms' inability to alter their accumulated stock of resources over time (Carroll, 1993). In this vein, each firm can be conceptualized as a unique bundle of tangible and intangible resources and capabilities (Wernerfelt, 1984). Resources, which are the basic unit of analysis for RBV, can be defined as those assets that are tied semi-permanently to the firm (Maijoor & Witteloostuijn, 1996; Wernerfelt, 1984). It includes financial, physical, human, commercial, technological, and organizational assets used by firms to develop, manufacture, and deliver products and services to its customers (Barney, 1991). We can classify resources as tangible (financial or physical) or intangible (i.e., employee's knowledge, experiences and skills, firm's reputation, brand name, organizational procedures).

Capabilities, in contrast, refer to a firm's capacity to deploy and coordinate different resources, usually in combination, using organizational processes, to affect a desired end (Amit & Shoemaker, 1993; Grant, 1996; Prahalad & Hamel, 1990). They are information-based, intrinsically intangible processes that are firm specific and are developed over time through complex interactions among the firm's resources (Amit & Shoemaker, 1993; Conner & Prahalad, 1996; Itami & Rohel, 1987; Kogut & Zander, 1992; Leodard-Barton, 1992; Winter, 1987). They can abstractly be though of as 'intermediate goods' generated by the firm to provide enhanced productivity of its resources, as well as strategic flexibility and protection for its final product or service.

In this definition, which primary relies on Amit and Shoemaker (1993), there are two key features that distinguish a capability from a resource. First, a capability is firm specific since it is embedded in the organization and its processes, while an ordinary resource is not (Makadok, 2001). This firm-specific character of capabilities implies that if an organization is completely dissolved, then its capabilities would also disappear, while in contrast, its resources could survive in the hands of a new owner. For example, if the Intel Corporation is completely dissolved, then its microprocessor patents (a resource) could continue to exist in the hands of a new owner, but its skill at designing new generations of microprocessors (a capability) would probably vanish. The second feature that distinguishes a capability from a resource is that the primary purpose of a capability is to enhance the effectiveness and productivity of resources that a firm possesses in order to accomplish its targets, acting as 'intermediate goods' (Amit & Shoemaker, 1993).

2.2. Asset accumulation as a developmental process

In a changing environment, firms must continually acquire, develop and upgrade their resources and capabilities if they are to maintain competitiveness and growth (Argyris, 1996a; Robins & Wiersema, 1995; Wernerfelt & Montgomery, 1988). A key challenge facing a firm is to identify the origin of resources and capabilities that establish and enhance the firm's sustainable competitive advantage. Within both the theoretical and empirical work to date, there has been limited discussion of how resources and capabilities are actually created (Schulze, 1994; Zajac, 1992). Some researchers ascribe capabilities to luck (Barney, 1986), whereas others analysts trace them to experiential learning by organizations (Nelson & Winter, 1982; Singh & Chang, 1993), and the more managerially inclined emphasize the role played by leaders of organizations (Prahalad & Hamel, 1991).

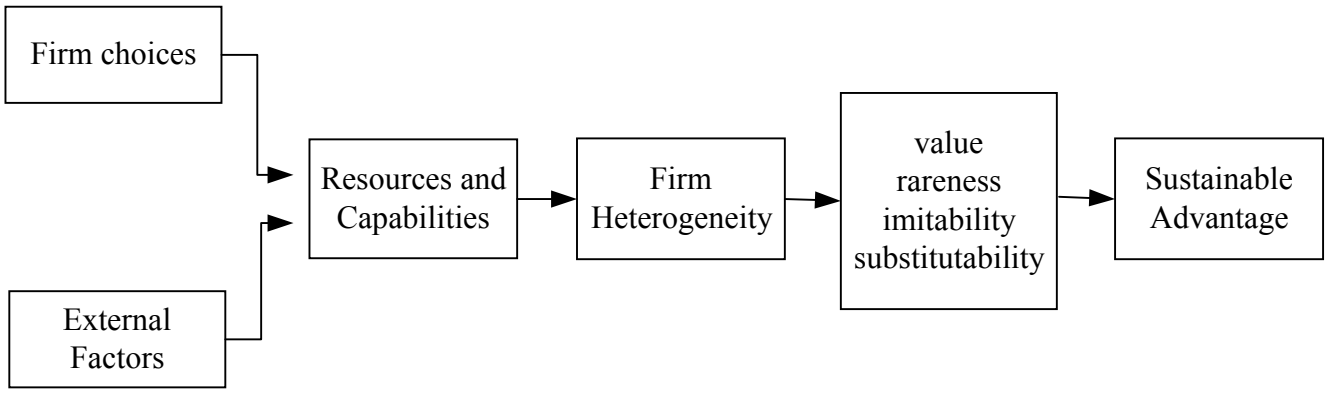
In a more formalized manner, Dierickx and Cool (1989) argue that strategic assets (those resources that are non-tradeable and create sustainable advantage) must be built or accumulated within firm boundaries by choosing appropriate time paths of flows (e.g., R&D expenditures). This internal process is determined by factors such as: time

compression, existence of other related assets, complexity and causal ambiguity of the accumulation process, and intraorganizational conflicts among those who make the managerial decisions about the process (Dierickx & Cool, 1989; Amit & Shoemaker, 1993). In other words, resources and capabilities are considered as the product of a history of strategic choices and resource commitments made by the firm, and guided by an economic rationality and by motives of effectiveness and profitability (Conner, 1991).

Apart from firm-specific characteristics, we should not ignore the fact that resource selection and deployment are also influenced by external factors, including the social, economic, or technological environment, industry structure, buyer and supplier power, and competitors' behavior. Therefore, following Amit and Shoemaker's (1993) point of view, we argue that the development of a firm's strategic assets is an integrative process that depends on the firms' strategic choices, in relation to industry and market-determined factors (or Strategic Industry Factors, as Amit and Shoemaker call them). The applicability of the firm's bundle of resources and capabilities to a particular industry setting (i.e., the overlap with the industry and market factors) will determine the firm's competitive advantage.

In sum, from a resource-based perspective sustainable competitive advantage is the outcome of resource selection, accumulation and deployment (through organizational capabilities), and is based upon the premise of firms' resource heterogeneity (Figure 1).

Figure 1: Sustainable Advantage and RBV



3. A resource – based view of the firm's capacity to innovate

Traditionally, one of the most important research questions of the management literature has been the relationship between innovation[1], firm structural characteristics (e.g., formalization, centralization, specialization) and industrial environment. From this traditional perspective, it is supposed that differences in the firm's innovative activities are basically explained by industry and organizational structure characteristics (e.g. Kimberly & Evanisko, 1981; Damanpour, 1991; Wolfe, 1994; Duncan, 1976; Daft, 1992). By contrast, more behaviorally oriented research streams, and especially evolutionary economics (Nelson & Winter, 1982), have studied innovation activities and performance not only in terms of organizational structure or industry characteristics but also in terms of resources and capabilities (Dosi, 1988).

Within the same line of reasoning, a growing body of literature that embraces the resource-based view of the firm (e.g., Brown & Eisenhardt, 1995; Henderson & Cockburn, 1994; Iansiti & Clark, 1994; Leonard-Barton, 1995) offers new insights to innovation management. According to this influential perspective, the presence of different organizational resources and capabilities positively affects the outcome of the innovation process and, thus, can be used to extend the findings -gained by past research- on the firm's capacity to innovate.

[1] Hereafter when we use the term 'innovation' we will refer to organizational (or firm-level) innovation. Organizational innovation is generally defined as an internally generated or externally purchased device, system, policy, process, product or service that is new to the adopting organization (Damanpour, 1991). Under this view, innovation represents a means of transforming an organization, whether as a response to changes in its internal or external environment or as a proactive action taken to influence its environment.

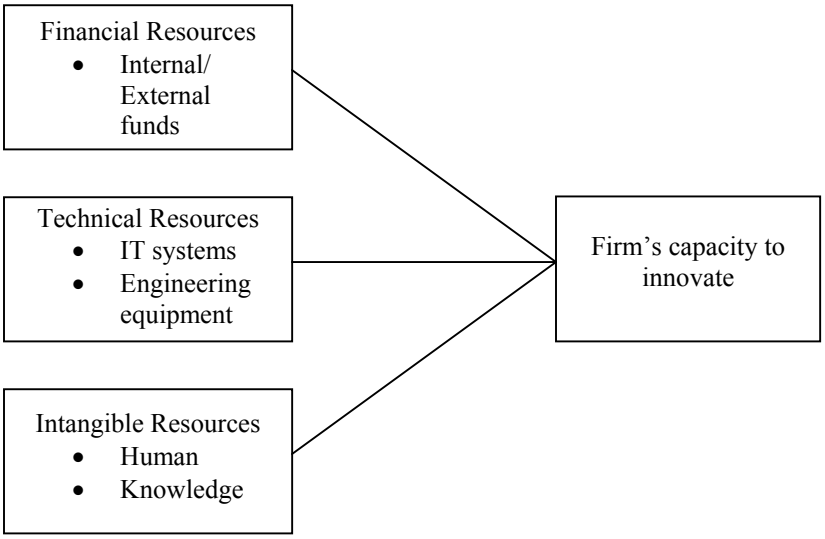
3.1. Theoretical linkages and empirical evidence

The resource-based research on innovation is based on the fundamental premise that organizational resources and capabilities are those that underlie and determine a firm's capacity for innovation. Within this perspective, organizational resources (tangible and intangible) are taken to provide the input that in turn is combined and transformed by capabilities to produce innovative forms of competitive advantage.

The literature has identified a number of resources that are critical for innovation (see Figure 2).

The availability of financial resources can expand a firm's capacity to support its innovative activities (Lee et al., 2001; Delcanto & Gonzalez 1999; Harris & Trainor 1995), whereas the lack of financial funds may limit firm level innovation (Baysinger & Hoskisson, 1989; Teece & Pisano, 1994; Helfat, 1997). According to Transaction-costs Economics and Agency literature, internally (firm) generated funds are more conductive to R&D activities and investments than external funds primary because there exist information asymmetries between the firm and the external capital market (e.g., competitors get information on R&D projects, firm lose total control over their innovations).

Figure 2: Resources determining a firm's capacity to innovate



Technical resources (e.g., engineering and production equipment, manufacturing facilities, IT systems) have also been found to positively affect innovation (Song & Parry 1997; Gatignon & Xuereb 1997; Mitchell & Zmud 1999; Liyanege et al., 1999). Carrying out innovation activities in many cases requires a minimum prior investment in highly sophisticated technical equipment, which raises the possibility of producing innovative output of increased value for the firm (unique, diversified products) and for its customers (increased quality).

More recent research has shifted attention from tangible to intangible resources. Intangible assets may be more important from a strategic point of view, since they bring together more frequently the requirements necessary for producing *sustainable advantage*: to be valuable, rare and difficult to imitate and replace by competitors (Barney, 1991; Hitt et al., 2001b). For example, a high stock of qualified human capital with advanced technical skills, know-how in R&D projects, and risk taking propensity increases the probability of a firm to carry out innovative activities (Delcanto & Gonzalez 1999; Kessler & Chakrabarti, 1999; Song & Parry, 1997; Huiban & Bouhsina, 1998).

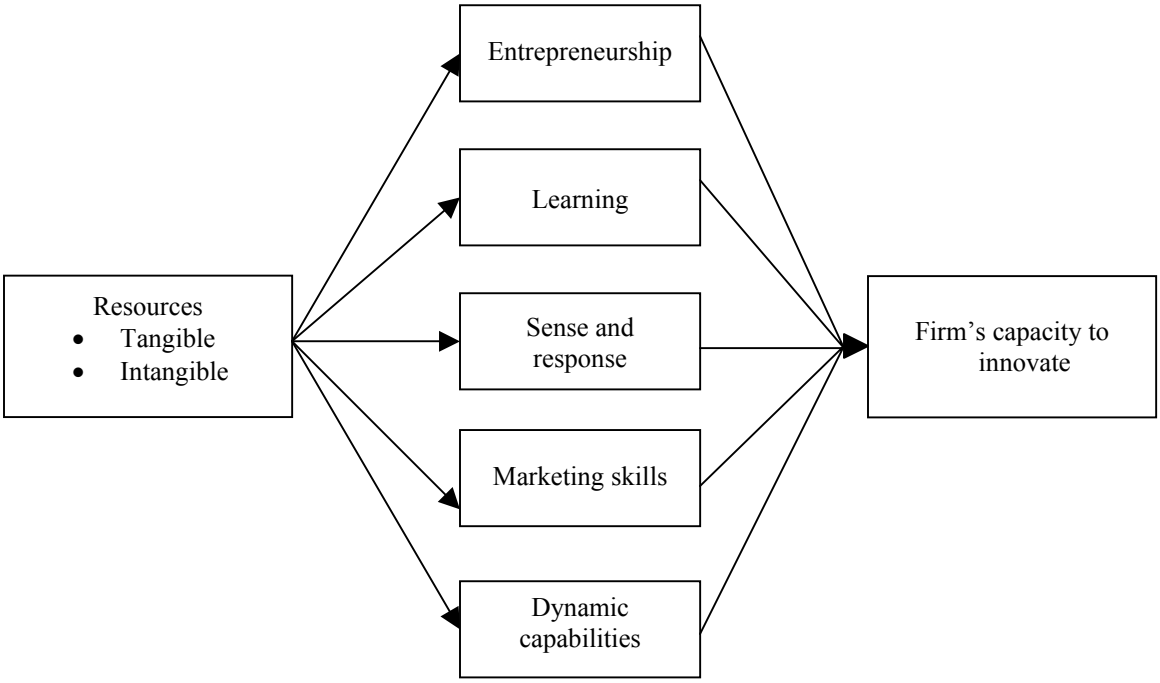
The increasing role of intangible assets has led to the emerging knowledge-based view (KBV) of the firm as an extension of the RBV. Viewing a firm from a knowledge-based perspective places particular emphasis on the firm's stock of knowledge (tacit or explicit) as a strategic resource and as an important determinant of its competitive success (Kogut & Zander, 1992; Nonaka, 1994; Decarolis & Deeds, 1999). Therefore, according to RBV, not only must firms be able to create knowledge within their boundaries, but they must also expose themselves to a bombardment of new ideas from their external environment in order to prevent rigidity, to encourage innovative behavior, and to check their technological developments against those of competitors (Leonard-Barton, 1995).

Within this line of reasoning, there exists strong evidence that confirms the positive relationship between organizational knowledge and the capacity to innovate. For example, Joyce and Stivers (1999) established the positive effects of market knowledge in their study of a sample of Canadian and US firms. Hoopes and Postrel (1999) found

that shared knowledge is an important resource underlying new product success. Tiger and Calantone (1998), in their study of the US software industry found that thorough customer knowledge enhances new product development. Similarly, Helfat and Raubitscek (2000) argued that market knowledge could form the foundation for generating multiple new product lines, while Whittington et al. (1999) in their study of large European firms confirmed that systemic change and innovation is high in organizations with increased knowledge intensity.

If resources provide the inputs, organizational capabilities represent the firm's capacity to coordinate, put it in productive use, and shape inputs into innovative outputs (Collis, 1994). Entrepreneurship, organizational learning, 'sense and response' capability, marketing skills, and 'dynamic' capabilities are those most strongly emphasized in the extant literature (Figure 3).

Figure 3: Capabilities determining a firm's capacity to innovate



Entrepreneurship refers to the articulation of a long-term vision for the firm that aims at higher growth through the introduction of innovative products and technologies at the expense of short-run profit maximization. There is a strong interrelationship between innovation and entrepreneurship. Drucker (1985), for instance, suggests that innovation is the primary activity of entrepreneurship. Lumpkin and Dess (1996) argue that a key dimension of an entrepreneurial orientation is an emphasis on innovation, while Cohen (1995) analyzing the adoption of new technology and commercialization of innovations notes the crucial role of the entrepreneur (see also Schumpeter, 1943;). Many other studies (e.g. Lal, 1999; Iansiti & West, 1999; Pllai & Meindl, 1998; Markham, 1998) reached similar conclusions examining US and Japanese industrial settings.

Research evidence on organizational learning has also indicated positive effects on innovation. Learning helps firms to generate new knowledge, recombine existing knowledge and skills, and adapt to changing market conditions. Newman (2000) argues that learning can help organizations to change. Lynn et al. (1999) studying high technology US firms found a positive relationship between learning and innovation. Bartezzaghi et al. (1997), Helfat and Raubitschek (2000), and Lane and Lubatkin (1998), reached similar conclusions examining Italian and Swedish companies.

Similar positive effects also seem evident for 'sense and response' capabilities. 'Sense and response' skills refer to the ability to rapidly sense changes in the environment, conceptualize a response to that change, and reconfigure resources to execute the response. Quinn (2000) argued that these skills are critical for continuous innovation, and Souder and Jensen (1999) confirmed the positive relationship in their study of Scandinavian and US telecommunication firms.

Marketing skills also appear important for the implementation and exploitation of innovation. Several authors found a positive association between innovation and marketing competences examining US, European, and Japanese contexts (Song et al., 1997; Song & Parry, 1996, 1997; Hultink et al., 2000). Moreover, what constitutes perhaps a more important capability for the firm is the integration and interaction

between marketing and R&D functions in order to facilitate information flow within and between departments, accelerate innovation process and achieve successful innovation output (Souder & Jenssen, 1999).

Finally, Teece et al., (1997) have put forward the so-called 'dynamic capabilities' framework. Dynamic capabilities refer to the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments. In their view, coordination/integration, learning and transformation are the fundamental dynamic capabilities that serve as the mechanisms through which available stocks of resources (e.g. marketing, financial and technological assets) can be combined and transformed to produce new and innovative forms of competitive advantage.

4. Conclusions

Undoubtedly, the resource-based view of the firm offers new directions for strategic management as has shifted the attention towards the firm and its unique characteristics. In this vein, RBV redirects organizational innovation research as well, especially in terms of the factors that determine firm-level innovation. The contributions of the resource-based perspective highlight the differences that this research stream brings comparing to other (traditional) perspectives that study innovation. On that sense, the basic research contributions of the resource-based school of thought to organizational innovation can be summarized as follows:

1. *From the resource-based view perspective, innovation does not come simply from scanning the external environment for market opportunities, but from looking inside and build on the resource endowment and core competencies of the organization.*
2. *Organizational resources and capabilities are taken to offer the necessary input for the development and exploitation of the firm's innovation activities. Consequently, the focus of the RBV is not only on how to squeeze innovative*

output out of the organizations, but also on how to provide the fuel for innovative activity to occur in the first place.

3. *Based on the assumption of firms' resources heterogeneity the RBV focuses on the firm's opportunity to produce innovative output with increased future value. The benefits of such an innovation output may last longer, will probably motivate and facilitate a new innovation effort, and may contribute to a sustainable competitive advantage. This is primary because the whole innovation process is based on combinations of strategic assets that are firm-specific and thus, difficult for competitors to imitate.*

4. *The RBV literature suggests that a firm should strive to innovate not only better than competitors but also one step before the competition. By developing dynamic capabilities, for example, a firm is able to adapt to changing industry conditions, learn and exploit new knowledge and articulate an innovative response to previously nonexistent market demand.*

5. *Finally, the relationship between RBV and innovation is bilateral. By this we mean that while RBV expands our knowledge on the factors that determine the firm's capacity to innovate, at the same time innovation is one mechanism through which a firm can renew the value of its assets. This mutual beneficial relationship helps create and sustain advantage in two ways. First, we are able to produce innovative output of increased value, and second, through implementing innovations firms can establish new 'stocks' of specific assets that others will find impossible to replicate quickly.*

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