Title: SUBSIDIARY STRATEGY: THE EMBEDDEDNESS COMPONENT

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SUBSIDIARY STRATEGY: THE EMBEDDEDNESS COMPONENT

Abstract:

Subsidiaries in Multinational Corporations are embedded in a differentiated network. This paper further develops the concept of subsidiary embeddedness as the canvas within which subsidiary strategy can take place. In as such, we differentiate embeddedness among Operational, Capability and Strategic. Operational embeddedness relates to the interlocking day-to-day relations among value chain activities. Capability embeddedness deals with the development of competitive capabilities for the multinational as a whole. Strategic embeddedness deals with subsidiary participation in the MNC strategy setting. We deem these three types of embeddedness as the limits that restrain subsidiary strategic alternatives. In as such, different types of subsidiary embeddedness imply different subsidiary roles, and different possibilities to develop strategic initiatives. We also suggest that embeddedness is not merely an outcome of the institutional setting, but a resource a subsidiary can manage by means of manipulating dependencies or exerting influence over the allocation of critical resources. We illustrate this framework with an example of a longitudinal case study from a subsidiary in the automotive components industry.

INTRODUCTION

Present the model and explain each node

Theory and research has suggested that subsidiaries may develop strategy alongside its evolution (Andersson, Forsgren and Holm, 2002; Birkinshaw and Hood, 1998; Taggart, 1999). Although subsidiaries face corporate and resource constraints, they actually have space to define their own mission and goals, and look after their own future (Birkinshaw and Hood, 1998). However, this statement has not been made operational, which highlights a gap regarding theory on the intricacies of subsidiary strategy. Moreover Andersson and Forsgren (1996) suggest embeddedness as a good predictor of the role a subsidiary may play in the overall MNC network. However, to our knowledge no framework has been developed to describe the particulars of this relationship. Hence, our research question is, how does embeddedness determine subsidiary stratgy? Based on a longitudinal case study, which includes quantitative data, this paper attempts to answer this question through an inductive conceptualization of subsidiary strategy as managing embeddedness.

Our main argument is that, at any point in time, it is the level and type of embeddedness of the subsidiary that limits its potential initiate taking behavior. When we look at a subsidiary we can see that the limits to its actions are due to the relationship it has with the different actors it relates to.

Subsidiaries are paramount to Multinational Corporations (MNCs) performance. The study of their contribution to the overall MNC has evolved from a merely passive implementation of head offices mandates, towards a more pro-active and initiative-taking strategic behavior. Underlying this pattern of research the idea prevails that subsidiaries may develop its own strategy by means of two alternatives. On the one hand, the subsidiary may simply fulfill the responsibilities that come from a specific

role assigned from headquarters (HQ), following a mainly induced behavior. In this sense, subsidiary strategy may be equaled to subsidiary role, as some literature may suggest (Jarillo and Martínez, 1990). On the other hand, subsidiaries may be sources of a MNC's competitive advantage and providers of strategic initiatives, following a more autonomous behavior (Burgelman, 1983). From this point of view, subsidiary strategy may be equaled with initiative-taking, as some authors also seem to suggest (Taggart, 1999; Birkinshaw, Hood and Jonsson, 1998; Delany, 2000). Therefore, subsidiary strategy can be seen as a complicated balance between its induced and autonomous behavior, a balance between fulfilling the responsibilities that come from the HQ assigned role, and the generation of strategic initiatives that add value to the MNC.

We view subsidiaries as balancing these requirements inasmuch as they manage embeddedness. Based on the interorganizational network approach (Ghoshal and Bartlett, 1990), our stance is that the strategy a subsidiary can play can be traced down to their embeddedness consequences. We present our argument developing a three-stage model of subsidiary strategy. For that purpose, we built on the literature of subsidiary embeddedness and lean on quantitative and qualitative evidence from a longitudinal grounded case study of *Brakes Spain*.

In line with Nohria and Ghoshal (1997) we view MNCs as a network of members. Consequent with their framework, we argue that the subsidiary's strategy has to be developed from its embeddedness. Building from Granovetter (1985) we use embeddedness as *the network of relations with other units of the MNC and the market in general*. We further propose that there are three types of embeddedness, namely, operational, capabilities and strategic embeddedness. The development of a company named *Brakes Spain*, using case study research and network analysis, provides support

to develop this notion. Our model has five main elements grouped in two types (see figure 1). First, three states of embeddedness, i.e. operational, capability and strategic. And second, two generators of this embeddedness, the HQ mandates or assigned role and the subsidiary autonomous behavior. The later embodies the capacity of the subsidiary to develop social action in its dynamic essence, while the former depicts the shaping and condition of the context.

Insert Figure 1 about here

We suggest that the subsidiary can manipulate embeddedness as part of its strategy, as it can manipulate other resources. Embeddedness is not only determined by the external factors surrounding the subsidiary, but can also be seen as the result of the efforts of the subsidiary to stand out as value adding to the overall MNC. For this reason, subsidiary strategy can be deemed as enacting subsidiary embeddedness. We suggest that there are three dimensions of embeddedness, which the subsidiary can influence in order to increase its strategic importance.

First, *operational embeddedness* is the set of relationships between the subsidiary and other units of the MNC that concern the day-to-day activities. If MNCs coordinate their manufacturing operations worldwide the result is a network where factories in one country act as suppliers or customers of factories in other subsidiaries. Thus, the operational activities give pace to a network of relations whose end is to keep operational day-to-day activities afloat.

Second, *capability embeddedness* is the set of relationships between the subsidiary and other units of the MNC that refers to the development of capabilities that are relevant to the overall MNC. Unless subsidiaries do have a thoroughly defined role and responsibility, it is unlikely that the subsidiary alone is going to develop a worldwide applicable capability. However, when a subsidiary has developed a certain proficiency, which is considered a strategic capability for the MNC, it is usually called to develop those capabilities further and to contribute to the generation of company wide capabilities. This would account for either extending or reinforcing the existing charter in Birkinshaw and Hood's terms (1998). The more the subsidiary develops these strategic capabilities, the higher the chances of being called to spread them. Overall knowledge management processes will integrate the best actors to contribute to the different strategic capabilities of the multinational.

Third, *strategic embeddedness* is the set of relationships between the subsidiary and other units of the MNC that relates to the subsidiary's participation in the overall strategy of the MNC. Active participation of subsidiary members in the strategy process may influence the overall MNC's strategy through a group of relations generated from the subsidiary. The more participation there is in the strategic process of the MNC, the more dependencies will be drawn between subsidiaries and HQ and between subsidiaries themselves. The more one particular subsidiary participates in this process, the more embedded it will be in strategic terms. Consider for instance the effect that *Brakes Spain* had on HQ through its involvement in the strategy of Asian expansion. In different European meetings, HQ claimed the importance of serving Asian customers. However, none of the subsidiaries of the MNC felt confident to overcome problems derived from cultural, geographic distance and language differences. At certain point in

time, the strategy of expanding to Asia seemed impossible. Nevertheless, *Brakes Spain* pushed his commercial department harder and was able to start projects with one client in Japan and one in Korea, which was the first step to make the Asian expansion feasible.

The proposed model posits an active and important role of subsidiaries in breeding relationships with other members of the MNC as well as customers and suppliers. The content of these relationships may range from an operational nature, through capability content and all the way to a strategic character. Consistent with previous theorization, the subsidiary may evolve developing its embeddedness from operational through capability into strategic, but it can also suffer decline in the opposite direction either loosing strategic or capability embeddedness. Our point of departure is that subsidiaries are strategy capable units; that is a unit that can define, within constrains, their own strategy.

We will proceed to develop the argument as follows. In section two, next, we will present the methods used including the research setting and design as well as the data analysis. In section three we will present the results of the study. Section four will present the inductively derived theoretical framework, which is the contribution to this paper. Finally in section five we will present the discussion and conclusions.

METHODS: QUALITATIVE AND QUANTITATIVE:

Justify the Methods and the combination of Q-Q

Research Setting [1]

We will describe a single critical case study that utilizes social network analysis to quantify the interactions of the network developed by Brakes *Spain*. The case study

[1] Company data has been disguised for reasons of confidentiality without changing the essence of their evolution. One of the authors has been following the company for more than ten years; through this source we've had access to extensive strategic documentation as well as operational data.

company, *Brakes Spain*, is a unit and a subsidiary of *British. British* in turn, is a diversified MNC, active in more than 30 countries in Europe, the Americas and Asia Pacific. *Brakes Spain* belongs to the automotive brake division, *Brakes* [2]. *Brakes* is a world leader in the design and manufacture of its products, with 40% volume world market share. *Brakes* is *British* largest business, with turnover of €2.8 billion in 2001. Most of the leading vehicle manufacturers (OEMs) produce vehicles containing components made by or under license from *Brakes*. In distributed R & D settings around the world, *Brakes* is developing new brake systems designed to reduce weight, minimize noise, vibration and harshness and improve safety.

Auto components have been recognized as one of the few truly global industries (Womack, Jones and Roos, 1991). But, the consolidation that has been going on in the automobile industry has triggered a certain consolidation in the auto components industry (Roland Berger, 2002). As a consequence the number of customers is limited to few OEMs for a company like *British*. This situation explains to the challenges in the auto components industry as perceived by *British*, i.e. to become more flat and agile, leveraging global affiliates for responses, while focusing on overall value chain cost-cutting activities. *Brakes* has manufacturing facilities in all significant car manufacturing countries worldwide, with the exception of Russia. Its worldwide operations are run through regional centers in Germany, UK, US and Singapore. It operates 46 manufacturing facilities in 20 countries worldwide, with over 20,000 employees. Approximately 44% of sales in 2001 were originated in Continental Europe, 32% in the Americas and 8% in the UK. The Spanish subsidiary, *Breaks Spain*, was able to develop a turnover of €350 million in 2001 with 1.800 employees. This

[2] Along the document, *Brakes* is sometimes referred simple as “the division”.

subsidiary has two main manufacturing facilities (Plant1 and Plant2) and local headquarters (HQ *Spain*).

There are three characteristics that make *Brakes Spain* worthwhile study. First, *Brakes Spain* has been consistently the better performing subsidiary in the division, both in economic and operational terms. It has consistently shown the higher Return on Sales (ROS), flexibility and productivity measures among all the subsidiaries worldwide. Second, as it is based in Spain, the subsidiary does not have local customers to serve. The locus of decision-making of its customers is at the regional HQ of the different OEMs, none of those are in Spain. Since there are other subsidiaries that are better positioned to establish relationships with its customers, *Brakes Spain* is forced to be especially active in developing its position within the global market and across the MNC to keep itself adding value. Third and most important, *Brakes Spain* has been a net contributor in strategic initiatives and capability development for the division, which opens ground to explore the transmission of expertise from one subsidiary to the MNC.

Initially, the subsidiary was able to perform all the activities of the value chain on its own, with local customers and suppliers. However, as the process of globalization and the opening of borders promoted by common European market policies was implemented, its design centers, product development facilities, and their customers and suppliers were "globalized". This meant that certain resources were concentrated geographically in order to obtain economies of scale. By 1998, *Brakes Spain* was already integrated into the global operations. However, it had significant leeway in designing its strategy. Even though disruption of orders to be manufactured was starting to get fought over, each individual country maintained a significant set of products. The situation as of 2003 shows an increasingly global MNC with a successful subsidiary in

Spain. While relentlessly losing control over more and more resources, keeping control over production facilities and processes. For example, global purchasing had already been established for the majority of inputs, and a centrally managed marketing and sales organization eliminated the marketing function from the subsidiary.

The case presented in this paper lends itself to inductively develop theory on the evolution of subsidiary strategy. *Brakes Spain* has undergone an organic process built around the growth and decline of valuable and distinctive resources as illustrated in Birkinshaw and Hood (1998). For this reason, it has the potential to shed light on the issues of subsidiary strategy evolution making it appropriate under the criteria of critical single case study (Yin, 1994). What makes the case more attractive is that *Brakes Spain* is a unit of high strategic importance to the MNC even tough its position is not the most favorable across the division. Basing our analysis in institutional theory as well as exiting theorization in subsidiary evolution we were able to develop the model presented in the present paper.

Research Design

We pursued our research from two broad angles, quantitative and qualitative. Additionally, we gathered data for this research in two stages, first one author maintained the relationship and kept records and then another author performed a more structure interview process. Along both we combined inductive and deductive methods to develop the proposed framework.

Qualitative Data

Our involvement with the company started at 1993 when one of the authors was invited to facilitate a meeting at *Brakes Spain*. The objective was to review the company's situation and develop a detailed plan for implementation of the desired changes. From

1993 to 2003, the author participated in several such meetings at several levels in *Brakes Spain*, interviewing managers and collecting relevant data to help structure the agenda for the company.

The frequency of contact throughout the years varied from more than weekly to a monthly contact in different periods of time. In the periods were there was a weekly contact, relationships were establish at many levels of the organization, from factory foremen to the CEO of *Brakes Spain* and some divisional level management. In the periods where contacts had a monthly frequency, the main relationships were established with the top management of the company. Hence, we had access to a huge amount of internal classified documents as well as reviews of open-ended conversations with most executives in the company, as well as operational personnel at the factory level.

On the second stage, to gain further and formal understanding of the strategic evolution of the subsidiary, 31 in-depth interviews were carried out. These interviews took place from March to December 2003. Interviews lasted between 45 minutes and one hour and one researcher took notes for all interviews. The interviewees were all key officers that had a role in the evolution of the subsidiary strategy, as depicted in Table 1. We interviewed 20 managers directly involved with the formulation and implementation of *Brakes Spain*'s strategy. The interviewees can be classified in two groups. The first group includes the executives that had a more direct impact in the direction and management of *Brakes Spain* from 1993 to 2003: the three company's CEOs during the period, the current plant directors of the two plants, the Human Resources Manager and the Chief of the Engineering Department. High and medium-level managers form the second group. These interviewees had been working more than

5 years in *Brakes Spain*. The reason to interview these individuals was to have a more medium level view of the subsidiary evolution. .

Two researchers were involved in developing the interviews to avoid a bias in interpretation and to assure covering all relevant issues. All along the data collection and analysis, we aimed at internal validity looking for alternative explanations between the two researchers and directing attention to internal processes (Yin, 1994). As interviews were collected iteratively along several months' questions were included in subsequent interviews point towards overall consistency, but covering equivalent matters in each interview. After each round of interviews a critical discussions was maintained among authors to validate interpretation (Silverman, 2001). Whenever disagreement arouse it was sorted by a direct communication with the interviewee. This entire process aimed at maintaining reliability and internal validity during qualitative data collection.

We used at various sources of information to develop the case of *Breaks Spain*. For consistency, we triangulated the information obtained through the interviews with the longitudinal database derived from our involvement with the company and the access to archival data (Yin, 1994). Archival data included first, strategic and organizational documents, which in turn included strategic goals, evaluations and summaries of internal strategic meetings as well as at European level; second, historic financial reports, organizational charts; third, industry studies and competitive reports that analyzed the position of Brakes Spain; Fourth, advise and communication records with external consultants fifth, presentations and communications records with HQ and other business units; sixth, historic records of the relationship with customers; seventh financial results, productivity indexes at the plant and department level; and finally

relevant press releases. The rich data that emerged from this triangulation helped us built the case of the subsidiary. As a final authentication the written case was sent to *Brakes Spain* and was approved by two informants independently. After few minor modifications the case was deemed as the true description of the events occurred in *Breaks Spain*.

Quantitative Data

The most recurring issue, which appeared during our interaction with managers, was the idea that *Brakes Spain* was losing contact with different counterparts of the business (other units of the MNC, units of the subsidiary itself, and clients) during the period of study. In order to validate this argument, we performed a network analysis of the relationships started at *Brakes Spain* and oriented towards an 'outside' sphere. Outside in this design means oriented towards other units, but those that form part the subsidiary. For that purpose we examined the subsidiary network as it was reflected in two points in time, 1998 and 2003. Network analysis has a particular set of methods and techniques used to catalog a pattern of relationships; in the Appendix we define and explain the methods used throughout this research.

Data Analysis

Combined with our qualitative data, network analysis allowed us to understand not only the relationships between entities but also the content of those relationships. The case study presented in this paper is longitudinal, as it analyzes changes in a ten-year period, and it is enriched with quantitative data from network analysis. For this analysis we have used Ucinet 6 as network analysis software. Resulting network analysis calculations were centrality indexes (degree) and the blockmodelling algorithm.

RESULTS

Tell the Story and how data was collected and analyzed

Brakes Spain: The history of its strategy

The story of *Brakes Spain* is one of a regular subsidiary that surprisingly was able to gain significance in the strategic development of her mother company. However, *Brakes Spain* strategic importance was put in danger as the MNC centralized key activities. From 1993 to 2003 *Brakes Spain* suffered, initially a rise and then a decline in its strategic importance. Firstly, *Brakes Spain* moved from being a mere plant to becoming a strategic player within the global company and among customers and suppliers. Then, it started to lose strategic relevance in such a way that, its managers perceived the subsidiary was going back to its mere operating role within the MNC. Based on the case study built from qualitative data, we summarize this story into three different stages we have called: *Obeying orders*, *Gaining Fit* and *Losing ground*. We report next these three stages.

Stage I: Obeying Orders

Previous to 1998, the business strategy of the MNC had been one of optimizing operations, reducing costs and minimizing delivery time in a globalized marketplace. Due to its high market share and the consolidation of the automotive market, their managers perceived their business strategy as sound. However, the globalization process carried out by the MNC had lead *Brakes Spain* to a situation where its customers and suppliers were spread worldwide distant to its national operations. Moreover, by 1993, *Brakes Spain* had little local customers, neither a proprietary technology nor a team to develop it, and its three plants were at odds from each other. This situation stood as a clear disadvantage in front of other subsidiaries in European countries, which either had relationships with local customers or enough R&D to cope

with developing new products. In words of the *Breaks Spain's* CEO from 1993 to 1998 their situation was as follows:

> "Until 1998 our role was to execute orders coming from the head office or from other units within the group: we were just manufacturers of parts, simply plants with a marginal role within the group".

Faced with this situation, managers of *Break Spain* felt the subsidiary was a candidate to be relocated to countries that enjoyed lower labor costs. In order to overcome this dismal future, the subsidiary decided to design a strategy that allowed *Brakes Spain* to gain distinctiveness within the division. The subsidiary's CEO summarized this notion as:

> "If we were to avoid plants relocation, something that happened to other plants of the group, it was vital for Brakes Spain to be able to add value to the MNC; we decided to transform our unit in order to make it able to contribute greatly to the division; we wanted to base our prestige in efficiency, the best manufacturing and a high flexibility".

The strategy designed to overcome the 'obey orders stage' was based upon three pillars. First, it aimed at developing strong local HQ in order to improve coordination and knowledge transmission among plants. Fulfilling this function, *Brakes Spain* expected to serve as a filter between its plants and other units of the MNC. Given the low-profile position of its plants, *Brakes Spain* thought it was necessary to act as an intermediary between Spain and the division. This action was intended to gain presence in the normal set of business routines generated by the units of the MNC. Second, they pursued to develop the R&D subsidiary capabilities, giving emphasis to the engineering department. Several young engineers were recruited with the objective of generating novel manufacturing processes, more efficient plant layout designs, and better applications of the existing products. It was also expected that this recruitment investment, indirectly, might give *Brakes Spain* a better position compared with similar

units in countries like France and Germany. Should this plan work, *Brakes Spain* would be able to establish immediate and fluid relationships with both the engineering departments of other units of the MNC and its clients. Finally, the strategy aimed at developing the sales department, in order to bring customers closer to *Brakes Spain*. As previously mentioned, all leading vehicle manufacturers developed its manufacturing activities in other counties as Germany, France, the US, or Japan. In order to compensate for their dull geographic position, *Brakes Spain* decided to push its sales department trying to develop the Asian market. They decided to push its production department and its plant managers in order to bargain internally within the MNC to gain projects and products; and, finally, decided to invest in its sales department, hiring international and well prepared managers that were able to be directly get in touch with clients and engineers of other units of the MNC.

These decisions were materialized via project teams. Two types of teams were devised on the basis of the two essential processes in manufacturing brakes, i.e. mass production and launching of new products. While the former was formed by interdisciplinary teams, within a defined time frame, and aiming at serving the customer through all the development process, the latter followed a functional structure to serve standard production, aiming at flexibility and reducing time-response.

The overall strategy was brought up by the subsidiary, in the form of a suggestion, to the divisional head. The argument used was that the integration of the subsidiary within the group activities, being closer to the customer and the division, would allow *Brakes Spain* to produce faster, respond before and ad more value to the division. Nevertheless, the process followed to gain the division's authorization was quite eclectic. In words of the 93-98 CEO:

> "From the subsidiary viewpoint one moves in a political environment, within which you have to get what you want without upsetting others. So far nobody has felt that way with our moves, since Brakes Spain was not important within the group…Sometimes you negotiate these things with head office, some they grant and some not… sometimes you just don't make a proposal, you simply act and head office would endorse it after the facts"

The results of the implemented strategy started to be evident in 1998, when as consequence of sound management performed by the CEO of *Brakes Spain*, he was promoted to a higher position within the MNC. Additional results attributed to this strategy determined the second stage of *Brakes Spain*'s strategy.

II. Gaining Fit.

By 1998, *Brakes Spain* had turned the previous situation around. With a share of 11% over total turnover, it was the larger subsidiary of the division *Brakes*. During the period 1998-2002, many managers from the Spanish subsidiary were promoted to global functions and responsibilities. This reveals the contribution potential of the unit within the MNC. Managers' promotions were driven to the perception from the division that *Brakes Spain* was then more capable to contribute strategically to the global organization, due to its managers' expertise on operations and processes of the business. This perception of strategic contribution is shown by the flow of product process development brought from other subsidiaries to *Brakes Spain*, to speed up the production process. For example, *Brakes Spain* was able to put into mass production a prototype in the record time of one month. What is more, from the selling perspective, customers from distant countries as the US or Japan would specifically ask to be served by *Brakes Spain*. Similarly, after a global benchmark process, the MNC decided to clone across the rest of the subsidiaries the task forces model designed by *Brakes Spain* to launch new products. Unpredictably, the MNC decided to 'translate' to the US the

layout designs developed and implemented by the plants of *Brakes Spain*. Additionally, after bargaining with the division, plant managers at *Brakes Spain* were able to gain for the Spanish subsidiary the production of certain parts that were turned down by other units of the MNC. The whole process left *Brakes Spain* specialized and responsible, within the group, of the production of high-margin brakes-system parts.

In sum, *Brakes Spain* achieved a high reputation across the MNC based upon its manufacturing excellence, its best selling team, its flexibility at launching new products, its well-known engineering team and the fact of being the largest subsidiary of *Brakes* in terms of sales.

The strategy proposed in 1999 tried to keep and strengthen this position. It focused in keeping the "state of the art" in organization and techniques of mass production, but added a search for excellence in engineering, to strengthen the identity of the plants, foster good relationships with the workers as well as to develop international executives who could aim at positions at Brakes. Yet more than anything else the strategy strengthened their R&D department by looking for recognition within the group and helping develop the plants in Asia. Nevertheless, the future was going to prove different from expected.

III. Loosing Ground.

By the middle of 1998, a new CEO was appointed at divisional level. His main self-imposed strategic goal was to attack the Asian market through the European operations given their level of technology, efficiency, reliability and geographical location (closer than the US, for example). Meanwhile, from the divisional viewpoint of *Brakes*, it was thought that in order to achieve this goal a higher level of centralization was needed. Consequently, by 2002 purchasing, launching of new products,

engineering applications processes and sales activities were centralized. Additionally, the division also imposed a certain level of rationalization at the manufacturing level, trying to leverage specialization of plants. The logic behind these decisions was to keep control over key business activities, to better coordinate R&D investment among units and to obtain lower manufacturing costs.

This set of measures trimmed back the relationships *Brakes Spain* had established with customers as well as with other units of the multinational. The consequences on *Brakes Spain* were dramatic to their autonomous strategic behavior. As global managers and functions were established, local managers and functions started to vanish. Key decisions started to be taken by global managers and only low-level decisions were kept on a country basis. For instance, under the new structure, *Brakes Spain* was not allowed to contact a client directly the client decided to include a small change in the design of a new product or application. That function was responsibility in full of the new Global Account Manager, who, in turn, had to coordinate with global project leaders. Apart form losing contact with clients, managers of other units of the MNC, *Breaks Spain* was forced to just improving internal coordination among its plants. In the aftermath, the strategic role played by *Brakes Spain* vanished under centralized activities such as marketing, sales, new products launching and R&D. In words of the 2002-2003 CEO:

> "when we had control over marketing, sales and engineering, it was the integration of all those activities that made us strong at launching new products and allow us an advantageous position along the MNC; currently, our advantage rests upon manufacturing, trying to keep that process on hand with the entire process that precedes launching of new products… which is harder for us given that we're not longer responsible for those activities nor we have control over them and global responsibilities are far away from us"

The entire process of the development of Brakes Spain strategy can be summarized as Figure 2 shows.

Insert Figure 2 about here

Data Analysis Describe the network analysis and match it with the story

The story of *Brakes Spain* shows the transition of a marginal unit that shaped its destiny. It did so by taking an active role in building valuable relationships. Finally it lost its level of autonomy through the centralization of resources and decisions carried out by HQ counterbalancing the subsidiary attempts to govern its future. The subsidiary managers had decided to design a strategy that allowed the unit to gain distinctiveness within the MNC through a purposive generation of relationships with clients and units of *Brakes*, However, a higher level of centralization promoted from the divisional level, *Brakes*, in mid-2000, reduced the strategic space that *Brakes Spain* had enjoyed. These lacks of space for relationships lead to a transformation of the subsidiary into a mere manufacturing plant by the end of 2002.

Underlying this process there is a change in the number of relationships generated from *Brakes Spain* towards other units of the MNC and its clients. All the interviewees manifested they felt *Brakes Spain* had lost control over key business processes during the last years as *Brakes* centralized key activities. Some key excerpts from interviews will illustrate this,

"some design client petitions are no longer under our control; if the original prototype is changed, it is the Global Chief Engineer who coordinates with the Global Account Manager before going to the client to negotiate the new design….. that way, we no longer have direct control over the budget of a project"

"our process of launching new products based its flexibility in the direct control of all the functions related from quotation to mass production; when the division decided to centralize key engineering activities and its relationships with clients, we lost that control and, consequently, our flexibility for launching new products"

"we cannot hire new personnel nor consultants without having the division's authorization… a couple of years ago we only needed our plant manager opinion"

Analysis of internal archival data, as communication records with HQ and with other subsidiaries confirm that a higher level of centralization meant less control over key business activities. Higher centralization meant for instance, that the number of formal communications received from customers and other units of the MNC decreased from 1999 to 2003. Many routines were 'translated' to the central services unit developed by *Brakes* Division, forcing the subsidiary to 'close on itself' in order to just keep operational results in good shape.

Network analysis supports the qualitative evidence. As shown in table 2, there is a significance decrease in external relationships and a significant increase in internal relationships. Most relationships starting from *Brakes Spain* were no longer oriented toward clients and other units of the MNC (local HQ, manufacturing plants, centralized units and general HQ). The level of centralization imposed by HQ had incremented its internal coordination but made Breaks Spain loose contact with the MNC and its clients. In 2003, people working at the Spanish subsidiary direct their relationships to local units and departments.

Insert Table 2 about here

The decline in relationships seems to have diminished the distinctiveness of the *Breaks Spain* within the MNC. In order to separate operational from strategic relations

we specifically isolated the local Spanish HQ from the subsidiary plants. We further disaggregate the internal network classifying 'senders' and 'receivers' among plants and HQs. Manufacturing plants would perform mainly 'operational' activities, while the HQ subsidiary would perform more 'strategic' activities, less related with day-to-day operations and more related with setting, negotiating or implementing the strategy of the MNC, or simply working in MNC's projects, meaning projects that are not country-specific. In the period analyzed a there is an increase in the number of relationships as shown in table 3. But this increase is fundamentally caused by a higher number of relationships among plants rather than with the rest of the MNC. This also suggests that the only significant increase happened in operational rather than strategic relationships.

Insert Table 3 about here

The distribution of agents' power also suggests that in the period analyzed a shift occurred in the content of work-based interactions. An active agent in a network, i.e. an agent that starts and receives many relationships, is an agent that enjoys a high level of power. If the relationships of the subsidiary are more operational-related, its work-based relationships network must show a shift in the distribution of power. The degree of centrality of the agents, i.e. the proxy for calculating power, has changed in the period analyzed, being more evenly distributed in 2003 as can be seen in Figure 3

Insert Figure 3 about here

As regards the corporate network results also suggest a reduction in the number of relationships with the MNC. As shown in Table 4, although the number of

relationships of the entire corporate network had been reduced significantly, the number of work-based interactions among plants had increased significantly too. Our qualitative evidence also suggests these work-based interactions are of the operational type, implying that by 2003 *Brakes Spain* is more a manufacturing than a strategic unit across the MNC.

Insert Table 4 about here

The department that is most active sending and receiving through relationships among plants in the corporate network is 'quality' substantiating the work relationship supremacy over strategic ones. Productivity levels imposed by *Brakes* forced subsidiaries to specialize in the manufacturing of a specific component or input for a particular brake system. Hence, quality controls and reports are mainly operational between subsidiaries. When a mass-production petition arrived to *Brakes*, its subsidiaries have to coordinate timing, volumes and delivery of components of the whole brake system, forcing them to increase the number of manufacturing work-based interactions.

Insert Table 5 about here

The situation as for 2003 is radically different as that of 1998, when *Brakes* asked the Spanish subsidiary to replicate its new product launch organization to the whole MNC. Table 5 presents the density image matrix resulted from the blockmodelling algorithm performed to the 2-mode network generated by the relationships reported from managers at *Brakes Spain* (original results of this algorithm

are shown in Appendix 2) . Table 5 shows a higher density in 1998 between strategic departments of *Brakes Spain* and the MNC, while 2003 shows that the Spanish subsidiary has a higher number of work-based interactions with plants departments of the MNC. As the activities of these last departments are centralized, these relationships reflect country or project specific coordination needs among subsidiaries' manufacturing units. Finally, results of the external network shown in Table 6 also show a significant lower number of relationships in the overall network but a higher number of relationships among plants and clients. Additionally, quality and logistic departments are the most active ones starting interaction with clients, meaning that these work-based interactions are more related with day-to-day operations like timing of mass-production, delivery and standards fulfilling.

Insert Table 6 about here

All in all, our quantitative evidence suggests that *Brakes Spain* has lost its strategic relevance within the MNC while its operative role has received more emphasis. Network analysis strengthen by our qualitative evidence presented combined with the network results suggest that decline in the strategic significance of the subsidiary was driven by the loss of relationships. Similarly, the previous strategic development suggests that the mechanism used by Breaks Spain to develop strategy was exactly the reverse. The relationships that the subsidiary developed with the MNC and customers were the vehicle to develop their own strategy. In the following section we articulate these e findings into a theoretical proposal of embeddedness as the subsidiary strategy.

TOWARDS A MODEL OF SUBSIDIARY STRATEGY Teoría derivada inductivamente.

The case of *Breaks Spain* provides an insightful situation from which theory of how can a subsidiary generate its own strategy can be inductively derived. As the subsidiary was allowed leeway to develop relationships with customers and other units of the MNC, *Breaks Spain* was able to develop first operational embeddedness, engaging for instance in quality control with other units of the MNC. Next, the subsidiary through recruitment of R& D staff was able to develop its own capabilities as (ejemplo). Then, the subsidiary was able to develop strategic embeddedness by developing new products and markets for the whole MNC. As the subsidiary grew into developing its own strategy it gained distinctiveness within the MNC.

The subsidiary lost its distinctiveness, as shown in our network analysis, as the role assigned by HQ to the subsidiary changed. As HQ trimmed the leeway that the subsidiary had enjoyed, the subsidiary embeddedness shrank. Nevertheless, it was by developing its embeddedness that the subsidiary had gained distinctiveness in the first place. We define subsidiary embeddedness as the regular set of relationships that build into subsidiaries. From the case of *Breaks Spain* we are bale to picture these three states of embeddedness. First, into operational improvement or excellence, second into capability development and third into the subsidiary's own strategy. In this line the concept of strategy and the concept of role are seen as the same, in fact for the present research we've used role as the subsidiary strategy. This transition is reflected in the three development stages we have utilized, i.e. I Obeying orders, II Gaining fit and III Loosing ground. When the subsidiary raised from stage I to stage II, it did so by developing its operational embeddedness, which in turn fostered its capability

embeddedness in stage II. Although in stage III the subsidiary begins to lose its strategic embeddedness it gained such embeddedness by developing new products and markets. With further research in mind we state the following propositions:

Proposition 1: The distinctiveness a subsidiary may achieve will depend on the embeddedness the subsidiary is able to develop with other units of the MNC and with customers and suppliers.

Proposition 2: The degree of distinctiveness will depend on the type of embeddedness the subsidiary is able to develop.

The conditions for embeddedness to serve as a vehicle for subsidiary strategy are various. First, the subsidiary must find space to develop embeddedness, i.e. if HQ exercises excessive centralization no embeddedness will be possible. Second, subsidiary managers have to be proactive in developing embeddedness. Third, if the content of relationships will vary between operational, capability building or strategically, then data from *Breaks Spain* suggests there is a sequence to gain strategic autonomy that goes through those three faces.

The relationship between the subsidiary and the MNC seems to be paramount to the development of subsidiary strategy. Should induced behavior be exercised in excess from HQ, the possibility of subsidiary strategy will be minimal. AS seen in the case of *Breaks Spain*, when the role assigned by HQ to the subsidiary was trimmed back, the lack of leeway left the subsidiary dangling as an operational unit. This concept is schematically shown in figure one as the main driver of subsidiary strategy. With further research in mind we propose the following:

Proposition 3: The capacity for a subsidiary to develop strategy will depend on the autonomous behavior it is allowed to develop.

Proposition 4: The sequence a subsidiary will follow to develop distinctiveness will start from operational embeddedness, go through capability embeddedness, to finally achieve strategic embeddedness.

The theoretical approach presented in this paper offers one way through which subsidiaries may develop their own strategy. As shown in figure 1 the key condition for subsidiary strategy to exist is that the relationship between HQs assigned role and the autonomous behavior of the subsidiary be in balance. As shown in *Breaks Spain*, little or no strategy was left for the subsidiary to develop when HQ determined the role would be only operational. At this point, if HQ's notion of the subsidiary is loosely coupled then there is space for the subsidiary to develop the three stages of embeddedness and through them achieve subsidiary strategy. The proactive initiative of the subsidiary or its autonomous behavior, will establish which degree of embeddedness the subsidiary achieves

Subsidiaries play an important role in the performance of MNC. Surprisingly, some authors seem to suggest that subsidiaries may only contribute to corporate performance either in terms of their financial achievements or in the fulfillment of a concrete strategic role assigned from the center (Jarillo and Martínez, 1990; Porter, 1986). Increasingly, however, subsidiaries have been seen as active units, as sources of a MNC's competitive advantage, and providers of strategic initiative (Taggart, 1999). The main motivation for this shift was the emergence of alternative conceptions of the MNC in which all subsidiaries are contributors to a complex networked firm (Ghoshal and Bartlett, 1990; Hedlund, 1986; Nohria and Ghoshal, 1997). These models proposed that MNCs cannot be conceptualized as hierarchical organizations, but rather as a puzzle whose pieces have to fit among each other. Thus, the different elements in a MNC, subsidiaries among them, need, complement, and nurture each other. As a consequence, the term "subsidiary strategy" has to be taken into consideration.

Subsidiary development through initiative-taking emphasizes the shift on strategic importance of these units. Subsidiaries are encouraged to be proactive in developing initiatives that add value, not only to their local operations, but to the parent's overall business (Birkinshaw and Hood, 1998; Birkinshaw, Hood and Jonsson, 1998; Delany, 2000).

DISCUSSION AND CONCLUSION

Contribution using Institutional theory to further understand the dynamics of subsidiary embeddedness

The notion that a subsidiary may develop its own strategy has an interest that stems from the effect this development can have on the MNC's performance (Andersson and Forsgren, 2000; Taggart, 1999). From the viewpoint of institutional theory the role of agency or social action in institutional analysis has been emphasized (Perrow, 1985) or (DiMaggio, 1988). The reason for this emphasis is the reaction to early institutional theorists, who stressed convergence, conformity and isomorphism as a means to create and diffuse institutions. However, more recently rather than presuming social action's determination, Emirbayer and Mishe (1998) have stressed that it is neither independent from social constraints nor there is a moment in which action is free from structure.

In this line we center in the ability of the subsidiary to develop its own strategy, and in doing so, affecting MNC's norms and particularly its strategy. Although the power to design a strategy for the subsidiary may be vested in headquarters (HQ), conflicting logic or interests from the subsidiary may reshape both the subsidiary and the MNC strategy. Social action of the subsidiary is not only shaped and conditioned by the context of action, determined by HQ and the action of other subsidiaries, but also by the dynamic element of social action itself.

The strategy of the subsidiary will depend on its ability to combine conforming and resistant behaviors, as it is for any organization (Oliver, 1991). By assuming partially both the institutional imperative and necessary responsiveness a SS can act strategically. A multinational corporation (MNC) is composed by several organizations that include the subsidiaries and headquarters (HQ) (Ghoshal and Bartlett, 1990). Moreover, each organization is interconnected to each other. As such, the SS may conform to norms and rules either from the rest of the MNC or from the external environment to survive (DiMaggio and Powell, 1983). Conversely, the subsidiary may engage in adapting to the environmental uncertainty by actively managing resource flows (Pfeffer and Salanzik, 1978).

One way to manage flows of resources is by developing and leveraging relationships with the environment, including other entities from the MNC. In doing so the subsidiary exercises to manipulate dependencies or exert influence over the allocation of sources of critical resources. If the subsidiary is able to exercise strategic choice by developing an active role by a leading group within it a, this proactive behavior may not only affect the SS but expand its effect to the whole MNC. Should the mandates from HQ de followed as taken-for-granted norms by the subsidiary; the institutional process will work depriving the subsidiary from its own strategy.

Manipulating embeddedness can be viewed as a subsidiary strategy. Organizations aim at purposive action and its actors are embedded in a concrete, ongoing systems of social relations (Granovetter, 1985). Thus, subsidiary strategy can be depicted as the systems of relationships she is able to nurture with the rest of the MNC and with the external environment. For this reasons its embeddedness will be the

canvas within which SS strategy can take place. Further developing not only the quantity but also the quality of the subsidiary's relationships is in fact strategic behavior.

Therefore, subsidiary actions are not limited to those of induced behavior from the parent. Managerial action may enact subsidiary strategy by changing its role within the corporate network. This may be particularly important when the strategy promoted by the MNC puts into danger the existence of the subsidiary itself. For example, a strategy that attempts to rationalize operations worldwide and close those units were the local labor wages are high, may find a response from the threatened subsidiary. This was the case of *Brakes Spain*. In 1998 they responded to the threat of becoming a mere operational facility by investing in a first class engineer department. This decision, made without the endorsement of HQ renewed the subsidiary into a crucial component of the MNC. From a population ecology point of view, organizational performance has been measured as survival. Consequently, organizations work in their niche for survival confronting external environmental change (Hannan and Freeman, 1977). Subsidiaries quest for survival implies the development of its own strategy within the limits imposed by the MNC. If operational activities, such as manufacturing, are subject to de-localization upheavals, subsidiaries that play a strategic role within the MNC may appear harder to be relocated, given their contribution to the overall MNC performance.

Our model allows relating the strategic role of a subsidiary and their types of embeddedness. Subsidiaries that act mainly as implementers may have a high operational embeddedness; contributors, on the other hand, may present a high capabilities embeddedness while strategic leaders would show high strategic embeddedness. Additionally, the subsidiary can enact its own strategy and change its

role by affecting embeddedness. For example, an implementer may try to develop capabilities that are useful for the MNC as a whole. Then, it will alter its level of capabilities embeddedness by communicating to their colleagues how that particular capability is to be built and through coordination among different units.

The overall level a subsidiary may be capable of affecting the MNC's strategy will depend on how the subsidiary manages the three types of embeddedness. In turn, HQ can affect embeddedness in its three types through the assigned corporate role. The first can be viewed as the autonomous behavior of the subsidiary and the latter the induced behavior from HQ. The interplay between these two behaviors can explain the resultant strategy of the subsidiary.

Caution must be kept before discussing the results of the present study. First, it has been carried out within a Spanish context and cultural elements could explain in part our findings. Second, being a single case study, only conceptual generalization is possible. Finally although we have used quantities data to supplement our analysis, the used qualitative data entails its interpretation. While this approach is highly powerful for developing theory, it does not provide unequivocal results. Although, cautions have been taken to strengthen validity and reliability, further quantitative designs in future research will strengthen the framework and concepts presented here.

All in all, while traditionally the literature on subsidiary strategy has been focused on the role it plays within the multinational company, no work, to our knowledge, has operationalized the concept of embeddedness in concrete strategic and organizational issues. We introduce a new dimension on which subsidiary strategy can be enacted. The three dimensions of embeddedness that we propose correspond to three basic dimensions of subsidiary strategy. Thus, we are proposing a new dimension of subsidiary strategy that deals

with managing the level of embeddedness in its operational, strategic and capability components. Although we do not claim to reduce all components of subsidiary strategy to managing its embeddedness level, aiming at parsimony we further develop the concept of embeddedness and make it a strategic variable to define subsidiary strategy.

APPENDICES

Appendix 1: Network Analysis: Methods and Techniques used

Boundary Specifications and Sampling

The first step necessary in any network-based research is the determination of the population to be studied. Simply put, we want to determine the work-based pattern of relationships that start at the units that make up *Brakes Spain,* both internally and externally, that is to say, the work-based interactions among and across employees that work at Plant1, Plant2 and HQ Spain (1,500 and 1,685 in 1998 and 2003, respectively). However, collecting all this information would have been not only costly but also impossible to compliment even for the most clever and collaborative interviewee, not to mention inability of any network software to handle such a large database. Just consider the dimension of the database if each employee would have been asked to report its proximity with all the employees of the firm (1,500 x 1,500 = 2,250,000 cells). In such instances, sampling is necessary (Knoke and Kuklinski, 1982).

To that purpose, we use the "reputational approach" (Scott, 1991), which states that obtaining information about the actors with the higher level of reputation in a particular set of actors is enough to determine the network of relations of that set. This criterion is particularly useful when the knowledge of the agents themselves may help to determine an appropriate sample. In this case, managers at *Brakes Spain* are the actors with the best knowledge about who are the agents that enjoy the highest level of reputation in the company.

In order to avoid "hierarchy bias" (tendency to select one's subordinates as enjoying high reputation), the researchers turn to *Brakes Spain*'s payroll and based on their knowledge of the firm and its employees, selected those with higher levels of

reputation among their peers. This list was judged by the managers of the different plants of *Brakes Spain* and by four members of the board of directors. The final list was compared to a different one elaborated by *Brakes Spain*'s Human Resources Manager, adding or deleting members based on a discussion about his/her actual level of reputation level. As a result of this process, 50 managers were selected in 1998 and 84 in 2003.

Comparing both samples, we found that only 26 managers were included in both waves, 24 of them maintaining the same position within the company in a five-year period, indicating frequent movements within the company, which is common in big MNCs [3]. Strictly speaking, therefore, both networks cannot be directly compared and analysis may be done with caution.

Structural and Composition Variables

Network analysis is based upon two types of variables: structural and composition variables (Wasserman and Faust, 1999). Structural variables are measured on pair of actors and measure ties of a specific kind between them; that is to say, structural variables are the *content* of the relation as named by (Scott, 1991). This paper analyses work-based interactions as recognized by a sample of managers from *Brakes Spain*. Complementary, composition variables are measurements of actor attributes. This paper records firm, plant and department from all the actors involved in the relations. Composition variables of the interviewees are available upon request to authors.

[3] MNCs do this in order to improve their employees' abilities by forcing them to develop different activities at different levels of responsibility.

Type of Network and Unit of Analysis

Networks are categorized by the nature of the set of actors and the properties of the ties among them. The term *mode* refers to a distinct set of entities on which the structural and composition variables are measured. Structural variables measured on two different set of actors give rise to two-mode networks (Wasserman and Faust, 1999). Here, we study actors from two different sets tied by a work-based relationship, one consisting of a sample of employees at *Brakes Spain* and a second larger set consisting of employees of the same company plus employees of other units of the MNC, as cited by the interviewees. Actors in the first set are "senders" of the relation (*egos*), while those in the other set are "receivers" (*alters*).

The difference between the sets is a matter not only of size but also of capacity to enumerate all the actors that belong to the each set. While the first set is closed and reduced to the size of the sample selected, the second one is open, allowing the interviewees to name anyone within and outside *Brakes Spain* with whom she or he has a work-based relationship, be that *alter* part of the selected sample or not.

The resulting network is one made up by ties surrounding the sampled individual units. This network, however, can be separated into more specific groups. We will analyze three different, more concrete networks. The first one is the *internal network*, that is to say, the one made up by the relationships within and across the units of *Brakes Spain* (Plant1, Plant2 and HQ Spain). The second one is the *corporate network*, or the pattern of relationships of *Brakes Spain* with any "alter" that is a member of a unit of the MNC. As far as our knowledge goes, this is the first attempt made in the literature to disentangle "subsidiary embeddedness". Similar investigations,

e.g., (Andersson and Forsgren, 1996; Ghoshal and Bartlett, 1989)), identify two sets, the external (relations to actors outside the subsidiary, such as clients, providers and regulators), and the corporate (same as defined here). These designs are based on the implicit assumption that subsidiaries are a sole unit, while in most of the cases subsidiaries are make up by a number of plants and local headquarters, units that may relate differently along the MNC. Finally, we will briefly analyze the *external network*, or the pattern of relationships of *Brakes Spain* with any "alter" that is any member of a unit outside the MNC, such as clients, providers or others.

Network Data Collection

We collected network data in two waves. The first wave of data was collected between January and April of 1998, while the second was collected in the last fortnight of May and the first of June of 2003. In 1998 the interviewees received a printed questionnaire that was returned to the researchers once fulfilled. In 2003 we take advantage of an online questionnaire designing a similar version of that of 1998, and hosted it in the web page of the researchers' University affiliation. Each user received an e-mail with his/her username, password and a link to a customized questionnaire, which is a measure that improves response rate (Knoke and Kuklinski, 1982). Additionally, we take the standard security measures that are taken in order to avoid access to the web-page and its database by hackers and people outside the interest of this research. Response rates each year were 95% in 1998 and 96% in 2003. In both instances, personal calls were made to individuals that were reluctant to respond at first. In both cases a presentation of aggregate network results was made to different units within the company, which also helped to clarify our interpretation of the results.

Questionnaire

Questionnaires are the most commonly used network data collection method. They are most useful when the actors are people, and the respondent relations are the ones he or she can report on (Wasserman and Faust, 1999). Questions were formatted in a free-recall and fixed-choice design. Free-recall allow respondents to name any actor belonging to any unit in *Brakes Spain* or the MNC with whom he or she has a work-based interaction in the last six months. This format is particularly useful when a roster including all the possible *alters* is extremely large or unknown. Complementary, as interviewee fatigue is an issue as regards accuracy (Knoke and Kuklinski, 1982), fixed-choice reduces the number of alters to a maximum, five in this case.

An important issue that arises with the social network data that is collected under questionnaire is informant accuracy. Bernard *et al* (1984) state that people are not very good at reporting on their interactions in particular situations. However, Freeman *et al* (1987) had said that particular interactions are not of primary concern to social network researchers, but relatively stable, long-term patterns of interaction, situations were the informants are more able to report accurately. Work-based relations, in a horizon of six months fit into this category. However, in order to eliminate errors coming from inadequate measurement, (Knoke and Kuklinski, 1982) suggest to be as specific as one can be as regards questions made. As some people may tend to report work-based relations within members of his/her unit, we explicitly ask the respondent to report interactions *with* units at *Brakes Spain, with* other units of the MNC and *with* external agents such as clients and suppliers. Given that we were mainly interested in the networks of the individual departments of the different organizational units, informant inaccuracy is also neutralized in the aggregation of data.

Data Tabulation

As free-recall allows to define *alters* composition variables based on the criteria of the interviewee, we depurate the entries based on company's flow chart when available and most frequent classifications. For example, different egos claimed to have a work-based relation with a manager from Germany; while one ego classified that alter as someone working at the Research and Development department, others classified the same alter as the Product Applications Engineering head of department. While these situations were not common, some depuration was needed. Several calls to key informants within the company where made to clarify some of the positions, mainly of alters, outside the MNC. Evident mismatches and incomplete entries were eliminated leading to a final database of 1411 entries in 1998 and 1827 entries in 2003 (99,22% and 99,27% of the original database respectively). This has to be interpreted as 1411 and 1827 pairs of ego and alter tied by a work-based relation.

From both databases a selection of entries was needed, since we want to analyze different networks separately. The internal network's databases include 734 and 1315 pairs in 1998 and 2003, respectively. As regards the corporate network, databases include 355 pairs for 1998 and 280 for 2003. Finally, the external network includes 322 and 232 pairs respectively.

Given the difference between the samples that make up the first set of actors each year, a comparative network analysis performed at the individual level will show little or none interest. An analysis at the functional level will be more appropriate, as the differences between 1998 and 2003 are least extremes at the functional level than those at the individual level. Therefore, we aggregate similar entries by plant and department, classified by plant or HQ. For example, relationships with people that work in the

department of Process Engineering in Italy, were added to those relationships with people that work in the same department in Germany, France, or Britain. The result actor is the best approximation to the functional level. Finally, data was analyzed on cross-tabs, each cell representing the frequency of work-based interactions between ego and alter.

Appendix 2

Centrality Indexes 1998: Internal Network *Brakes Spain*

MULTIPLE CENTRALITY MEASURES **(1998)**

Input dataset: C:\Mis documentos\Doctorado\Tesis\Files Ucinet\interna_externa_1998_feb10

Important note: This routine automatically symmetrizes and binarizes.

Normalized Centrality Measures

		1 Degree	2 Closeness	3 Betweenness	4 Eigenvector
1	P1CAL	21.739	46.000	4.370	33.220
2	HQCAL	17.391	37.097	2.981	19.916
3	P2CAL	17.391	45.098	2.307	28.983
4	P1CTR	21.739	46.939	17.246	24.637
5	HQCOM	21.739	41.071	12.466	15.093
6	P1FABR	21.739	51.111	12.660	31.314
7	P2CTR	13.043	35.385	0.791	8.598
8	HQCOMP	30.435	48.936	10.937	45.841
9	P1IFA	30.435	52.273	8.313	50.028
10	P2COMP	17.391	46.000	1.621	28.986
11	HQCTR	8.696	32.857	0.000	6.219
12	P1DG	21.739	47.917	6.651	34.229
13	HQDG	26.087	44.231	9.560	33.531
14	P1HR	17.391	46.000	10.263	22.720
15	P2FABR	13.043	41.071	2.076	17.321
16	P2IFA	26.087	48.936	5.560	44.893
17	HQENS	4.348	31.944	0.000	4.251
18	HQHR	21.739	42.593	3.729	27.722
19	HQI+D	17.391	40.351	1.773	26.877
20	HQIPA	43.478	60.526	35.734	55.913
21	P1LOG	4.348	29.487	0.000	2.824
22	P2DG	8.696	33.824	0.624	10.001
23	P2IPA	8.696	39.655	0.509	15.492
24	P2LOG	8.696	41.818	2.003	13.287

DESCRIPTIVE STATISTICS FOR EACH MEASURE

		1 Degree	2 Closeness	3 Betweenness	4 Eigenvector
1	Mean	18.478	42.963	6.341	25.079
2	Std Dev	8.985	7.112	7.768	14.296
3	Sum	443.478	1031.120	152.174	601.900
4	Variance	80.734	50.581	60.348	204.369
5	SSQ	10132.325	45514.313	2413.217	19999.996
6	MCSSQ	1937.618	1213.950	1448.346	4904.865
7	Euc Norm	100.659	213.341	49.125	141.421
8	Minimum	4.348	29.487	0.000	2.824
9	Maximum	43.478	60.526	35.734	55.913

Output actor-by-centrality measure matrix saved as dataset

Centrality Indexes 2003: Internal Network *Brakes Spain*

MULTIPLE CENTRALITY MEASURES **(1998)**

MULTIPLE CENTRALITY MEASURES **(2003)**

Input dataset: C:\Mis documentos\Doctorado\Tesis\Files Ucinet\interna_externa_2003_feb10

Important note: This routine automatically symmetrizes and binarizes.

Normalized Centrality Measures

		1 Degree	2 Closeness	3 Betweenness	4 Eigenvector
1	HQCAL	23.077	47.273	1.744	29.694
2	P1CAL	23.077	49.057	2.090	33.654
3	P1DG	23.077	52.000	5.083	30.657
4	P1FABR	26.923	52.000	3.060	36.585
5	P1IFA	26.923	52.000	6.776	33.828
6	P2CAL	26.923	50.000	7.266	32.810
7	P2DG	26.923	52.000	7.426	31.125
8	HQCOM	34.615	50.980	9.709	37.734
9	P1CTR	15.385	46.429	1.756	17.751
10	P1LOG	7.692	38.806	0.000	10.322
11	P2CTR	23.077	48.148	3.795	29.365
12	P2LOG	23.077	46.429	4.276	31.323
13	HQCOMP	38.462	56.522	21.702	35.604
14	P1COMP	3.846	36.620	0.000	5.322

```
 15 P2COMP         3.846       36.620        0.000        5.322
 16  P2IFA        26.923       56.522       10.293       35.722
 17  P2IPA        11.538       43.333        1.116       16.271
 18  HQCTR        19.231       43.333        4.565       16.058
 19 P2FABR        19.231       46.429        4.425       23.894
 20   P2HR         7.692       34.211        0.359        5.296
 21   HQDG        30.769       52.000        4.038       39.200
 22  HQENS        11.538       39.394        1.748       10.717
 23  P1ENS         7.692       33.333        0.209        5.061
 24   HQHR        23.077       45.614       12.581       19.370
 25   P1HR         3.846       31.707        0.000        2.895
 26  HQI+D        23.077       47.273        7.708       23.141
 27  HQIPA        42.308       56.522       10.890       50.108
DESCRIPTIVE STATISTICS FOR EACH MEASURE
                      1            2            3            4
                 Degree   Closeness  Betweenness  Eigenvector
            ----------- ----------- ----------- -----------
  1     Mean       20.513      46.095       4.912       24.031
  2  Std Dev       10.310       7.097       4.905       12.778
  3      Sum      553.846    1244.553     132.615     648.827
  4 Variance      106.290      50.366      24.057     163.270
  5      SSQ    14230.770   58726.988    1300.906   20000.000
  6    MCSSQ     2869.823    1359.894     649.542    4408.302
  7 Euc Norm      119.293     242.337      36.068     141.421
  8  Minimum        3.846      31.707       0.000       2.895
  9  Maximum       42.308      56.522      21.702      50.108

Output actor-by-centrality measure matrix saved as dataset
Copyright (c) 1999-2000 Analytic Technologies
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Blockmodelling *Brakes Spain* towards *Brakes* 1998 - 2003

```
2-MODE CATEGORICAL CORE/PERIPHERY MODEL (1998)
Input dataset:                C:\Mis documentos\Doctorado\Tesis\Files
Ucinet\MNC_1998_feb10
Starting fitness: 0.310, Final fitness: 0.580, Blocked Adjacency Matrix
              11  9 13 20    2  6  7  8  4  5  1 12  3 14 15 16 17 18 19 10 21
              HQ HQ PL PL   HQ HQ HQ HQ HQ HQ HQ PL HQ PL PL PL PL PL PL HQ PL
                 IPA I+D COM IPA   COM ENS FABR HR  CTR  DG  CAL CAL COMPCOMPCTR  DG  ENS I+D
                 IFA IFA LOG
              ------------------------------------------------------------------------
  8   HQIPA  | 19  7  4 46 |  3     1           1 10  1  4        1  1  6  3     |
  2   HQCOM  |       18  5 | 14              1     1     2                 1     |
  7   HQI+D  | 10  9    14 |        1                  2              6     8     |
              ------------------------------------------------------------------------
  3  HQCOMP  |     1  2  1 |                 2       15 10     1        1  1     |
  5    HQDG  |  2        1 |        3        2                 4                 |
  6   HQENS  |     1       |     2                                  3              |
  4   HQCTR  |  1          |              11  3                1                    |
  1   HQCAL  |             |        1           2  4                              |
  9  PLACAL  |  1  1  1    |                       6                              |
 10 PLACOMP  |             |                          1                           |
 11  PLACTR  |             |        2     4                                        |
 12   PLADG  |             |        1                                              |
 13 PLAFABR  |  1          |                                                    2  |
 14   PLAHR  |             |           1                                           |
 15  PLAIFA  | 12  1       |       10                 2                 3  2     |
              ------------------------------------------------------------------------

Density matrix
          1       2
     ------ ------
  1  11.000  1.083
  2   0.556  0.349

2-MODE CATEGORICAL CORE/PERIPHERY MODEL (2003)
Input dataset:                C:\Mis documentos\Doctorado\Tesis\Files
Ucinet\MNC_2003_feb10
Starting fitness: 0.225, Final fitness: 0.458, Blocked Adjacency Matrix
              12 13 21    4  3  6  7  8  9  5 11  1  2 14 15 16 17 18 19 20 10 22
              PL PL PL   HQ HQ HQ HQ HQ HQ HQ PL HQ HQ PL PL PL PL PL PL PL HQ PL
                COM  COMP IPA   CTR COMP ENS  GP  HR  I+D  DG  CAL CAL COM CTR ENS FABR GP  HR I+D
                IFA   ING LOG
              ------------------------------------------------------------------------
  9   HQIPA  | 28    22  |        1  7                              5        1        |
  2   HQCOM  |  9     1  |           1                 9                              |
  3  HQCOMP  |  6  9     |     14                                                     |
  4   HQCTR  |           |  23                 2           1                          |
  6   HQENS  |  2        |        10              3           13           1          |
  8   HQI+D  |       12  |                  2     1                       16  2  9    |
 10  PLACAL  |     7  1  |                       19  1           2           1        |
              ------------------------------------------------------------------------
```

```
  5    HQDG |           |                    5                                    |
  7    HQHR |           |                4                                        |
  1   HQCAL |           |           1        1  3  1                               |
 11  PLACTR |           |  1                                                       |
 12   PLADG |           |                    2  1                            1    |
 13 PLAFABR |           |           1     1                        1               |
 14   PLAHR |           |                 1                                        |
 15  PLAIFA |     1     |           3     1                              6  2      |
 16  PLALOG |     8     |                                      1                5 |
            ----------------------------------------------------------------------
```

Density matrix

```
        1     2
     ----- -----
  1  4.619 0.698
  2  0.360 0.213
```

```
----------------------------------------
Running time:  00:00:09
Output generated:  28 feb 04 19:59:32
Copyright (c) 1999-2000 Analytic Technologies
```

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FIGURES

Figure 1: Subsidiary Strategy and Different Types of Subsidiary Embeddedness

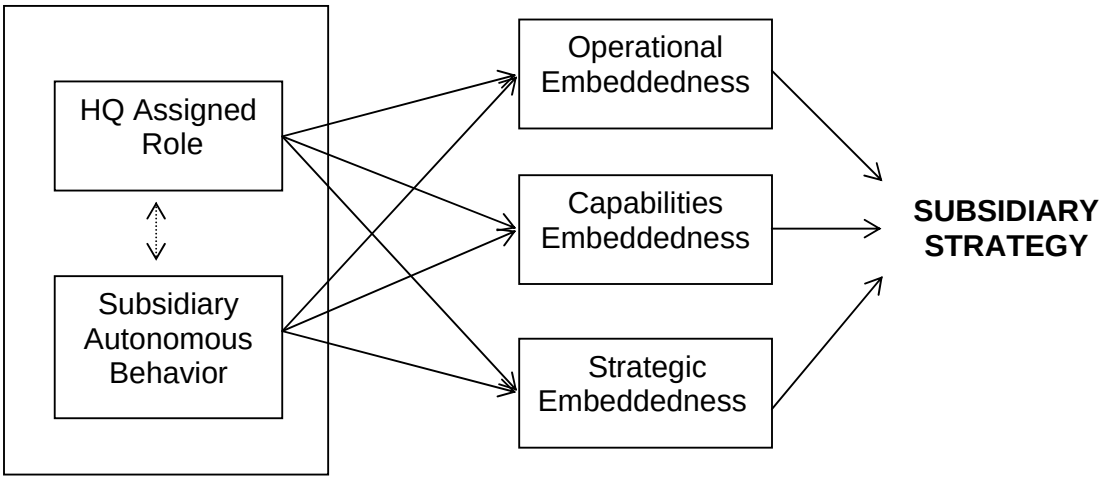


Figure 2: Brakes Spain: The history of its strategy

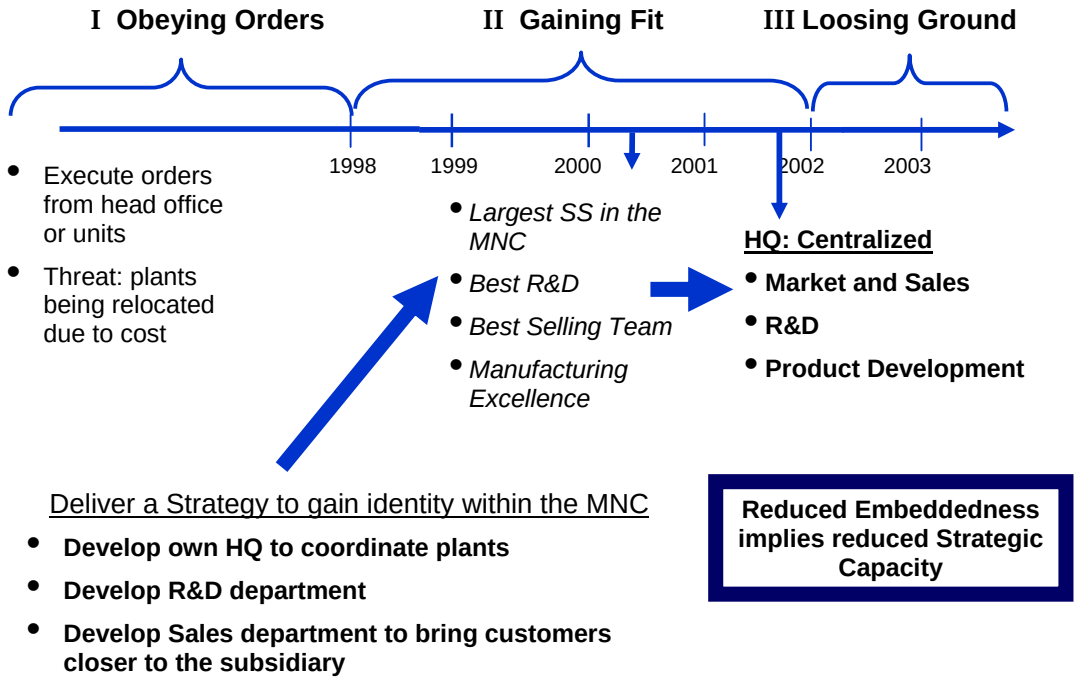
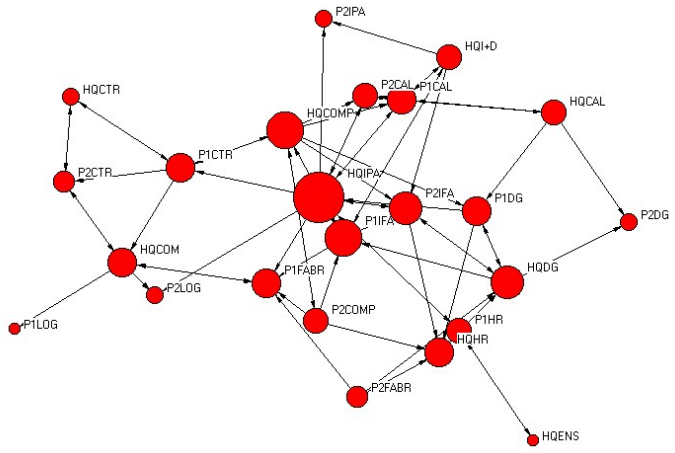
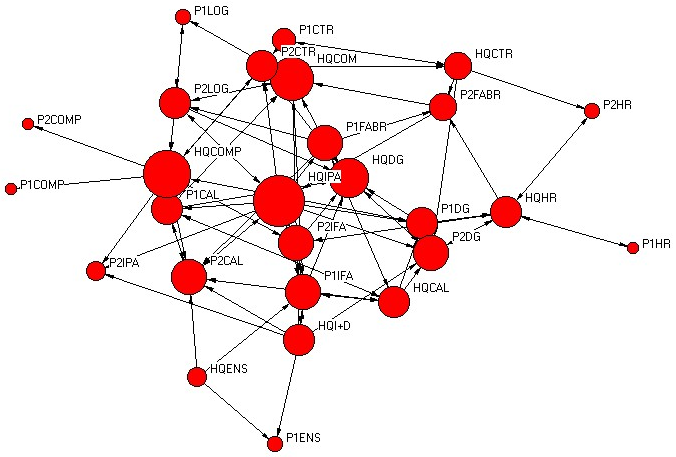


Figure 3: Evolution of power: Brakes Spain Internal network

1998



2003



TABLES

Table 1. List of Interviews

Level within the subsidiary	Job Title	Number of Interviews
1	Brakes Spain's Chief Executive Officer 1	2
1	Brakes Spain's Chief Executive Officer 2	2
1	Brakes Spain's Chief Executive Officer 3	2
1	Plant 1 Manager	2
1	Plant 2 Manager	2
1	Chief Engineering Officer	2
2	Quality Manager	2
2	Purchasing Manager	1
2	Product Testing Manager	1
2	Client 1 Account Manager	2
2	Application Engineering Liason	2
3	Application Engineering Liason	2
1	Human Resources Manager	1
2	Controller Brakes Spain	2
3	Plant 1 Process Engineering Manager	1
3	Plant 1 Controller	1
3	Plant 2 Quality Manager	1
3	Plant 2 Controller	1
3	Plant 2 Production Manager	1
3	Plant 2 Process Engineering Manager	1
	Total	31

Table 2: Brakes Spain: Evolution of Relations 1998-2003

	1998		**2003**		**1998 a 2003**
	# Relations	$\hat{p}_1$	**# Relations**	$\hat{p}_2$	**¿** $\hat{p}_1 \neq \hat{p}_2$ **?**
All the Relations	**1183**	1	**1705**	1	
Internal Network	734	0,62	1315	0,77	(+) ****
Corporate Network	325	0,27	292	0,17	(-) ****
External Network	124	0,11	98	0,06	(-) ****

**** p<0,0001

Table 3: Internal Network: Operational and Strategic Relations 1998-2003

	1998		**2003**		**1998 a 2003**
	# Relations	$\hat{p}_1$	**# Relations**	$\hat{p}_2$	**¿** $\hat{p}_1 \neq \hat{p}_2$ **?**
Internal Network	**734**	**0,62**	**1315**	**0,77**	**(+) ******
1) HQ Spain-Plants	106	0,09	185	0,11	(+)
2) Plants-HQ Spain	78	0,07	103	0,06	(-)
3) HQ Spain-HQ Spain	322	0,27	408	0,24	(-)
4) Plants-Plants	228	0,19	619	0,36	(+) ****

**** p<0,0001

Table 4: Corporate Network: Operational and Strategic Relations 1998-2003

	1998		**2003**		**1998 a 2003**
	# Relations	$\hat{p}_1$	**# Relations**	$\hat{p}_2$	**¿** $\hat{p}_1 \neq \hat{p}_2$ **?**
Corporate Network	**325**	**0,25**	**292**	**0,16**	**(-) ******
1) HQ Spain-MNC Plants	156	0,13	136	0,07	(-) ****
2) HQ Spain-MNC HQ	118	0,09	89	0,05	(-) ****
3) Plants Spain-MNC HQ	39	0,03	14	0,01	(-) ****
4) Plants Spain-MNC Plants	12	0,01	53	0,03	(+) ***

**** p<0,0001; *** p<0,001

Table 5: Density Image Matrixes 1998

	A	B
X	1	1
Y	0	0

X Group (Brakes Spain actors): HQIPA, HQCOM, HQI+D
Y Group (Brakes Spain actors): HQCOMP, HQDG, HQENS, HQCTR, HQCAL, PLACAL, PLACOMP, PLACTR, PLADG, PLAFABR, PLAHR, PLIFA

A Group (Brakes actors): HQIPA, HQI+D, PLAIPA
B Group (Brakes actors): HQCOM, HQCOMP, HQENS, HQFABR, HQHR, HQCTR, HQDG, HQCAL, PLACAL, PLACOM, PLACOMP, PLACTR, PLADG, PLAENS, PLAI+D, PLAIFA, HQIFA, PLALOG

2003

	A	B
X	1	0
Y	0	0

X Group (Brakes Spain actors): HQIPA, HQCOM, HQCOMP, HQCTR, HQENS, HQI+D, PLACAL
Y Group (Brakes Spain actors): HQDG, HQHR, HQCAL, PLACTR, PLADG, PLAFABR, PLAHR, PLAIFA, PLALOG

A Group (Brakes actors): PLACOM, PLACOMP, PLAIPA
B Group (Brakes actors): HQCTR, HQCOMP, HQENS, HQGP, HQHR, HQI+D, HQDG, HQCAL, HQCOM, PLACTR, PLAENS, PLAFABR, PLAGP, PLAHR, PLAI+D, PLAIFA, PLAING, PLALOG

Table 6: External Network: Operational and Strategic Relations 1998-2003

	1998		**2003**		**1998 a 2003**
	# Relations	$\hat{p}_1$	**# Relations**	$\hat{p}_2$	$\hat{p}_1 \neq \hat{p}_2$
External Network	**124**	**0,10**	**98**	**0,05**	**(-) ******
1) HQ Spain-Clients	114	0,09	58	0,03	(-) ****
2) Plants Spain-Clients	12	0,01	40	0,02	(+) **

**** p<0,0001; ** p<0,002