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*Abstract*

According to the resource-based literature, essence of firm's idiosyncrasies is better investigated looking at the bundle of resources that constitutes them. According to this view, this paper examines the role of cumulated experience in influencing strategy-making process by directing selection of strategic initiatives. Moreover, this work regards it as necessary to look at the organisational and behavioural systems in which resources are embedded. For this reason, it places itself in the area of research, within the resource-based view of the firm, recently denominated 'Competitive Organizational Behaviour' that studies the strategic consequences of behavioural and social phenomena within the firm jointly with the content of strategy and the competitive context [Barney and Zajac, 1994]. Taking this intraorganisational point of view, it is argued that firms not only cumulate experience that enhance their ability to compete, but also build core rigidities which biases their learning (Leonard-Barton, 1992). A system dynamic simulation approach is used to explore the consequences of such an assumption. A firm is represented that allocates funds among competing strategic initiatives using evolving routines. On one hand, the firm learns and exploits accumulated knowledge, on the other hand, it is strongly biased by past experience. A behavioural perspective is, therefore, taken in highlighting heuristics and biases in the strategy-making process.

As a result, the paper (i) proposes some areas of analysis as crucial to address the paradox of taking advantage of core capabilities without being hampered by their dysfunctional flip side learning (Leonard-Barton, 1992) (ii) investigates the suitability of system dynamics modelling to this kind of analysis.

**1. Introduction**

Since Edith Penrose's book "The Theory of Growth of the Firm", a rich stream of research in strategic management has been identified as the **resource-based view of the firm (RBV)**.

The gist of this concept hinges upon the idea of investigating the essence of firm's idiosyncrasies looking at the bundle of resources that constitutes it. Many important contributions, since Penrose's seminal work, have enriched this perspective. Among the most widely quoted, Wernerfelt [1984], and Barney [1986], few years later, provided theoretical arguments explaining the link between resource heterogeneity and competitive advantage, giving rise to the so-called *formal* school in the RBV [Foss, 1995]. These see resource heterogeneity as exogenously created and rents as results of imperfect factor markets not able to arbitrage away, in equilibrium, difference in resource positions among firms. On the other hand, Prahalad and Hamel [1990], focusing on knowledge-type resources,

have proposed a dynamic, longitudinal approach to capability building. The gist of the argument is the shift from the emphasis on resources to core competences. These are defined as *collective learning in the organization...how to coordinate diverse production skills and integrate multiple stream of technologies*. It is a concept spanning throughout the firm and usually refers to large, multidivisional companies, more precisely, *it involves many level of people and all functions*.

Following this article, many authors have generated another thread of thought in the RBV literature which has been referred to as the *appreciative* school [Foss, 1995]. This point of view is intriguing under some angles. First, it is more dynamic, it focuses on characteristics of process rather than of resources themselves, heterogeneity develops continuously, as firms decide which competencies should be fostered and nurtured. Competitive advantage is the result of the ability to create and update a *situational fit* between combination of resources and environmental demand, playing an ever-changing, *dynamic puzzle game* [Bogaert, Martens, Van Cauwenberg, 1994].

Second, it stresses the idea that resource accumulation process can be represented as a system comprising people, resources and activities.

## 2. Infinite Recursion

Among scholars in strategy literature, it is widespread belief that RBV literature has some theoretical limits. Among the other, one is referred to as *infinite recursion* [Collis, 1994].

In Wernerfelt's perspective, heterogeneity in resource endowments is exogenously generated (1995), and in Barney's it is due to luck or foresight. In the latter case, what distinguishes firms then, is the manager who has foreseen the greater value of a particular resource. But how is explained the fact that one firm has this superior managerial resource? We must go back again recurring to the ability of who has hired or trained that manager and so on. On the other hand, the *appreciative* school has not solved either this problem, and we don't know yet why some firms are able to perform the activities of individuating and fostering core competencies better than others, unless we don't recur to a superior competence in accumulating core competencies. Collis (1994) has explained this problem as the *infinite regress in the explanation for, and prediction of, sustainable competitive advantage*.

To escape this riddle, two are the ways out. First, we admit that the value of capabilities is context dependent (Barney and Zajac, 1994; Collis, 1994). That is, depending to the competitive context,

some capabilities arise as important to achieve competitive advantage, and *to the extent that the firm's competitive environment changes, the advantages identified by traditional resource analysis at a prior point in time may not lend themselves to a competitive advantage in subsequent time periods* [Levinthal, 1995].

Second, since value of resources evolve over time, source of diversity among firm performances can be investigated looking at different ability of behavioural decision-making routines to adapt and to overcome core rigidities [Leonard-Barton, 1993].

This work intend to address the source of performance differences basing upon the following hypotheses: (i) unit of analysis is the firm as a RESOURCE ACCUMULATION SYSTEM, (ii) system dynamic is a suitable methodology to operationalise the concepts of resource and capability, (iii) competitive context influences the value of resources, (iv) behavioural decision-making makes adaptation to dynamic competitive environments not perfectly rational.

### **3. Methodology**

A model has been built in which a firm is represented pursuing a productive activity. The firm produces a consumer good and can follow two strategies. To each strategy is associated the accumulation of a dedicated resource, the latter represented by the hours of R&D. Each period the firm can invest in R&D a fixed proportion of the value of sales. First, the firm can follow a differentiation strategy managing the quality of the product with stable selling price. The characteristics of the product can be enhanced by increasing the quality of raw material (proportion of high-class raw material over low-class raw material) and increasing the R&D hours invested in research projects directly related to quality enhancement. Second, it can follows a cost strategy by moving downwards prices and increasing sale volume and/or investing R&D hours in research projects directed to increasing capital productivity. Effect of learning is captured by the productivity of R&D, the latter increases at a decreasing rate with accumulated hours of research.

Moreover, a market is represented receiving information concerning the price and the values of quality parameters, and matches them with two elasticities: price elasticity and elasticity to product quality. Therefore, the demand for firm's product depends on the elasticities and the difference between firm's parameters, relative to quality and price, and an average market value for these parameters. The firm looks at its performances and decides to invest in one or the other strategy.

The behavioural hypothesis built into the model is that of *motivated search* [Cyert and March, 1963]. This suggests that the firm search for new strategy only after negative performances. Furthermore, firms with an history of successful performances ( stock of accumulated good results) need a longer series of negative results to change strategy. Circumstances under which firm builds and loses its competitive position are analysed, running different scenarios concerning the behaviour over time of the values of market elasticities.

#### 4. Conclusions

The model is able to describe circumstances under which interaction between resource building, behavioural decision-making and competitive context generates change in competitive positions.

In particular, the efficiency of different degrees of sensitivity to negative performance and rapidity of strategic adjustment is investigated in presence of dynamic competitive context. The model shows that capability to quickly react to environmental changes and negative performances not always generate better results depending on the frequency and magnitude of variation in market elasticities.

Under a methodological point of view, this paper advocates the usefulness of system dynamic modelling as a tool to investigate issues related to resource accumulation in the firms. Hypotheses concerning rate and direction of resource building can be rigorously tested for logical coherency, and new, testable hypotheses can be generated.

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