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Penrose Revisited:

A Re-Appraisal of the Resource Perspective

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Abstract

This paper presents a revision and re-structuring of the Resources/Capabilities/Competences (RCC) perspective, arguably the most important research program in strategy, based on a thorough epistemological analysis and a re-interpretation of Edith Penrose's 1959 classic. Three distinct schools of thought are identified and differentiated according to a set of dimensions spanning the epistemological, methodological and conceptual domains. The three schools are: 1) The rational-equilibrium school; 2) the behavioral-evolutionary school; 3) the constructionist school. For each school, the pertinent literature is briefly reviewed followed by an in-depth analysis of the underlying theoretical framework. Important implications are drawn for scientific progress in the field.

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Epistemology, Resource Based View, Core Competences, Dynamic Capabilities, Strategy

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1. Introduction

In the field of strategy, the resources/capabilities/competence approach (henceforth RCC approach) has emerged as a powerful current with a sizable body of literature, whose proponents claim has the potential to offer a unifying paradigm for a highly fragmented field (Volberda & Elfring, 2001). Many writers erroneously refer to it as the resource-based approach, but other labels, such as the capabilities-based approach, dynamic capabilities or competence approach have also been used. This paper argues that the RCC approach, which is often portrayed as a single integrated school of thought, consists of three distinct research programs that exhibit some similarities, but also house non-trivial differences. This restructuring of the RCC approach is based on a thorough epistemological analysis and a re-interpretation of Penrose's 1959 classic. The purpose of this paper is threefold: First to give an overview of the current state of the art in all three research programs, secondly to show the most important commonalities and differences between them and lastly to discuss the strengths and weaknesses of each school and to point the way to areas where each is most fit to contribute.

The three distinct schools of the RCC approach will be differentiated according to a set of dimensions spanning several levels of inquiry, including the epistemological, methodological and conceptual (substantive) levels. The three schools are: (1) the rational-equilibrium school, which mainly consists of the resource based view of the firm; (2) the behavioral-evolutionary school, exemplified in the capabilities approach, and specifically the Dynamic Capabilities research program; and (3) the social constructionist school, which includes the Core Competence approach as well as other earlier contributions.

A meta-goal of this study thus is to show, how bringing to the surface the fundamental assumptions, which are very rarely explicitly discussed, aids in deepening our understanding of the literature and our appreciation of subtle but critical differences in the three approaches. Further dimensions such as assumptions about managers' rationality, the portrayed relation of the firm with its environment, the degree of strategic choice imputed to firm management and the criteria under focus in managers' strategic decisions are discussed for each school. In addition to presenting a useful structure that helps readers make sense of the vast literature within the RCC approach, the proposed typology produces some interesting findings that illuminate a hitherto unrecognized central and critical aspect of Penrose's

contribution. The paper will specifically discuss the pros and cons of employing economic methods in the study of strategy, a topic that Penrose had rather unusual and conveniently overlooked ideas about.

Differentiating between the schools and their characteristics is not a simple task, partly because the RCC approach is characterized by a proliferation of terms and concepts, and in most cases different authors are using different terms to describe the same or very similar concepts. This review will preserve each author's original terminology. However, it will try to contribute to reducing the confusion in terms by pointing out the similarities in the underlying concepts, so that one may discriminate the substantive from the merely semantic differences. This paper also provides a nuanced review of the RCC approach, which builds on previous attempts at mapping the field (Sanchez, 2001; Schulze, 1994; Mahoney & Pandian, 1992). However, the current study goes beyond previous reviews in its recourse to epistemology, which allows the delineation of a constructionist stream that has not previously been recognized as a distinct school. The constructionist school provides an explanation for the divide that some authors have sensed in the RCC approach (Schulze, 1994; Foss, 1997) but for which they could provide no adequate explanation. Hardly recognized in the literature is the insight that Penrose's views on management and the growth of firms are intimately related to this constructionist school. This constructionist school is in many instances incorrectly subsumed under the behavioral-evolutionary school due to some similarities in the content of the two schools.

After this introduction, we revisit Penrose's 1959 classic, which sets the foundation upon which the RCC approach has been built. A correct understanding of Penrose proves to be pivotal in the mapping of the RCC approach into three distinct schools. Next, we devote a section to each of the three schools respectively, followed by the concluding section.

2. Edith Penrose as the Foundation

The contributions of Penrose are often mentioned, but very rarely explicitly discussed and in our view always misunderstood. A complete re-interpretation of her work is needed, which in turn necessitates a complete overhaul of the research which purportedly is carried out with Penrose's work as the basis.

The heterogeneity of firms with respect to their resources had been emphasized by Chamberlin as early as the 1930s (Fahy, 2000). However, it was Penrose's landmark, *The Theory of the Growth of the*

Firm (1959) that clearly laid the foundational ideas of the RCC approach in strategy. For over twenty years, the work of Penrose was not recognized as a breakthrough and was not given due attention in economics and in management. In the early 1980s, however, several scholars published papers drawing on some of Penrose's ideas and this stream soon came to be called the resource-based view of the firm (henceforth the RBV). The name was coined by Birger Wernerfelt in his 1984 article under the same title, however, the term is inspired by Penrose's (1959) notion that the firm should be regarded as a bundle of resources. By accepting Penrose's starting point (the firm is a bundle of resources), but not incorporating her following ideas about the futility of conventional economic methods in analyzing the implications of the resource-view, the RBV set itself an impossible task. It is thus necessary to first give a brief overview of Penrose's main ideas, and later to return to the issue of how each school relates to Penrose. The foundation that Penrose established for the RCC approach consists of four basic ideas: (1) viewing the firm in terms of its resources; (2) explicating the sources of firm heterogeneity; (3) the creation process of idiosyncratic firm resources; (4) the trigger behind firm expansion and the basis for diversification. These ideas need to be explained at some length because a false interpretation of her ideas is quite entrenched in scholars' minds. We will be using a large number of direct quotations to show that there is indeed very little room for interpreting what Penrose really said.

Penrose defined the firm as a bundle of resources. The importance of this contribution from the point of view of strategy is that managing the firm is essentially managing a set of tangible and intangible resources. Penrose looks particularly to the productive services that are available to the firm from the use of its resources, and asserts that these are not the same for different firms, even if the resources are identical. This is because of a two-way interaction:

“It is shown not only that the resources with which a particular firm is accustomed to working will shape the productive services its management is capable of rendering,(...), but also that the experience of management will affect the productive services that all its other resources are capable of rendering.” (Penrose, 1959:5)

These productive services depend on the “function” or “activity” for which the resources are used, as well as the type of other resources they are combined with and the manner in which they are combined. *“It is largely in this distinction [between resources and the services they render] that we find the source of*

the uniqueness of each individual firm” (Penrose, 1959:25) This heterogeneity arises from the possession of different resources, but more importantly from the varying services that firms derive from similar resources, as a result of the particular ways in which the resources are employed within the idiosyncratic circumstances of each firm. Coming from an economist, this view of the firm is a great leap because the classical view of the firm in mainstream economics is based on the representative firm premise. In the economic theory of the firm, firms are typically seen as identical, represented by a production function, in which resources enter as quantities of homogenous inputs. Also noteworthy is the focus on the inside of the firm not the market surrounding it which is another important new contribution of Penrose.

Regarding the creation process of idiosyncratic firm resources, Penrose put forth the key idea that new services are continuously being created out of the firm’s resources. Further, she argues that these services are never fully utilized by the firm’s productive operations, and that unused services exist in every firm. She gives three reasons why this is always the case: the indivisibility of resources; the specialized use of resources; and the observation that in the course of normal firm operations, new services from existing resources are continually being created (Penrose, 1959:68) This happens because some resources, mainly human resources, exhibit services that are inherently heterogeneous. Every time the service is rendered it is unique, and with each unique exercise of a service, new knowledge is created.

“The number of entrepreneurial man-hours has surely very little relation to the ‘amount’ of service rendered... An idea produced, a decision made, an important employee grievance settled, are each a unique operation of value in the organization of production – services performed which cannot be repeated.” (Penrose, 1959:75)

Since it is the human resources that put the organization’s material resources to use, the services rendered by the material resources are also heterogeneous depending on the various ways in which the organization’s members use them. The increase in knowledge and experience results in continuous creation of new productive services¹.

“The possibilities of using services change with changes in knowledge. More services become available, previously unused services become employed and employed services become unused as

¹ Penrose must also be credited with introducing knowledge (the product of a learning process) to the debate. The two more economically inclined approaches struggle unsuccessfully with incorporating knowledge production, while the Core Competence approach made it its central theme.

knowledge increases about the physical characteristics of resources, about ways of using them, or about products it would be profitable to use them for. [...] That the knowledge possessed by the firm's personnel tends to increase automatically with experience means, therefore, that the available productive services from a firm's resources will also tend to change.” (Penrose, 1959:76)

The fourth of Penrose's foundational ideas is that the principal motive that lies behind expansion and diversification, and thus the root of firms' growth can be found in the firm's unique resources. Expansion and diversification provide profitable ways to utilize the unused services that the firm's resources provide. Penrose suggests that the type of resources available in the firm determines the direction of expansion, or what kind of products/services the firm will consider producing when it expands or diversifies (Penrose, 1959:82). In innovation, although entrepreneurs only develop products for which they anticipate considerable consumer demand, the prime force suggesting what new products to produce is not what customers want, but rather what the unique productive services rendered by the firm's resources can produce. As such, Penrose's outlook is more in the spirit of Schumpeterian economics.

“Unused productive services are, for the enterprising firm, at the same time a challenge to innovate, an incentive to expand, and a source of competitive advantage. They facilitate the introduction of new combinations of resources – innovation – within the firm. The new combinations may be combinations of services for the production of new products, new processes for the production of old products, new organization of administrative functions.” (Penrose, 1959:85-86)

In addition to spurring growth, Penrose proposes that the firm's managerial resources impose limits on the extent of firm growth, which has been referred to later as the 'Penrose effect' (Marris, 1963; Shen 1970).

Each of the three schools identified in this study draws on some aspects of Penrose's views albeit to varying degrees. This will become apparent in the following sections which review the main characteristics of each school. It is interesting to note that among the three schools, the rational-equilibrium RBV, displays the least resemblance to Penrose's growth theory, despite the common view in the literature that Penrose is the pioneer of the RBV. It is shown below that Penrose is truly a pioneer, but not of the

RBV. The behavioral-evolutionary school bears a closer resemblance to Penrose than the RBV, but delving deeper than the surface leads one to conclude that the constructionist school shares a very similar philosophical view that underlies Penrose's approach to management and firm growth. The following analysis of the three schools will argue that the constructionist school is the modern, true, and fruitful extension of Penrose's insights, which is not currently recognized as such in the literature dealing with the RCC approach.

Some authors (Foss 1996, 1999, 2000; Schulze, 1994) have sensed a schism in the RCC approach that separates a static, equilibrium-based version of the resource-based argument that draws on formal economics, from a dynamic, process oriented version. Although the extant characterization of the divide shares some common elements with the analysis presented here, it is deemed inaccurate as it misses out on important epistemological distinctions to be revealed shortly. An alternative typology will be proposed that identifies a third school related to the RCC approach distinguishable from the other two by its constructionist epistemological framework. It is shown that Penrose employs an unmistakable constructionist epistemology in her *Theory of the Growth of the Firm*, an aspect that is at the core of her argument. This dimension of Penrose's thinking is at odds with the formal economic framework underlying the RBV and therefore had to be dropped in RBV accounts. This observation increases the gulf between Penrose and the RBV and refutes the allegation that the latter is an outgrowth of Penrose. Another interesting finding concerns the surprising lack of recognition of the constructionist inclination of Penrose's theory. It seems that this epistemological dimension has escaped the attention of the majority of prominent scholars working on the RCC approach simply because Penrose preceded constructionism by a good 20 years. Accordingly, publications embracing the constructionist view, the salient example here being the work of Hamel & Prahalad on Core Competences, are mistakenly grouped in the behavioral/evolutionary school for their focus on dynamic aspects and for the absence of formal economic theorizing from their work. These misunderstandings will be clarified in the following sections. First, however, our claim that Penrose is following a constructionist epistemological frame must be substantiated.

The constructionist inclination becomes apparent in at least two major aspects of her work. First, in the way Penrose explicates the relation of the firm to its environment, secondly in her definition of the

productive opportunity of the firm and her identification of the determinants of market demand. It is also accentuated in how she incorporates knowledge, and particularly tacit knowledge in the determination of the productive services that firms extract from their resources. In the ensuing analysis, the prolific use of quotes from the original text is intended to help the reader witness first-hand the constructionist character of the arguments. The direct quotations will also help readers to immediately understand the massive differences between her work and that of both the rational-equilibrium RBV and the behavioral-evolutionary school.

Penrose explicitly states that the environment relevant to her study of the growth of business organizations is the subjective environment created in the cognition of the entrepreneur/manager. For Penrose, the objective environment that economists observe and measure is irrelevant given that the aim is to explain the behavior of firms and their managers.

“In order to focus attention on the crucial role of a firm’s ‘inherited’ resources, the environment is treated, in the first instance, as an ‘image’ in the entrepreneur’s mind of the possibilities and restrictions with which he is confronted, for it is, after all, such an ‘image’ which in fact determines a man’s behavior; whether experience confirms expectations is another story.”

(Penrose, 1959:5)

This by no means implies that taking a subjective cognitive view leads us to live in a dream world. Penrose emphasizes the importance of a subjective view because it is these cognitive constructions that determine the actions of managers. The collective enactment of reality rooted in subjective individual and social cognition shape both the organization and the environment.

“In the last analysis the ‘environment’ rejects or confirms the soundness of judgments about it, but the relevant environment is not an objective fact discoverable before the event; economists cannot predict it unless they can predict the ways in which a firm’s actions will themselves ‘change’ the relevant environment in the future. In any event, what the economist sees may be very different from what an individual firm sees, and it is the latter, not the former, that is pertinent to an explanation of a firm’s behavior.” (Penrose, 1959:41)

This view has profound implications for the way firm behavior and competitive advantage is researched. The objective methods of economics that attempt to derive covering laws and calculable

outcomes cannot work. According to Penrose, the focus of analysis should shift to the cognition of the firm and its environment happening on the managerial individual and organizational level. This is the view taken in the social constructionist school. Accordingly, strategy starts from the inside of the organization first, and then proceeds to the outside.

“We shall be interested in the environment as an ‘image’ in the entrepreneur’s mind (...). The factors affecting the relation between the ‘image’ and ‘reality’ are not being ignored, but for an analysis of the growth of firms it is appropriate to start from an analysis of the firm rather than of the environment and then proceed to a discussion of the effect of certain types of environmental conditions. If we can discover what determines entrepreneurial ideas about what the firm can and cannot do, that is, what determines the nature and extent of the ‘subjective’ productive opportunity of the firm, we can at least know where to look if we want to explain or to predict the actions of particular firms.” (Penrose, 1959:42)

In this view of strategy-making, the firm does not take the environment as a given. Rather, firms and their managers enact the organization and the environment. Thus, the organization is an active creator rather than a reactive adapting entity that is continuously struggling to shape itself according to the dictates of a forceful environment.

“Firms not only alter the environmental conditions necessary for the success of their actions, but, even more important, they know that they can alter them and that the environment is not independent of their own activities. Within the unknowable limits placed by the environment on successful action there is a wide scope for judgment.” (Penrose, 1959:42)

This view brings back a great deal of strategic choice to the organization and its members and managers. It stands in stark contrast with the extreme form of environmental determinism implied in such theories as population ecology (Hannan & Freeman, 1977), institutional theory (Meyer & Rowan, 1977) or neoclassical perfect competition, where the activities of organizations and their members are depicted as mere reactions to powerful environmental forces that determine the correct behavior of a surviving organization. Other approaches, such as the classical SWOT approach, the positioning approach (Porter, 1980), or approaches originating in organizational economics (IO, TCE, evolutionary theory) take on a milder form of environmental determinism where the organization is portrayed as acting and being acted

upon. Penrose does not take the middle of the road here, but is firmly in the constructionist camp putting more emphasis on what the firm does with its environment, how it enacts itself and its surroundings and the power it has to construct this environment. This view is apparent in the following quotes, in which Penrose explains that the productive opportunity of the firm is a purely subjective matter, rather than the objective exhaustive technical production frontier commonly used by economists. Even market demand, which is normally treated as an exogenous variable, and a force that determines a firm's strategic marketing and production plans, is considered in the constructionist approach an endogenous variable.

“Although the ‘objective’ productive opportunity of a firm is limited by what the firm is able to accomplish, the ‘subjective’ productive opportunity is a question of what it thinks it can accomplish. ‘Expectations’ and not ‘objective facts’ are the immediate determinants of a firm’s behavior, although there may be a relationship between expectations and ‘facts’ – indeed there must be if action is to be successful, for the success of a firm’s plans depends only partly on the execution of them and partly on whether they are based on sound judgment about the possibilities for successful action.” (Penrose, 1959:41)

“The really enterprising entrepreneur has not often, so far as we can see, taken demand as ‘given’ but rather as something he ought to be able to do something about.” (Penrose, 1959:80)

“Once it is recognized that the ‘demand’ with which an entrepreneur is concerned when he makes his production plans is nothing more nor less than his own ideas about what he can sell at various prices with varying degrees of selling effort, then we ought to consider what influences the development of those ideas. For if entrepreneurial notions about what consumers ought to like have some influence on what is offered to consumers and therefore on what they do in fact like, or learn to like, a mere inquiry into the ‘state of demand’ will not enable us to understand the productive activity of entrepreneurs and, in particular, their innovating activity.” (Penrose, 1959:81)

It is expected to find various interpretations of a classic such as *The Theory of the Growth of the Firm*. However, what is unique in the case of Penrose, is that what is arguably the most important (and at

the time she wrote, novel) dimension of her work is virtually dropped, as it was completely impossible to fit within the dominant economic frame that shaped the resource-based view subsequently. If the market does not shape the structure and strategy of the firm, economic theory is futile for the analysis of the firm's growth as creativity, chance and learning cannot be incorporated in the formal models economics has to offer (maybe with Ludwig von Mises's praxeology as an exception). Penrose emphasizes, as shown in the quotes above, that it is the subjective outlook of the entrepreneur that should take precedence, and that scholars need to examine more seriously the notion that the direction of causality may flow more forcefully from the 'inside' to the 'outside' of the organization, or in other words from the individual and collective actions of organizational members to the world. When it comes to strategy prediction, not explanation, is important. Penrose made it clear that she does not believe in economics' predictive power, instead she focused on the active creative powers of the firm's members.

3. The Rational-Equilibrium School

During the 1980s and early 1990s, some economists and strategy scholars wrote papers in business policy focusing on the heterogeneity of firm resources as an explanation for sustained economic rents, and as grounds for diversification. This collectivity of ideas was eventually dubbed the resource-based view (RBV) of the firm, and of strategic management, after the title of Wernerfelt's seminal article (1984), which is (arbitrarily) taken to mark the birth of the RBV. This section first presents a review of the basic ideas and logic of the RBV, followed by an analysis of its fundamental assumptions, epistemology and methodology. The extent to which the RBV draws on Penrose's thinking as well as its strong and weak points are discussed. We will present the rational-equilibrium school as being synonymous with the RBV, which provokes the question, why the need for another fancy label? The reason we insist on the 'rational-equilibrium' label is two-fold. First, the label is in harmony with the core epistemological and methodological criteria we use to differentiate between the three schools. The second reason is the confusion that abounds in the literature concerning the resource-based view and the work that constitutes it. Some authors equate the RBV with the whole RCC approach, and consider all the literature described under the three schools to belong to the RBV (Spender, 1994; Foss, 1997). However, we agree with Jay

Barney when he claims that the RBV is more limited in its origin, which is rooted in the interaction among some economists and strategists at UCLA, and is specifically characterized by its economic character.

3.1 A Conceptual Outline of the Rational-Equilibrium School

Wernerfelt's seminal paper (1984) proposed a view of the firm that focuses on resources rather than products, in line with Penrose (1959). RBV scholars viewed firm resources as causes of monopolistic or efficiency advantages, and thus differential performance across firms (Wernerfelt, 1984; Rumelt, 1991). The firm-specific resources were also viewed as a reason for firms to diversify into markets in which these resources were important inputs (Teece, 1980; 1982). The most important theoretical contributions in the RBV sought to describe the characteristics that resources need to display to earn rents, which in economics refer to profits over and above the price of obtaining the resource. They also explain the different types of rents and sketch the factors that account for the sustainability of the rent streams in equilibrium.

Although various definitions have been put forth as to what is meant by resources, Barney's definition captures most of what is found in the RBV literature. According to Barney (1991)

"... firm resources include all assets, capabilities, organizational processes, firm attributes, information, knowledge etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness" (Barney, 1991:101)

This definition is in line with the strengths that feature in the internal analysis part of the SWOT model of Harvard style strategy, and from it is derived the first characteristic of rent generating resources, namely that they must be valuable to the firm. Barney further classifies resources into physical (capital equipment, physical technology, geographic location, raw materials), human capital

"...training, experience, judgment, intelligence, relationships and insight of individual managers and workers in the firm" and organizational, *"...a firm's reporting structure, its formal and informal planning, controlling and coordinating systems, informal relations among groups within a firm and between a firm and those in its environment"* (Barney, 1991:101)

This comprehensive definition of resources implies that almost anything inside a firm can be a source of advantage, and hence the importance of further specification of the characteristics of rent generating resources. These characteristics were deduced using the basic economic logic of neoclassical

price theory. The competitive conditions affecting the supply and demand of resources in strategic resource (factor) markets determined which resources would command monopoly rents due to market power considerations (Wernerfelt 1984). Barney proposed that strategically valuable resources had to be rare, because the fewer the number of firms possessing the valuable resources, the higher the degree of competitive advantage that accrues to a firm possessing the resource (of course relative to demand) (Barney, 1991). The rare resource commands what economists call Ricardian rents (Castanias & Helfat, 1991), such as the case of a superior location of a store at the corner of two main streets. Besides being rare, an asset may yield more productive value when combined with the asset base of a specific firm, than when it is used in other firms. Economists refer to the extra return as a quasi-rent, which is the difference in rent between the first and second best uses of the resource (Castanias & Helfat, 1991). These specific assets are said to be imperfectly mobile, because although they can be sold on the market, they earn a higher value when used in the firm. Imperfect mobility assures that the resources are ‘sticky’ to the firm and can thus be a source of competitive advantage (Peteraf, 1993). If resources are mobile (not sticky) their price is bid up and extra rents are appropriated by the resource owner, rather than by the firm. In a widely cited article, Dierickx & Cool (1989) ask a fundamental question: Are all strategic factors bought and sold on markets? They claim that indeed the most important strategic resources, such as reputation, are not, and no markets exist for them. As such, it is not factor market imperfection, but rather incompleteness that is the key issue. *“Being nontradable, the firm-specific component is accumulated internally... by choosing appropriate time paths of flows over a period of time.”* (Dierickx & Cool, 1989:1505) This means that a firm with an accumulated stock of valuable resources must deploy them in product markets in order to acquire their rent potential. It also means that firms lacking these resource stocks cannot simply buy them; they must expend the time, effort and investment to build them internally (Dierickx & Cool, 1989). Relevant examples here are customer loyalty, goodwill, trust between the firm and its suppliers or customers, and teamwork among members of the firm.

The RBV does not explicitly deal with the processes by which firms can endogenously create, build or otherwise acquire valuable, rent generating resources. Barney (1986) assumes the existence of markets for strategic resources, albeit imperfect markets. Peteraf (1993) emphasizes the necessity of ex ante limits to competition in the relevant factor markets for acquiring particular resources (Peteraf, 1993).

These imperfections may be monopolistic and related to market power, which is consistent with Bain style IO, or they may be informational in nature, consistent with the new IO of the Chicago school (Connor 1991). Barney (1986) states that if the value of resources needed to implement successful strategies was perfectly known, their potential return would be competed away in their price, and there would be no abnormal returns. Barney mentions several important causes of competitive imperfections in strategic factor markets (such as uniqueness). However, he reduces all of the causes to a simple dichotomy of perfectly accurate expectations about the future value potential of the resource versus pure luck. According to Barney, a firm buys a resource because it is able to forecast the future value of the resource better than other firms (due to information asymmetries and the costs of acquiring information), or it acquires a resource by luck, which turns out to have superior value in the future (Barney, 1986). Dierickx & Cool propose that firms accumulate strategic resources in the firm by deliberate investments, such as the case of R&D (Dierickx & Cool, 1989).

Besides understanding the characteristics of rent-generating resources, contributors to the RBV have elucidated several mechanisms that enable firms to sustain the superior returns from their unique resources. The RBV justification for persistent heterogeneity in firm returns rests on two main pillars: strategic factor market imperfections; and factors that deter imitation or substitution of strategic resources that generate rents. Superior return can be sustained in equilibrium only when competitive imperfections persist. Peteraf (1993) explains four necessary conditions: heterogeneity in firm resource sets; ex ante limits to competition in acquiring the valuable resource are necessary, so that the cost of acquiring it does not offset the rents it generates; ex post limits to competition over these rents once a particular firm has acquired, and finally, imperfect mobility makes these resources specific to the firm so that the rents are shared by the firm and the resource owner (Peteraf, 1993). Wernerfelt approaches the sustainability question from the strategic positioning perspective, utilizing Porter's Five forces model and the BCG growth-share matrix, but applying them to resources rather than products. Wernerfelt concludes that for a resource to obtain a sustainable rent stream, the firm must build resource position barriers, similar to entry barriers in product markets (Mason, Bain) and mobility barriers in strategic groups of firms (Porter, Caves). Although market imperfections and incomplete markets (for non-tradable resources) prevent competitors from buying the rent-generating resource, they may try to imitate resources of strategic

importance (Peteraf, 1993). Hence, Barney emphasizes that if resources are to be the basis for a sustained advantage, they must be imperfectly imitable and non-substitutable by competitors. RBV scholars have elaborated a set of factors that make it difficult or impossible for competitors to imitate or substitute the rent generating resources; these are explained next.

Lippman & Rumelt (1982) present a formal model of uncertain imitability, which is based on the idea that uncertainty plagues the sources of potential rent, such as technological changes, discoveries and inventions, changes in consumer tastes or changes in laws and regulations. With uncertainty, Lippman & Rumelt propose a list of isolating mechanisms, such as causal ambiguity, which preserve the disparities in firm profits in the long run due to prevention of entry or imitation. While causal ambiguity deters imitation by challenging competitors' understanding of the important links among resources and sustainable competitive advantage, social complexity is another deterrence mechanism that poses a challenge to competitors' ability to control a resource, even if they can understand how it relates to the achievement of superior performance. Castanias & Helfat (1991) present the firm's top management team as a rent-generating resource that embodies both causal ambiguity and social complexity. Dierickx & Cool (1989) offer four, slightly more technical, factors that deter imitation, namely time compression diseconomies, asset mass efficiencies, interconnectedness of asset stocks and asset erosion.

3.2 The Underlying Framework of the Rational-Equilibrium School

The above review has covered the main conceptual building blocks of the rational equilibrium RBV. The following analysis strives to go beyond the concepts, to examine the underlying epistemology and basic assumptions. This provides for a deeper understanding of the school and facilitates the comparison with the other schools.

As explained above, the central concern in the school is to describe the characteristics of resources that command rents, and to account for the sustainability of those rents under equilibrium. The resource-based explanations draw primarily on neoclassical price theory, but present a more sophisticated picture, in which several types of market imperfections produce the possibility for different types of rent. Equilibrium is at the core of the analysis, as it serves as the benchmark against which above-normal returns are measured – normal here referring to the return under near-perfect competitive conditions. Equilibrium also

marks the horizon for when an above-normal return (competitive advantage) is considered long lasting, or sustained. Barney (1991) defines a sustained advantage independent of time: it depends on the number and severity of attempts at duplication. As such, RBV contributions such as Wernerfelt (1984) and Barney (1991) may be considered an extension of mainstream IO economics and of Porter's industry structure approach, applied to the case of resource/factor markets instead of product markets. In keeping with Chicago IO, neoclassical price theory and competition are central concepts, in which costly information and differences in production/distribution efficiency are used to explain firm size and scope (Connor, 1991). Foss (2000) emphasizes the influence of Harold Demsetz of UCLA, who is a prominent contributor to Chicago IO, and whose 1973 article "*Industry Structure, Market Rivalry, and Public Policy*" anticipates many of the main RBV ideas. Therefore, in terms of base discipline, the RBV stems from IO economics, in either of its two versions (the Bain/Porter/Caves IO or the Chicago/Demsetz IO). Jay Barney, a key contributor to the RBV, has argued against rational reconstructions of the RBV that tie its early literature to Selznick (1957), Penrose (1959) and Chandler (1962), which he calls 'a myth'. He clarifies that the RBV actually "...owes its origin to the interaction, mainly at UCLA, between such economists and strategy scholars as William Ouchi, Michael Porter, Richard Rumelt, Oliver Williamson, Sidney Winter and Barney himself." (Foss, 2000:21) To summarize, two traditions within the RBV are noted; one drawing on market power explanations in keeping with Bain IO, the new IO based on game theory, and consistent with the Porter/Caves industry structure approach to strategy; and the other drawing on efficiency based explanations in the Chicago IO tradition and in Harold Demsetz's work. These two traditions are considered to be highly differentiated within IO economics, and according to strategy scholars such as Teece, Pisano & Shuen (1997). However, there is adequate reason to argue that despite some differences, there are more important commonalities in the underlying analytical logic, as well as in the epistemological basis, as is shown next.

The disciplinary base of IO economics and the analytical framework provided by neoclassical price theory displays a system of assumptions about the industrial and business world and about the actors that constitute it. This system of assumptions starts out with the portrayal of an almost perfectly competitive and predictable world, and subsequently starts to introduce some imperfections that explain certain aspects of firm behavior.

“Consistent with neoclassical economics, this school describes economic activity as occurring within efficient markets whose parameters of behavior are presumed to be known, or at least, knowable. Important sources of change are presumed to be exogenous – since that which is endogenous is presumed known or knowable and is thus reflected in current conduct ... The portrait is not that of static markets – perpetually at or near equilibrium – but rather of a stable system in which competitive advantage is quickly eroded and in which previous conduct is a valuable guide to future conduct.” (Schulze, 1994:134)

Foss (1999) argues that the core logic is the same in both traditions of the RBV, based on competitive advantage being conceptualized as rents sustained in equilibrium. Further, *“...the ‘trick’ with which these rents are generated is in both cases the time-honored one of throwing one or two spanners into the works of an otherwise perfect world ... these spanners in the works are essentially informational in nature,”* and are chosen by the analyst as the relevant factor market imperfections that underlie product market advantages (Foss, 1999:93).

The view presented by the RBV (rational-equilibrium) school, and consistent with IO economics as its base discipline, displays a positivist epistemology and methodology. Objective knowledge of the relevant parameters is assumed to be obtainable and can be accurately displayed in precise mathematical forms according to hypothetico-deductive methodology (Blaug, 1992). For a social science this is unacceptable. In fact, economics pretends to be a formal science (like mathematics) which is clearly not the case. Firms (and their managers) are assumed to behave rationally, according to the precise maximization of profit functions and minimization of cost functions subject to the technological constraints of the firm’s production function, where the parameters are objective and measurable. All firms and managers are presumed to choose the best out of all possible alternatives according to this single optimizing rationality, and thus their behavior is highly predictable, as well as the market behavior, which is described by the concept of equilibrium. The whole system can be expressed in a deterministic mathematical model that is accurate in explaining and predicting its outcomes – the prices and quantities of products in the market system. This determinism eliminates the capacity of management to produce superior performance (Helfat et al., 2007) except for identifying and acquiring control over those assets that command rents. Barney proposes that a firm either acquires rent generating resources as a result of

pure luck, or as a result of superior information (Barney, 1986). There is no discussion of how these resources can be applied in different ways or how firms can create rent generating resources endogenously. This gives the RBV a primarily retrospective focus and results in a view of the competitive environment where there is one technically optimal way to act to obtain sustainable rents, and where emphasis is placed on imitation and appropriation (rather than substitution). Thus, competition leads to isomorphism (Schulze, 1994) which in turn leads to unhealthy hypercompetition (Porter, 1996:61-62). The assumption of rationality and the use of equilibrium-based analysis assume away complexity since the calculative powers imputed to actors allow the computation of an optimal decision, and the only complicatedness allowed is that introduced at the discretion of the analyst in the form of market imperfections. When admitted, uncertainty takes the form of information asymmetry and costly search (Connor, 1991).

The RBV under the rational-equilibrium approach has tried to make contributions in elucidating the characteristics of resources that yield sustainable rents and outlining the market imperfections that account for the rents. This allows managers to analyze their resource markets (albeit retrospectively and therefore irrelevant for strategy-making), to identify rent generating ones, and to gain better understanding of their resources and their firm. On a theoretical level, several authors commend the RBV for its integrative potential, as its literature has brought together concepts from several fields in strategy and economics (Foss, 1997; Mahoney & Pandian, 1992; Mahoney, 1995). Mahoney & Pandian (1992) argue that resource-based theory is able to sustain a conversation among different disciplines, which is, according to them and contrary to Thomas Kuhn (1962) (incommensurability), the mark of a good theory. Connor (1991) claims that the RBV provides the seeds of an alternative theory of the firm in place of the flawed neoclassical model. The RBV provides an explanation for the existence and scope of the firm, as opposed to purely market transactions - a rather academic interest as nobody really doubted that firms exist. According to the RBV, the firm exists to assemble valuable resources for productive opportunities that would otherwise be difficult or very costly (transaction wise) to utilize through market transactions. This means it is more efficient to organize these productive activities within the firm. For the firm's scale and scope, Connor mentions the resource based explanation based on the specificity or relatedness of the new project to the firm's existing resource base. High degrees of relatedness provide inducements for the firm to expand into the related areas (Connor, 1991).

These contributions of the RBV are not without costs. Despite portraying itself as non-traditional the RBV has failed to show where it differs from mainstream economics. The combination of the rationality assumption, the modeling of the firm in terms of optimization of profit functions and the utilization of equilibrium analysis have led to a static, abstracted view of the firm that misses out on the rich organizational and managerial dimensions that it claims it is interested in. The RBV fails to account for dynamic issues deemed to be central to treatments of firm strategy and growth. Empirical tests conducted at the industry level are deemed inadequate for testing phenomena that take place at the level of the individual firm and below.

Foremost is the critique of the rationality postulate, which, to say the least, has proven to be glaringly detached from managerial decision making reality. Mahoney (2005) considers the issue to be settled beyond dispute.

“There can no longer be any doubt that the micro-analytic assumptions of neoclassical economic theory – the assumptions of perfect rationality – are contrary to fact. It is not a question of approximation; the assumptions of perfect rationality do not even remotely describe the processes humans use for making decisions in complex business situations. Moreover, there is an alternative. If anything, there is an embarrassing richness of alternatives.” (Mahoney, 2005:52)

Extensive critique of the rationality assumption can be found in the work of Herbert Simon on bounded rationality, for which he was awarded the 1978 Nobel Prize in Economics, as well as other heterodox economists’ work, such as Nelson and Winter (1982). As for the drawbacks of employing the rationality assumption in management and strategy research, authors such as Huehn (2005) and Bromiley & Paupenhausen (2001) have discussed the issue extensively. Suffice it to say here that the rationality postulate (that is what it is) is a conceptual distortion imposed on managerial behavior for the sole reason that it renders possible the mathematical modeling of social phenomena under optimization methodology.

Besides employing the rationality assumption, analysis in the rational-equilibrium school, which utilizes equilibrium methodology based on comparative statics, is inadequate “... *because it involves applying a timeless equilibrium model to an inherently dynamic reality.*” (Foss, 1996:181) The equilibrium-based methodology of the RBV fails to capture important dynamic aspects such as learning and innovation, and cannot account for the process of creation of competitive advantage. Eighty years ago,

Schumpeter, with piercing insight, criticized this aspect of economic equilibrium analysis, “... *the problem that is usually being visualized is how capitalism administers existing structures, whereas the relevant problem is how it creates and destroys them.*” (Schumpeter, 1942/1994:84) Resource-based analyses which do not draw on neoclassical economics, and use the new IO methodology based on game theory suffer from the same shortcomings. Foss (1996) elaborates that in such studies heterogeneity among firms arises from differences in resource endowments or market environments, and are thus fixed and given. There is no room for learning (which Penrose and mainstream management scholars like Hamel, Mintzberg and others assume to be critical for strategy-making) or for deliberate creative acts by managers that may differentiate firms. The calculative powers of agents enable them to foresee all possible moves in current and future stages of the game, and calculate the optimal solution. Therefore,

“...there cannot be any failed strategies and wrong conjectures, no need for restructuring organizations in the face of , for example, new competition from innovative entrants, no ‘emergent’ (unintended) strategies (Mintzberg 1994), and no accumulation of resources (except in a trivial way by learning by doing) – in short, there can be no process.” (Foss, 1996:186)

This abstraction of dynamics and of the managerial role is exacerbated by the use of market level explanations related to strategic factor market imperfections to account for phenomena that essentially take place and assume importance inside the business organization. Accordingly, empirical studies are conducted at the industry level and comprise cross sectional analyses based on secondary, publicly available data (Montgomery & Wernerfelt, 1988) intended to measure aspects that are supposed to be idiosyncratic and specific to the firm (Schulze, 1994). This shortcoming is again due to the nature of the tools that economic theory utilizes to look at the phenomenon of sustained competitive advantage. Finally, formal economic models fail to capture important qualitative differences among resources as well as soft factors that are central to strategy such as vision, intuition and creativity. Penrose’s important distinction between the objective characteristics of resources and the specific manner in which they are deployed within a particular firm is not emphasized in the rational equilibrium school (Schulze, 1994). Interestingly Penrose, the purported source of resource-based ideas, has explicitly criticized the use of neoclassical price theory for the study of firm growth. “*We shall be dealing with the firm as a growing organization, not as a ‘price and output decision maker’ for given products; for this purpose, the ‘firm’ must be endowed with*

many more attributes than are possessed by the 'firm' in the [economic] theory of the firm, and the significance of these attributes is not conveniently represented by cost and revenue curves.” (Penrose, 1959:14) In a footnote on the same page, Penrose states that *“The economist’s ‘main conceptual schema’ is designed for the theory of price determination and resource allocation, and it is unnecessary and inappropriate to try to reconcile this theory with ‘organization theory’”* (Penrose, 1959:14)

Overall these naive assumptions lead to a theory that seems to be more concerned with ex-post explanations than prediction. One may ask how such a theory can claim to be useful for strategy, when strategy undoubtedly is concerned with the future, not the past. Scholars of the RBV who would agree with the above critique of the rational-equilibrium approach tend to find the solutions to its problems in the approach taken by the behavioral-evolutionary school, which is described next.

4. The Behavioural-Evolutionary School

The literature of the behavioral-evolutionary school is less homogenous than the rational-equilibrium school (RBV) literature. The school’s identifying characteristic is its attempt to focus on the dynamic and process aspects of the RBV, by relaxing some of the limiting assumptions of mainstream IO and adopting alternative forms of economic analysis. Authors belonging to this school include Amit & Schoemaker (1993), Teece et al. (1990, 1997), Teece (2007), Helfat et al. (2007) and others. The theoretical contributions in this school draw on the behavioral theory of Simon’s *Administrative Behavior* (1945/1997), Cyert & March’s *A Behavioral Theory of the Firm* (1963/1992) or on the evolutionary economics of Nelson & Winter (1982). Work in this school is consistent with strategy process research (Helfat et al., 2007; Schulze, 1994) and includes a vast amount of literature, comprising several identifiable research streams such as resource-based research, capabilities based literature (Dosi, Nelson & Winter, 2000; Kogut & Zander, 1992), dynamic capabilities (Helfat et. al., 2007; Teece, 2007; Teece et al., 1997) and some of the literature on the competence perspective (Foss & Knudsen, 1996). A comprehensive review of this massive literature is a considerable task that is beyond the scope of this paper. Rather, the aim here is to provide an outline of the main substantive considerations explored in research belonging to the behavioral-evolutionary school, and from there to examine the underlying assumptions, methodology and the general perspective from which this school springs. The analysis elucidates areas of overlap with

the rational-equilibrium RBV as well as areas where the behavioral-evolutionary school improves on the shortcomings of the RBV.

4.1 A Conceptual Outline of the Behavioral-Evolutionary School

The substantive content of the behavioral-evolutionary school is distinguished from the rational-equilibrium RBV by its focus on dynamic process aspects, both technological and organizational in nature. In this respect, it draws on some of Penrose's ideas and overlaps with the rational-equilibrium RBV on some of the latter's foundational ideas, but also goes beyond it. Early contributors to this school include Richardson (1972), Teece (1980, 1982) and Nelson & Winter (1982). Richardson argues that *"organizations will tend to specialize in activities for which their capabilities offer some comparative advantage"* (Richardson, 1972:888), in other words, activities that require the same or very similar sets of knowledge, experience and skills. These similar activities may lead the firm into diverse markets. Similarity in this sense, is distinguished from the complementarity of activities (such as car tires and cars). The activities of designing and making an engine are dissimilar (in terms of capabilities) to those of making car tires, so they are produced by different firms. Due to the need for harmonization, there are forms of intense cooperation and coordination among automakers and parts subcontractors that transcend the market. Although this argument bears some resemblance to analysis in transaction cost economics dealing with inter-firm relations, Richardson considers capabilities/competences as the central factor motivating cooperation rather than the minimization of transaction costs and opportunism. Similarly, Teece (1982) proposes an explanation for diversification based on efficiency considerations, showing that the assets organized by a firm have greater value when assembled internally than when they are externally coordinated through the market. The higher efficiency of internal organization is due to the nature of organizational knowledge, which contains a tacit component that is exercised without conscious deliberation within the specific organizational context, and is therefore irreducible to individual knowledge. Other reasons include the generation of excess managerial and technical resources through learning and the interchangeable or 'fungible' characteristic of organizational capabilities, which allows their use in various products without impairing their functioning for any of the products. Teece emphasizes that market failure prevents a firm from selling its usable inputs to other firms, which makes it more

efficient for a firm to diversify, than for two firms to specialize and trade on the market (Teece, 1980). He further elaborates four classes of resource-based scope economies that result in higher efficiency for diversified firms, using transaction costs logic (Teece, 1982).

Teece's and Richardson's contributions reflect the central role that the concept of organizational capabilities plays in the behavioral-evolutionary school. While the RBV scholars use the concept of 'resources' in broad terms, the emphasis on processes and interactions among human, material and intangible resources gives rise to the capabilities concept. Nelson & Winter, who devote a part of their (1982) landmark, *An Evolutionary Theory of Economic Change* (1982), to an "*Organization-Theoretic Foundation*" of their evolutionary theory, propose that the essence of organizational capabilities is organizational knowledge (Dosi et. al, 2000; Nelson & Winter, 1982). Organizational capabilities involve knowledge of how to accomplish "...a smooth sequence of coordinated behavior that is ordinarily effective relative to its objectives, given the context in which it normally occurs." (Nelson & Winter, 1982:73) This knowledge may exist in a codified form such as blue prints, manuals or firm documentation, or it may exist in a more tacit form in the minds and actions of experts, and is manifest in the form of organizational routines. An organizational routine can be defined as a "...coordinated activity" (Nelson & Winter, 1982:97) performed by one or more subunits in the organization, which involves "...behavior that is learned, highly patterned, repetitious, or quasi-repetitious, founded in part in tacit knowledge" (Winter, 2003:991). Nelson & Winter have provided a detailed discussion on organizational routines in their evolutionary theory. They draw the metaphor that organizational routines to firms play the role of skills in individuals. According to evolutionary economic theory, organizational routines are repositories of organizational knowledge, and thus represent organizational memory. Organizational capabilities are made up of bundles of organizational routines (Dosi et al., 2000). However, organizational capabilities are also made up of individual skills, competences and other organizational resources. Winter defines an organizational capability as "...a high level routine (or collection of routines) that, together with its implementing input flows, confers upon an organization's management a set of decision options for producing significant outputs of a particular type." (Winter, 2003:991)

The focus on capabilities in the behavioral-evolutionary school is intimately related to the types of economic rents, or competitive advantages that are under focus in this school. As Teece (1980, 1982) and

Richardson (1972) explain, firms are heterogeneous with respect to the level of efficiency their particular capabilities confer upon them, and this accounts for heterogeneity in firm performance. In addition to efficiency rents, Teece explains that some resources may be of higher value when employed inside the firm, possibly due to complementarity advantages in combination with other firm-specific capabilities, as in the case of co-specialized assets. In such situations, quasi rents accrue to the firm, which represent the difference in returns between the first and second-best use of the assets.

Work in the behavioral-evolutionary school is distinguished by its focus on the dynamics of firm capabilities. Consistent with evolutionary theory, scholars of the behavioral-evolutionary school emphasize the importance of path dependence and history in the emergence of capabilities underlying superior performance. Moreover, some technological changes may be advantageous to some firms, whose capabilities are suited to conditions brought about by the radical change. The school overlaps with some of the literature on technology strategy, in which some studies go beyond the firm level, and examine trends at the meso-level, like the literature on technological systems (Carlsson, 1997; Carlsson, 2002) and technological regimes (Malerba & Orsenigo 1993, 1997; Pavitt, 1984). Other authors examine capabilities and their evolution at the industry level (Helfat & Peteraf, 2003). One particularly influential strand of this school examines the notion of Dynamic Capabilities, which are higher order routines or capabilities that operate on other organizational capabilities to modify, develop or reconfigure them (Helfat et al., 2007; Teece, 2007; Teece et al., 1997).

Diversification and inter-firm alliances are also main concerns of the behavioral-evolutionary school, allowing an organization to tap on capabilities and resources that reside in other organizations. Due to the tacit, embedded and co-specialized nature of organizational capabilities and their underlying routines, acquisitions are viewed as ways of acquiring whole bundles of resources and capabilities through the acquisition of firms or business units. These acquisitions may have a path-deepening effect on the acquirer when the acquired unit's capabilities are related to the acquirer's (Karim & Mitchell, 2000). Acquisitions may also function to reconfigure a firm's base of routines and capabilities (Karim & Mitchell, 2000; Teece, 2007; Teece et al., 1997) in case a firm is not looking for incremental improvements, and wants to gain new bodies of knowledge that are unrelated or path-breaking (Helfat & Raubitschek, 2000;

Karim & Mitchell, 2000). Inter-firm alliances and networks are also viewed as sources that may augment the organization's capabilities.

4.2 The Underlying Framework of the Behavioral-Evolutionary School

In terms of epistemology, this school is very similar to the rational-equilibrium school regarding its fundamental belief in the existence of an objective reality facing managers and firms, which if known to them, would dictate optimal solutions to their problems and decisions. In other words, the behavioral-evolutionary school also subscribes to positivist epistemology. However, this school is more modest regarding the perceptive powers imputed to managers. According to Simon, managers are presumed to be boundedly rational and to make decisions based on satisficing rather than optimizing. Nelson & Winter follow Simon in proposing that managers make decisions based on heuristics, or crude rules of thumb (Nelson & Winter 1982). Thus, behavioral assumptions following the contributions of Simon (1945/1997, 1982) differentiate between the 'real' objective environment that exists independently of managers' perceptions of it, and the perceived environment, which is plagued with the flaws and biases of human cognition.

In the behavioral-evolutionary school, the middle way is adopted concerning the issue of environmental determinism. While some degree of inertia exists and preserves heterogeneity among firms in initial capabilities and historical trajectories on which future paths are dependent, organizations can also alter their capabilities (Helfat, 2003). Since firms act and are acted upon, evolutionary theory makes possible the endogenous generation of heterogeneity in organizational capabilities. Accordingly, managers play an important role because investment in strategic capabilities is "... *a highly complex uncertain process that cannot be reduced to algorithms.*" (Schulze, 1994:13) Amit & Schoemaker (1993) emphasize that it is the presence of uncertainty, complexity and conflict that gives strategy and managers such important roles in bringing about heterogeneity in firm capabilities and performance. An interesting stream of research regarding the role of managers examines the shortcomings of human cognition. Decision biases and flaws in perception are factored in (Mintzberg, Ahlstrand & Lampel, 1998; Tversky & Kahneman, 1974), and their effects on organizational capabilities and outcomes are explored (Helfat et al., 2007). In this cognitive stream of the behavioral-evolutionary school, the gaps between managerial cognitive biases

and the objective reality of the situation gleaned by researchers (retrospectively) account for unfavorable organizational outcomes (Barr, Stimpert & Huff, 1992; Tripsas & Gavetti, 2000). Overall, the behavioral-evolutionary school relaxes (but does not rid itself of) many of the limiting and unrealistic assumptions of the rational-equilibrium school. This provides for a somewhat richer view of organizational resources and capabilities where there is no single best way for all organizations. Rather, organizational capabilities are equifinal, which means that different organizations can reach similar outcomes by various means (Eisenhardt & Martin, 2000). *“Given the competitive and changing context in which managers must decide which R&C [resources and capabilities] to develop as their firm’s basis for competition, it is doubtful that decisions about which SA [strategic assets] to develop and deploy can be optimally deduced from a general normative theory. More likely, continually changing heuristics will emerge that strive to better incorporate the uncertainty, complexity and organizational conflicts confronting managers.”* (Amit & Schoemaker, 1993:40) The school also takes account of the effects of extra-managerial considerations (Schulze, 1994) such as organizational learning (Zollo & Winter, 2002), organizational culture (Barney, 1986) and politics (Amit & Schoemaker, 1993).

Commensurate with the wide range of issues considered in the behavioral-evolutionary school, the empirical work displays a rich diversity. Empirical studies include quantitative statistical research carried out on both primary survey as well as secondary data; some studies also feature simulations. There is also qualitative research and single or small sample case studies focusing on intangibles such as skills and capabilities that cannot be fully owned or controlled. A large part of the empirical work in this school takes the form of firm performance being a function of the interaction between capabilities and organizational processes or a function of qualitative differences in resources and capabilities (Schulze, 1994).

The behavioral-evolutionary school is looked upon as the promising way forward for the RCC approach, since it suffers to a lesser degree from many limitations of the rational equilibrium RBV (Foss, 1996, 1997; Schulze, 1994). The most commonly reiterated strengths lie in the school’s treatment of the dynamic and process-oriented facets of organizational capabilities, its more realistic treatment of the uncertainty and complexity facing boundedly rational managers, combined with the rigorous formal theoretical tools offered by evolutionary economic theory. The school does undoubtedly make relevant contributions to our understanding of organizational routines, capabilities, issues of path dependence and

organizational inertia and the evolution of capabilities at both the firm and industry level. However, a major shortcoming is the cavalier treatment of learning and the vagueness concerning how organizational routines and capabilities contribute to the strategy-making process. The social constructionist school, of which Hamel & Prahalad's Core Competence approach (1989, 1990, 1993, 1994) is the most important example, is focusing exactly on these aspects.

5. The Social Constructionist School

What sets the third school in the RCC approach apart from the other two is its underlying epistemology which emphasizes the social construction of knowledge and reality. Most influential in this school is Prahalad & Hamel's *The Core Competence of the Corporation* which is just one part of these authors' more comprehensive view displayed in their book *Competing For the Future* (1994) as well as a couple of other influential articles published in the HBR. Among the schools of the RCC approach, the constructionist school and specifically Hamel & Prahalad's ideas are the closest to Penrose's (1959) insights. Their ideas highly resemble the earlier work on the subject done by Itami & Roehl *Mobilizing Invisible Assets* (1987). The epistemic characteristics of this school are also related to several other important characteristics, including its forms of theorizing and empirical work, its focus on the dynamic aspects of competence/capability creation rather than sustenance of existing advantages, its depiction of the relation between firm and environment and its implications for the degree of strategic choice imputed to managers (Huehn 2008). Before examining these facets of the school's underlying framework, we briefly describe its substantive focus.

5.1 A Conceptual Outline of the Social Constructionist School

Similar to the previous schools, the current one also concerns itself with RCC based explanations for superior business performance. The most prominent authors in this respect are Penrose (1959), Itami & Roehl (1987), Nonaka & Takeuchi (1995), Spender (1996, 1998), Kim & Mauborgne (2005) as well as Prahalad & Hamel (1989, 1990, 1993, 1994). The constructionist school can uniquely be identified among the approaches dealing with resources by its focus on the creation of new competences or capabilities, most of which are intangible (Itami & Roehl 1987), knowledge-based (Nonaka & Takeuchi, 1995; Spender

1996, 1998) and collective in nature (Penrose, 1959; Prahalad & Hamel, 1990). In its focus on creation, it is the most dynamic among the resource-based approaches. The constructionist school acknowledges that competitive advantages are based on firm-specific resources such as technological competencies, knowledge and other intangibles that are not quickly imitated and thus provide for an advantage that can be sustained. However, the school attaches prime importance to the continual regeneration of these sources of advantage as the only guarantor of superior performance in the long term. *“The essence of strategy lies in creating tomorrow’s competitive advantages faster than competitors mimic the ones you possess today (...)* An organization’s capacity to improve existing skills and learn new ones is the most defensible competitive advantage of all.” (Hamel & Prahalad, 1989:69) This creation of new advantages is possible by means of consistent focused investment in a few broad lines of expertise (core competences) that is infused with adequate ambiguity regarding the means and the short term goals, which allows for emergent organizational learning (Prahalad & Hamel, 1990). Further, the focus on creation takes the discussion to the ex ante phase of managerial decision and action, where decisions have to be made about strategic directions and resource investments in the midst of highly uncertain and complex circumstances. Most empirical studies in the rational-equilibrium and behavioral RCC schools that examine firm-specific resources and capabilities explain past firm performance, which does not help managers who need to act for the future (Amit & Schoemaker, 1993). The benefit of hindsight, which researchers utilize to put together objective analyses ex post, is not available to managers ex ante. It is for this reason that the constructionist school stresses creativity, resourcefulness and entrepreneurial qualities and avoids models which have cooking-recipe character.

5.2 The Underlying Framework of the Social Constructionist School

While all economical theories (including the two other schools discussed) assume an objective, separate world knowable with accuracy, the constructionist school takes on the assumption that a single objective world ‘out there’ simply does not exist. The relevant world or environment is the subjective environment that is specific and idiosyncratic to the firm or manager of interest. The constructionist approach considers that the worlds or environments of managers and organizational members are actively constructed by them, and represent their particular and subjective creation, to which they adapt and

respond. This may sound quite exotic, but when viewed through the eyes of a strategist, it becomes very plausible. Strategists are interested in the future and the future does not simply happen to us, it is created/influenced by human actions: markets consist of humans trying to get or create the best deal for themselves. Markets are not places where impersonal forces walk on a preset path towards a known future. That means that strategy as prediction is replaced by strategy as creation² as information from the surroundings of actors interacts with their internal dispositions or tendencies and what results is a creation and not a (flawed) mirroring of reality. In the words of Henry Mintzberg,

“...what is inside the human mind is not a reproduction of the external world. All that information flowing in through those filters, supposedly to be decoded by those cognitive maps, in fact interacts with cognition and is shaped by it. The mind, in other words, imposes some interpretation on the environment – it constructs its world. In a sense, the mind has a mind of its own – it marches to its own cognitive dynamics. Or perhaps we might better say they march, because there is a collective dimension to this too: people interact to create their mental worlds.”(Mintzberg et al., 1998:165)

This epistemology is markedly distinct from the behavioral school’s view that cognition is at best a highly simplified and flawed reflection of reality. *“What the one sees as the basis for distortion, the other takes as the opportunity for creation.”* (Mintzberg et al., 1998:170) Following the views of Berger & Luckman (1966), within a collective context, these individual constructions of knowledge and of reality take on an objective or separate existence as they continue to exist beyond the time and place of their original construction, through socialization and internalization. However, the creation of reality is a dynamic and continuous process of construction, which implies that there is no logical inevitability, even with all of the inertial forces working to keep it in place. It is this ever present, but insufficiently acknowledged, capacity to create new reality that is the focus of the constructionist school. In order for it to become relevant to strategy it needed a focus (strategic intent - Hamel & Prahalad, 1989) and a process through which the future that is created gives the firm a sustainable competitive advantage (learning). The Core Competence program tries to deliver both ingredients.

² For an in-depth discussion we recommend Hans-Hermann Hoppe’s (1997) brilliant essay on uncertainty and rationality. He shows the logical flaws in classical economical thinking when it comes to assumptions about human behavior. (p.35 1st paragraph)

The implications of a constructionist epistemology are discernible in this school's view of actor (manager) rationality. There is no assumption of a singular form of rationality such as maximizing profit; however, multiple rationalities are assumed (Huehn, 2005; Schoemaker, 1990). In addition, factors that fall outside the realm of conscious and calculable rationality, such as vision and intuition are realistically acknowledged as central features of management (Mintzberg et al., 1998). Lindblom's (1959) work on how messy decision making is in complex organizations as well as Mintzberg & Waters' (1985) work on emergent strategies are relevant to the depiction of managers under the constructionist perspective. In this school, strategy is conceived through incremental or revolutionary learning under a broad strategic direction, rather than through deliberate and rational choice. In addition to multiple individual rationalities, the collective (social) dimension of organization features prominently in the constructionist school in such central concepts as organizational learning. Overall, the constructionist assumptions contradict the 'rational' management views described earlier, and present a more realistic view with which most managers can relate to (Mintzberg et al., 1998).

The constructionist school's underlying epistemology has unique implications for describing the boundaries of the organization and the relationship of the firm with its environment. As emphasized earlier, social constructionism does not view the environment as a single objective existence discoverable by means of facts and governed by natural or social laws that dictate an optimal behavior that defines success in business. Rather, the delineation of organization from 'not-the-organization' is quite fuzzy as both the organization and its environment are created by the interactions among members of organizations. The concept of an organization's environment, that is normally seen to consist of customers, suppliers, competitors and other stakeholders, becomes difficult to define with precision. The boundaries separating what is inside and what is outside are not clearly demarcated as

"... the actors themselves create the environment to which they adapt ... Rather than talking about adapting to an external environment, it may be more correct to argue that organizing consists of adapting to an enacted environment, an environment which is constituted by the actions of interdependent human actor ... This reasserts the argument that the environment is a phenomenon tied to processes of attention, and that unless something is attended to it doesn't exist. While this is a rather radical turnabout in the way environments are usually discussed, there is precedent for

this view in organization theory itself, ... in empirical research ... and in theories of how people discover knowledge.” (Weick, 1969:27-28)

The concept of an enacted environment suggests very different implications for strategy-making from the objective and perceived environments of the rational equilibrium and behavioral evolutionary schools respectively. Smircich & Stubbart (1985) show that when managers view the environment and the organization as being enacted by their (and others’) thoughts and actions, the traditional prescription that the organization must adapt to its environment ceases to be of importance. Managers start to see themselves as creators of their own opportunities and threats so instead of looking externally to allocate blame and find remedies to their problems, they look to themselves and how their perspectives and actions have contributed to their situation. This view brings empowering strategic choice back to managers and members of an organization. Other perspectives, that include some of the work in the behavioral-evolutionary school, allow for some influence by organizations over their environments, but they see that the organization must necessarily adapt to contingencies in the environment over which it has no control (Weick, 1969; Helfat et al., 2007). However, Weick (1969) emphasizes that the constructionist approach asserts the strong form of this argument, claiming that organizations are always actively constructing their environments.

The constructionist school shares a number of interests with the behavioral-evolutionary school, which leads the majority of scholars to treat the former as a part of the latter. However, there are fundamental differences between the two approaches about basic assumptions and methodological choices. The first and most salient difference is the reliance on economics as a base discipline. The constructionist school is unique among the RCC approaches as it does not draw on formal economic theory, whether in its neoclassical form, IO and game theoretic form, transaction cost or evolutionary economics. However, it draws heavily on Schumpeter’s ideas on creative destruction and innovation (Schumpeter, 1934; 1942/1994). Further, it takes organization theory and other social sciences such as sociology, cognitive and social psychology as its disciplinary base. As a consequence of the underlying epistemological framework and the base disciplines, the form of theorizing in the constructionist school is what Nelson & Winter (1982) have referred to as ‘appreciative theorizing’. This means that theories in the constructionist school do not use formal mathematical theorizing based on axiomatic deductive logic, as is the dominant

methodology in the range of economic approaches dealing with organizational issues. In the words of neoclassical economic theory, instead of optimizing a production function, the constructionist school is concerned with the creation of new production and cost functions. As Schumpeter notes, “*Carrying out a new plan and acting according to a customary one are things as different as making a road and walking along it*” (Schumpeter, 1934: 85). The process is a highly uncertain and complex one involving an interaction among strategic directions of managers, human systems that involve social, psychological and political dimensions, material resources and organizational processes. Here, the qualitative attributes of organizational capabilities are of central importance and may become entirely distorted when quantified and operationalized, as quantification tends to dilute the descriptively rich nuances that make firms qualitatively different (Conner, 1991). In addition, factors such as stretch (Itami & Roehl, 1987), leverage (Hamel & Prahalad, 1993), synergy (Penrose, 1959), vision, intuition and creativity (Mintzberg & Westley, 2001; Schumpeter, 1934) that are central to effectiveness considerations in the constructionist school defy mathematical modeling that can at best tackle issues of efficiency, and treats these factors as chance events. Empirical work in the constructionist school is carried out from an interpretative perspective (Mintzberg et al., 1998), trying to capture the subjective views of managers, dealing with issues from multiple standpoints (Smircich & Stubbart, 1985), and preserving the incommensurability of quantitative and qualitative dimensions (Huehn, 2005). Large sample quantitative designs are ill suited for such purposes as they tend to look for general rules governing the behavior of groups or populations of individuals or firms, leaving out the random and idiosyncratic elements, as well as the outliers (Aharoni, 1993). It is the few exceptional organizations that interest the researchers in this school and thus anecdotal information is preferred over statistical information. The RCC approach to strategy emphasizes uniqueness, and thus empirical research would not seek out similarities between firms, but rather differences. “*Thus in the best of all worlds, resource-based theory would be aimed at generalizing about uniqueness, which clearly is impossible*” (Connor 1991: 144) In-depth qualitative designs as well as longitudinal and historical methods are more suited to the nature of the problems tackled from the constructionist perspective. Authors who have reviewed the literature of the RCC approach have noted the similarity between the constructionist and the behavioral-evolutionary schools in taking a dynamic, process-oriented approach to the creation of resources and of new competitive advantages (Foss, 1997;

Foss & Knudsen 1996; Mahoney, 1995; Mahoney & Pandian, 1992; Schulze, 1994). However, most authors have not shown adequate appreciation of the massive differences between the two schools. Actually, all of the above mentioned authors place the work of Prahalad & Hamel within the same category as research in the behavioral-evolutionary approach. While there are some superficial overlaps, for instance in the common focus on technological and organizational capabilities, intangible aspects such as knowledge and learning, and collective processes, there are indeed non-trivial differences rooted in the epistemology and the basic assumptions.

6. Conclusion

This paper aimed at bringing some structure to a debate about what was previously assumed to be one of the most important research programs in strategy but which turned out to be three more or less loosely connected research programs (Table 1 in the appendix gives the reader a structured overview). We hope to have shown that the commonalities between the three programs are surprisingly superficial while the differences are rather profound. It is fairly safe to assume that research in any given field will progress much faster if researchers are fully aware of their own epistemological and contextual position vis-a-vis other researchers/research programs. Only from this basis can a meaningful and focused scientific debate emerge that pushes forward the boundaries of research. It may come as a surprise just how disinterested scientists seem to be in structuring their research field and how little regard they seem to have for the philosophy of science. It can be assumed that this laissez-faire attitude has hindered progress in the RCC approach for some time and has resulted in widespread confusion about the most basic issues. We hope that this paper can improve the understanding of the idiosyncracies of the three strands and thereby start a meaningful debate between and within the three research programs. The three programs seem to be interested in different aspects and maybe a division of labor can further improve the understanding of the whole field. The two more economically oriented programs seem to be more focused on distinguishing between the firm and its market and the respective roles of both, while especially the Core Competence approach focuses on firm-specific learning processes which produce competences or capabilities. Thus, even if a co-operation between the research programs proves impracticable (due to the incommensurability of assumptions) research can move forward independently.

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Table (1)
The Three Schools of the RCC Approach

	Rational – Equilibrium School	Behavioral – Evolutionary School	Social Constructionist School
Epistemology	Positivist	Positivist	Constructivist
Basic Assumptions			
Manager	Managers are rational; they optimize	Managers are bounded rational; they satisfice	Managers are entrepreneurs: they synthesize and create
Environment	Objective; independent; accurately measured by managers	Objective; independent; inaccurately perceived by managers	Subjective; enacted; created by managerial cognition & action
Degree of Strategic Choice	Minimal: exogenous market forces determine firm behavior	Moderate: firms act on the market and are acted upon by its forces	Maximal: firms create themselves and their markets
Implications of Basic Assumptions			
Substantive Focus	Retrospective, static; Which resources yield sustained rents in equilibrium? What mechanisms sustain rents?	Retrospective, dynamic: How do markets co-evolve with firm capabilities and technologies?	Prospective, dynamic: How do firms create future markets through learning new competences and creating new knowledge?
Methodology			
Theoretical	Hypothetico-deductive; formal mathematical modeling; optimization; game theory	Hypothetico-deductive; mix of formal mathematical and appreciative theorizing; evolutionary game theory;	Appreciative theorizing
Empirical	Quantitative; large sample statistical analyses; industry or market level data;	Mix of quantitative and qualitative methods; simulation and historical study	Mostly qualitative; case study, anecdotal evidence
Base Discipline	Industrial organization economics	Behavioral economics; evolutionary economics	Schumpeter's entrepreneurial theory; organization theory; social and cognitive psychology
Theoretical Roots	Bain; Mason; Demsetz	Schumpeter; Simon; Cyert & March; Richardson; Nelson & Winter	Schumpeter; Penrose
Contemporary Authors	Wernerfelt; Barney; Rumelt; Helfat; Peteraf; Montgomery	Teece; Nelson; Winter; Dosi; Carlsson;	Hamel; Prahalad; Nonaka & Takeuchi; Spender; Itami & Roehl; Schoemaker
Current Research Streams	Resource-based theory & research	Organizational capabilities; routines; dynamic capabilities; technology strategy; industrial dynamics and technological change	Core competence research; knowledge creation; organizational learning