TECHNOLOGY INNOVATION MANAGEMENT IN MNCS’ BUSINESS INTERNATIONALIZATION: THE ROLE OF A BRAZILIAN SUBSIDIARY FROM THE AUTOMOTIVE INDUSTRY

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Abstract

In recent years, new roles have been attributed to the foreign subsidiaries of multinational companies (MNCs). Among these, a new role of particular interest has been observed when a subsidiary manages the technology innovation process related to the corresponding business internationalization. Considering this context, this paper investigates a Brazilian subsidiary which is in charge of technology innovation management. The main goal of the research is to identify and analyze how some factors influence the role of subsidiaries, in relation to the management of technology innovation in an internationalization process. Some of these factors selected from the literature are: excellence on technical and managerial competences; specific managerial skills on strategic international technology cooperation; and learning ability. The case method was selected, due to the complexity of the phenomenon, which calls for in-depth analysis. The article focuses on a case study developed in the shock absorbers division of an Italian auto parts multinational group, namely Magneti Marelli Cofap (MM Cofap), whose main R&D center for this product line is based in Brazil. The case study reveals that the main factors determining the participation of the Brazilian subsidiary in the technology innovation process are: technical excellence related to shock absorbers technologies; expertise on the management of strategic partnerships; high level of managerial capability on organizational learning; and distinctive abilities in knowledge management and diffusion. It has also been discovered that the studied subsidiary took part of internalization processes of MM Cofap, when the company expanded its operations to the USA, Italy, Poland, India and China, responding for the whole process of technology and knowledge transfer. The main contribution of the study is uncovering
the factors which influence the role of this subsidiary in the company’s technology development process, as well as its implications on the international expansion of the MNC.

*Keywords:* technology innovation management; business internationalization; Brazilian subsidiary role; automotive industry; center of excellence

1. Introduction

With the increasing internationalization pace of multinational companies (MNCs) in recent years, new roles have been attributed to their foreign subsidiaries. Among these, a new role of particular interest for MNCs, from the strategic perspective, has been observed when a subsidiary has a relevant participation in the management of technology innovation process related to the corresponding business internationalization.

Considering this context, this paper investigates Brazilian subsidiaries which are in charge of technology innovation management, in foreign MNCs. The main goal of this research is to identify and analyze how some factors influence the role of subsidiaries, in relation to the management of technology innovation in a business internationalization process. Some of these factors selected from the literature are: excellence on technical and managerial competences; specific managerial skills on strategic international technology cooperation; and learning ability.

This research was originally developed as part of a dissertation in business administration (Costa, 2012). The case method was selected, due to the complexity of the phenomenon, which calls for in-depth analysis. The article focuses on a case study developed in the shock absorbers division of an Italian auto parts multinational group, namely Magneti Marelli Cofap (MM Cofap), whose main R&D center for this product line is based in Brazil. At first, a conceptual framework was developed, based on a literature review, in order to establish guidelines for the investigation and to prepare the interview scripts, which were pre-tested and then used to collect primary data. Based upon the scripts, semi-structured interviews were conducted with five key executives of the company (parent and subsidiary), which have been directly involved on technology innovation management, reaching almost eight hours of conversation.

The case study reveals that the main factors determining the participation of the Brazilian subsidiary in the technology innovation process are: technical excellence related to shock absorbers technologies; expertise on the management of strategic partnerships; high level of managerial capability on organizational learning; and distinctive abilities in knowledge management and diffusion. The focused subsidiary has a role of a center of excellence for the shock absorbers business unit, managing its global operations, as well as the R&D and innovation activities, spread over four different countries.

During the research investigations it has also been discovered that the studied subsidiary took part of the internalization processes of MM Cofap, when the parent company expanded its operations to the USA, Italy, Poland, India and China. It was found that the Brazilian subsidiary was responsible for the whole process of technology and knowledge transfer. This paper presents an in-depth investigation about one of the internationalization episodes, which is the creation of a joint-venture between MM Cofap and a local partner in India, emphasizing the main duties and
responsibilities assumed by the Brazilian subsidiary in the process. More details regarding the other internationalization occurrences can be found in Costa (2012).

The main contribution of the study is uncovering the factors which influence the role of the Brazilian subsidiary in the company’s technology development process, as well as its implications on the international expansion of the MNC. An additional result of the work is presenting a set of considerations about the management practices learned or improved by MM Cofap, which can be useful as a reference for MNCs willing to take advantage of its foreign subsidiaries’ competences, when defining and implementing their R&D and internationalization strategies.

Another contribution of this research is to evidence that nowadays some MNCs are taking advantage not only of existing skills in their home country’s units, in order to develop competitive advantages, but also of those skills and competences found in their foreign subsidiaries. In this regard, the results reinforce current theories about the subsidiary roles, which have detected an enlargement of the activity spectrum of foreign subsidiaries of the MNCs, as well as a progressive increase of its strategic relevance to the corporation, including their R&D and technology innovation activities.

2. Theoretical Framework

2.1 Role of the subsidiary in the internationalization

The ability of a multinational company to effectively and efficiently manage its dispersed capabilities has been considered by many researchers as a crucial resource for the MNC’s competitive advantage, whether it be conceptualized as a set of internalized transactions across borders (Buckley & Casson, 1976); as a differentiated network of affiliated companies (Ghoshal & Nohria, 1989), or as a community that crosses national borders (Kogut & Zander, 1993). Thus, a central issue in the debates about the nature and evolution of the MNC refers to its ability to identify, develop and leverage their capabilities found in their dispersed network of foreign subsidiaries (Frost, Birkinshaw, & Ensign, 2002). The concept of the subsidiary role, crucial to this research, has been developed with more intensity from the 1990s, and encouraging the publication of numerous papers in the area of international business (IB) (e.g. Jarillo & Martínez, 1990; Gupta & Govindarajan, 1991, 2000; Roth & Morrison, 1992; Birkinshaw & Morrison, 1995; Birkinshaw, 1997; Birkinshaw & Hood, 1998; Frost, Birkinshaw, & Ensign, 2002). These studies demonstrate that, depending on the function they perform and the resources and capabilities they develop, the subsidiaries may play different roles in the organization, and also that this role is typically dynamic and can therefore evolve over time.

Birkinshaw and Hood (1998) established an organizational model for the evolution of a subsidiary, based on three categories of decision: (i) decisions attributed to the subsidiary directly by the parent company; (ii) decisions made by the managers of the subsidiary, relating to its specific activities; (iii) decisions made jointly by the managers of the subsidiary and the parent company, based on contextual factors specific to the host country. For the case (ii) mentioned, the authors have defined a network model that allows the subsidiary to move from a...
subordinate position in relation to the parent company to a position of equity, or even leadership. This model recognizes that there may be specific advantages of the subsidiary, on which the remainder of the MNC is dependent. Having established the role of the subsidiary in the MNC, so that it grows and evolves, according to the authors, two assumptions are necessary: the growth of the capacities of the subsidiary; and the clear establishment of its charter, understood as the main business of the subsidiary in the corporation.

Regarding the transfer of knowledge between the units of an MNC (whether from the parent company to the subsidiary or vice versa, or between two subsidiaries), Gupta and Govindarajan (1991; 2000) found that the production of knowledge by a subsidiary is positively associated with the value of the subsidiary’s stock of knowledge; its motivation to share it and its capacity to absorb what is received. These authors proposed a typology for the roles of the subsidiaries based on the inputs and outputs of knowledge flows. Birkinshaw and Morrison (1995) also propose a typology for the strategic roles of subsidiaries of MNCs, presenting a comparative table with the taxonomies presented by other researchers. Cavanagh and Freeman (2012) presented an updated synthesis of these classifications, detailing the criteria and dimensions used in each one of them and incorporating some authors. The typology comprises three levels, which represent the growing strategic importance of each type of subsidiary for the organization: Local Innovative/Implementer (level 1), Specialized Contributor (level 2) and Center of Excellence (level 3).

The study by Frost, Birkinshaw and Ensign (2002) focused on the case of the foreign subsidiary that acts as a center of excellence, considered by the authors as a mechanism increasingly used by MNCs to identify and leverage existing niches of competences in their corporate networks. They define center of excellence (CE) as a unit of the organization that “embodies a set of capabilities that has been explicitly recognized by the firm as an important source of value creation, with the intention that these capabilities be leveraged and/or disseminated to other parts of the firm.” (Ibid., p. 997). According to these three authors, the appearance of CEs in foreign subsidiaries of the MNC seems to be a rarer phenomenon and more recent than its existence in the parent company. They claim, however, that the incidence of MNCs adopting structures of CEs should increase, both in quantity and in scope, and that the globalization and technological developments are two engines that will drive MNCs to adopt global settings increasingly complex, and finer divisions of competence and authority between the dispersed units of the company. The results of this study indicate that the investments made by the parent company are essential to the development of the capacities of the subsidiary, so that it is able to achieve the status of CE, and that the configuration of a CE manifests when the subsidiary is able to create and transfer to other units of the multinational, superior skills, which add value to the corporation.

The strategies of MNCs in relation to their subsidiaries are classified in different ways. However, there is no specific concern with units located in emerging countries. Although this is a relatively new subject in Brazil, several researchers have investigated the performance of subsidiaries of foreign companies in our country, aiming to better understand their strategic role (e.g. Fleury & Fleury, 2003; Boehe, 2008; Galina, Camilo, & Consoni, 2010). In their study Oliveira Jr., Borini and Guevara (2009) indicated two distinct periods in the evolution of the role of subsidiaries of foreign companies operating in Brazil. According to these authors, in the initial period the units
located in emerging countries such as Brazil only had to explore these markets and implement the strategies developed by the parent company. However, as from the 1990s, the flow of FDI entering emerging countries soared, increasing from US$ 30 billion in 1990 to US$ 224 billion in 2000 and reaching US$ 684 billion in 2011. With these high investments, multinationals longed increase their efficiency through global production chains and strategic assets, in addition to a greater dispersion and decentralization of activities.

This change of attitude has caused a significant change in the strategies of some MNCs which started to see their foreign subsidiaries as extensions of their capabilities and strategic resources, distributed among several countries and acting as centers for the generation of competitive advantage. In addition to the usual tasks (e.g. productive, commercial, managerial, financial), these MNCs started to entrust to their units abroad certain activities with higher value added, such as the development of new products, technologies, applications, and in some cases, even the basic research, aiming to improve the overall efficiency of the organization. Some subsidiaries take over even greater strategic responsibilities, becoming a sort of “regional headquarters” for a particular product line, or even acquiring a global mandate, with full responsibility on investments in development and production, to an entire product line.

2.2 Management of technological innovation, competitiveness and internationalization of business

It is possible to assume, in a perspective of innovation as a key determinant of competitiveness, that the economic development primarily depends on the renovation process promoted by people, companies, institutions, and especially by entrepreneurs, who are able to seize opportunities, investing and generating wealth. Therefore, stimulating business competitiveness requires the induction of behaviors favorable to a systematic and sustainable innovation, through continuous improvement and radical innovations Thus, innovation can be an effective strategy for business success, if we consider its potential to create competitive gains. Teece, Pisano and Shuen (1997) advocate the importance of innovation in their dynamic capabilities framework, analyzing the sources and methods for the generation of wealth in companies that operate in environments of rapid technological change. According to these authors, the competitive advantage of the companies lies in their processes (ways of coordinating and combining efforts), shaped by their specific assets, such as their portfolio of knowledge and know-how, and the evolutionary path that the company has adopted or inherited. Within this perspective, the creation of value in sectors of rapid technological change depends in large part on the company’s ability to continually refine their technological, organizational and managerial processes, identifying new opportunities and organizing effectively and efficiently to take advantage of them.

The dynamic capabilities framework partly stems from economic theories, from the basic understanding of imitability and competition, and also from the study of innovation and organizations. Many economic analyzes, however, are focused on analytically simple situations, where technology remains unchanged and the markets are in balance. The dynamic capabilities, on the other hand, especially focus on innovation (technological and organizational) and market imbalances (Teece, 2009). The author postulates that the maintenance of the dynamic capabilities
requires from the company the creation, integration and commercialization of a continuous stream of innovation, consistent with the customer needs and technological opportunities, employing mechanisms of detection, dimensioning and reconfiguration, to direct its financial resources consistently with the needs and demands of the market.

It should be noted also that in the past there was a great tendency to make innovations in the most “internal” way possible, in order to ensure their confidentiality, whereas, nowadays, companies have been increasingly seeking to combine internal and external sources, as knowledge is no longer exclusively concentrated in a few centers – universities, research institutes, government or selected groups of companies, large enough to support all efforts required in R&D. Based on these findings, Chesbrough (2005; 2008) proposes the concept of open innovation, emphasizing that the companies should use external ideas and technologies to generate innovation, as well as share with other companies their unused ideas. According to Chesbrough (2008), a business model focused on open innovation can address the problems of rising costs and limited potential to increase revenues that the innovation process had been causing in the organizations.

Another recurring aspect in the analysis of technological innovation in large MNCs is the strategy adopted in relation to the level of centralization for R&D activities internationally. The study of Vasconcellos et al. (2009) addresses the four key aspects involved in the international decentralization of R&D, especially the decision regarding which R&D activities should be decentralized among subsidiaries, and which should be retained in the parent company. They point out that companies with a wide range of R&D activities distributed in many different locations should create clear policies for the definition of the duties and responsibilities of each center, and illustrate these ideas through a scale used by 3M to manage its numerous R&D centers dispersed worldwide. The scale comprises seven different levels of complexity typically employed incrementally and cumulatively, to classify the R&D centers: (1) Technical support; (2) Product control; (3) Product engineering; (4) New product; (5) R&D; (6) Pure research support and (7) Pure research.

2.3 Alliances between organizations: frequent strategy in the internationalization of business

In many cases, multinational companies expand their operations abroad through international strategic alliances, since this approach may accelerate its expansion, allowing the company to gain access to new markets faster and allowing it to increase its own competitiveness, with the use of resources and knowledge from their partners (Kanter, 1994). According to Teece (1992), strategic alliances typically are agreements in which two or more partners share the commitment of achieving a common goal, combining their skills and resources, and coordinating their activities. A strategic alliance involves a certain degree of strategic and operational coordination of activities, and may include the following operations: joint activities of R&D and innovation, mutual transfer of technology, granting of exclusive rights of production and/or sale and cooperation agreements, among others.

It is worth it to point out that a technology alliance is a cooperation agreement between organizations, which typically include joint activities of innovation or exchange of technology.
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(Hagedoorn, 1996). Usually, the participating organizations expect to obtain with these agreements a lasting positive effect on its market positioning through joint efforts for innovation and/or transfers of technology (Schakenraad & Hagedoorn, 1994). Alliances are also a powerful way to improve organizational learning, technological leadership and capabilities based on knowledge (Hipkin & Naudé, 2006). A closer interaction between the partners may complement the internal developments and allow a faster access to new technologies that transcend the boundaries and responsibilities of each company individually. Thus, obtaining favorable results from alliances depend on an efficient governance of the strategic objectives of the partnership and the expertise of the partners (Ibid.).

In this scenario, it is also important to evaluate the role of the subsidiaries to the success of technology alliances involving MNCs, as did Baglieri et al. (2010) in their study about Fiat. In their research, it is clear the importance of the parent-subsidiary relationship, and the communication flow between them for the successful technology cooperation, in addition to the need to develop specific skills in some units of the MNC to facilitate the transfer of technology generated in the subsidiaries. The authors point out that technological alliances have been studied with more emphasis on the strategic decision process at the parent company level, and on the conditions for the success of the alliance. According to them, only recently the IB literature has begun to consider the role of the subsidiary in the expansion of the capacity of its parent company to develop intercompany alliances and joint ventures. However, the authors argue that the interaction between these two agents for the development of technological innovation continues to be investigated, especial from the point of view of the parent company, and they consider it important to develop a joint perspective to enable a more complete understanding of this dynamic.

3. Methodology

The case study method was selected due to the complexity of the issue and the large number of factors involved. The survey was conducted at MM Cofap, the shock absorbers division of an Italian auto parts multinational group, whose main R&D center for this product line is based in Brazil. At first, a conceptual framework was developed, based on a literature review, in order to establish guidelines for the investigation and to prepare the interview scripts, which were pre-tested and then used to collect primary data. Based upon the scripts, semi-structured interviews were conducted with five key executives of the company (parent and subsidiary), which have been directly involved on technology innovation management, reaching almost eight hours of conversation. Most of the executives have more than twenty years of professional experience at MM Cofap. The data for this case study were also obtained from documents provided by the company, as well as during a one-day visit made to the Brazilian R&D center, in the metropolitan area of São Paulo.

During the interviews, there was an attempt to identify which factors found in the literature had been relevant to the participation of the Brazilian subsidiary in the technology innovation and in the internationalization processes of the company, in addition to others occasionally mentioned by the respondents and which had not been listed in the literature review. The limitations of the
study do not allow a generalization of the results, but, on the other hand, this methodology allows for a more in-depth analysis, generating ideas that can be tested in future researches.

4. The Magneti Marelli Cofap Case

Magneti Marelli (MM) is an Italian company of auto parts with international presence, which currently stands as one of the world leaders in the development and production of high technology systems and components for the automotive industry, which is controlled by the Fiat group. This case study aims to address one of nine business lines of the company, its unit shock absorbers, also known as Magneti Marelli Cofap (MM Cofap).

4.1 Profile of the Magneti Marelli Group

MM was founded in 1919 in Italy, with half of the capital paid up by Fiat Torino and the other half by Ercole Marelli & Co. In 1967, Fiat acquired the shares of Ercole Marelli and assumed full control of the company. The group operated in several market segments along its history, undergoing several processes of mergers and acquisitions, and then, in the late 1990s, it started focusing on the development and production of systems and components for vehicles. In October 2002, the Fiat Group decided to transform MM into a holding company, grouping together all of its auto parts units, hitherto independent.

The MM group obtained € 5.9 billion turnover in 2011, with 8.5% growth in comparison with the previous year, with 34,800 employees distributed in 83 production units, 12 R&D centers and 26 application centers, and with operations in 18 countries: Italy, France, Germany, Spain, Poland, Czech Republic, Russia, Slovakia, Turkey, United States, Mexico, Brazil, Argentina, China, Japan, India, Malaysia and South Africa. According to the latest annual report of Fiat (2012, p. 76; 114), the commercial profit of MM in 2011 was € 181 million, almost double the € 98 million in the previous year, an increase that was obtained due to the increase in the sales volume and manufacturing efficiency, which offset the pressures of the high cost of materials.

The company stands in the market as “systemist” providing components and systems directly to major automakers in Europe, Asia and the Americas. Total investments accounted for 8.3% of the annual turnover of the group in 2011, with 5.4% only in R&D, with about three thousand employees involved in product innovation and process improvements in its technology centers located in four countries (Italy, France, Germany and Brazil), and in the application centers.

4.2 The role of the Brazilian subsidiary MM Cofap Brazil

With the advent of automakers in Brazil, in the 1950s, a park of auto parts suppliers was also established in the country. Cofap (Companhia Fabricadora de Peças Ltda.), founded in 1951, became in a few decades the largest producer of auto parts in Latin America, exporting to more than one hundred countries. Before its winding up and sale for two major international groups in 1997, Cofap had already initiated its internationalization towards Europe and the United States, integrating a select group of Brazilian MNCs. After the acquisition of its shock absorbers
division by MM in 1997, the second phase of internationalization was initiated, to countries such as USA, Poland, India and China.

The MM Cofap shock absorbers unit earned € 403 million in 2011, which is equivalent to 6.8% of the total of the MM group, employing approximately 4,300 employees. In addition to shock absorbers, this unit also produces gas springs, and sintered parts. The total investments of the unit reached 4.4% of the revenue in 2011, with 2.5% invested in its R&D and application centers, located in Brazil and in four other countries: Italy, Poland, USA and India. Its Brazilian subsidiary leads the production of shock absorbers in Brazil and Mercosur, with approximately 29.6 million units produced in 2011.

The coordination of the R&D activities for shock absorbers remained in Brazil, setting up this subsidiary as a center of excellence for this technology. In addition, it played a leading role in the internationalization processes of MM Cofap. The adoption of the Brazilian subsidiary (hereinafter referred to as MM Cofap Brazil) as the operational headquarter of the shock absorbers unit reflects its great strategic importance to the group. The director of this subsidiary is responsible for the overall result of the business unit, thus, besides the six directors present in Brazil, in its organizational structure, the managers from other subsidiaries functionally report to him.

According to the executives interviewed, MM Cofap Brazil has a “mandate” to manage the operation of the shock absorbers unit as a whole, acting, for a few issues, as a kind of “parent company”. In other respects, however, its structure is subject to the direction of the MM group. The entire definition of strategy, structure, investments and hiring require the prior approval from the parent company in Italy in order to be implemented. On the other hand, the coordination of the procedures for technology transfer is made directly by the Brazilian subsidiary, since the know-how and expertise for shock absorbers are in Brazil. Therefore, the MM Cofap Brazil represents a source of knowledge for the other subsidiaries, acting as a center of competence for this business line, and coordinating the development of innovations in technologies, products and manufacturing processes.

4.3 Core competences and technological innovation in the automotive sector

The automotive sector, which includes companies of auto parts in its value chain, such as MM, is currently facing one of the biggest challenges in terms of pressures for innovation, due to the declining profit margins and the increased presence of automakers in the global market. This requires companies to develop a great ability to search for opportunities in new markets and reduce costs, usually through international expansion. At the time of its acquisition, Cofap already mastered the core competences to design and manufacture shock absorbers, and this was one of the main attractions for MM to create its shock absorbers unit through its acquisition, in addition to its leading position as a supplier of this product in Latin America. Since 1979, the technological center for shock absorbers of Cofap already had suitable facilities and a highly qualified team of engineers and technicians to perform research and development (R&D), both for products and processes. MM had no prior know how of this product or knowledge about this market, and therefore the global competence center for shock absorbers is kept in Brazil until today, concentrating most of the activities of technological innovation and R&D.
In order to guide the technology strategy of the different units of the MM group, generic corporate guidelines are outlined (which are also in line with the strategies of the Fiat group, its controlling company), based on its mission, vision, values and strategic objectives. Based on this guidance, each business unit has the autonomy to develop and propose their own technology strategy based on market information, customers and competitors, as well as on the technological advances in their field of operation. This strategy is subject to the corporate approval of MM, in Italy. The units have specific products and markets, so that each one produces its own strategic technology plan, with little or no contact with the others – except in the case of the units for suspensions and shock absorbers, which have some interaction by the integration of these products to the vehicle suspension assembly.

The markets of each country or region also have different requirements, which influence the type of technology added to the products. In Europe, for example, there are peculiarities that need to be worked more intensely than in Brazil, due to the increased regulatory and market requirements, illustrating that some more sophisticated technologies can be applied only to certain regions, depending on their characteristics. On the other hand, the conditions of urban roads and highways in Brazil and India, for example, differ from those in the U.S. and Europe, requiring differentiated products. In each case, there is an evaluation of the products supplied and the vehicles on which they will be applied, as well as their positioning towards the competitors in terms of technology, quality and cost.

MM Cofap Brazil has full autonomy for the R&D activities, from a technical standpoint, but the budget and the strategy must be previously approved by the parent company of the group. The shock absorbers unit has a board of engineering in Brazil, which is also responsible for R&D, and two technical centers (TCs), located in the U.S. and Italy. The strategic technology plan is common to all TCs, whose coordination is made from the Brazilian subsidiary. If there is a specific project theme, it is presented to the board of engineering, which approves, prioritizes and manages the portfolio of projects. In addition to the structure mentioned above, there is also a TC in Poland, which works as an extension of the TC in Italy, in addition to an application center (AC) adjacent to the plant in India and another under construction in China, for validation tests and application of products. The organizational structure that supports these activities employs approximately 200 people, of whom almost 80% are in Brazil, and the management is under the responsibility of the Brazilian director of engineering.

The TCs include the following activities: new product designs, development and optimization of processes; applications of shock absorbers in new vehicles, jointly with the client-automakers; performance and durability tests on components and products; and the development of suppliers. Shortly after the acquisition of Cofap, still in 1997, an area for innovation engineering was created (located in Brazil until today), with the mission of developing new technologies not available in the company and new materials for use in shock absorbers. Over the years, the portfolio of innovations increased. The technology was also disseminated to the technical center of Italy, which develops innovations focused on the European market. MM Cofap has its own facilities for R&D and engineering (laboratories, workshops), but the most important is the Brazilian center, concentrating about 80% of the equipment. There are various test instruments in the laboratory of the Brazilian TC and also in three buses that were adapted to operate as mobile laboratories, allowing the performance of tests and trials with customers of the company. There
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is also an indoor test track for testing the shock absorbers installed in the vehicles, in the plant of MM Cofap Brazil, in Mauá.

The other TCs (Italy and USA) have certain autonomy, but with facilities having less capacity and reduced teams. In the Poland TC, whose lab is adjacent to the plant, the new products are tested during the tryout of the lines (usually six months before the beginning of production) to support quality control and the validation of the processes. When more sophisticated tests are required, the Brazilian TC is contacted, which provides personnel and equipment. We asked the respondents to classify the various centers according to the seven levels of complexity of R&D of the 3M scale, mentioned in the theoretical framework (Vasconcellos et al., 2009). According to the respondents, the Brazilian subsidiary is at level 7 (maximum), which includes some initiatives of basic research; the TC of Europe (Italy/Poland) reaches level 5, with the development of new products, from basic technologies already mastered by the company; and the TC in the U.S. is at level 3, making adaptations of existing products to the local market. It was emphasized, however, that the TC in the U.S. should evolve over time up to level 5, and that the also company intends to create R&D centers in India and China.

Also according to the respondents, the subsidiaries have autonomy to develop local innovations, but the information is shared with all units from the early project stages, to avoid the duplication of efforts and maximize the synergies between the teams. It was emphasized that the centers located in Brazil and Italy have the capacity to develop innovation in technology and product, serving the entire unit of shock absorbers, while Brazil and Poland have competence in the area of processes, for the production and transfer of knowledge to other subsidiaries. The tendency is that in the future, the U.S., India and China have local capacity in the processes and products already known, but for new products and technologies, the development would remain concentrated in Brazil and Italy.

MM Cofap works with different types of partners in their R&D projects. There are partnerships with universities, research institutions and suppliers, in addition to hiring, in specific cases, external consultants. The respondents mentioned a few partners of the company in Brazil, listed below: Universidade Estadual de Campinas (Unicamp); Powerbust (company of fluids for shock absorbers); Universidade Mackenzie and Universidade Federal do ABC (Masters programs); other divisions of the MM group (Powertrain and plastic components); in addition to the suppliers of components and raw materials. In case of Italy, the following partnerships were mentioned: a Swedish supplier of electro valves, for the shock absorbers with continuous control; two suppliers of hydraulic pumps for the lifter (one Swedish and the other from the U.S.), with applications in vehicles from Ferrari and Lamborghini; one U.S. supplier of electro valves for DSV (double stage valve); and a Dutch supplier of a valve that was designed for McLaren, which was adapted for customers of MM in the segment of luxury cars.

4.4 Creation of a subsidiary for the production of shock absorbers in India: the role of the subsidiary MM Cofap Brazil

In order to elaborate its five-year strategic plan, MM conducted a thorough market study, which indicated that some of its business units should expand their international operations, including the shock absorbers unit, aiming to monitor the increasing globalization trend of the global
automotive market. Based on this study, it was determined that this unit should start prospecting in the global market in order to seek business opportunities in emerging markets. The resulting plan included the following strategic objectives: (i) expand the presence of MM in the emerging Asian market, preferably through associations with partners who were already present in this market; (ii) eliminate the technological gap and expand the product portfolio; (iii) ensure the presence of the products from the shock absorbers unit in all commercial offices of MM, settled in the customers’ decision-making centers (and open new offices, where necessary); (iv) concentrate the sales force on customers with higher volume and profitability growth (Japanese and Korean automakers); and (v) increase the suppliers base of MM worldwide.

In the case of shock absorbers, a strategic option was adopted by India, since the automotive market in India is one of the largest in the world, with high annual growth rates, and the possibility of using a plant in India also as an export platform for other countries in Asia and Europe. Companies such as Volkswagen, Suzuki, BMW and Toyota produce vehicles in that country, in addition to Fiat itself, whose presence in India was a crucial factor for the decision, since the automaker wanted to expand the content produced by MM in their vehicles, in that country. At the time, the shock absorbers for the vehicles assembled by Fiat in India were supplied by another manufacturer. In addition, other lines of auto parts of MM were already present in the country, and the existing administrative structure would facilitate the implementation of the shock absorbers business. On the occasion, there was also a unit of MM interested in developing batteries for electric cars, which would benefit from the expansion of the MM group’s presence in the country. In addition to these favorable factors there was the availability of raw materials and components at competitive prices, the access to plenty and low cost skilled labor, and also, one of the highest rates of graduation of engineers in the world. These characteristics reinforced the choice of India for the implementation of a new plant, initially only for front shock absorbers (structural) to the local market, but with the possibility of becoming a production base for export in the future.

It was decided that the Indian subsidiary would be deployed through a joint venture (JV) with a local partner, following a preferential policy of the group, due to the following positive aspects of this form of entry, especially for the case in question: (i) facilitate the deployment and business management in the Indian market, since the partner would have greater knowledge about the logistics chain, suppliers, potential clients and local legislation; and (ii) greater synergy of investments, with the possibility of using the existing machines of the partner, adapting them to the standard production process of MM Cofap. According to the respondents, after these initial decisions – the country of destination will be India, and the entry will occur through a JV, the Brazilian subsidiary acted with enough autonomy in this process of internationalization, with a very intense participation. As soon as the JV agreement was signed, several missions Brazilian engineers and technicians traveled to India, evaluating and selecting local suppliers of parts and raw materials. To accommodate the Brazilians who remained in the country during this period, a guest house was prepared. A plan for the transfer of technology (product designs, manufacturing processes, quality, inspection) was developed, which required a large exchange of personnel, with Indian technicians visiting Brazil, and vice versa.

The construction of the plant quickly began, in July 2008, only two months after the official start of the partnership, and in May 2009, the work was completed. While the new building was built,
all the knowledge necessary to sustain the operation was being transferred to Endurance Magneti Marelli (EMM), as the JV was called. Initially, the general premises of the project that guided the entire transfer of technology was transmitted to the Indians, based on the business plan prepared by marketing and sales teams, defining which products would be sold to the customers in India. Depending on the models, drawings and volumes of shock absorbers in the plan, the particularities of the local products were analyzed, setting up the machines and processes best suited for their manufacture, and which components should be bought directly on the market.

All stages of the process of knowledge transfer were explained in detail to the Indians. The important aspects regarding the product manufacturing were highlighted to the technicians, e.g. what were the maximum permissible deviations in each dimension specified, and how was the evaluation of a supplier in OEM contracts. There was a special attention to that because the staff of Endurance had a very strong culture, focused on the replacement market, which needed to be adapted to provide products directly to the automaker. The criteria for the qualification of suppliers were presented, detailing the processes of quality audit. There were also meetings with the procurement team to define the sources of supply of raw materials and components, and the presentation of the rules and procedures of MM Cofap to request quotes and price evaluation.

In the product engineering, the concept and principle of operation of the shock absorbers produced by MM Cofap Brazil were transmitted to the Indians of the JV, in addition to the know-how of their key features in relation to the products manufactured previously by Endurance. For example, MM Cofap holds the patent in Brazil for a hydraulic stop, a device that operates within the shock absorber; all the knowledge required to apply this technology to the local products was transferred to the technical team of EMM, enabling the manufacture of shock absorbers with this device in the Indian subsidiary. There was also an investment to build up a laboratory for product testing and for the manufacture of specific tooling for the lines of EMM.

For the application engineering, it was decided that, in cases of carry-over of existing products (i.e. update for a new model year), the drawings of Brazilians products should be used (translated into English) with the due adjustments made by the team of EMM. However, in cases of significant change, the Brazilian engineering should be involved, especially in if it concerned a new product or manufacturing process or if it presented a high level of innovation. In short, it was decided that the design of products and the definition of the processes would continue to be made by MM Cofap Brazil, while the Indian engineering would focus solely on adaptations of product or process for the local needs. The process of knowledge transfer was fully coordinated by the industrial area in Brazil, from the selection of people who would be sent from Brazil to train Indians; from the manufacturing processes to be adopted in the Indian plant; to the jointly operation with the team of EMM to perform the first activities in that subsidiary. During the initial period, said one of the respondents, it was as if the Brazilian subsidiary team was working remotely, from Brazil, and working side by side with their “partner” in the Indian EMM, to prepare budgets, select people, prepare the plant layout and the documentation of the processes, among other issues.

In August 2009 the training of the operators who would work in the Indian plant began. Some operators came to Brazil in key phases of the project so that they could be trained in hands-on sessions, operating the machines existing in the plant of MM Cofap Brazil, in Mauá, whose
production is similar to the one settled at EMM. In December 2009, the transfer of technology was concluded and the tryout of the lines and equipment began. The production of shock absorbers of MM Cofap in India began in January 2010, one year and a half after the establishment of the JV, complying only with the domestic demand in India and employing approximately 250 people. At that time, the plant had 9,100 square meters of built area, on a land of 31,000 square meters, allowing future expansions of its operations.

5. Discussion of the Results of the MM Cofap Case

The evolution of MM Cofap Brazil in Magneti Marelli corporation can be analyzed and understood according to the network model proposed by Birkinshaw and Hood (1998), since the operational decisions regarding their specific activities, or even many relating to subsidiaries in other countries, are made by the leaders of the Brazilian subsidiary. Especially in the field focused on the development of innovations for products and processes, and in their migration to the new production units established in other countries, emerging or not, the Brazilian subsidiary has operated with a relatively high power of decision. The case of MM Cofap Brazil can be analyzed also in relation to the flow of knowledge, considering the model proposed by Gupta and Govindarajan (1991; 2000). Based on the finding that the company has a technology center headquartered in Brazil, for the development of damping technologies, the Brazilian subsidiary can be considered a global innovator, providing knowledge and skills to subsidiaries of the shock absorbers unit in other countries. This analysis is consistent with the role played by the Brazilian subsidiary during the process, getting involved from the early stages of partner selection, survey, qualification and development of suppliers, transfer of know-how and training of human resources in India, among others.

To achieve this goal, this business unit has sought to exploit its technological and operational superiority, found predominantly in its Brazilian subsidiary, since it possesses specific skills about shock absorbers not existing in the parent company or other subsidiaries of the group. Therefore, it can be observed in MM Cofap Brazil, the settlement of a center of excellence for shock absorbers according to the concepts supported by Frost, Birkinshaw and Ensign (2002), so this subsidiary plays a strategic global role (level 3) according to the classification of Cavanagh and Freeman (2012). On the other hand, in the episodes of internationalization studied, one can say that the other subsidiaries of MM Cofap (in USA, Poland, India and China), play the role of implementing or local innovative units (level 1), aiming to increase the company’s sales and market share in these markets, also being able to act as an export platform to other countries.

It can also be emphasized, as an important characteristic of Cofap (precedent of MM Cofap Brazil) in the period prior to its acquisition, the fact that it had started its internationalization process late, facing from the start the challenge of the competition with multinationals in its own country. Even in this period, with strong internal competition, Cofap was positioned as an exporter of products, competitive, and remained as the leader of the Brazilian market of shock absorbers. As stressed by Ramamurti (2009), to overcome this challenge, the company needs to achieve an advanced level of technology and management – as was the case of Cofap, and this
was a crucial factor for the leadership of MM Cofap Brazil in the episodes of internationalization investigated.

By evaluating the mastery of core competences by the subsidiary, it can be said that, even before its acquisition, Cofap already mastered the technologies of product, manufacturing processes and application of shock absorbers, and had deep knowledge of this market, which eventually translated into a major attraction for its acquisition by MM. As the mastery of these competences remains high until today, this factor proved to be the predominant motivator and facilitator for the remarkable participation of the subsidiary in the internationalization process evaluated. Its technological innovation capacity also proved to be a notorious factor, because MM Cofap Brazil has its own structure for R&D in product, processes and application of dampers with a qualified team of engineers and technicians, in addition to proper laboratories in its TC in Mauá unit. The Brazilian board of engineering, also responsible for R&D, also coordinates the TCs in other countries. The innovation engineering area, created in the Brazilian TC in 1997, develops new technologies not available in the company and new materials for use in shock absorbers. This area has partnerships with universities, research institutes, suppliers, customers and other divisions of MM, and work together with other TCs, benefiting from technological partnerships held with institutions from more developed countries.

As seen in the study, the MM Cofap Brazil is the world’s center of excellence of MM’s shock absorbers technologies until today. The behavior of the MM group is in line with the conceptual model of formation of TCs of Frost, Birkinshaw and Ensign (2002): due to the formal recognition of the superior capacities of the Brazilian subsidiary and its contribution to the entire organization, it achieved positive performance in profitability, competitiveness, innovation and learning; the result was to induce the parent company of MM to make new investments in that subsidiary, thus feeding back the process, as specified in the model of these authors. In short, similarly to what was observed with the role of the subsidiary, the factors related to the mastery of core competences and its technological innovation capacity were, at the same time, motivators and facilitators for MM Cofap Brazil to be ahead in the processes of international expansion of the company’s business.

With respect to the subsidiary’s competence in strategic alliances, it is worth noting that the Brazilian Cofap already relied on an extensive history of strategic partnerships, prior to its acquisition by the Italian multinational (e.g. technology licensing, joint ventures, alliances for R&D). Currently, MM Cofap Brazil maintains partnerships for R&D and innovation with universities and research institutes, such as Unicamp; with strategic suppliers, such as Powerbust, and with the Powertrain and Plastic Components divisions of MM, among others. It uses these alliances to improve its skills based on knowledge, as argued by Hipkin and Naudé (2006), complementing its internal developments and allowing faster access to new technologies. Thus, due to this competence, the subsidiary played an important role during the negotiation of the conditions for the creation of the alliances. However, the formalization of partnerships at MM is conducted by its corporate area of business development, experienced in strategic alliances, which provides support to the business units of the group. Therefore, it was found that the competence of MM Cofap Brazil in strategic alliances was also an important motivator and facilitator for its participation in the internationalization of the group.
It was also observed that the organizational learning and the dissemination of knowledge are strengths of the Brazilian subsidiary, and can be considered in the analysis as facilitating factors for its participation in the processes of technological innovation and international expansion. It is worth to point out the creation of the knowledge management area, in the engineering division in Brazil, and the intensive use of the software platform for collaboration, which provides access to all the knowledge produced. The training of employees is managed by the human resources area, and is based on training and facilitators. However, in cases of specific technologies or projects, key employees are trained and they transfer the knowledge to others through meetings, internal courses or workshops. In cases of transfer of knowledge to new subsidiaries, the on-the-job training resource was widely used.

The participation of the Brazilian subsidiary in the various aspects of the implementation of the strategies outlined by the corporation for its internationalization has always been very intense and comprehensive, as soon as the two main points of the strategy were defined: the country of destination and form of entry. Regarding the creation of the JV with Endurance in India, the team of MM Cofap Brazil was responsible for the negotiations with the partner; preparation of the business plan; project management; definition of processes and equipment; transfer of technology; as well as the support to the partner for setting up the operation; selection and technical qualification of the suppliers of components and raw materials; and training of the partner’s staff in management activities, transferring the methods and procedures adopted by the MM group. It was also observed that in the process of expansion to India, a member of the Brazilian team was appointed as the CTO of the new plant for some time after the beginning of the operation. Nowadays the CTO of this plant is Italian.

It is worth to point out that the technical team of the Brazilian subsidiary was responsible for the definition of products, technology, levels of verticalization, manufacturing processes and types of equipment that should be used in each new unit. Since this subsidiary is still the main holder of the technical knowledge of shock absorbers in the MM group, it is natural to heavily rely on its staff to conduct training processes and knowledge transfer, vital to the success of internationalization initiatives. It should be noted that the support offered by the Brazilian team for the selection and qualification of suppliers for new subsidiaries has been extremely important, as evidenced in the investigation of several episodes of internationalization of MM Cofap (Costa, 2012).

With regard to the main management practices learned and/or improved by the MNC with the process of internationalization, it should be pointed out initially that there has been a great learning with the Brazilian subsidiary, in the management aspect, due to the continuous experiences of internationalization, which is visible when analyzing its organizational structure and its role in the MNC. Given the challenges faced by the shock absorbers unit of MM since its creation, a board of engineering was structured in its unit in Brazil, which is currently responsible for coordinating the technological activities of all TCs, globally dispersed, relating to product engineering, application, processes, R&D and innovation.

In addition, the overall operation of the business unit is controlled from Brazil and managerial mechanisms were developed to consolidate the results of all subsidiaries for the calculation of the overall result, which is under the responsibility of the manager of the Brazilian subsidiary.
Although the results are consolidated within a corporate structure, located in Italy, some Brazilian employees were integrated into the team responsible for this consolidation to facilitate communication. To coordinate these interrelationships, management tools were developed based on a matrix structure, implying that several areas in MM Cofap Brazil, besides being responsible for local activities, also operate in the coordination of correlated areas in subsidiaries in other countries. Another important aspect to be considered is that the board of engineering in Brazil, in addition to the responsibilities mentioned, also has strong participation in the internationalization processes in course, demanding a strong project management effort to sustain such participation.

Therefore, we observed a solid work for the readjustment of the management structure of MM Cofap, aiming to preserve and extend its preexisting skills (from the period prior to the acquisition of Cofap by MM), while it turned into a subsidiary of the Italian multinational. Given this new reality, a significant portion of the strategic decisions was subordinated to corporate managers of the MM group. However, certain autonomy was granted to managers of MM Cofap Brazil, through a mandate to operate as the “operational headquarters” of the shock absorbers unit. This may have been the most important learning of the MNC, from the managerial standpoint. The centralization of part of the decisions in the parent company aims to ensure the alignment of the various investment initiatives of the unit with the strategic guidelines of the corporation, while granting significant autonomy to MM Cofap Brazil (which heads the shock absorbers unit) is a way to take advantage of its agility in business, demonstrated in numerous situations throughout its trajectory.

6. Final Considerations

The processes investigated in the case study of MM Cofap constitute an important and rich field of research, as they represent a phenomenon still little explored in the literature: the subsidiary of an MNC from a developed country (Italy), located in an emerging country (Brazil), leading innovation and technological development and the internationalization of the company’s business to other emerging (India, China and Poland) or developed (USA, Italy) countries. We investigated and analyzed the motivating, facilitating and inhibiting factors impacting the processes; the responsibilities and tasks undertaken by the Brazilian subsidiary; and the main lessons learned by the multinational involved, which may be useful to support future initiatives in this direction by multinational companies in the same industry (or possibly others).

We evidenced in the case studied an advance in the management practices, allowing the company to expand its operations abroad through the operation of its Brazilian subsidiary. It was necessary to adapt its organizational structure and establish mechanisms and specific management tools, in addition to criteria for the definition of responsibilities and authority levels of decision to enable the management of globally dispersed operations. We found that the mastery of core competences, by the Brazilian unit of MM Cofap, and its role as a center of excellence for shock absorbers in the organization, were factors that made the participation of this subsidiary essential in the several episodes of internationalization of the company.
The case study conducted at MM Cofap made it clear that the parent company has preserved in its Brazilian subsidiary the core competences concerning shock absorbers, keeping it as the manager of this business unit, operating as a center of excellence, as conceptualized in the literature. Thus, this factor proved to be dominant over the others, as a motivator and facilitator, for the participation of MM Cofap Brazil in the episodes studied. It should be noted, however, that the main definitions and strategic decisions relating to the internationalization processes remained a prerogative of the parent company of the group, which, in turn, operates always in line with the strategies of Fiat, its controlling company.

We found numerous positive aspects in the case of MM Cofap Brazil, which proved to be able to implement several production units abroad, being responsible for the entire transfer of knowledge and even the management of the new units, at the beginning of their operation. These findings emphasize the importance of the participation of the Brazilian subsidiary in the internationalization process of the shock absorbers business of the MM group, allowing the conquest of new markets and the expansion of its global presence. For India, besides supplying to the local market, the subsidiary already started the production of shock absorbers aiming to export to the demanding European market.

However, it is worth noting here a limitation, mentioned by the respondents, arising from the absence of a specific structure to operate in the processes of internationalization, particularly for carrying out the activities involved in the transfer of knowledge to the training of teams in the new subsidiaries established abroad. We also found in this case study that the reduced size of the team responsible for conducting the process, and the fact that this team was also responsible for operational activities related to the daily routine of the Brazilian plant negatively impacted their effectiveness in the implementation of new subsidiaries in other countries. Despite the recognized limitations for the generalization of the case studies, the authors of this paper include a recommendation to the corporate managers of multinationals, in case of similar situations to that observed at MM Cofap, depending on the budget availability, the use of a more robust structure, with dedicated resources to ensure the compliance with the agreed deadlines and the desired quality levels, without compromising the regular activities of the pre-existing operations in the subsidiary, as well as the R&D and technological innovation functions. However, it must be considered the tradeoff between the benefits of this structure and its additional costs, which may demand a higher budget allocation.
References


Technology innovation management in MNCs’ business internationalization: the role of a Brazilian subsidiary from the automotive industry


