DEVELOPING COMPETITIVENESS UNDER DISCONTINUOUS INSTITUTIONAL ENVIRONMENT CHANGES: THE CO-EVOLUTION OF RESOURCES AND SCOPE

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Abstract

I analyze transformation processes used by firms under conditions of discontinuous institutional environment changes. I argue that, among other propositions, firms use the co-evolution of resources and scope to manage their transformation in a highly uncertain and changing environment, enabling them to alter their resource set and activity set interactively as the environmental conditions progress. This concept links the resource-based view and positioning argument in a contextual, temporal and dynamic strategy framework. [72 words]

Key words: resources, activities, co-evolution

Discontinuous institutional environment changes such as processes of economic liberalization in both developing and developed economies create the need for domestic firms to catch-up to international competition. In general, companies protected from international competition by barriers to trade or governmental regulation become accustomed to lower levels of competitive pressure and have fewer incentives to become competitive at international levels. The discontinuous institutional environment changes created by governments as they open and integrate their economies into free-trade areas and liberalize and deregulate industries, alter the basis and rules of competition and the type and number of competitors, facilitating the entry of foreign firms. As the economy opens and the barriers or regulations disappear, domestic firms face the challenge of catching-up to international competitors with more developed resources. The alteration of the competitive environment, in turn, renders obsolete previous strategies and activities and alters the strategic value of resources upon which the strategies were built. Thus, the discontinuous changes in the institutional environment force firms to alter their strategy (Baden-Fuller and Stopford, 1991) and develop their resources (Geroski and Vlassopoulos, 1991; Helfat, 1997; Sharma and Vredenburg, 1998) to survive the transformations and regain their competitiveness in the face of incoming competitors and new competitive conditions. Managers need to understand why and how to alter the activity and resource set to catch-up to incoming competition while adapting to the new requirements of the changing competitive environment.

In this paper I study processes of firm transformation and answer the question how to regain competitiveness after the transformation of the institutional environment created by the opening of the economy? In particular, I study what are the transformation processes used that link resources and activities? I argue that companies under these conditions regain their competitiveness, among other processes, through the co-evolution of resources and scope of the firm, or the interactive development of the resources and activities sets. As the institutional environment changes, companies can alter their scope –vertical integration, diversification, and internationalization– to facilitate the development of resources –management, human resources, organization, finance, technology, production, supply, and marketing–, that, in turn, permits further transformations in the scope. In this way, the firm's resources and activities are interdependent and co-evolve. Although in some instances the co-evolution might happen naturally, it is not an automatic process but a guided one. Moreover, as the firm transforms its scope and develops resources, new opportunities that before were not available appear, thus enabling the firm to regain its competitiveness following a path dependent transformation.

This argument of a co-evolution of resources and scope integrates theories of strategic content –the resource-based view and positioning or activity-based view– and theories of strategic process –evolutionary theory– to provide a comprehensive dynamic view of strategic change that extends the resource-based view towards a theory. I integrate the dichotomy of the content of strategy being the resources of the firm, as supported by the resource-based view of the firm (Penrose, 1959; Wernerfelt, 1984), and the activities of the firm, as proposed by the positioning school (Porter, 1980, 1991), using evolutionary theory (Baum and Singh, 1994; Aldrich, 1999) into one dynamic perspective of strategy, where both resources and activities are the basis of the firm's behavior and ultimately of its competitiveness.

The study contributes not only to theory but also to the development of management practice. Managers have to create and administer not only the resources and capabilities inside the company, but also the activities, markets, and geographies in which the firm competes, to achieve the competitiveness that would assure the survival of the firm and lead to profitability. By viewing the development of resources and scope as part of a co-evolutionary process, they can gain a dynamic view of the interrelations among resources and scope as the sources of the transformation of the firm and its competitiveness.

The proposition of a co-evolution of resources and scope, and other related propositions presented in the paper, emerged from an inductive comparative analysis of the transformation processes of three matched quartets of firms in three industries and two countries. I undertook the inductive study because existing theory was not clear on the interactions among resources and scope and their transformation under conditions of discontinuous institutional environment changes. The use of an in-depth comparative analysis of multiple structured case studies facilitates the study of processes of resource development and the establishment of causal relationships among variables (Yin, 1994), leading to the development of an empirically grounded theory (Glaser and Strauss, 1967; Eisenhardt, 1989). The comparison of companies in different industries and institutional settings facilitates the establishment of generalizable propositions (Chandler, 1990).

The rest of the paper is organized as follows: in section 2 I provide the theoretical background and reasons for an inductive study; in section 3 I present the research design; in section 4 I discuss the results of the comparative case studies and develop the propositions that emerge from them; finally, in section 5 I provide conclusions.

CONTEXTUAL FIRM TRANSFORMATION: LINKING RESOURCES AND ACTIVITIES

Views of strategy: Resources versus activities

There are currently two main views within strategic management on the source of the competitive advantage of the firm: the positioning school or activity-based view, which argues that the competitive advantage of the firm lies in its product positioning, and the resource-based view, which argues that the competitive advantage of the firm lies in its factor positioning.

Under the positioning school or activity-based view (Ansoff, 1965; Porter, 1980, 1985, 1991), the firm derives its competitive advantage from its position in the industry, sustained by barriers to entry (Bain, 1956) and barriers to mobility (Caves and Porter, 1977). The scope of the firm, not only in terms of diversification, but also in its other two dimensions –vertical integration and internationalization– determines the position of the firm in the market place and ultimately its profitability, using two generic strategies, differentiation or cost leadership, to achieve this. Managers have to understand and select the industry that has the potential to provide monopoly rents and choose to either be the leader in costs or differentiate the offer of the firm. The source of superior profitability arises from imperfections in the product markets that enable the firm to obtain monopoly rents.

Under a resource-based approach (Penrose, 1959; Wernerfelt, 1984; Barney, 1991; Peteraf, 1993; Prahalad and Hamel, 1990), the company is a bundle of resources, capabilities, and competencies. I follow the definition of resources as the productive services available to the firm (Penrose, 1959) or the stock of available factors owned or controlled by the firm (Amit and Schoemaker, 1993), capabilities as the capacity by which resources and competencies are developed over time (Amit and Schoemaker, 1993; Teece, Pisano and Shuen, 1997) and competencies as systemic resources (Prahalad and Hamel, 1990). Among them, those resources, capabilities and competencies that are rare, valuable, difficult to imitate, and difficult to substitute have the potential to sustain the competitive advantage of the firm (Barney, 1991). Mangers have to understand and select the resources that have the potential to provide rents to the firm and choose how to exploit those resources. The sources of abnormal returns emerge from imperfections in the factor markets that permit the firm to obtain Ricardian rents.

The two views tend to discuss the achievement of a competitive advantage from a static viewpoint due to their grounding on the economics literature and its tendency of the analysis of equilibrium and ceteris paribus conditions. Hence, the interactions among the view tends to be downplayed. Despite the fact that resources and activities are intimately related, they suffer from a chicken-and-egg problem of which comes first, resources or activities, in determining the sources of the competitive advantage. On the one hand, resource-based view authors (Barney, 1986) argue that the activity-based view treats the firm as a black box and that the activities are based upon resources. Therefore resources are the bases of the competitive advantage. On the other hand, activity-based authors (Porter, 1991) argue that the resource-based view neglects the environment of the firm and that only when the resources are applied to the activities there is a generation of competitive advantage. Therefore activities are the bases of the competitive advantage of the firm. I would argue that these two views are complementary and that they can be integrated within a dynamic framework that helps understand the transformation of the firm in its context and the identification of the drivers of the process. The integration of the theories can be done using concepts from evolutionary theory.

Processes of transformation: Evolution and co-evolution

Evolutionary theory is not really a theory but a general framework that helps understand processes of transformation (Aldrich, 1999). The evolutionary process of transformation follows three stages of variation, selection, and retention, were within the initial variations in the variable some are selected out and eventually retained. The theory is flexible enough that can accommodate different levels of analysis, from the highest level of technology (Nelson, 1994), populations of firms (Hannan and Freeman, 1989), organizations (Marcus and Geffen, 1998), and routines (Nelson and Winter, 1982). It also deals with the interaction among levels of analysis, not only the selection of lower levels by the higher levels, but also the co-evolution among different levels of analysis (Levinthal and Myatt, 1994), or the interaction and feedback loops among variables.

Although evolutionary theory has been applied to the behavior of the firm, it requires a content that determines the reasons for the setting in motion of the variation-selection-retention process (Aldrich, 1999). In this paper I use the content provided by the resource-based view and positioning argument to develop a dynamic theory of firm transformation.

Analyzing contextual firm transformation: Interactions among resources and activities

Due to the limitations of existing theory, I undertake an inductive study to understand the relationship among resources and activities as part of the contextual process of transformation of the firm. I analyze the transformation of firms under conditions of discontinuous institutional environment change as a natural experiment of environmental changes that induces the rapid transformation of the companies. The use of the inductive study serves to develop theory that explains the transformations and interactions between resources and activities, facilitating the identification of the process of transformation and the solution to the chicken-and-egg problem of the sources of competitive advantage being based on the firm's resources or activities.

RESEARCH DESIGN: COMPARATIVE CONTEXTUAL CASE STUDIES

I examine the transformations undertaken by three matched quartets of firms under conditions of discontinuous institutional environment change. The transformation of each firm was first constructed as a case study of the history of the firm from its inception until 1998, in order to better understand the firm and its processes of transformation. Events in eight dimensions of resources and three dimensions of scope were then recorded in chronological order from the date when the company faced discontinuous institutional environment changes at the industry level until the end of 1997 and their interactions mapped to understand their links.

Case selection

The companies studied are three matched quartets of firms in the petroleum, paper and construction industries in Argentina and Spain that operated under conditions of discontinuous institutional environment change. I chose to analyze firms from different industries and countries in order to achieve a degree of generalization (Chandler, 1990).

Argentina and Spain, the countries selected, are two late-industrializing countries that followed similar macroeconomic transformations, evolving from a closed, regulated economy with high state intervention in the 1950s-70s towards an open and integrated economy in the 1990s, with a transition period in the 1980s. Discontinuous institutional environment changes at the country level such as macroeconomic stabilization, liberalization, and economic integration induced discontinuous institutional environment changes at the industry level.

The firms were initially chosen from three industries subject to different competitive pressures (Prahalad and Doz, 1987) to facilitate the generalization of results across industries: petroleum firms are subject to pressures for global integration, construction firms are subject to pressures for local responsiveness, and paper firms are subject to both.

The firms were chosen from the largest domestic firms in terms of sales in the 1980s, using the rankings of two long-established business magazines, *Mercado* in Argentina and *Fomento de la Producción* in Spain. Only domestic companies were chosen since subsidiaries of multinational enterprises are subject to different processes of resource development, as they can draw resources from the resource set of the parent firm (Bartlett and Ghoshal, 1989). The companies selected were matched by similarity in initial conditions before discontinuous institutional environment changes, rather than by their success at the end of the period or behavior in dimensions of resources. This was done to increase external validity (Leonard-Barton, 1990) through the use of different data-points (McPhee, 1990), reduce selection biases, and study both high and low performers, thus facilitating the understanding of strategic success (Barnett and Burgleman, 1996). The petroleum companies selected were the leading state-owned and private firm in each country; the paper companies selected were similar large family-owned firms; and the construction companies selected were part of similar leading family-owned business groups. Despite the care taken in the selection procedure, the companies chosen are still subject to the selection bias of having survived discontinuous institutional environment changes as domestic firms. Hence, they are partially successful since they managed to transform themselves through the period of discontinuous institutional environment changes.

The companies selected are the following: in the petroleum industry, the Argentinean YPF and Perez Companc and the Spanish Repsol and Cepsa; in the paper industry, the Argentinean Papel Argentina and Zucamor and the Spanish Unipapel and Papel España; and in the construction industry, the Argentinean Sideco Americana and BRH, and the Spanish FCC and ACS. Some of the names were disguised at the request of the managers.

Data sources

The sources of data are both documents and interviews. Annual reports, industry analyses, periodicals, and public and company archival data formed the basis for the construction of the case studies of the contextual evolution of firms since their creation until the beginning of 1998. After this, semi-structured interviews with managers at the executive and intermediate levels, with former managers, with directors, and with industry experts served to complete the case studies, obtain additional information, and understand the causality and purposefulness of actions. The interviews were undertaken during two three-month stays in Argentina and Spain in 1998. The number of people interviewed per company varied from four to twelve, with the following areas represented: 1) strategic management-general management, 2) production-operations-technology, 3) finance, 4) organization-human resources, and 5) marketing-sales. Interviews lasted between thirty minutes and four hours, and, in many cases, I conducted several interviews with key informants.

Case analysis

For the analysis of the transformation of firms, events in eight dimensions of resources and three dimensions of scope were recorded in chronological order from the date when the company faced discontinuous institutional environment changes at the industry level until the end of 1997. The analysis of events facilitates the understanding of processes (Van de Ven and Poole, 1990), in particular which resources are developed and how. Events in resources are defined as discrete actions on a dimension of the resource set. Events in scope are defined as discrete actions on a dimension of the activity set. Events are separated into causes and consequences (Van de Ven and Poole, 1990) to establish the causality process, and into design and non-design (Glick et al., 1990) to establish purpose.

The transformation of each firm was analyzed in three phases. First, I constructed a case study on the evolution of the firm since its inception until nowadays to understand the historical background, transformation, and complexities of the interactions among internal variables and of the internal variables with the external environment. Second, I charted annual changes in the eight dimensions of resources and capabilities and the three dimensions of scope from the date when the company faced the discontinuous institutional environmental change at the industry level until 1997 to understand the transformation of the firm in detail. Third, I mapped the relationships between dimensions of resources and dimensions of scope to understand the interactions among resources and activities over time.

The starting dates for the analysis of events in resources were the beginning of discontinuous institutional environment changes at the industry level, changes that were induced by the transformations at the country level. The outcome of these changes at the industry level was an alteration in the rules of competition, and type of competitors, from processes of deregulation and liberalization, which resulted in the need for a set of more developed resources to compete effectively and the opportunity to use them in different activities that until recently were off-limits to the firms. The starting dates for the analysis of petroleum firms are 1989 for Argentinean companies and 1984 for Spanish companies, since this is when the petroleum industry was deregulated, including the lifting of restrictions on the ownership of productive assets, liberalization of prices, privatization of state-owned firms, and entry of new and foreign competitors. For paper firms, the starting dates for comparison are 1991 for Argentinean firms and 1986 for Spanish firms, since this is when the paper industry became open to international competition, which included the liberalization of acquisition of firms, lifting of restrictions on operation of companies, and liberalization of imports. Finally, for construction firms, the starting dates for comparison are 1988 for Argentinean firms and 1991 for Spanish firms. This is the point when the industry entered a deep recession and demand conditions were altered, as the main client of construction firms, the state, altered the basis of contractual relationships from construct-transfer to construct-operate-transfer.

I classify resources in eight dimensions to analyze their transformation. These dimensions are based on previous classifications (Collis and Montgomery, 1997; Grant, 1995; Itami, 1987; Porter, 1980) and are selected because they are commonly discussed as forming the basis of the strategy of firms. However, the classification does not include systemic competencies that run across different dimensions, or intangible resources that cannot be observed. The dimensions studied are: 1) The management team or the executives that run the firm, examining their educational and professional backgrounds, language capabilities, international experiences, professionalization, and separation from shareholders. 2) Human resources, focusing on education, training, and reward systems. 3) Organization, studying the information systems, decision-making processes, and organizational structure. 4) Finance, observing the access to external sources of capital, both local and international, the rating of debt, and the ownership structure. 5) Technology, analyzing its origin, development, and benchmarking. 6) Production processes, studying the efficiency in manufacturing and the achievement of quality and environmental standards. 7) Supply network, looking at the degree of subcontracting and relationships with suppliers. 8) Marketing, studying relationships with clients and distributors.

I study the scope of the firm in three dimensions that are commonly discussed in the literature: 1) Vertical integration, focusing on the integration of activities that are part of the value chain and that could be performed by independent firms; 2) Horizontal diversification, looking at the expansion into related or unrelated activities outside the value chain; 3) Internationalization, studying the firm’s geographical presence.

RELATIONSHIPS AMONG RESOURCES AND ACTIVITIES IN TRANSFORMATION PROCESSES: THE CO-EVOLUTION OF RESOURCES AND SCOPE

The analysis of the transformation of firms under conditions of discontinuous institutional environment change serves as a laboratory of contextual firm transformation. The analysis of comparative case studies enables to highlight the commonalities among the cases selected rather than to explain the differences among cases as done in econometric studies. I present a summary of the transformations of the environment to provide a context in which the companies undergo their transformation. Then, I provide the analysis of the transformation of resources and activities and their interactions.

Firm transformation under conditions of discontinuous institutional environment changes

The environment of the firm influences both the level of development of resources and the set of activities of the firms. The transformation of the companies under study can be summarized in a three period model of firm transformation under conditions of discontinuous institutional environment changes. Period 1 is the period before discontinuous institutional environment changes. Firms in this period are subject to constraints in the form of limitations on the set of resources controlled or on the use of resources, such as governmental regulation that limits the resources controlled by firms or the use of resources in activities, governmental ownership of resources that limits the availability of resources to firms, or the government as the main client that influences the use of resources to governmental specifications; and limitations in the number or type of competitors, such as governmental regulation that limits the number of firms and/or number of competitors, or governmental protection that shields domestic firms from international competition. These constraints reduce the level of competitiveness of the firm because the resources and use of resources are below optimal, as firms do not have the freedom to control or use resources as desired, and lack the incentives to achieve higher levels of competitiveness because companies are protected from competitive pressures. Moreover, restrictions in the use of resources establish limitations in the set of activities that the company undertakes and on the supply of intermediate products that are competitive, thus forcing firms to reduce dependency on external suppliers and control the value added chain while focusing on undertaking activities in the domestic market in an opportunistic manner, with the firm expanding in those areas where it is allowed rather than where it desires.

In period 2, discontinuous institutional environment changes such as deregulation, liberalization, or economic opening and integration, lift the constraints on the control and use of resources and the number and type of competitors. The rapid changes in the basis of competition force firms to develop resources to catch-up to incoming competitors with more developed resources, and to alter the set of activities they undertake to adapt to and benefit from the changing environmental conditions. The lifting of environmental constraints on the control and use of resources creates the possibility for the upgrade of resources as firms enjoy higher degrees of freedom with regard to how they can operate, while they also create the possibility of altering the activity set of the firm to make best use of the resource the firm has and take advantage of the opportunities that open in the environment. Moreover, incumbents face not only the possibility but also the incentive to upgrade their resource set to meet the new environmental demands that result from the transformation of the competitive conditions. The entry of new competitors generates time pressures on the firms to upgrade resources and catch-up to incoming competition. The time pressure on incumbent firms to catch-up will depend on the speed of entry of new competitors, and on the competitiveness of new competitors. Even in the case of rapid entry of competitors with more developed resources, incumbent firms will have some time to change. New competitors will face a liability of newness of diversifying firms or liability of foreignness of internationalizing firms (Zaheer, 1995) that limits their initial competitiveness and provides incumbents with a time lag in which they upgrade their resources.

Period 3 is the period after discontinuous institutional environment changes. Firms have already upgraded their resources and managed to catch-up, and altered their scope to take advantage of the changing environmental conditions. The companies now operate in the new competitive conditions where they have to continue developing their resources and adjust their activities to achieve a competitive advantage that will lead to superior profitability.

Transformation of resources and activities

In the conditions described before, the transformation processes can be analyzed by studying the changes of dimensions of the resource set, the alteration of dimensions of the activity set, and the transformation of both resources and activities. In the paper I focus on the latte, though I have also studied the transformation processes in the other dimensions.

First, the transformation of the dimensions of resources was done through the use of alternative methods of resource development –purchase of resources, link to a firm to obtain resources, or internal development of resources– based on their capacity to provide a rapid upgrading of resources, with purchase facilitating a large rapid upgrade, link permitting medium rapid upgrades, and internal development facilitating small rapid upgrades. Moreover, the use of the methods evolves over time, with purchase and link being used more intensively at the beginning of the discontinuous institutional environment changes when companies have to catch-up, and internal development being used more intensively later on when firms have already caught-up and now have to develop a competitive advantage (Cuervo-Cazurra, 2001a).

Second, the activity set of the firm evolves as changes in the environment influence the availability of external resources and the value of internal resources and activities, with companies following a series of reactive and proactive strategic responses that lead to the transformation scope (Cuervo-Cazurra and Toulan, 2001). After the discontinuous institutional environment changes, firms slightly increase and then reduce their vertical integration, augment their related diversification, increase and then decrease their unrelated diversification, and expand their internationalization. The evolution of the scope is subject to limitations in the management of a complex set of diverse activities, with dimensions of scope evolving through paths that reflect this limitation (Cuervo-Cazurra, 2001b).

Finally, the transformation and interactions among dimensions of resources and activities leads to the co-evolution of resources and scope, as I argue in the coming paragraphs.

Relationships among resources and activities and transformation processes: Activity-based, resource-based, and co-evolutionary

The notion of a co-evolution of resources and scope emerged from the analysis of the relationship between key events in dimensions of resources and scope as described in the research design. The analysis of events revealed three types of relationships between the resources and the activities of the firm that enabled their transformation: activity-based, resource-based, and co-evolutionary.

First, an activity-based transformation is an event where the company changes its scope of activities to achieve an advantageous position by increasing its market power in the industry, or enters an industry which is profitable and protected from competition, thus achieving high profitability from the existence or creation of barriers to entry in the segment. This type of relationship between resources and scope is one where the activities of the firm drive the transformation of its resources. The company first develops the activity set by entering a new area of business and might later develop the resource set by learning how to compete in that area. The path of transformation is unidirectional and stops there, as there are no further developments of activities or resources. For example, on the firms acquired a position in a privatized telecommunications company, which was managed by a foreign firm. This diversification action is an activity-based transformation as the firm is taking advantage of the opening of a new industry to make a profitable investment. I call this type of relationship activity-based as it is the activity the driver of the transformation, as proposed by the positioning or activity-based view of strategy (Porter, 1985) where the firm's activities are the base of the competitive advantage and induce the development of resources.

Second, a resource-based transformation is and event where the company has developed resources that have spare capacity or non-rival consumption and that are transferable, and enters in a new activity to take advantage of the resources it possesses, thus achieving a higher return over previous investments. In this relationship between resources and scope, the resources are the driver for the transformation of the activities of the company. The firm first develops the resources in its current activities and later takes advantage of them to enter a new activity. The path of transformation is unidirectional and stops there, as there are no further developments of activities or resources directly related to this change. For example, one of the companies extended the production of natural gas, and later decided to construct a pipeline to transport natural gas to an adjacent country for its use in a natural gas plant to generate electricity. This internationalization event is a resource-based transformation as the company developed and used a resource it had in excess that could be transferred, production of natural gas, to facilitate its internationalization and generate higher returns from existing production capacity. I call this transformation resource-based as the development of resources drives the change in activities, as discussed in the resource-based view (Wernerfelt, 1984; Montgomery and Hariharan, 1991) where the firm's resources are the base of its activities and the source of advantage.

Third, a co-evolutionary transformation is an event where there the company enters a new area where though it might not have the necessary resources to compete, it has the aim to learn and develop the needed resources and capabilities which will enable it to compete successfully, and which later lead to further developments of activities. The firm takes advantage of feedforward loops that enable it to develop its resources and activities interactively. The firm has some resources that enable it to enter the new area, but lacks some resources to compete in the new activity. As it operates in the new activity, it develops new resources that facilitate later the expansion into other activities. In this relationship between resources and scope, the resources and activities are interactive drivers of the transformation of the other dimension, as the activity facilitates the development of resources while the resources facilitate the development of the activities. In the co-evolutionary transformation, the path of transformation is bi-directional and continues over time, with resources and activities altering each other. For example, one of the firms acquired a position in a chemical operation. The diversification movement permitted the entry into a regulated segment, thus appearing to be an activity-based transformation. However, the use of technology and management in petroleum and engineering operations of the firm facilitated the diversification, thus appearing to be a resource-based transformation. Nevertheless, the diversification led to the development of technology and personnel in chemical operations, which later supported the entry into refining, thus the overall process became co-evolutionary. The co-evolutionary process integrates the two seemingly competing arguments of the sources of the competitive advantage of the firm –resources in the resources-based view and activities in the positioning argument– by taking a dynamic perspective, where the firm develops its resources interactively with transformations of scope. In this way, the evolutionary approach serves to illuminate the process of transformation of the firm within its environment, neither the environmental determinism of population ecology nor blind evolution, but a guided evolution of actions (Lovas and Ghoshal, 2000). In this type of relationship, both the resources and activities are the base of the advantage of the firm.

After coding the relationships among resources and activities into the three types described, I analyzed their frequency of each type interactions between resources and scope to get a sense of their prevalence and importance in the transformation of companies under conditions of discontinuous institutional environment changes. Of all the relationship events analyzed, 38% were classified as activity-based, 29% were classified as resource-based, and 33% were classified as co-evolutionary, thus, indicating that the three types are not only part of the transformation process of the firm, but also they are not unusual.

Figure 1 is the visual representation of the three alternative interactions among resources and activities that facilitates the transformation of the firm. In it, I highlight not only the direction of the main thrust of change, but also the time component in the relationship. In the activity-based transformation, the main change occurs first in dimensions of activities, which later lead to changes in dimensions of resources. In the resource-based transformation, the primary change appears first in dimensions of resources that induce changes in dimensions of activities. The co-evolutionary transformation can be represented rather than by feedback loops that dismiss the time dimension by interactions over time between the two dimensions. In this case, the start point of the transformation can be either resources or activities, but the determining characteristic that differentiates it from the other two types is the multiple interactions among resources and activities, which lead to a longer transformation path than the other two processes.

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Insert Figure 1 here

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The three processes of transformation of resources and activities can be grounded in theory through a liberal use of the notions of exploration and exploitation (March, 1991). Figure 2 presents the visual representations of the alternative transformation processes through the interactions among resources and activities. It highlights the order of the processes of transformation, exploration and exploitation, which tend to be presented as alternatives. The activity-based relationship has more of an exploratory nature, where the firm explores its environment in search for new opportunities that arise from the discontinuous institutional environment changes. The resource-based transformation can be viewed as being more of exploitative in nature, where the firm exploits the resources it has developed in new activities to achieve a higher return on them. Finally, the co-evolutionary transformation is both exploitative and exploratory, as the firm exploits its resources and explores the environment interactively. In this manner, these two processes are not mutually exclusive, but can be present at the same time.

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Insert Figure 2 here

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An analogy, making liberal use of the notion of search in a rugged landscape (Levinthal, 1997) and the concepts of exploration and exploitation (March, 1991), helps to understand and illustrate the transformation process and frame it. We will assume that the firm is an army fighting in rugged landscape. It has resources in the form of trained personnel, information and support systems, and fighting/construction tools and skills. The company is not only endowed with a set of resources, but can develop it over time as it gathers experience. It faces a partially known environment in the form of rugged landscape where there are different prices/rewards associated with different positions in the peaks, which it has to achieve in competition with other armies. The firm determines its scope by expanding and altering the terrain to position itself in different valleys and hills. It has several options for expansion, such as achieving a strong position in a particular area, or establishing a base and performing reconnaissance raids, or continuously expanding into different areas, quickly adapting to the contours of the landscape. As the company expands and arrives at perceived hilltops, new peaks are revealed, and the firm continues its development and expansion. In this analogy, the positioning strategy would lead the company to focus on the highest peak and move towards conquering it, while the resource-based strategy would lead the firm to evaluate its tools and skills, and select those peaks most appropriate for them. Encounters with other armies and interactions would lead to fighting or competition, or to truces and peace agreements.

Discontinuous institutional environment changes act as an earthquake. The earthquake alters the environment, changing the shape of valleys and hills. It destroys the value of firm's current resources and capabilities –the tools, personnel, and information and support systems– and alters the firm's scope and the prices associated with different positions. It also changes the resources and scope of competing armies, the conditions for the peace agreements, and the environment, creating new opportunities. The firm/army now faces new unknown landscape, with different competitors, rules, and altered resources.

Under conditions of discontinuous institutional environment changes, the company can follow three options to transform itself. First, following a classical resource-based argument, the company will evaluate the state of existing resources and will focus on those hills where it can achieve the highest advantage, given its resource endowment. This is, it will judge the state of its gear and skills and retrench to those hills that are appropriate for the existing resources. This is the exploitation process where the firm focuses on exploiting its existing resources, retrenching to the areas where it is strong. Second, following a positioning argument, the company will choose to climb the peak that it perceives as most desirable, disregarding the nature and state of existing resources of the firm and how institutional change has affected them. It will focus on conquering the highest peak without evaluating its gear and skills. This is the exploration process where the firm decides to explore the new environment and achieve a desired position. Third, following a co-evolution argument, the company chooses different hills that allow it to achieve a better position, while at the same time developing its resources. It evaluates both its gear and the hills, selecting those where it can develop new skills and improve its resources, while at the same time it achieves the optimum. The process is a combination of exploitation and exploration processes, where the firm develops both resources and scope, to achieve a rapid transformation that will ensure its survival.

Therefore, from this and the previous discussions I propose that:

Proposition 1: There are three types of transformation relationships among resources and activities: activity-based, where activities drive the transformation of resources; resource-based, where resources drive the transformation of activities; and co-evolutionary, where *resources and activities are interdependent and induce their mutual transformation. In the activity-based transformation there is first exploration and later exploitation, in the resource-based transformation there is first exploitation and later exploration, and in the co-evolutionary transformation there is a simultaneous exploration and exploitation. Therefore, exploration and exploitation are not mutually exclusive paths of transformation, but can occur at the same time.*

A dynamic contextual view of strategy

Although the analysis of the companies revealed that they undertook the three types of transformation, the timing of the use of these transformations processes varied. Although they happened throughout the period of analysis, they tended to concentrate in different time periods. Activity-based transformations were more prevalent early at the beginning of the discontinuous institutional environment changes when the changes in the economy in the form of liberalization and deregulation created large opportunities for companies to enter areas that until then were restricted to them, either because the government regulated the number and type of industry participants, or because the government reserved those areas for itself through the use of a State-owned firm.

As the processes of liberalization progressed and not only domestic companies but also foreign companies entered the competitive arena, the co-evolutionary transformation processes appeared more frequently, as firms were facing not only opportunities from the changes in the environment, but also pressures from new competitors that induce them to upgrade their resources. One way to upgrade the resources to levels of international competitiveness was through the co-evolution of resources and scope, as this process facilitated the development of resources through interactions with changes in activities.

Finally, resource-based transformations are more prevalent later on, as the firm faces a less uncertain environment since the discontinuous institutional environment changes are left behind. The company now can focus more on extracting higher returns of the resources already developed and center its attention in competing and achieving a competitive advantage.

In this way, the transformation process of the firm follows alternative processes that although not mutually exclusive, since the firms studied used the three methods throughout the period, can be viewed as alternative strategies for different conditions of the environment and the firm. The interactions between resources and scope can be understood only in their context and through time, leading to a contextual dynamic view of strategy where there is no single best strategy or process to recommend, but there are better transformation strategies depending on the context and time the firm operates. The interaction among resources and activities needs to be viewed in long term as part of the adaptation efforts of the firm to change with the changing conditions in the environment. As a result of this discussion, I propose that:

Proposition 2. The use of transformation processes changes over time with the conditions of the firm and its environment. Both the context and the time influence the optimality of the strategy to use, with better strategies for a context and time rather than best strategies acontextual and atemporal. Activity-based transformations are more likely to appear right after the discontinuous institutional environment changes as the firm faces opportunities to explore the environment. Co-evolutionary transformations are more likely to appear after a period after the discontinuous institutional environment changes as the firm faces both opportunities and needs to change and upgrade its competitiveness. Resource-based transformations are more likely to appear later after the discontinuous institutional environment changes as the company faces the need to develop a competitive advantage.

Complementarities and degrees of freedom in the resource and activity set

Although the resource and activity set of the firm are intimately linked and can be perceived as sides of the same coin (Wernerfelt, 1984), their characteristics in terms of complementarity and degrees of freedom differs, which limits the drawing of conclusions from the analysis on one side on the other. On the one hand, resources require more complementarities among the different dimensions than activities. For the firm to be a viable company, it requires not only resources that provide it with a competitive advantage, as discussed in part of the resource-based view literature (Barney, 1991; Peteraf, 1993), but also resources that support those that provide the advantage. The lack of resources constraints the transformation of the company. For example, in some of the companies studied, the lack of finance place limited the ability to transform the firm as desired and induced second best transformation strategies. However, once the financial constraint was solved, the access to finance did not provide the basis of a sustainable competitive advantage. Hence, the firm has to have not only "good" resources that provide it with a competitive advantage, but also "ugly" resources that do not provide it with a competitive advantage but that support the "good" resources and avoid becoming "bad" resources, or resources that provide the firm with a disadvantage (Cuervo-Cazurra, 2001a). As a result of the complementarities among resources, the firm faces more limitations, or fewer degrees of freedom, on the resources it controls and uses. Although, in principle, the firm could focus on developing those resources that provide it with a competitive advantage, as it is proposed by authors in the resource-based view (Barney, 1991; Peteraf, 1993), it cannot neglect the development of other dimensions of resources. This complementarity and fewer degrees of freedom were highlighted in the inductive study. Some dimensions of resources became limitations to the transformation, like for example lack of finance or managerial expertise, forcing the firm to solve the limitations before concentrating on developing those areas where it had an advantage with respect to competitors, like for example productive capabilities of preferential access to supplies.

On the other hand, the firm faces less need for complementarity among activities and therefore has more degrees of freedom on the type of activities it undertakes. The activities of the firm can be compartimentalized more easily and, though it might be good or useful to have complementary activities, a company can be viable and profitable with a diverse set of activities. The company can rank its activities and select those in which it is performing better than others, discarding those in which is performing poorly and that are reducing its profitability. This process of selection was undertaken by the firms studied, which not only entered new activities as the conditions in the institutional environment provided them with the opportunity, but also exited activities as the environmental conditions deemed them less viable or profitable than new opportunities. However, the same cannot be done for the resource set of the firm. Although the company can rank the resources according to the competitive advantage they provide, it cannot discard those resources that do not provide an advantage, as it needs them to have a viable operation. The firms studied chose different dimensions of resources on which to focus their development efforts, but they could not divest other dimensions. For example, although the firms changed from owning to subcontracting out certain activities and the resources associated with them, they could not subcontract an entire resource dimension. Hence, the capacity to select investments and divestitures in activities is much higher than in resources. Whereas the company can enter and exit activities as the conditions of the competitive and institutional environments changed over time, it can only focus more or less on different resources, but it cannot exit dimensions of resources completely and has to develop all its resources. Hence, I propose that:

Proposition 3: The set of resources and activities of the firm have different degrees of selectivity. Activities can be selected with more degrees of freedom than resources because whereas the firm can choose those activities in which it can achieve a competitive advantage, the firm has to have not only resources that provide it with an advantage, but also resources that make the firm a viable entity and that complement the former. Hence, firms under conditions of discontinuous institutional environment changes will experience higher degrees of transformation in its activities than in its resources.

DISCUSSION AND CONCLUSIONS

This paper analyzed the interaction among resources and scope in the transformation process of companies under conditions of discontinuous institutional environment changes. The inductive analysis of three matched quartets of firms in the petroleum, paper and construction industries in Spain and Argentina reveals a common process of resource development that is only revealed using longitudinal comparative case studies: the co-evolution of resources and scope. The development of resources is interdependent with firm activities, where the transformation of resources and activities are interactive and follow a co-evolutionary transformation.

The study also made other arguments beside the existence of the co-evolution of resources and scope. This co-evolution is one of three interactions among resources and scope that enable their transformation, being the other two the resource-based transformation where resources lead to changes in activities, and the activity-based transformation where activities lead to changes in resources. Moreover, the use of the three methods is contingent on the conditions of the company and the environment, and their use changes over time. Finally, I argued that although resources and activities are intimately linked, they differ in terms of the complementarity and degrees of freedom in selecting where the company can focus its efforts to transform itself and achieve a competitive advantage.

Although the processes presented here appear to be intentional, in many cases the transformation processes, especially the co-evolutionary one, were subject to unanticipated or secondary motivations that lead to further transformations of dimensions of resource and activities. Transformation processes are subject to both deliberate or design (Ansoff, 1991), and emergent (Mintzberg, 1987) strategies, where resources and "capabilities arise both by design and as the unexpected by-products of firm actions" (Henderson and Mitchell, 1997: 12).

The transformation processes presented are part of a guided evolution (Lovas and Ghoshal, 2000) where the management of the firm selects among the three variations in processes of development –activity-based, resource-based, and co-evolutionary– the one that, in their view, is better suited to the conditions of the firm and environment. If the selected process produces the desired results, it is likely that it will be retained and used repeatedly. However, as indicated before, unexpected events might alter the nature of the selected transformation process, thus inserting unexpected variation or mutations in the alternatives. Hence, although the selection of alternative is guided by managerial decision, the final outcome is still subject to uncertainty, and environmental influences.

The study presents some limitations that arise from both the particular cases chosen as well as the type of firms analyzed. First, the cases chosen are not representative of an overall population of firms since they were not chosen to represent the population but to study their transformation and develop grounded theory. The analysis of multiple case studies in different industries and countries not only provides a richer and fuller understanding of transformation processes and interactions among resources and activities, but also facilitates the establishment of generalization (Chandler, 1990). The second limitation is in the type of companies analyzed, large and medium-sized firms. Under conditions of discontinuous institutional environment changes, these firms are more likely to face evolutionary challenges rather than survival challenges, which are more likely to be faced by small firms or new firms, which have smaller sets of resources and activities.

The co-evolution of resources and scope discussed here complements previous literature on the co-evolution among different levels of analysis by focusing at the level of the firm and studying the co-evolution of internal variables –resources and activities–. Other studies have focused on the co-evolution among internal and external variables, such as the firm and its environment (Baum and Singh, 1994; Van de Ven and Grazman, 1999), technology and organizations (Rosenkopf and Tushman, 1994), firm capabilities and industry (Levinthal and Myatt, 1994), innovations and institutions (Van de Ven and Garud, 1994), or alliances and strategies (Ariño and de la Torre, 1998).

The proposition of a co-evolution of resources and scope that arises from the inductive study expands the strategic management literature. It provides a basis for understanding the process of company evolution and transformation. The arguments provided encompass the resource-based view (Penrose, 1959; Barney, 1991) and positioning argument (Ansoff, 1965; Porter, 1980) within a single dynamic view of company transformation. In a dynamic analysis of company evolution, both resources and scope are a source of competitive advantage as they are interdependent and co-evolve. Moreover, the transformation of the company is interdependent with the transformation of its environment, not only at the industry level, but also at the economy level. Hence, the strategic evolution of the firm becomes a path where the past shapes the present and constrains the future (Kimberly and Bouchikhi, 1995).

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TABLES AND FIGURES

Figure 1. Temporal and atemporal representations of the interactions among resource and activity dimensions.

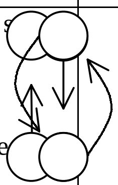
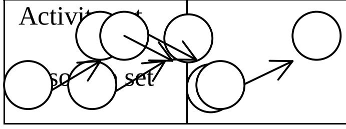
	Activity-based (atemporal)	Resource-based (atemporal)	Co-evolutionary (atemporal)
Activity s Resource 			
	Activity-based (temporal)	Resource-based (temporal)	Co-evolutionary (temporal)
Activi t so set 			

Figure 2. Alternative explanations of firm transformation under conditions of discontinuous institutional environment changes: Resource-based, positioning and co-evolution views.