1) INTRODUCTION

The difference between a local firm and a multinational is international operations. Even though that might be taken as common sense, it is stressed in recent definitions by Rugman and Li (2007): “A MNE is a firm with some foreign sales and some foreign production, where the latter takes place in a wholly-owned subsidiary” and Hill (2008): “A MNE is any business that has productive activities in two or more countries”.

However, the role that Operations/Manufacturing plays in the internationalization processes of firms is not often addressed in the recent literature. In the area of Production and Operations Management, the sub-area of International Manufacturing is very young: M. T. Flaherty’s book on “Global Operations Management”, dated 1997, is considered as the first book that entirely dedicated to the theme. It seems that, formerly, there existed an assumption that Production and Operations obeyed to the same principles and were similarly organised independently of time and location.

On the other hand, the discipline: International Business, since the 50s, is wholly dedicated to the study of internationalisation. However, the Manufacturing function, although frequently mentioned, is rarely the main subject of its research agenda.

The internationalisation processes of the New Multinationals, firms from the so called emerging economies or BRICS, Brazil in particular, requires that the
Manufacturing function, here defined as “The entire process that takes a product from initial concept to its eventual use by customers, including design, production, marketing, distribution, service and disposal” (Gregory, 2003), be brought to the forefront of the analyses and interpretations. And, additionally, the movements of Brazilian firms must be addressed by considering their relative strengths and weaknesses in relation to the existing manufacturing systems operated by the traditional MNEs.

This article is structured in four sections. After this introduction, a brief review of literature on International Business will be presented. An historical perspective is adopted because the construction of theory in International Business (IB) has been influenced by the origins of the firms which were under study and by timing. In the section that follows, the current landscape of Production and Operations activities is framed, because that explains the main opportunities and threats over the internationalisation processes of firms from the BRICS. That concerns especially the early-movers, the traditional MNEs whom, in the last 20 years more or less, are undergoing continuous restructuring processes, caused by a variety of factors. It is assumed that the main characteristics of the current process of internationalisation of firms from the BRICS is primarily justified by that restructuring process. Thus, alternative frameworks to describe the changes in the organisational pattern of production and operations configuration worldwide will be presented.

In the subsequent section, a field research carried among Brazilian Multinationals is described and the insights about the question formerly addressed are highlighted. And in the final section the main conclusions are presented.

2) A REVIEW OF LITERATURE ON INTERNATIONALISATION AND THE ROLE OF MANUFACTURING

The literature review reveals that, after WWII there were two periods that were especially propitious for the internationalization of firms. The first period, in the 1950s and 1960s, was led by firms from the Advanced Industrialised Countries, especially the USA, and set the stage for the pioneer approaches that, in time, evolved into the current IB mainstream.
The second wave of internationalisation originated from a different set of factors and is mainly related to the internationalization of Japanese firms. Even if they might have profited from the body of knowledge available at that time, Japanese firms were successful in their internationalization processes because they did not follow the established logic; instead, they created new competitive advantages based on factors not taken into account in the earlier literature.

The third wave concerns the internationalisation of firms from the BRICS, the late-movers or late-comers in international manufacturing. It is likely that the late-movers, the new MNEs from the Emerging Economies, and particularly from Brazil, will be creating novel strategies for internationalisation in order to become successful in the prevailing environmental conditions.

Figure 1, below, represents the three waves of internationalisation.
2.1 The early-movers and the role of Manufacturing

The first wave of internationalization is essentially related to firms from the Industrially Advanced Countries, in the post WWII period. The American firms such as Caterpillar, GM, Ford, among others, were the main protagonists.

The theories developed at that time reflect a situation in which the internationalizing country and firm, for having superior competences and resources, took the decision to internationalise based on strictly economic reasoning. For example, Ietto-Gillies (2005) considers Stephen Hymer to be the author of the first modern theory of large firms’ ‘international operations’. She argues that “Hymer’s demarcation criterion between FDI and portfolio investment is control. Direct investment gives the firm control [and increased market power] over business activities abroad; portfolio investment does not”.

Vernon’s “extended product life cycle” theory (1966) departs from a similar assumption. Since firms from advanced countries take the lead in the development of new products and services and exploit them in their home markets to the point of saturation, it is only a marginal investment for them to transfer operations abroad, exploiting new markets by offering products already obsolete in their home countries. Therefore, the role of manufacturing in their internationalisation processes was essentially related to establishing new factories abroad and transferring technology (products, processes, methods and procedures) that already existed in their home countries. Evidently, adaptations were required at the host countries, but that was not of minor relevance.

2.2 The internationalisation of Nordic firms and the identification of the Nordic approach

Later, the internationalization of the Nordic enterprises revealed a distinct pattern in internationalisation processes. Since their national markets were relatively smaller, becoming international was a prerequisite for growth. Flaherty (1997) explained the greater importance of foreign markets for Scandinavian enterprises when compared to their competitors originated from larger markets, the U.S.A. in particular.
The pattern identified by the Nordic School was developed by focusing on actual
decision-making at firm level. It is built over the concept of bounded rationality:
managers acknowledge that the complexity of the decision at hand is greater than their
capacity for modelling and processing. This being the case, firms internationalize
gradually, choosing their paths in such a way that every step represents no more than an
incremental challenge and learning from this experience in order to move to further
countries and markets. Because a firm’s absorption capacity expands incrementally,
internationalization processes were often viewed as evolving slowly and gradually;
firms would adopt a sequential process of internationalization by moving first into
psychically closer countries in order to avoid uncertainty and minimize risks.

Therefore, according to the Nordic School, the internationalisation of
manufacturing would have experimental features aiming to the creation of a learning
experience that would gradually increase the knowledge stock of that firm thus allowing
its increasing commitment to international manufacturing and operations.

In a way, the Nordic School’s approach attenuates the assumption of “easy
internationalization” implicit in the early approach. There are risks that cannot be
anticipated in the decision-making process and there are risks that emerge only after the
internationalization process is its implementation stage. Therefore, Manufacturing
would play a different role: instead of being a passive organizational function
responsible for the implementation of a pre-defined strategy, it would be an active
player in the process of learning and strategising about the internationalisation process
of the firm.

2.3 The role of Manufacturing in the internationalisation of Japanese firms

Though Japan has an ancient tradition as an industrialized country, its
emergence as a global player occurred during the 70s and 80s and the country is
regarded as a “late-industrializer” in recent literature. To Western eyes, the increasingly
competitive power of Japanese industry was initially considered to be a product of local
conditions: “the Japanese are different”. But, the story was more complex and, in
reality, true acceptance of Japan’s international power was only achieved once Japanese
subsidiaries operating in the U.S.A., using American workers, began performing better than their local competitors.

Still, Japanese industrial growth and the internationalization of their enterprises occurred at a time when environmental conditions favoured their action. One of the key points was a change in the general functioning of products and markets. Until the 70s, most markets operated according to the “seller’s law”: since demand was greater than supply, producers established their rules and procedures and imposed them on consumers. Japan’s rise coincides with a set of events in the global macro-environment that led to a shift in certain markets, where increased production capacity caused supply to exceed demand. Markets started to operate under the “buyers’ law”: power shifted to consumers, while quality became the chief buzzword. The Japanese industry was the first to operate according to this new rule. The Japanese Production model offered a paradigm shift and allowed Japan to catch up with the most advanced countries.

Japanese industry was preparing for this conjuncture for a long time. Fleury and Fleury (1995) observed that after IIWW, the Japanese catch-up strategy went through three different stages: learning at the production level (1945 to 1964), linking markets to the production process (1964 to 1973) and consolidating the Japanese Production Model (from 1973 onwards).

The upgrading of Japanese firms occurred within a national context in which “the purpose of [Japanese] industrial policy is to promote internationally competitive business enterprises in markets that are continuously being reconstituted by strategically aware competitors” (Best, 1990). Within this context, it is also important to recall the role of the Ministry of International Trade and Industry (MITI) as the conductor of the process at the macro level (Friedman, 1989); the role of associations such as JUSE – the Japan Union of Scientists and Engineers and JPC – the Japan Productivity Centre, among others, at the meso-level, as catalysts and sources of information for Japanese industry’s continuous and rapid upgrade; the specific features of Japanese inter-organizational arrangements, such as the zaibatsu and the keiretsu (Aoki, 1990; Fruin, 1992); and the specificity of the Japanese industrial relations system.

In their internationalization process the Japanese firms seek to maintain their the managerial model as a competitive advantage: “When they set up their factories abroad, Japanese manufacturers usually try to transplant key elements of the so-called Japanese
Model of Production (JMP), which is their mainstay in global competition” (Watanabe, 2007). That was clearly observed in the case of Japanese subsidiaries in the USA, where the first criterion for the decision about the location of a greenfield plant was the site to be in a non-unionized area.

Therefore, in relation to internationalisation and the role of manufacturing, what seems to be particularly noteworthy is the trajectory of the country and firms in terms of preparation and entry strategies into international markets. Japanese industrial internationalization was a process that was prepared for at least 30 years and that was based on a very carefully planned and implemented entry strategy.

Additionally, the emergence of Japanese multinationals raised the hurdle for all firms that were already in international markets as well as for those that intended to become global players by establishing new standards in terms of productivity.

2.4 What the literature has to say about the role of Manufacturing in internationalization?

In summary, depending on the origin of the firms which were chosen for research purposes and the timeframe, it is possible to identify three different roles for the manufacturing function in internationalisation processes as roughly sketched below:

<table>
<thead>
<tr>
<th>American/European firms</th>
<th>Economic reasoning &gt; decide &gt; transfer</th>
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<tr>
<td>Classical IB approach</td>
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<table>
<thead>
<tr>
<th>Nordic firms</th>
<th>Decided &gt; create experiential plan &gt; learn &gt; decide &gt; transfer</th>
</tr>
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<tbody>
<tr>
<td>Nordic School</td>
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</table>

<table>
<thead>
<tr>
<th>Japanese firms</th>
<th>Observe &gt; imitate, learn and improve &gt; catch-up &gt; innovate &gt; transfer (greenfields)</th>
</tr>
</thead>
</table>

The above mentioned Multinationals started their international trajectories some time ago. Actually, the World Investment Report 2006 mentions that there exists around 77,000 MNEs which control 800,000 subsidiaries all around the world. They are in an advanced stage in relation to the new Multinationals and they create the competitive environment for them.
Therefore, it is important to understand what are the current concerns in regards to international operations for the established MNEs. This has repercussions on which are the main issues on International Business and International Manufacturing.

2.5 The internationalisation of late-movers: trajectories, opportunities and threats

A review of the literature characterise enterprises from the Large Emerging Economies as follows: a) mature and integrated enterprises which grew on protected or uncompetitive markets (Ghoshal and Bartlett, 2000; Ramamurti, 2004); b) based on natural resources and utilising low-cost labour; c) lacking technological capabilities (Dunning, 1993); d) laggard in terms of managerial capabilities (Ghoshal and Bartlett, 2000); e) embedded in turbulent environments (Khanna and Palepu, 1999). Those firms are struggling to internationalise under conditions that are radically different from the ones faced by traditional MNCs. The following environmental characteristics must be highlighted: i) the highly competitive conditions prevailing in most industries; ii) the traditional MNEs, the early-movers, being in a process of restructuring and rationalising international operations, focussing on highly value adding activities, and seeking the command of global production networks; iii) governments assuming a new role, seeking attract foreign firms through public policies, aiming to improve the achievement of their national, regional or local objectives; and iv) the institutional mechanisms that rule international trade in a process of consolidation.

The argument that will be defended in this paper is that the current movement of internationalisation of firms from the Emerging Countries is justified, mainly, by the reconfiguration of Global Production Systems created by the early-movers and the opportunities that it creates.

3) THE RECONFIGURATION OF GLOBAL PRODUCTION SYSTEMS

In today’s dynamic and, much of the time, turbulent environments, companies are becoming different from each other; they are not the monolithic divisionalised enterprise proposed by Chandler (1962) whose international structure has been studied by Stopford and Wells (1972). Currently, they adopt idiosyncratic structures and
assemble into distinct configurations, resulting in a variety of production systems or networks (Egelhoff, 1988; Galbraith, 2000).

Given that the rate of change of production system configurations has been so great, it is not surprising that distinct frameworks are proposed to describe them. A supply chain is one example of an analytical framework and is possibly the one that is most studied and most important. But there are others which have a wide scope as presented in the next topic.

3.1 Modelling the reconfiguration of manufacturing enterprises in current times

The discussion and assessment of frameworks is relevant because both academic debate and managerial practices are based on frameworks, whether explicitly or implicitly. Moreover, since every analytical framework is derived from a theoretical approach, implicitly there is a choice of theory and the paradigm that “lies behind.

For example, focussing on recent changes on OEM type of firm [car assemblers], Karlsson (2003) observes that, currently, companies organize in a way that involves more and more activities that are external to the traditional organizational boundaries. In the OEM’s competitive environment, firms move from the product level to the level of selling functions that create customer value. To be able to handle much more complex offerings, companies abandon lower levels of technology and focus on system integration and product characteristics. The author proposes “an emerging role model for organization of the company with the focus on operations in networks”. The perspective created by Karlsson implies a shift from the enterprise to the extraprise.

Johansen and Riis (2005) in “The Interactive Firm – towards a new paradigm” create an interesting typology (or a template, as they mention), inspired by a research among Danish small and medium sized enterprises. The Interactive Firm would be a concept that codifies the most important characteristics of the firm of the future. It is then expressed in more concrete terms through the identification of three archetypes that may be used as role models: the Focused firm, the Networking firm and the Integrating firm. Each one of them combines, in different proportions, five distinct functions: full-scale production, benchmarking, ramp-up, prototype and laboratory.
Departing from a different perspective, Fleury and Fleury (2007) developed a conceptual framework for the study of production systems in general derived from the analysis of the Telecommunications industry: since this industry is considered as one of the pillars of the coming Information Society and Knowledge Economy, the application of that framework to other industries and production systems brings insights as to their recent changes and future trends.

Following a literature review of the evolution of the Telecommunications industry, the framework (TbF for Telecommunications based Framework) was built from scratch, using Grounded Theory, Case Studies and Delphi methods. The field for research was the Brazilian Telecommunications industry, considered as a microcosm of the whole industry. The TbF is composed by six types of companies, characterised by distinct profiles of organisational competences, interacting according to some specific patterns of relationships (Figure 3, below).

A word of warning is necessary in relation to the way in which firms are classified. In the large majority of cases, firms run different businesses and accomplish different production and operational activities. The categorisation of firms has taken
into account each firm’s main role in the functioning of the entire production network or system (or its core competence in the sense established by Prahalad and Hamel, 1990). For example, IBM is classified as an Integrator even if it performs activities related to Development and Manufacturing (Gerstner Jr, 2003). The same holds true for the automakers, or for the firms considered in the aeronautics industry.

The key features of typical enterprises in the TbF are presented in Figure 4, below.

<table>
<thead>
<tr>
<th>OPERATORS</th>
<th>Core processes</th>
<th>Key processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service providers (products and/or services), direct interaction with end markets, B2C</td>
<td>Marketing, customer relations</td>
<td>Service identification, development, implementation and operation</td>
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</tbody>
</table>

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<tr>
<th>INTEGRATORS</th>
<th>Core processes</th>
<th>Key processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complex system providers (integrating products, processes and operational systems, taking into account institutional requirements)</td>
<td>Customer driven systems design, engineering and delivery Management of large multidisciplinary projects</td>
<td>Systems engineering, institutional and financial engineering, technology monitoring and assessment, systems specification, procurement, assembling and delivery</td>
</tr>
</tbody>
</table>

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<tr>
<th>DEVELOPERS</th>
<th>Core processes</th>
<th>Key processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Providers of innovative products and solutions (product systems)</td>
<td>R &amp; D Breakthrough innovations</td>
<td>Advanced R&amp;D Complex products design and production</td>
</tr>
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</table>

<table>
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<tr>
<th>MANUFACTURERS</th>
<th>Core processes</th>
<th>Key processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Providers of parts, components (hardware and software), commodities, or routine services</td>
<td>Process and production engineering, efficiency</td>
<td>Manufacturing process conception, development and operation</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>TECHNOLOGY SPECIALISTS</th>
<th>Core processes</th>
<th>Key processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Providers of knowledge and information for the industry in general and Developers in particular</td>
<td>Basic and applied research</td>
<td>Scientific research Technological services</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LOGISTICS OPERATORS</th>
<th>Core processes</th>
<th>Key processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Providers of transportation services</td>
<td>Logistics</td>
<td>Transportation Warehousing Purchasing</td>
</tr>
</tbody>
</table>

Even if the role of Manufacturing is not self-evident from that structure one important contribution is that the framework positions Manufacturing in relation to the other organisational functions in respect to its strategic role. That is a key factor for the
analysis of the late-movers in international markets: what are their strengths? which type of position does the late-mover reclains when it moves? how does its position change in time after the initial internationalisation process?

4) THE RESEARCH PROCESS

The aim of this study is to discuss two questions:
1. What is the role to be played by the Manufacturing function in their internationalisation processes?
2. Is there any linkages between the movements of the Brazilian firms and the reconfiguration of global production systems?

To elaborate on those questions, a research design which consisted of the application of the distinct approaches to the Brazilian Multinationals was developed.

The methodological choices were, to a certain extent, limited by the nature of the research problem and the availability of research objects because Brazilian firms manufacturing abroad are simultaneously small in numbers but an extremely diversified group. Initially, a dossier about the 23 largest Brazilian multinationals was prepared. The analysis revealed common features of the internationalisation process of Brazilian late-movers.

Then, from the above universe, we selected four firms as case studies. Following the guidelines proposed by Pauwels and MatthysSENS (2004), we made a theoretical sampling. We first distinguished commodity producers from manufacturers, assuming that the comparative advantage of the former would be greater than the latter. Among the commodity producers we chose Voto Cements representing the privately owned enterprises and CSN, a recently privatised enterprise. As both had established international operations in recent times (in 2001), we considered that they would bring to light the reasons for the resistance in establishing foreign factories and how they are managing in very crowded markets: Voto Cement in the North-American market and CSN in the European market. Besides, both firms are relatively small in terms of size when compared to their global competitors. Among the manufacturers we were able to choose two polar types (Eisenhardt, 1989): Embraer and Sabo. Embraer is the worldly
known producer of aircraft, the third largest in that industry, a company that has built and exerts the coordination of a very complex and sophisticated global supply chain. Embraer has only recently established operations abroad, embarking on a JV with a Chinese firm. On the other hand, Sabo is an auto-parts producer, highly connected to the large auto assemblers and mega-suppliers since the mid-1970s. It is a relatively small enterprise who is building an interesting international trajectory initiated in 1992. For triangulation purposes we used as criterion for selection the existence of former studies about the firms as well as an extensive coverage from the specialised media. With this we intended to have material for a better reconstruction of the firms’ histories and trajectories as well as ammunition for checking the information collected in the interviewing processes. We also had meetings with consultants who were formerly contracted by those firms. The semi-structured questionnaire was applied to the Director of International Operations Manager and in two cases we also interviewed the Industrial Director and the Human Resources Manager. The analysis of individual firm’s reports brought additional subsidies.

5) THE CASE STUDIES

The Voto Cement case

Due to technical features and logistics costs, cement is an industry where long distance transportation is unfeasible; the geographic range of a given plant is highly limited. Therefore, the globalisation of the cement industry involves international acquisitions and partnerships mainly.

Votorantim is one of the most traditional industrial groups in Brazil, 100% Brazilian owned and concentrates its activities in the domestic market. However, after the economic instabilities in Asia, 1999, the international cement producers turned their attention to Latin America, Brazil inclusive (it is sixth largest in the world and half of the South American’s demand). The French Lafarge bought three local companies, Holderbank, a Swiss firm, acquired one, the Portuguese Cimpor another three. Under the threat of those international groups operating in its domestic market, Votorantim Cimentos started reviewing its locally focused strategy. By trying to expand to other
close markets (Latin America), the company found itself already encircled by its competitors in locations such as Venezuela, Colombia and Argentina. For example, Holderbank paid a high price for the control of an Argentinean cement company, thus avoiding Votorantim to enter into the neighbouring market.

In 2001, Votorantim acquired St. Marys, a Canadian company with plants in Ontario and in the United States and nine distribution terminals in the Great Lakes area. From 2003 to 2005, Votorantim acquired another four plants in the USA thus becoming one of the 10 biggest cement companies worldwide.

The idea of expatriating managers to manage the foreign plants was soon discarded. Knowing that their strength relied on Process Engineering and Operations Management, Voto decided that would transfer know-how through best practices (low cost operations supported by tools such as TPM, Six Sigma, Project Management, etc). The first version of the VCBP-Voto Cement Best Practices was rapidly prepared. Simultaneously, large exchange programmes were implemented. Since their acquisitions, the foreign plants are showing a constant reduction in costs (around 25%/year) and production and sales increase regularly. However, for the interviewed Brazilian managers, there one more important lesson yet which was associated to managing cultural differences, especially those related to interpersonal and labour relations.

The company is investing simultaneously in domestic expansion by building new plants, and has a goal of duplicating its international production in the next three years.

The CSN case

The Companhia Siderurgica Nacional (CSN) was established as a state-owned enterprise in 1941. It was privatized in the early 1990s. As a group, CSN holds business in mining, distribution, port terminals, rail roads and hydroelectric power stations. Exports share of steel products grew considerably after 2000, reaching the 60% level in 2003. The steel industry is going through a strong process of concentration where Mittal, an Indian producer whose head-quarters is in Luxembourg, is leading the way.
Technically, that concentration process is based on the premise that the ideal logistic configuration requires proximity between mines, mills and ports.

The main reasons declared for the internationalization of production were of a financial nature (hedging and revenues in strong currencies) and of a regulatory nature (overcoming technical and sanitary barriers). Its first international acquisition was Heartland Steel, in 2001. For CSN, its acquisition provided an excellent opportunity to entry into the American market. It is a focused plant that receives inputs from the Brazilian mills for the finishing parts of the production process (“postponement”).

The acquisition of a steel plant in Portugal, in partnership with Corus Steel (the merge of the Dutch Hoogovens with British Steel), in 2003, was the entry step into the European market. In the basic arrangement, CSN assumes the operational responsibilities while Corus deals with the commercial activities, mainly. Differently from Votorantim, as the Portuguese plant was relatively small, CSN decided to expatriate the Industrial Director and some staff to assist him in the reorganisation of the foreign factory. The new operational procedures were carefully negotiated and gradually implemented. The productivity of Lusinor, the Portuguese plant, has increased considerably and currently, as the expatriates have returned to Brazil, it operates in a very autonomous way.

The main benefits declared by the interviewees were related to experiential knowledge gained in terms of “real time understanding of the dynamics of global markets for being operating in advanced countries” and “the management of human resources and industrial relations in different cultures”.

The Sabo case

Sabo is a family owned enterprise, founded in 1939, that develops and produces application-oriented sealing elements and sealing systems for automotive industry, mainly. Sabo has a strong orientation towards international markets since 1977, when it became one of GM’s world-class supplier. Due to its high quality standards, Sabo exports for the European market and maintains an agreement with a German firm as its technology supplier since the early 1980s. In the late 1980s, cost became the prime
factor in the auto industry. Sabo managed to achieve cost targets without compromising quality, thus keeping a competitive standing as a global supplier.

The first factory abroad was in Argentina, in 1992, and, in 1994, after a long period (around seven years) dating Kaco, a renowned German producer, Sabo was authorised by the local government, to acquire the whole operation, which included three plants in Germany and one in Austria. Sabo kept Kaco’s profile of operations and started to use it as its European base and main source for Research and Development activities. In 1997, Sabo implemented a new factory in Hungary and, in 2006, its first factory in the USA. It also has commercial offices in the USA, UK, Italy and Australia to supply almost all automotive producers in the world.

The main point to be highlighted in the Sabo’s case is its role as a “follow source” in the automotive industry. The gradual and long involvement with the German producer gives an idea of the learning process that Sabo managed to create the necessary competences and knowledge to successfully move into higher performance standards in international manufacturing and in technological development, as well. Additionally, it has to be pinpointed that by acquiring a German firm, Sabo gained access to new sources of financial support.

*The Embraer case*

In a certain sense, Embraer was born international because airplanes are a global product. It was founded in 1969, as a state-owned enterprise, manufacturing civil and military aircrafts. In its conception, Embraer would be a driver for the Brazilian industry creating a demand for advanced products and precision engineering. However, the response of the local industry to the demand was not satisfactory, even though supportive mechanisms were available. Therefore, Embraer became almost self-sufficient and integrated, relying on a small number of international suppliers for the delivery of specialised systems, such as engines and avionics.

Its first civil product, a regional turbo was made for the internal market only, but the second family of products was designed and manufactured having the international market as main target. In the early years, a joint development programme with the Italian firm Airmacchi provided important inputs for the formation of its technological
competences. An alliance with Piper (USA), in the late 1970s, was crucial for the
creation of the competences needed for sales, services and maintenance in global
markets. Therefore, Embraer is a company characterised by early exposure to
internationalisation, having created competences in international partnering,
international technology transfer, international logistics and international trade from its
very start.

However, for a long period of time Embraer sold, in markets which can be
characterised as peripheral. In 1997, Embraer was privatised, after a long period of
crisis caused by poor product design. When the new administration took office, the
regional transportation markets were booming but financial and infrastructural
conditions were difficult. Thus, a new business model was put in place: for the
launching of a new product, a 45 seat regional jet, risk partnerships with four foreign
suppliers, from Chile, Spain, Belgium and the USA, were established. That
organisational model was innovative not for being based on a global supply network,
but for the cooperative character associated to partnering and risk sharing. In its
subsequent product family, a 70 to 110 seat jet, Embraer increased the number of risk
partners to 11, including large traditional MNEs. Therefore, Embraer might be
considered a successful MNE without having foreign subsidiaries.

6) THE INTERNATIONALISATION OF BRAZILIAN FIRMS AND GLOBAL
PRODUCTION SYSTEMS

Analysing the position of the Brazilian multinationals according to the analytical
framework formerly presented, it becomes evident that the four cases represent different
entry points and trajectories. Embraer is an Integrator; Sabo entered the international
markets as a manufacturer and, by acquiring Kaco, evolved for the position of a
Developer that keeps Manufacturing activities. CSN and Voto entered as Manufacturers
and are struggling to upgrade in the value chain.

Therefore, the key factor in the explanation of the internationalisation of
Brazilian enterprises seem to be the intangible assets associated to differentiated
competences in Process Engineering, Manufacturing and Operations Management for
all cases except Embraer, where a strong competence in complex products design and
project management provided the basis for negotiation with potential partners. CSN and Voto Cement, as commodity producers, are worldly recognised by their competences in Production and Operations Management; those are firms that achieve productivity levels similar or superior to their international competitors. As for Sabo it has been for a long time a distinguished follow source in the automotive industry.

It is interesting to observe the different approaches that the cases revealed in terms of how to manage the Manufacturing function. In the case of Votorantim, the diffusion of its Enterprise Production System was a key factor; that is not the case of CSN who has transferred its practices through informal means. In the Manufacturers group, both firms where soon exposed to the rules of international competition. As a leader of supply chains, Embraer was not successful in creating local suppliers and developed a successful international supply chain. Finally, Sabo is a successful follower, a firm able to manage its development aligned to the requirements of the leading automotive global enterprises.

Two firms moved earlier and two went international only a few years ago. The pattern shown by the latter suggests opportunistic strategies, with firms seeking to capture windows of opportunity in foreign countries. The pre-conditions for that to be successful involved the careful preparation of qualified people to take on, and rapidly, the responsibilities as well as having structured processes for the transfer of knowledge, formally or informally, in both directions.

However, the real drivers of those enterprises where located at an strategic level and what Manufacturing really delivered were the conditions to achieve those higher level objectives. Therefore success in international late-moving requires systemic innovation competences. Manufacturing, in particular, is expected to be agile and efficient in what concerns learning and evolution.

7) CONCLUSION

In their internationalisation movement the Brazilian enterprises are using the differentiated competences that they have built for operating in an extremely turbulent national environment. Their strategies are short term, supported by distinctive
competences in the technological and operational spheres, learning and reacting very efficiently and objectively to threats and opportunities.

The sequence of steps shown by the case studies suggests a rather preliminary proposition in regards to the internationalisation of Brazilian firms as pictured below.

<table>
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<td>Classical IB approach</td>
<td></td>
</tr>
<tr>
<td>Nordic firms</td>
<td>Decide &gt; create experiential plan &gt; learn &gt; decide &gt; transfer</td>
</tr>
<tr>
<td>Nordic School</td>
<td></td>
</tr>
<tr>
<td>Japanese firms</td>
<td>Observe &gt; imitate, learn and improve &gt; catch-up &gt; innovate &gt; transfer (greenfields)</td>
</tr>
<tr>
<td>Brazilian firms</td>
<td>Understand Global Value Chain &gt; decide &gt; acquire and upgrade &gt; move up the Global Value Chain (by acquisition or organically)</td>
</tr>
</tbody>
</table>

If that is valid, than Manufacturing must become “world class” previously to the internationalisation decision. The GVC analysis aims at finding opportunities for internationalisation within a context that is well known. After the acquisition, the Manufacturing function has to efficiently intervene in the acquired plant through a variety of means, thus upgrading it to world standards.

There are several limitations for any generalisation of the insights achieved so far. The main restriction derives from the bias of the sample firms studied. However, some guidelines for the establishment of an analytical framework appropriate for the study of the emerging multinationals from emerging economies were put in place.

REFERENCES


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