



Comparative Advantages of Spinoff Firms: An Evolutionary Perspective

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Abstract

As predicted by evolutionary economics, historical antecedents matter when it comes to the relationship between survival of entrants and organizational capabilities. Spinoff firms provide an exemplary case of such relationship where the founders' pre-entry capabilities that are inherited from the parent firm increase their survival chances. Looking closer and deeper to the evolutionary spinoff success mechanisms, I examine three specific genetic features which make spinoff firms more advantageous compared to other entrants; namely 1) Genotype: Transfer of blueprint, 2) Phenotype: Organizational learning, and 3) Memes: Informal relations and social capital. A detailed theoretical analysis of each mechanism prevails how they function and provide sustainable competitive advantage to spinoff firms. Testable hypotheses are provided about each mechanism.

Keywords: Spinoffs; evolutionary view; transfer of routines; organizational learning; social capital.

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Introduction

Although the evolutionary view itself has long been seen as a biological process, the theories of biological evolution have gradually been employed in investigating organizations (Aldrich, 1999). The applications of these theories are gathered around evolutionary economics and evolutionary economics predicts that historical antecedents matter when it comes to the relationship between survival of entrants and organizational capabilities. Spinoff¹ firms provide an exemplary case of such relationship where the founders' pre-entry capabilities that are inherited from the parent firm increases their survival chances. The inheritance of spinoffs from their parents is of booming interest in the organization theory literature (Phillips, 2002; Parhankangas and Arenius, 2003; Agarwal et al., 2004; Klepper and Sleeper 2005; Sahaym, 2005; Buenstorf, 2006; Ferreira et al., 2006; Buenstorf, 2007a, b; McIvor, 2007; Breslin, 2008; Garnsey et al., 2008). It is customary to use biological metaphors in discussing spinoffs and to talk about "parent" firms and their "children" (Klepper, 2001; 2011).

One prominent line of research focused on the idea introduced by Klepper and Sleeper (2005) that established companies can be taken as mothers generating spinoffs, such that the heritage of these parents pass onto their spinoffs. Studies have shown that spinoffs are among the most successful entrants in a diverse set of industries like the tire industry (Buenstorf and Klepper, 2009), medical device industry (Chatterji, 2009), laser industry (Klepper and Sleeper, 2005), automobiles (Klepper, 2002), and disk drives (Agarwal et al., 2004). For example, Shockley Semiconductor Laboratories (a spinoff itself from Bell Labs) spun off Fairchild Semiconductor which in turn produced Intel as a third generation progeny together with many other spinoffs. This process formed Silicon Valley, which is known today as the epicenter for innovation in the United States. Employees of established firms in these industries turn out to be one of the main sources of entrepreneurship (Agarwal et al., 2010; Benner and Tripsas, 2011; Campbell et al., 2011). The parent affects the initial strategies of its spinoffs, their behaviors, production techniques, innovation and organizational learning capabilities, habits, and hence their survival rates and performance (Lindholm–Dahlstrand, 1997, 2000; Klepper, 2001; Agarwal et al., 2004; Berchicci et al., 2011).

Much attention has been paid to these evolutionary pre-entry mechanisms, trying to explain the factors underlying the performance of these "distinctive" entrants; why they are more innovative, why do they early-fail less and survive longer? Interestingly, findings do not converge, leaving ambiguity in understanding which of them is more vital in spinoff's success. A possible explanation to this ambiguity lies behind the reason that the literature stresses spinoffs' survival rates and performance (Lindholm–Dahlstrand, 1997, 2000; Klepper, 2001; Agarwal et al., 2004) without making use of the evolutionary view. Buenstorf (2006) states that the most straightforward analogy to "inheritance" of organizational characteristics is the knowledge transfer through the spinoff process. Since spinoffs are increasingly researched by evolutionary economists (and that's of no surprise), fending off this ambiguity is crucial for the development of a theory-based understanding of spinoffs. I attempt to thoroughly analyze the fundamental question: What really triggers the distinctive performance and innovativeness of entrepreneurial spinoffs?

Specifically, I exploit this idea and develop a theoretical model to analyze the mechanisms by which this distinct class of entrants, i.e., spinoffs, inherits certain traits through the three dimensions of the evolutionary view, namely genotype, phenotype, and memes, which put them in an advantageous position in their business lives compared to non-spinoff firms. This heritage can include specific traits such as the genotype, or the genetic material of the parent (Phillips, 2002; Sahaym, 2005) which breeds knowledge relatedness, i.e., shared understanding, common language, and open and fluent channels of transfer that enable the spinoff to easily transact with its parent (Sapienza et al., 2004; Sahaym, 2005; Klepper and Sleeper, 2005). Through this relatedness, the spinoff can develop its own phenotype, the outer appearance of the progeny, which is a result of its genotype and what it learns from its parent. Other than this genotype–phenotype evolution of the spinoff, there is another channel that differentiates spinoffs from non-spinoff entrants. This process of spinoffs' evolution, from genotype to phenotype, is supported with easy access to and acquisition of resources through the informal

⁵ The expressions 'spin-out' and 'spin-off' (both might be used with or without hyphen) are utilized for denoting firms that are founded by employees of incumbent firms in the same industry. As no consensus in the literature aroused yet, I prefer to use 'spinoff'.

relations between the parent and the spinoff (Agarwal et al., 2004; Klepper and Sleeper, 2005; Johansson, 2007). The informal relations are formed through the spinoff founders' prior job experiences which are shaped during the period the founders were employees of the parent firm. These informal relations can be proxies to social and cultural counterparts of genes, i.e., memes (Dawkins, 1976) or culturgenes (Lumsden and Wilson, 1981).

The theoretical perspective in this study is based on the evolutionary view and the notion of heredity (Nelson and Winter, 1982; Klepper, 2001; Klepper and Sleeper, 2005), so the main contribution of this paper is to evolutionary economics literature by the use of Nelson and Winter's managerial processes and routines as the DNA of the parent firm; i.e., the genotype. It is assumed that the more the parent firm is a prominent player in the industry in which it operates and

the more the inheritance from the parents provides performance advantages to spinoff. In other words, it is assumed that having genetic similarity with the parent provides the base for spinoff's advantages. This is in line with Klepper and Sleeper (2005)'s argument that larger and longer-lived companies have greater possibilities of spawning more and better spinoffs since they have the capacity to introduce greater knowledge that spinoffs can exploit. There are also other evolutionary mechanisms like the phenotype and memes which touch upon organizational learning, relatedness, and informal relations and social capital literatures, respectively. Taken together, the three dimensions of modern evolutionary theory, namely genotypes, phenotypes, and memes, give additional insights and, in my view, provide a better understanding of the spinoff process as the spinoff is separated from the parent firm.

This paper is organized as follows. The second section starts with the principles of the evolutionary view, does a review of the literature on the evolutionary view, presents its basic principles and explains how the evolutionary view can be applied to the case of spinoffs. In the third section I propose a model on spinoff firms and present testable hypotheses. Fourth section concludes with a discussion and future research areas. purpose.

Principles of the Evolutionary View and Its Application to Spinoffs

A general overview of the evolutionary view is needed in order to understand its relevance to this study. Different approaches are present in the literature that define the evolutionary mechanisms of inheritance from different angles. For example, Hodgson (2002) argues that a true analogy between biological and organizational evolution is not possible, i.e., industrial organizations are not counterparts of biological organisms; however, biological evolutionary principles can be used as a "metaphor". With his "continuity hypothesis", Witt (2004) argues that Darwinian theory is not adequate to clarify the detailed mechanisms of cultural evolution; i.e., "appropriate and peculiar explanatory theories are required for the different aspects of cultural evolution" (Witt, 2004). On the other hand, it is widely accepted by many scholars that organizational evolution is rooted in, and analogous to, the biological theory of evolution (Aldrich, 1999; Knudsen 2002; Hodgson 2003; Murmann 2003; Geisendorf, 2004; Hodgson and Knudsen, 2004, 2006a, 2006b; Vanberg, 2006). According to Nelson and Winter (1982), it can be anticipated that business organizations look rather like biological organisms. This can be observed in many ways.

Every organization is initiated with an individual person or group. These small initiators must keep up with all functions of the organizations, just like the simplest structures of biological organisms, i.e., cells. As the organization becomes more complex, different departments grow out of this initial core which is equivalent to diversified cells, i.e., brain cells, muscle cells, etc. Furthermore, the communication of these complex organizations shows additional resemblance to biological organisms. The counterparts to senses of humans in organizations are the information collecting channels by which an organization listens to its environment, i.e., market, competitors, customers, or suppliers. In his study, Mitchell (1991) indicates that not only formal market research reports, but front-line staff, salespersons, and call centers also serve as senses of organizations and facilitate collecting information about the organization's environment. The organizations react and adapt themselves according to the information gathered from their environment, which evolves based on a combination of random circumstances. Thus, these reactions and adaptations of organizations all happen in an evolutionary manner (Nelson and Winter, 1982). In other words, similar to biological organisms,

organizations largely shape their existence by their evolution in random, thus it is not based on an intentional design (McKelvey, 1982).

Furthermore, the idea of “universal Darwinism” has been adapted (Dawkins, 1983; Hodgson and Knudsen, 2004, 2006a, 2006b) claiming all evolutionary mechanisms share the conceptual organization of Darwinian processes. Universal Darwinism broadens Darwinian concepts from the field of biology to all types and levels of systems, including business organizations (Hodgson and Knudsen, 2004). In biology, the inherited characteristics of a population of organisms change from one generation to the next through the processes of evolution (Darwin, 1887). Darwin (1887) argued that all individuals strive to survive on limited resources, but some have small, heritable differences that give them a greater chance of survival compared to individuals lacking these beneficial traits. Such individuals have higher evolutionary fitness and the useful traits they possess place them in an advantageous position compared to other entrants to the population.

But why employ an evolutionary view and how does the evolutionary view fit organizations? Campbell (1960, 1965, 1969) reveals three main elements of the evolutionary view as variation, selection, and retention. These three elements of the evolutionary view give information about the so-called biology-based theory to be applicable to the business organizations (Aldrich, 1999; Klepper and Sleeper, 2005). First, the evolutionary view permits variation in the possible structures that organizations pursue (Aldrich, 1999), in which particular units or the entire organization produce unique and innovative combinations of their natural design in order to adapt to their environment in a better way. Second, the selection process is especially effective in winnowing weak variants out; i.e., it provides survival and reproduction of individuals whose inherited attributes are better suited to the current environmental state. In business organizations, selection occurs on at least two levels: Managerial selection of routines within firms and competitive selection of firms in markets (Simon, 1962). The scope of this study covers the former. Selection processes facilitate the distinction between the strong and weak variations in the existing collection of routines (Nelson and Winter, 1982). Finally, retention takes place where the selected traits are routinized and only a group of organisms are retained as a result of the selection processes of the nature; that is, most of them are rejected. In the organizational context, retention takes

place through the spread of routines and competences and the persistence of the selected variations within a population. Retention will include both the replication of successful routines within the firm itself and from other organizations; in this case, the parent firm. Knowledge of routines increases within the population, with firms learning vicariously from each other (Aldrich and Baker, 2001). This, in turn, increases confidence and access to the parent’s resources among the founders of the spinoffs as they enter the new industry with lower costs and risks involved compared to non-spinoff firms. The organizational blueprint of the spinoff founder confines the adaptation of individual formations shaping the administrative and managerial intensity of the firms, even after the departure of the founder (Baron et al., 1999). In this manner, as the spinoff grows, organizational learning is actualized through the shared understanding, common language, and related channels of knowledge transfer between the parent and the spinoff and is retained and protected within the organizational boundary.

After reviewing the traditional cycle of variation, selection, and retention and its applicability to business organizations, there are also other aspects of the evolutionary view that are worth mentioning. The evolutionary view lately adopted different perspectives and courses of action of many scholars such as the transfer of routines (Hodgson, 2003; Hodgson and Knudsen, 2004), organizational learning (Aldrich et al., 2001), entrepreneurship (Breslin, 2008), organizational survival (Buenstorf, 2007a), firm networks and early growth of the firm (Hite and Hesterly, 2001; Hite, 2005), and capabilities of new firms (Klepper, 2002). However, modern evolutionary theory deals with three different dimensions of inheritance which constitute the base of this study. The first is the collection of genotypes, which is delineated as the genetic heritage of an organism or group of organisms transmitted from a parent. The genotype in the organizational context can be characteristic elements of a firm, such as managerial processes and routines (Nelson and Winter, 1982). The second is the collection of phenotypes, which is stated in terms of what an organism looks like as a consequence of its genotype. Examples of phenotypes might comprise weight, appearance, size, hair color, or reactions to specific situations such as anything that can be learned experience (Nelson, 1995). The phenotype in the organizational context can be the visible activities of the firm, i.e., business behavior, organizational culture, language, performance, and innovativeness. An organism

acquires some attributes as a result of its genotype and all of these attributes are expressed externally that depict the “fitness” of each individual organism. “Fitness” here is defined in terms of solving particular problems better; e.g., being more profitable than other members of the population that do not have this genotype. The third dimension of inheritance is the less known concept of memes (Dawkins, 1976) or culturgenes (Lumsden and Wilson, 1981). Memes are somewhat different from genes in that they are the cultural units that are transferred between generations by nongenetic means. In other words, memes are the cultural counterparts of genes (Nelson, 1995). Some examples of memes include sanitary and security warnings like: “Don’t go swimming just after you eat”, games, actions, songs, and behaviors (such as teasing each other) that are peculiar to separate age groups, and memes of the Internet that spread rapidly amongst users by means of transactions such as blogs, websites, e-mail, and others. The memes in the organizational context can be any transferable cultural forms embedded in human capital like job experiences, ideas, economical and personal connections, and informal relations of employees with their previous jobs.

Evolutionary theory assumes that the parents’ blueprints can be recognized in the genotype of spinoffs (Klepper and Sleeper, 2005). The phenotype of the spinoff, which is based on the spinoff’s genotype, constitutes the solutions to problems or opportunities to improve the spinoff’s business behaviors. Normally new entrants to the market learn and find solutions to the challenges that they face through more costly ways, such as trial and error (Nelson, 2008). However, spinoffs inherit an industry-specific genotype and build a phenotype from their genotype through their relatedness with their parent firm (Sapienza et al., 2004). Many researchers also state that spinoffs have higher profits and higher expected survival rates because they inherit better quality knowledge compared to other forms of entries into the market (Agarwal et al., 2004; Klepper and Sleeper, 2005). These studies have shown that spinoffs inherited “genes” from their parents that were not available to non-spinoff firms in many industries including the U.S. tire industry (Buenstorf and Klepper, 2009), laser industry (Klepper and Sleeper, 2005), automobiles (Klepper, 2002), semi-conductors (Braun and MacDonald, 1978; Malone, 1985; Brittain and Freeman, 1986; Moore and Davis, 2004) and disk drives (Franco and Filson, 2000; Agarwal et al., 2004). The memes of spinoffs constitute another dimension that cultivates

the genotype-phenotype process. Industry-specific tacit knowledge and information, which is normally costly for a new venture to obtain, are commonly accessed through the spinoff founders’ informal relations with their parent firm. In order to get access to the parent’s resources while dealing with their daily activities, the spinoff founders use their prior job experiences (Campbell et al., 2011). These informal and cultural interactions constitute the third dimension, i.e., memes of the evolutionary inheritance cycle of spinoffs.

In order to reveal the performance differences between spinoff and non-spinoff firms, the effects of the distinctive traits that are bestowed to spinoffs can be defined as an evolutionary model. In the next section, I propose a model regarding these evolutionary mechanisms.

A Proposed Evolutionary Model for Spinoff Firms

Evolutionary view permits us to make the concepts of managerial processes and routines analogous to biological genotypes (Aldrich, 1999; Klepper, 2001). Through the transfer of the genotype, the spinoff inherits the capabilities that are the counterparts of genes. These capabilities together form the repository of genes, i.e., the DNA of the spinoff. Through its DNA the spinoff possesses relatedness with the parent firm in its business operations and behavior. In other words, a shared understanding, a common language, and better organizational learning from the parent firm compared to other non-spinoff firms are provided through this relatedness (Doz, 1996; Crossan et al., 1999). What a spinoff learns, however, is not important unless it puts its learned capabilities into practice. Every spinoff will have different perceptions and these will form their phenotype. While forming its phenotype from its genotype, the spinoff needs certain resources throughout the whole process, such as financial, knowledge, and human resources. The founder of the spinoff uses its prior ties with the parent firm to transfer the resources when necessary. The memes of the spinoff help it to obtain these resources from the parent firm. Through this study, one can identify the exploitation of the evolutionary view as an indicator of spinoffs’ distinctiveness compared to non-spinoff counterparts that also face similar environmental conditions.

See Figure 1 for an illustration of the sequential transfer process.

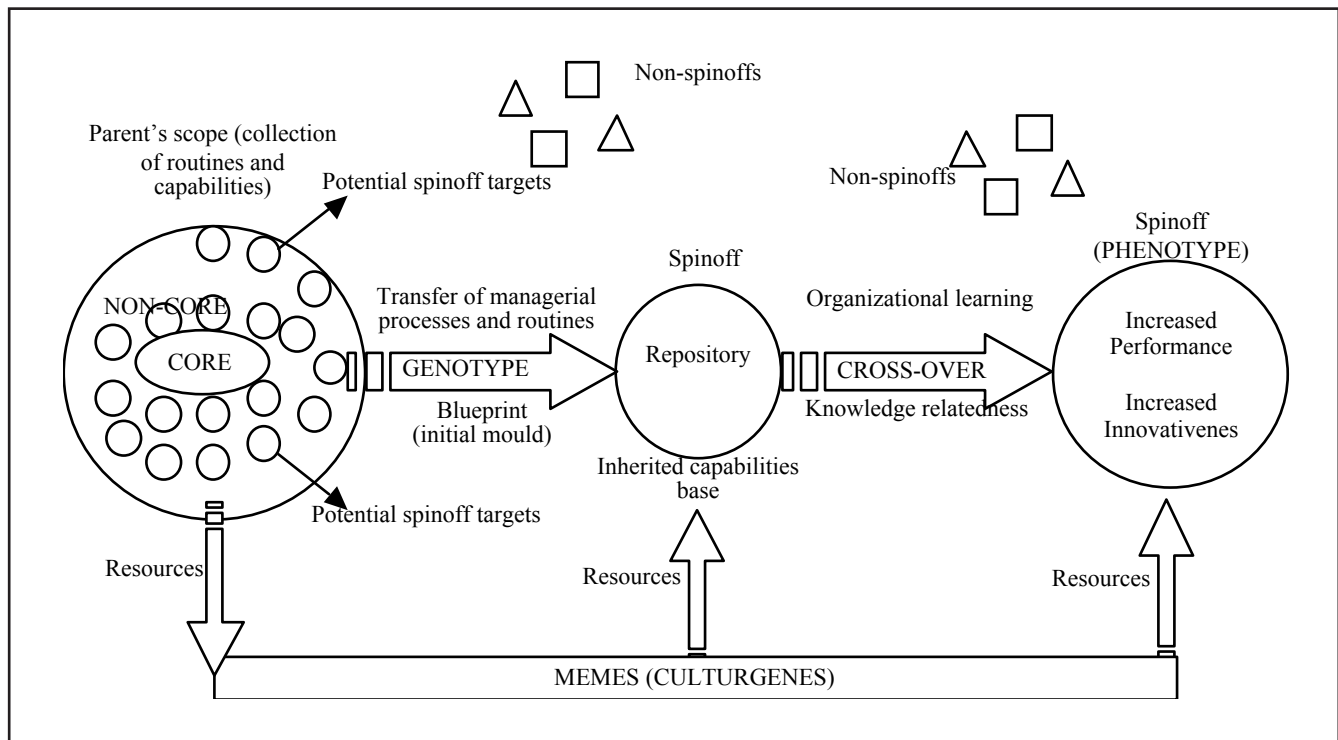


Figure 1. An illustration of the process of spinoff evolution through genotype, phenotype, and memes.

As it was mentioned in the previous section, biological metaphors such as “parent” and “children” have been used to discuss spinoffs (Klepper, 2001). The theoretical approaches to this type of parent–child interaction, such as the inheritance and reproduction of spinoffs, are commonly modeled with the concept of organizational routines (Phillips, 2002; Hodgson, 2003; Hodgson and Knudsen, 2004). Nelson and Winter (1982) originated the term “routines” to denote learned behavior used in the governance of firms. Routines are described as “what firms do” and “how productively they do it” in specific conditions, i.e., the ability of the firm to react to its changing environment without much explicit thinking. Firms mostly depend on their routines to make managerial decisions at different levels of their operations. In other words, routines do not only characterize how the company works now, but they also define how the firm is going to react, behave, and operate in the future. As it can be seen, the concept of managerial processes and routines is analytically similar to the genes in biological theory.

I propose that the transfer of managerial processes and routines from the parent to spinoff provides the accumulation of genes in the spinoff’s genotype. This

creates the repository of the spinoff’s inherited capability base (see the model). The transfer process can be seen as forming the initial mould of the spinoff, i.e., the genotype. This initial mould, formed through the inherited managerial processes and routines, is based on the inheritance of an organization at its founding and shapes what a company explores and experiences about its environment and how it reacts to different circumstances (Huber, 1991). In other words, I assume that part of the “blueprint” of the parent company would pass on to the progeny (Phillips, 2002; Sahaym, 2005) in the form of its managerial processes and routines (Nelson and Winter, 1982). In the evolutionary view, the accumulation of these managerial processes and routines correspond to the inherited DNA of the spinoff and cover the majority of what is habitual and expected about the business behavior of the progeny. The managerial processes and routines endure within the spinoff and are transmissible toward its future. The spinoff’s inheritance of genotype is the basis of its operations, growth, and development, and is at the heart of its survival (Chen et al, 2011). However, this genotype may also bind it to the way its parent currently operates and restrict its ability to change. Thus the paradox facing spinoffs is that this type of an inheritance is both the source of their survival and

success and the cage that imprisons them. However, this constraint is assumed to enhance the advantage of the spinoff over non-spinoff firms since the parent secures the spinoff by its bonds, i.e., spinoffs operate in the industry with lower costs and risks involved compared to non-spinoff firms². Newborn companies that have the right to access the tacit knowledge specific to their industry gain greater advantages (Klepper, 2001; Klepper and Sleeper, 2005). This inherited knowledge is invaluable to the ones that own it, since it is exceptionally hard to reproduce and imitate. This is similar to a mother creating the proper environment for its child to grow and the child using its genotype, i.e., its genetic inheritance, in order to have an advantage over other children (Klepper, 2001).

Proposition 1 (Transfer of Blueprint): Part of the “blueprint” of the parent company will pass on to the progeny in the form of managerial processes and routines, which is likely to create shared understanding, common language, and dialogue between both parties.

My first proposition covers the incubation period when no real economic activity of the spinoff has yet started. The transfer of the blueprint, which occurs during the pre-entry stage (the incubation and/or founding stage), certainly cannot account for all the differences in the spinoff’s performance. Other capabilities of spinoffs affect their performance as well. Organizational learning is one of those capabilities, which depends on firms’ post-entry activities (when the economic transactions of the spinoff start taking place). Organizational learning can be defined as building best practices in problem solving capabilities through improving managerial processes and routines of the firms (Sapienza et al., 2004; Sahaym, 2005). By definition, organizational learning suggests a stable and iterative pattern for generating improvements and modifications in managerial processes and routines (Nelson and Winter, 1982). The business behaviors and real life reflections of what the spinoff has learned simply reflect the adaptability of the progeny. This adaptability is a result of the cross-over of the genotype which, in turn, forms the spinoff’s phenotype. In this sense, learning is very much an integral part of the evolutionary process. In line with this view, we can say that spinoffs learn from their parent firms, e.g., by mutual adjustment, spinoffs can

exploit what they have learned from their parents, such as problem solving, coping with challenges, etc. (Crossan et al., 1999). Thus I hypothesize that organizational learning is facilitated through inherited managerial processes and routines. An important facet of organizational learning is that it is rooted in the genotype of the spinoff that is transferred during the pre-entry stage (Proposition 1). Assuming that learning is adaptive, the faster and the more efficient an organization learns, the stronger, and therefore the more advantageous it is expected to be compared to other entrants (Agarwal et al., 2004; Klepper and Sleeper, 2005).

In the evolutionary view, the firm is a complex evolutionary system adapting to outside changes by learning and developing new and effective routines (Bower and Doz, 1979; March, 1981; Nelson and Winter, 1982). As depicted in Figure 1, inherited managerial processes and routines form the initial mould, therefore the DNA (repository of inherited capabilities base) of the spinoff. Since this DNA is closely related to the parent’s, the initial mould of the progeny can cause distinct combinations of knowledge that lead to more efficient organizational learning, which turn into an important competitive advantage for spinoffs over non-spinoffs (Lindholm–Dahlstrand, 1997). The efficiency of the spinoff’s learning heavily depends on its knowledge relatedness with the parent company (Sapienza et al., 2004). Knowledge relatedness can be defined as the occurrence of parallel and/or related behaviors or shared knowledge bases in both the parent and the spinoff. This knowledge relatedness occurs through appropriate, open, and fluent channels of transfer between the parent and the spinoff (Huber, 1991). While the literature recognizes that organizational learning is very much an integral part of the evolutionary view (Miner, 1994; Jones, 2005), studies have not investigated how the knowledge relatedness between the parent and the progeny affects and enhances the organizational learning of the latter. Through its knowledge relatedness with the parent firm, a spinoff can easily learn the best ways to cope with the challenges it faces, therefore be exceptionally able to operate better compared to non-spinoff firms that operate in the same industry.

I propose that the relationship between the parent and spinoff would offer a fruitful ground for organizational

² See the assumption I made in the introduction: It is assumed that the parent firm is a prominent player in the industry in which it operates and the inheritance from the parents provides performance advantages to spinoff.

learning due to the knowledge relatedness between the two parties (Sapienza et al., 2004; Sahaym, 2005). Through shared understanding, common language and dialogue, knowledge relatedness between the spinoff and the parent offers an appropriate environment for significant organizational learning to take place (Roberts, 1991). Since the most efficient organizational learning takes place under similar domains of knowledge (Sapienza et al., 2004; Sahaym, 2005), a spinoff can achieve the competency of eliminating irrelevant knowledge and focus on valuable sources of knowledge through its relatedness with the parent firm (Sapienza et al., 2004). The knowledge-based approach claims that the firm is an entity that knows how to do things, acting like a repository of knowledge about its operations, which in turn provides a suitable base to more efficient organizational learning. Thus, we can evaluate the second proposition, organizational learning, only after significantly justifying the repository of the spinoff's inherited capabilities base's existence. The relatedness, shared understanding, and common language between the spinoff and the parent firm are necessary for better organizational learning.

Proposition 2 (Organizational Learning): Spinoffs are likely to learn the best ways to cope with challenges they face more efficiently, and therefore perform higher, than non-spinoff firms due to the knowledge relatedness between the parent and the progeny.

As depicted in Figure 1 and put forward in the first two sensitizing propositions, the blueprint of the parent firm is transferred to the progeny in the form of its managerial processes and routines in order to form the initial mould of the spinoff. Organizational learning is then carried out through the knowledge relatedness of the spinoff with the parent firm. The spinoff also takes advantage of its informal relations with the parent firm in order to get access to the parent's resources while dealing with challenges it faces. Finally, we ask: How about the effects of the backgrounds of the spinoff founders on spinoff firm performance? Helfat and Lieberman (2002) indicate that the focal mechanisms that determine the success and survival of new entrants are primarily shaped by the pre-entry experience of their founders. All founders convey expertise coming from their previous jobs and from their operational efforts. This expertise of the founders can be beneficial for capturing business opportunities and managing everyday operations of their new firms (Shane, 2000). Research points to the importance of spinoffs

exploiting the skills their founders acquired in their prior employment with their parent (Klepper, 2001). The prior relationships and experience that founders acquired from the parent company allow them to understand the specific requirements of the parent company and deliver better service levels compared to other vendors (Sanchez, 1997). Lindholm (1994) argues that spinoff firms that share resources with their parents before separation will most probably constitute a continuous collaboration and a partnership built on trust, co-operation, and information sharing for mutual benefit. Thus, all spinoff founders carry embedded relationships with their parents, which can affect the spinoff's success and survival.

The success of a firm is affected by the availability of resources it can access (Penrose, 1959). However, the resources that are important in firm growth are rarely found all together in one place. In other words, the resources required for the growth of a new firm show up in different sources that are physically separate (Shane, 2000; Helfat and Lieberman 2002). For instance, the resources of raw materials, customers, suppliers, and labor can show such great dispersions in their accessibility that a new firm's capacity would not be enough to reach them all. Therefore, founders of the new firms choose to stay in close contact with their prior employers in order to access resources that increase the likelihood of firm growth and success (Klepper and Thompson, 2005). Thus, spinoff founders, compared to non-spinoff founders, are expected to be in a better position to acquire resources from the parent firm (Cohen and Levinthal, 1990; Shane and Stuart, 2002). As Nelson (1995) mentions, memes are transferred through human capital; in this case the spinoffs' founders and their counterparts in the parent firm. For the progeny firm, since "experience from leading firms and the founders' informal relations with the parent firm to acquire resources" constitute a relevant meme, it is easier for the spinoff firms to acquire resources from the parent than the firms that do not have these relations (Cohen and Levinthal, 1990; Nahapiet and Ghoshal, 1998). For example, in order to reach a specific type of customer for its products or to outsource the maintenance of its broken workbench, the spinoff uses its informal relations with the parent (Shane and Stuart, 2002).

These informal relations may also be beneficial in accessing knowledge on market opportunities. Sapienza et al. (2004) define marketing knowledge as a phenomenon that enables firms to fulfill better sales figures through

the application of better marketing strategies. The degree of marketing knowledge learning includes the extent to which the spinoff firm learns from its parent about distribution channels, marketing techniques, customer groups, and marketing expertise in order to use it as an advantage over other firms in the industry. In his study on German laser producers, Buenstorf (2007a) presents evidence suggesting that entrants performed well because of their ability to learn about market opportunities prior to actually entering the market. Almost by definition, spinoff firms are likely to learn about customer needs and the corresponding opportunities through their informal relations with the parent firm. It can be anticipated that through mutually dependent collaboration between the parent and the spinoff, the information gained about the market and industry from the parent will underpin the development of the spinoff, allowing it to have better chances of success and survival.

But what are the informal relations between the spinoff and the parent firm, and how do they operate? The information exchange involves informal ties between parent managers and spinoff founders that require interaction and utilization of personal relationships, economic interactions, and social capital across functions (Hite, 2005). This can happen through daily telephone calls, visits to old colleagues, common outdoor activities, etc. To sum up, entrants to an industry vary in their capabilities of how effectively they utilize their informal relations in accessing their parent's resources. Therefore, the informal ties between the spinoff and the parent company foster the acquisition of resources of the spinoff, which creates an advantageous position over non-spinoffs in the same business environment (Helfat and Lieberman 2002).

Proposition 3 (Informal Relations): Spinoffs acquire resources through their founders' informal relations with their parent firm, which is likely to allow them to stand better chances of success and survival compared to non-spinoff firms.

Conclusion

Using insights from evolutionary theory, I built a model that provides a comprehensive understanding of the spinoff evolution process and a basis for comparison between spinoffs and non-spinoffs by taking advantage of the concepts of genotype, phenotype, and memes. Specifically, I use a blend of these evolutionary concepts with the fundamental notions of transfer of managerial processes and routines through relatedness, organizational learning, and informal relations and social capital to show the underlying evolutionary mechanisms behind the spinoffs' success and survival.

My analysis points to many areas where our knowledge is limited. Many questions stay unanswered about spinoffs, each one outlining another research opportunity. It is still not clear which mechanism better explains the spinoff pre-entry process. However, this proposal can be taken as a first step to illuminate the roadmap of spinoff research from an evolutionary perspective in the future. Here, in order to talk about sustainable competitive advantage of spinoffs, we should look at each mechanism with a strategic management lens. How can the competitive advantage provided to spinoffs by these three evolutionary mechanisms be sustained?

The mechanisms underlying the performance of spinoffs that are discussed here have explanatory power unless mimicking behavior of non-spinoff firms can replace the gains these mechanisms offer to spinoffs. Thus, future research should focus on the sustainability of spinoff mechanisms in the long run. This makes sense given the amount of longitudinal data used in spinoff research to explain geographical clustering and evolution of industries over time. For example, if we take the memes (informal relations) mechanism, while spinoffs possess advantages in the startup period, in the following years this advantage might be expected to lose its effect, i.e., become unsustainable. How? I can provide two quick explanations. First; non-spinoffs can compensate for the disadvantage of their lack of memes by other means. They may try to employ retirees of the parent firm, or visit the parent firm and try to get to know people at the parent firm. Second, as time passes, institutionalization and adapting to industry needs might gain greater importance than using informal relations. These are all prolific future research areas where scholars can test the model and its propositions to come to a conclusion about the nature of the evidence that has been accumulating in the spinoff literature and evolutionary economics, which is crucial for the development of a theory-based understanding of spinoffs.

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