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Abstract

The literature on internationalisation processes has largely been concerned with the trajectory of a subsidiary unit in its host country. Following Johanson and Vahlne's (1990) suggestion refining the Uppsala model, in this paper we consider how simultaneous and interdependent internationalisation processes in multinational corporations can interact over time. Using the case of the historical trajectory of the subsidiary of a British firm in Brazil, we demonstrate how interdependencies in internationalisation processes across multiple spatial and temporal contexts can impact upon that trajectory. Based on this case, we put forward three propositions concerning the impact of interdependencies on the uniformity, direction and rhythm of internationalisation processes.

1. Introduction

Behavioural models of internationalisation (Aharoni, 1966; Johanson & Vahlne, 1977), are concerned with processes as well as outcomes of international expansion. A focus on process rather than the mix of variables that produce particular outcomes means that internationalisation must be understood in the context of the paths undertaken by firms to reach their current international status (Vermeulen & Barkema, 2002).

The behavioural programme research on internationalisation of which the Uppsala model is a best known offspring, can be broadly characterised as follows. First, a firm undergoes a sequential process of expansion starting from "psychically closer" countries in order to avoid uncertainty and minimise risks (Cyert & March, 1963; Johanson & Wiedersheim-Paul 1975). The internationalisation pattern of firms results from the continuous interplay between knowledge of and commitment to a particular foreign market (Johanson & Vahlne, 1977). Secondly, because a firm's absorptive capacity (Cohen & Levinthal, 1990) expands only incrementally, internationalisation processes are often viewed as slow and gradual (Johanson & Vahlne, 1977, 1990).

Since it was introduced, the Uppsala model has sparked off a number of empirical studies aimed at examining its theoretical assumptions and implications across various spatial and temporal contexts (Andersen 1993, 1997; Casson, 1994; Forsgren, 2002; Hedlund & Kverneland, 1985; Sullivan & Bauerschmidt, 1990). One particular argument of interest to this paper is the notion that the Uppsala model pays little attention to the internationalisation processes of multinationals (henceforth MNCs) (Forsgren, 1989, 2002), a point acknowledged by the model's progenitors (Johanson & Vahlne, 1990). More specifically, the Uppsala model does not take into account that knowledge in internationalisation processes are not only created by the interplay between a subsidiary and external actors such as buyers and suppliers embedded in the host country but can also be accessed through sister subsidiaries and external actors located elsewhere in the

MNC network (Holm et al., 1995)[1]. In other words, the model does not consider that there may be simultaneous internationalisation processes within the MNC network that are contingent upon each other in particular spatial and temporal contexts. According to Johanson & Vahlne (1990: 15), "*this interdependence between markets can be expected to have a strong impact on the internationalisation of the firm*".

The aim of this article is to look at the effects of the interdependence on internationalisation processes within the MNC network and on their pattern of evolution. Our reasoning is that a MNC can be conceptualised as a loosely coupled system in which a number of internationalisation processes co-evolve in different, yet overlapping networks (Mattsson, 1998). These processes can be simultaneously independent and interdependent in the sense that they can intersect and exert influences on each other across multiple spatial and temporal contexts.

We argue that this perspective can explain different outcomes from those suggested by the Uppsala model in terms of three dimensions of the pattern of evolution of internationalisation processes: uniformity, direction and rhythm. Following recent attempts to formulate dimensions of international expansion (Kutschker et al, 1997; Vermeulen & Barkema, 2002; Hohenthal et al, 2003), we advance three propositions on the impact of interdependence of internationalisation processes on international expansion. While the Uppsala model concentrates on processes that rarely oscillate in terms of uniformity and direction, our proposals leave room for understanding less stable internationalisation processes, i.e. those which are less uniform and change direction in often unpredictable ways. In addition, we consider a dimension overlooked by the Uppsala model: the regularity of international expansion or rhythm (Vermeulen & Barkema, 2002). We suggest that internationalisation processes that exhibit higher levels of interdependence do not tend to follow a rhythmic pattern.

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[1] Originally, the Uppsala model viewed the internationalisation of the firm as resulting from knowledge developed between the HQ and the subsidiary unit (Johanson & Vahlne, 1977). Later, the model was expanded to take into account the role of multilateral relations, especially knowledge developed through inter-firm relationships (Johanson & Vahlne, 1990).

Although some scholars have argued that the understanding of the internationalisation process of MNCs is critical to further our knowledge of the internationalisation of the firm (Bell & Young, 1995; Holm et al., 1995; Chang & Rosenweig, 2001), surprisingly little research has examined the effects of interdependence of internationalisation processes. To the best of our knowledge, the only empirical study that touches upon this issue is Chang and Rosenweig (1998a). These authors analysed the evolution of Sony's American subsidiary by focusing on the actors that influenced this process and argued that the American subsidiary's development was dependent not only on US-based actors, but also on other actors within the Sony group.

This article is structured as follows. In the first section, we review the literature on internationalisation processes that has followed the lead of Johanson & Vahlne's (1977) seminal article Although there has been a plethora of studies examining empirical manifestations of the Uppsala model, little research has looked at what Johanson & Vahlne (1990) regard as one of the model's Achilles' heels: the interdependence between markets and its effects on the internationalisation of the firm. In the second section, we argue that the conceptualisation of the MNC as a loosely coupled system provides a solid foundation for addressing the interdependence of internationalisation processes. Our reasoning is that actors embedded in the same MNC network follow their own internationalisation processes (Forsgren et al., 1995; Birkinshaw, 1997) that are simultaneously independent and interdependent across various spatial and temporal contexts.

In the third section, we introduce a case of a British firm that has had an established presence in Brazilian market for over one hundred years. This case illustrates how the trajectory of the Brazilian subsidiary was dependent on processes that evolved elsewhere in the MNC network. In the fourth section, we advance three propositions on the impact of interdependence of internationalisation processes on their uniformity, direction and rhythm. The article concludes by outlining the implications of this view and advancing suggestions for further research on the internationalisation of the firm.

2. The Uppsala Model and the Internationalisation of MNCs

In their recent account of the genesis of the Uppsala model, Johanson & Vahlne (2003) claim that a new and more realistic picture of the internationalisation of the firm emerged from the early research carried out at Uppsala. Rather than seeing internationalisation as the outcome of a rational decision-making process through which the firm draws on secondary research and selects an optimal governance form, the model stresses that the internationalisation of the firm is a process strongly dependent on experiential knowledge (Blomstermo & Sharma, 2003).

In this sense, the model identified a single mechanism that could explain the decision to invest resources in a foreign market over time regardless of the governance form selected by the firm (Johanson & Vahlne, 2003), i.e., the self-reinforcing mechanism of knowledge development (Johanson & Vahlne, 1977; Eriksson et al., 2000). In short, over twenty-five years ago the model drew attention to issues that are currently at the top of the research agenda of international business: learning and knowledge development in internationalisation processes (Hadjikhani & Johanson, 2002; Havila et al., 2002; Blomstermo & Sharma, 2003).

Unsurprisingly, the Uppsala model has sparked off a fierce debate amongst scholars. On one hand, a number of studies found strong support for the model. For example, the notion of gradualism and sequential moves in foreign markets is supported by research carried out by Jull & Walters (1987), Calof (1995), Chang (1995), Camino & Cazorla (1998) and Chang and Rosenweig (1998b). Other studies confirmed that experiential knowledge has a pivotal role in the internationalisation of the firm (Calof, 1993; Calof & Beamish, 1995; Eriksson et al. 1997, 2000; Pedersen & Petersen, 1998; Hadley & Wilson, 2003).

On the other hand, a string of criticisms has been directed at either the theoretical assumptions or operationalisation of the model. In relation to the former, Andersen (1993) contends that the relationship between market knowledge and market commitment is not straightforward. The fact that the firm evolves in the international arena by gradually committing resources to a particular foreign market can be explained by factors other than market knowledge (Petersen & Pedersen, 1997). Forsgren (2002) casts doubt on the relationship between experiential knowledge and incremental behaviour by claiming that the relationship between them is negative rather than positive. The more the firm learns about the foreign market where it operates, the more it reduces the perceived uncertainty about it. As a result, the firm will be more confident to make larger steps in international markets. In addition, Forsgren (2002) proposes that firms can acquire knowledge not only from experience, but also from imitation, search and acquisition of other firms. Casson (1994) and Buckley et al (2002) advocate that the Uppsala model is better suited for analysing internationalisation processes in which the firm reaps sizeable economies of scope derived from learning. This corresponds to cases in which the home and the foreign markets are substantially different and yet the foreign markets are culturally similar.

In relation to the operational level, the notion of an establishment chain has been questioned by authors who associate the Uppsala model with the earlier work of Johanson & Wiedersheim-Paul (1975). These studies contend that firms can follow a number of alternative trajectories in foreign markets (Turnbull & Ellwood, 1986; Hedlund & Kverneland, 1985; Bell, 1995; Andersen, 1997; Oesterle, 1997; Zander & Zander, 1997). Still, other studies argue that the Uppsala model is time-bound. The most common argument is that the model was formulated in the late 1970s where the international business environment was less turbulent than today (Benito & Gripsrud, 1992; Strandskov, 1993; Bell, 1995; Khurana & Talbot, 1998). Finally, others have argued that the model is too closely bound to the Swedish context and as a result, is ill-equipped to explain the internationalisation process of Polish (Fonfara & Collins, 1990), Japanese (Banerji & Sambharya, 1996), South Korean (Oh et al, 1998) and Brazilian (Rocha et al, 2002) firms.

More importantly from the perspective of this paper, other scholars have suggested that the Uppsala model explains well the trajectory of the so-called “early starters” (Johanson

& Mattsson, 1988) - i.e. international novices - but is less suited to explain the internationalisation process of larger and more experienced firms such as MNCs (Birkinshaw and Hood, 1998)[2]. Forsgren (2002), in particular, emphasises that the explanatory power of the model is reduced for firms that have an extensive international presence.

MNCs are not only concerned with penetration and extension of operations in a particular foreign market (Johanson & Mattsson, 1988). An important dimension of their internationalisation processes is related to intra and inter-firm flows of knowledge (Gupta & Govindarajan, 1991). This means that knowledge in the internationalisation of MNCs can be created through relationships other than the focal subsidiary and external actors embedded in the host country. For example, it can be developed by the interplay amongst subsidiary units. In this case, the evolution of a particular subsidiary is dependent upon knowledge developed together with and/or transferred from sister subsidiaries (Lord & Ranft, 2000). In other words, knowledge evolves interactively within the MNC network. This interdependence signifies that knowledge in internationalisation of MNCs can be generated, transferred and appropriated by various actors embedded in the MNC network (Amin and Cohendet, 2004).

Kogut and Zander's (1993, 2003) pioneering contribution to the theory of the MNC, suggests that the advantage of the geographically dispersed firm is that it will develop efficient ways of transferring tacit and experiential knowledge across borders. Gupta and Govindarajan (2000) follow the same trail, and go as far as claiming that the primary reason why MNCs exist is because of their ability to transfer knowledge more effectively and efficiently in an intra-corporate context.

This has led Mattsson (1998) to claim that international integration should be regarded as a third dimension of internationalisation processes. Johanson & Vahlne (1990) go further by suggesting that international integration may have a strong impact on the

[2] Research on "born globals" (e.g. Oviatt & McDougall, 1994; Sharma & Blomstermo, 2003) challenges the idea that the firm initially accumulates capabilities in the domestic market and subsequently exploits them in the international arena. The main thrust of this body of research is that some firms establish

internationalisation of the firm. Due to the multiplicity of interdependent spatial contexts in which MNCs operate, changes within the MNC network can be originated in a particular context and be subsequently carried over to other contexts (Easton & Lundgren, 1992). Thus, it would be very difficult to predict the pattern of evolution of internationalisation processes for MNCs as they tend to be more complex and variable than the trajectory of neophytes (Melin, 1992; Forsgren, 2002).

In conclusion, it appears that the internationalisation of MNCs falls outside the scope of the Uppsala model. As discussed earlier, although this boundary condition is acknowledged in the extant literature, empirical research says little on the pattern of evolution of MNCs' internationalisation processes. In order to help fill this gap, in the next section we propose a model of the MNC as a loosely coupled system. In addition, we suggest that, rather than a single internationalisation process, there may be a number of internationalisation processes occurring simultaneously within a MNC network (Holm et al., 1995). Even though these processes evolve in parallel, they can influence and be influenced by other processes at specific critical junctures (Mahoney, 2000). Put differently, these processes can be simultaneously independent and interdependent across various spatial and temporal contexts of the MNC network.

3. MNCs as Loosely Coupled Systems

According to Johanson & Vahlne (1977, 1990, 2003), the Uppsala model regards the international firm as a loosely coupled system (henceforth LCS). Although this has remained an unexamined assumption, more recently Bjorkman & Forsgren (2000) have argued that the model is not congruent with key assumptions of the LCS perspective. Forsgren (2002) inverts the argument by suggesting that the Uppsala model works better with a more conventional, hierarchical view of the firm.

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operations in foreign markets from inception. As a result, they do not follow a gradual, stepwise internationalisation process.

First, in a LCS the focus on the dyadic relationship between the headquarters (HQ) and the subsidiary unit is expanded to embrace a multitude of direct and indirect relationships embedded in various spatial contexts of the MNC network (Hedlund, 1986). Lateral relationships are, for instance, critical to understand how MNCs are organised and evolve over time (Ghoshal and Bartlett, 1990; Axelsson & Johanson, 1992; Hedlund, 1993). Specifically, whereas in hierarchies the HQ controls and co-ordinates the internationalisation process, which is an idea implicitly espoused by the Uppsala model, in a LCS, the HQ does not necessarily have this prerogative (Birkinshaw 1996, 1997). Powerful subsidiaries may take on more responsibilities in the MNC network to which they are embedded by for example, guiding the internationalisation process of sister subsidiaries (Forsgren & Pahlberg, 1992). They may also be in charge of their own internationalisation process (Forsgren et al, 1995).

Secondly, the firm portrayed in the Uppsala model is a singular entity whose parts are undifferentiated (Lord & Ranft, 2000). However, the LCS perspective offers a diametrically opposite view of MNCs, which are seen as highly differentiated systems that simultaneously and paradoxically contain elements that are "open and closed, indeterminate and rational, spontaneous and deliberate" (Orton & Weick, 1990: 205). As a consequence, there may be distinct roles for the HQ and the subsidiary as well as amongst the subsidiaries (Bartlett & Ghoshal, 1986). In addition, power is likely to be unevenly distributed in MNCs (Forsgren, 1989).

Thirdly, the Uppsala model is dependent on the interpretation of experiential knowledge and past outcomes of a stable middle management team of the firm (Bjorkman & Forsgren, 2000) – in other words, there is no turnover of the staff in charge of each internationalisation process. This implies that there is a coincidence in the loci of knowledge, decision-making and implementation in the internationalisation in the firm (Birkinshaw, 1996; Forsgren, 2002).

As mentioned earlier, in the LCS perspective, knowledge of internationalisation does not rest only upon the experience of a middle management team but it is also developed by a number of actors within the MNC network through mechanisms other than "learning-by doing". Thus the idea of a single and coherent interpretation of an internationalisation process by a stable team of individuals steering the process throughout is open to question. In a MNC as a LCS, the internationalisation process is likely to lead to distinct and possibly contradictory interpretations reflecting knowledge of what is stored in the minds of those directly involved in the process, but also of what is embedded in the collective memory of the firm including routines, procedures, organisational structures and systems.

The LCS perspective leaves room to consider two dimensions that are in our view, pivotal to address the internationalisation process of MNCs as LCSs: independence and interdependence (Orton & Weick, 1990). Independence means that actors or units of a MNC are relatively autonomous to carry out activities that transcend the context in which they are initially embedded. For example, Forsgren et al (1992) coined the term 'internationalisation of the second degree' to illustrate the process through which the subsidiary follows its own internationalisation process by exporting and/or allocating resources to third countries. Birkinshaw (1997) provides examples of subsidiary initiatives in third countries such as world product mandates. Therefore independence implies that a number of parallel internationalisation processes may occur within the MNC network with and, sometimes, without the acquiescence of the HQ (Ghauri & Holstius, 1996).

In turn, interdependence means that these parallel internationalisation processes are contingent on each other. O'Donnell (2000: 530) defines international interdependence as the "…condition to which one subsidiary or subunit of the MNC relies on another subunit's activities or inputs in order to perform its role effectively". In a nutshell, this means that the internationalisation process of an actor or unit within the MNC influences and / or is influenced by other internationalisation processes occuring within the said MNC network.

We argue that the interdependence of internationalisation processes is particulary visible at critical junctures (Mahoney, 2000), i.e., points in space and time in which these processes intersect and collide. This is important because discontinuities in the evolution of internationalisation processes can occur at these points.
In summary, the LCS perspective implies conceptualising MNCs as heterogeneous networks within which numerous independent and sometimes interdependent internationalisation processes co-evolve in various spatial and temporal contexts. Because of interdependencies between processes, it is expected that the internationalisation of MNCs exhibits "a broader spectrum of internationalisation routes than the [Uppsala] model predicts" (Forsgren, 2002: 274).

In order to illustrate the interdependence of internationalisation processes, in the next section we introduce a case of a manufacturing British firm, henceforth called GD, that has had a presence in the Brazilian market for over one hundred years. This case is extracted from a large research project that analysed thirteen internationalisation processes of British firm in Brazil. The case is constructed from archival data, secondary sources and personal interviews carried out in Brazil and England during 1999.

We report the internationalisation process of this firm in the Brazilian market by using the framework developed by Authors (2003). In this framework internationalisation processes can be traced by analysing the sequence of modes of operation as well as the relationships that are articulated 'at' and 'between' modal changes. Whereas the mode of operation is characterised by the degree of localisation, externalisation and integration of activities (Jarillo & Martinez, 1991), the relationships that are taken into account are those between the focal subsidiary with the HQ, external actors and sister subsidiaries.

4. The Case of GD in Brazil

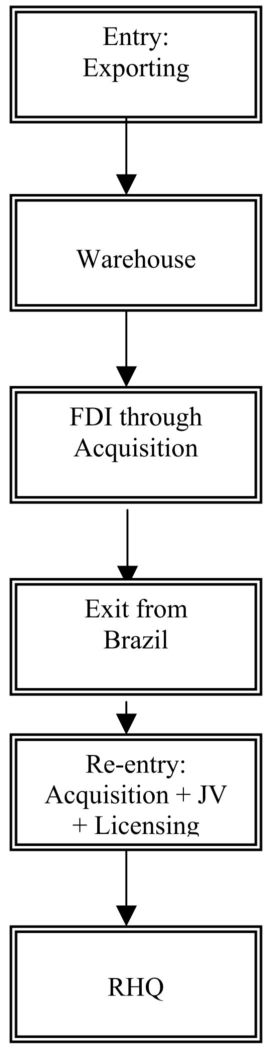
GD's history dates back to 1826, when it was founded in the Northwest of England to manufacture glass. GD was responsible for one of the major breakthroughs in the glass industry's history when in 1952, one of its directors invented a new process of producing glass subsequently called the 'float process'[3]. After the initial development of the float process, GD decided to license the technology to its major competitors. Due to the large capital requirements, GD could not afford to market it on its own or promote subsequent developments.

In 1999 GD operated twenty-three float plants in eleven countries and had stakes in ten more plants. It also run a number of downstream plants that processed glass for the automotive and construction industries. Its 1999 turnover was 2,752 billion pounds.

The internationalisation process of GD in Brazil comprises six events in terms of mode of operation (figure 1): i) the entry was carried out through exporting; ii) the first modal change was the establishment of a warehouse in Rio de Janeiro; iii) the second modal change was represented by manufacturing facilities through acquisition; iv) the third modal change occurred when GD exited the Brazilian market; v) GD re-entered that country through a combination of acquisition, joint venture and licensing; and vi) the establishment of a regional headquarters (RHQ) was the last modal change in Brazil.

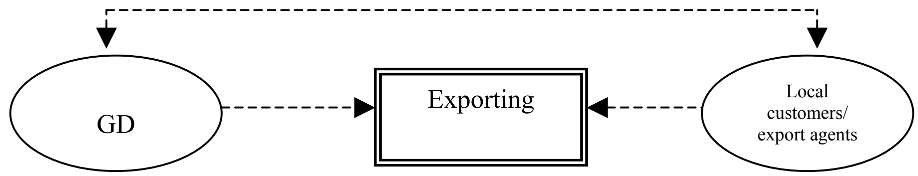
[3] According to one of our interviewees, the float process had many advantages over the previous process, called 'sheet process': i) it requires a much smaller manufacturing plant area as it eliminates the grinding and polishing production phases; ii) its labour requirements are 50% less; iii) it increases the productivity of the plant enormously and produces a higher quality glass; iv) process interruptions are scarce; and v) it lowers energy costs by 50%.

Figure 1 - The Internationalisation of GD in Brazil



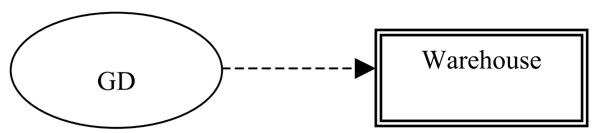
The first involvement of GD in the South American market dates back to 1888, when it received a large order of 2,900 square feet of sheet glass and 70,000 square feet of rolled plate glass. It is difficult to ascertain where this initial order came from. It is likely to have come from Argentina, a more promising market at that time, rather than Brazil. From 1917 to 1945, the export sales of sheet, plate, rolled, wired and cathedral glass to Argentina amounted to nearly double that of export sales to Brazil. Therefore GD's first involvement with South America was through exporting of glass. In this process, the HQ and external actors represented by local customers and export agents played a key role (figure 2).

Figure 2 – GD: Entry - Exporting



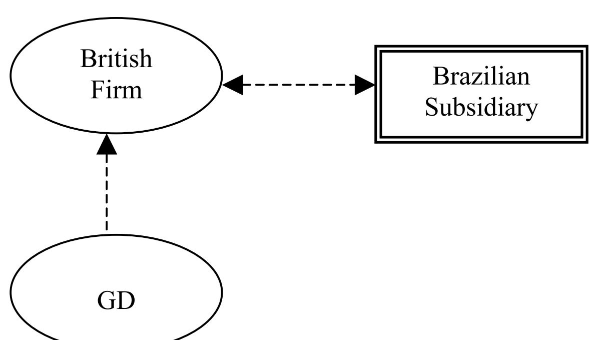
Exporting remained the mode of operation for nearly thirty years. By 1923 the export sales to Brazil had increased substantially, which drove GD to open a warehouse in Rio de Janeiro with the aim of co-ordinating exports and serving as a distribution channel to the Brazilian market. In this sense, GD transferred to Brazil some activities performed in the UK as well as internalised activities previously undertaken by local actors. The HQ carried out the modal change: from exporting to warehouse (figure 3).

Figure 3 – GD: First Modal Change – Warehouse



In 1965, GD acquired a British firm that processed glass for the automotive industry. The acquisition was carried out in the UK and indirectly, led to higher commitment to the Brazilian market. One of the subsidiaries of the acquiree was implanted in the Brazilian market and was responsible for producing and distributing safety glass to the local automotive industry. When this acquisition took place, the Brazilian operations of the acquired firm were incorporated into GD's Brazilian operations. In this sense, GD switched the mode of operation in Brazil due to an event triggered in the UK (figure 4).

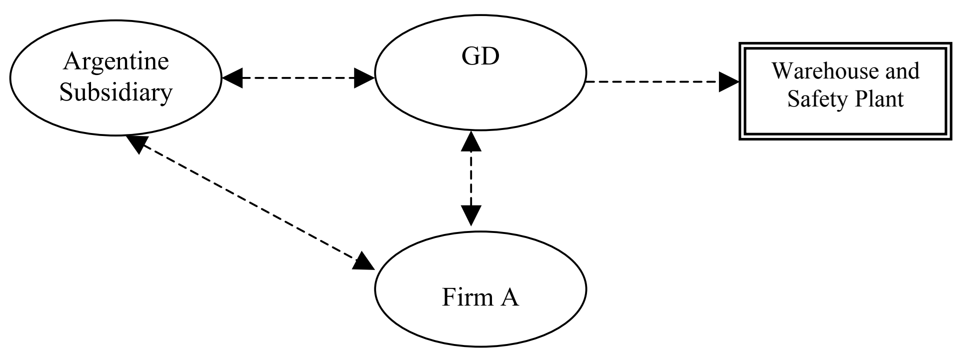
Figure 4 – GD: Second Modal Change – FDI through Acquisition



One year later, GD decided to exit Brazil. Not only did it close down the warehouse, but it also sold the small automotive plant to one of its European competitors, henceforth called Firm A. With regard to the former event, GD decided to close nearly all its international warehouses at that time. Rather than operating with warehouses, GD replaced them with sales subsidiaries, which could provide better services to local customers. In the case of Brazil, this strategy was not adopted since the Brazilian warehouse had operated unprofitably for a long time.

In relation to the selling of the automotive plant, one interviewee believed that it was not competitive due to local sources of sheet glass. It was also possible that GD swapped interests with Firm A, which was its partner in Argentina. As Firm A had sold its interests in the Argentine plant to GD at that time, the idea of these firms swapping interests seems highly plausible. The exit from Brazil was carried out by GD's HQ. External actors represented by one of GD's competitors must be taken into account if we take into account that GD swapped interests with Firm A (figure 5).

Figure 5 – GD: Third Modal Change - Exiting Brazil



Having exited the Brazilian market in 1966, GD only returned to that country in the late 1970s. At that time, Brazil was a very different market from the one in which GD had previously operated. The automotive industry had overtaken its Argentine counterpart, and the construction industry had grown considerably. GD, scanning for potential investments worldwide realised that the Brazilian market was one of the markets where it should have a presence[4].

In order to reenter Brazil, GD got involved in an intricate process whereby it simultaneously acquired two Brazilian glass-processing firms, embarked upon a joint venture with Firm A for manufacturing float glass and licensed to the joint venture the rights over the float technology for the Brazilian market.

One of the Brazilian firms, henceforth called Firm B, was a sheet glass producer, owned by three different groups: a Belgian glassmaker (40%), a French firm whose core business was related to agricultural products and had diversified into glass (30%) and a Brazilian oil firm which had been a sleeping partner in this venture (30%). The Belgian glassmaker had control over Firm B and was also in charge of providing it with technical support and technology.

In the late 1970s, the group that owned the Belgian glassmaker decided to exit the glass business in order to refocus its activities on the food industry. At that time, one of GD's directors was member of the Belgian glassmaker's board and thus would have been in an ideal position to be approached concerning Firm B and other glass businesses that the group intended to sell. After many rounds of negotiation GD, together with a German glassmaker[5], decided to buy Firm B, each one having 50% of the ordinary shares. Shortly afterwards, GD took over the German firm, thus becoming Firm B's only shareholder.

Having sold its shares in Firm B to GD, the French food firm did not hesitate to sell another firm it owned in Brazil. This firm operated in downstream value chain activities and was 100% owned. Thus, the acquisition of the two Brazilian glassmakers involved three phases: i) GD, in conjunction with the German glassmaker, bought Firm B; ii) GD took over the German glassmaker at a global level, thus becoming the sole owner of Firm B; and iii) GD bought another Brazilian glassmaker. The owner of this firm was one of the Firm B's shareholders.

In 1979, when GD acquired the two Brazilian firms, it was clear that the Brazilian market needed a float line to produce raw glass for further processing. The market had grown to

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[4] At the same time the float licenses were coming to an end. In addition to representing a significant part of GD´s turnover, the end of the float licenses would enable some ex-licensees to export to and eventually manufacture in countries where they were prohibited from entering due to license restrictions.

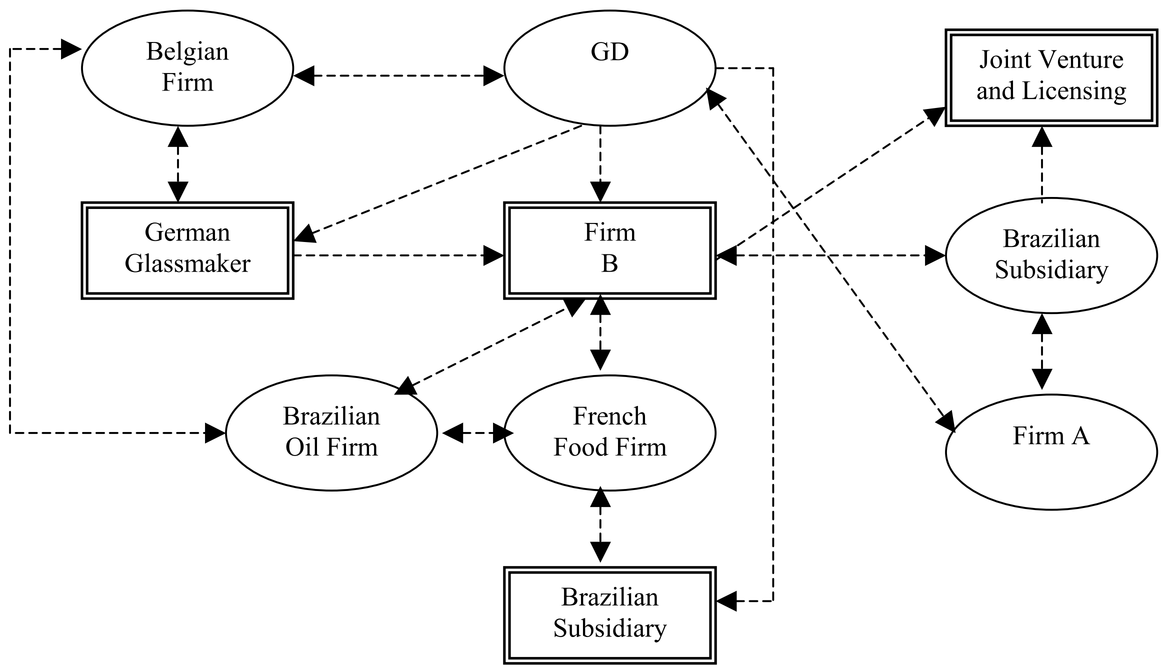
such an extent that its players could only reap substantial economy of scale in upstream activities through a float process. However, as a float plant involved high risks due to its costs (around US$170 million) no single firm was prepared to take the risk for discovering that a potential competitor was also considering manufacturing float glass in Brazil. A joint venture seemed to be the best option.

Firm A, one of the major GD's world competitors, has operated in Brazil in upstream and downstream activities for a long time. Owning 70% of a reputable downstream plant, Firm A agreed with Firm B, which was subsequently acquired by GD, that both firms would embark upon a joint venture to produce float glass for the Brazilian market. They legally formed a joint venture, but did not actually commit funds to start building the float plant.

Therefore, when GD acquired Firm B, it also bought the 50% shares of this joint venture. In this sense, GD would be competing in the downstream market at the same time that it would be co-operating in the upstream market with Firm A. Put differently, both firms would split the risks of going ahead with the development of the float plant in Brazil and consequently guarantee a reliable and cost-competitive source of raw glass. The output would subsequently flow to their competing downstream plants. Having reached an agreement on the float plant in Brazil, shortly afterwards GD granted the joint venture the rights over float for the Brazilian market (figure 6).

[5] This German firm was also owned by the Belgian glassmaker.

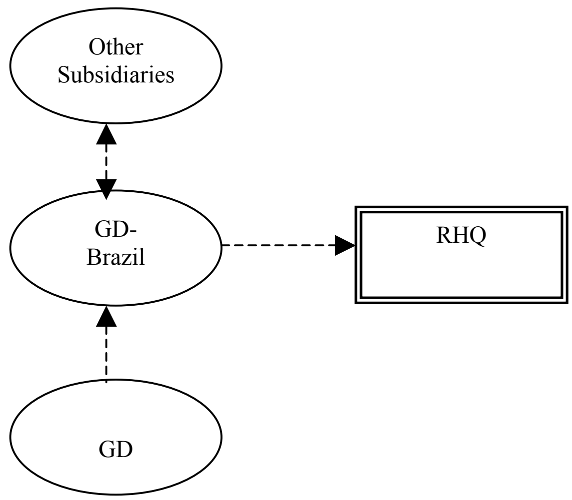
Figure 6 – GD: Re-entry into Brazil



Having entered Brazil using such a complex arrangement, GD found a very promising market. The joint venture managed to operate three float plants in less than fifteen years. The construction of the first plants started in 1980 in Rio de Janeiro State and came on stream in 1982. The second plant came into operation in 1986, whereas the third plant was added to the existing ones ten years later.

More importantly, committed to its worldwide integration and reorganisation programme, more recently GD has created a RHQ in South America, hosted by the Brazilian subsidiary. The RHQ is responsible for co-ordinating and controlling all subsidiaries located in that continent. It is also in charge of rationalising the South American operations in terms of manufacturing and flows of products. In this sense, this intermediate structure means that all South American subsidiary units report directly to the Brazilian subsidiary which in turn, reports to the global HQ. The Brazilian subsidiary is now connected to other South American units through control relationships (figure 7).

Figure 7 – GD: Modal Change - RHQ



5. The Pattern of MNCs' Internationalisation Processes: Uniformity, Direction and Rhythm.

The internationalisation process of GD in the Brazilian market comprises by two entries and four modal changes during which direct and indirect relationships between the Brazilian unit and the HQ, external actors and/ or sister subsidiaries were established, developed and broken in various spatial and temporal contexts.

It is interesting to notice that the internationalisation process in Brazil occurred in parallel with other internationalisation processes embedded in different spatial contexts such as Argentina. It was also concurrent with the internationalisation process of external actors such as one of GD's main competitors that at that time, operated in Argentina, Brazil, France and other countries where GD had a presence.

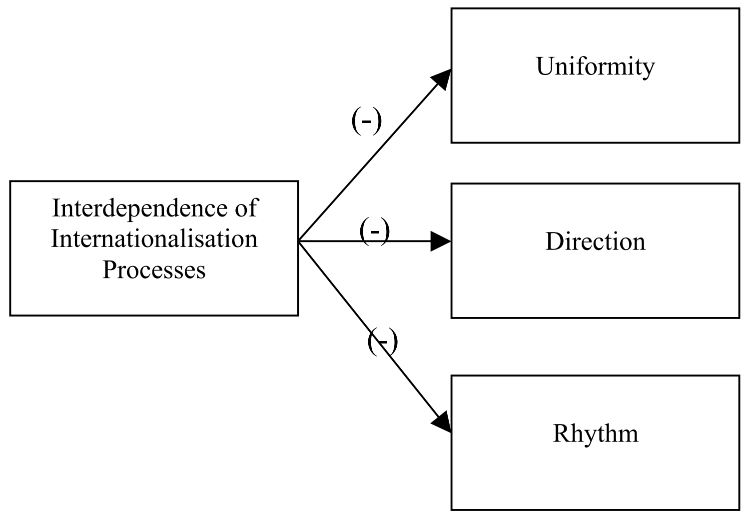
Although these processes were in the main independent, at times they became interdependent, i.e. one internationalisation process influenced and was influenced by other internationalisation processes occurring elsewhere in the GD network. More specifically, starting from the second modal change the evolution of the Brazilian unit was contingent on the evolution of the HQ, sister subsidiaries and a number of external actors that pursued their own internationalisation processes.

Amongst the six critical events of the internationalisation of GD in the Brazilian market, it is the re-entry of the firm into Brazil that best illustrates the interdependence of internationalisation processes. This particular event resulted from very complex and time-consuming negotiations, involving different actors that had developed relationships in various countries. For example, the relationship between the Belgian firm and GD enabled the latter to buy Firm B in Brazil. The acquisition of Firm B, in turn, triggered another acquisition in that market. One of the shareholders of Firm B had a plant in Brazil which dependent upon the Belgian firm's technology. When the Belgian firm sold Firm B, the shareholder did not hesitate to sell its own plant to GD.

Interestingly, the acquisition of Firm B was carried out on condition that GD could develop the float plant in the Brazilian market. The development of the float plant was, in turn, dependent on Firm A for two reasons. First, Firm B had already embarked upon a joint venture with Firm A's Brazilian subsidiary to manufacture float glass in Brazil. Secondly, neither Firm A nor GD wanted to run the risk of going ahead with the float plant on their own due to high costs and risks. In other words, GD would only embark upon a joint venture if it could buy plants for processing glass in Brazil. And it would buy those plants in the Brazilian market if it could reach an agreement with Firm A to jointly build a float plant in that market.

As mentioned earlier, internationalisation processes can be examined according to pace, rhythm and scope (Vermeulen & Barkema, 2002), or pace, orientation and extension (Hohenthal et al, 2003). The case of GD in the Brazilian market points to three dimensions that were influenced by the interdependence of internationalisation processes: uniformity, direction and rhythm. GD's case analysis suggests that the interdependence of internationalisation processes is negatively related to their uniformity, direction and rhythm (Figure 8).

Figure 8: Interdependence of Internationalisation Processes and Uniformity, Direction and Rhythm



5.1 Uniformity

The pattern of evolution of internationalisation processes of MNCs may differ in relation to uniformity. This dimension has to do with the continuity or discontinuity of successive market commitments. A highly uniform internationalisation process tends to have stepwise changes in market commitments and modal changes. For example, figure 9a depicts internationalisation processes characterised by a high degree of uniformity. By contrast, the internationalisation process shown in figure 9b is less regular because there is a discontinuous commitment and the mode of operation is changed abruptly.

Figure 9a – Uniformity of Internationalisation Processes: Examples of High Uniform Processes

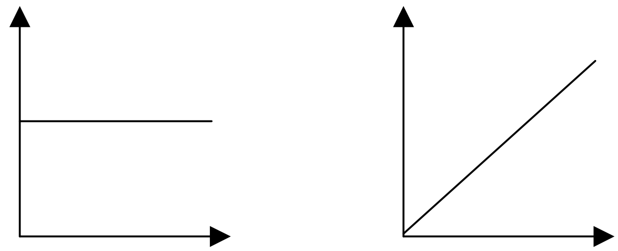
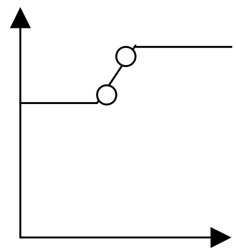


Figure 9b – Uniformity of Internationalisation Processes: Example of a Low Uniform Process



X = mode of operation (localisation, externalisation and integration)
Y = time

The Uppsala model envisages internationalisation processes that exhibit a high level of uniformity such as the process depicted on the right side of figure 9a. This reflects a gradual, stepwise process of resource commitment to a foreign market (Johanson & Vahlne, 1977). However, the pattern of evolution of the internationalisation of GD in Brazil is significantly different as it alternates periods of gradualism with more discontinuous phases. Whereas the first modal change (from exporting to warehouse) can be regarded as smooth in terms of degree of localisation and externalisation of activities, the exit from the Brazilian market can be seen as an unexpected discontinuity following a period of increasing commitments.

In the case of GD, the variation in uniformity was caused by the collision of a number of internationalisation processes that co-evolved in different spatial contexts within the GD network. This implies that there is a relation between the interdependence of internationalisation processes within the MNC network and their uniformity. We suggest that the more interdependent an internationalisation processes is in relation to other internationalisation processes coexisting in the same MNC network, the more vulnerable it is to changes originated in spatial contexts other than the host country. These changes have the ability to disrupt the uniformity of internationalisation processes.

> *Proposition 1 – Ceteris paribus, the interdependence of internationalisation processes within a MNC network is negatively related to the uniformity of an internationalisation trajectory in a particular host country.*

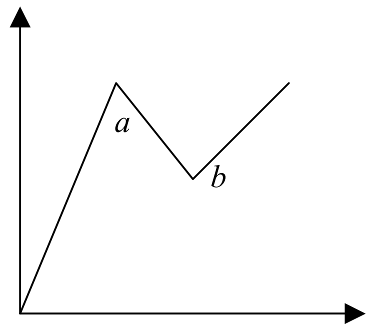
5.2 Direction

Whereas uniformity corresponds to continuity of internationalisation processes over time, direction refers to the sign (positive or negative) of commitment flows taken in a particular internationalisation process. The more an internationalisation process changes direction (e.g. from a period of increasing to decreasing commitments) the more there are variations in the degrees of localisation, externalisation and/or integration of activities.

Uniformity and direction are independent dimensions of internationalisation processes of MNCs. As discussed earlier, figure 9b depicts an internationalisation process with a low level of uniformity because the mode of operation does not change gradually. In spite of this, it remains in the same direction – positive flows leading to a increasing commitment to the host country.

By contrast, changing direction in internationalisation process implies altering the sign of commitments taken. This can be illustrated by figure 10, which shows an internationalisation process that changes direction twice. Up to point *a*, commitments are positive and increasing but from *a* to *b,* commitments decrease.

Figure 10 – Direction of Internationalisation Processes: Example of a Process that Changes Direction Twice.



X= mode of operation (localisation, externalisation and integration)
Y= time

There is a coincidence of uniformity and direction in the internationalisation processes analysed in light of the Uppsala model. The model's mechanisms point towards highly uniform and unidirectional processes. In this sense, the Uppsala model leaves little room for other internationalisation paths such de-internationalisation, partial withdrawals or reversals in commitment (Benito & Welch, 1997).

GD's trajectory in Brazil changed direction once leading to a complete withdrawal from the market. Up to that moment, GD had evolved by simultaneously increasing the degree of localisation and decreasing the degree of externalisation of activities. This trajectory was shattered when GD exited Brazil.

While our first proposition suggests that the uniformity of internationalisation is negatively affected by the interdependence of internationalisation processes within the MNC network, a similar reasoning applies to this dimension Changes originated elsewhere in the MNC network may drive one internationalisation process to abrupt changes in direction. Therefore the higher the interdependence of internationalisation processes, the more they likely to change direction.

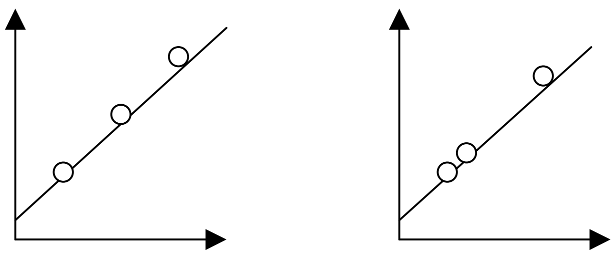
> *Proposition 2 – Ceteris paribus, the interdependence of internationalisation processes within a MNC network is negatively related to their direction.*

5.3 Rhythm

Rhythm is a dimension of internationalisation processes originally developed by Vermeulen & Barkema (2002) and refers to the regularity of international expansion. They suggest that firms following more rhythmic internationalisation processes tend to establish units in foreign markets at a more regular pace. More rhythmic expansion programmes avoid the overload of managerial resources by creating room for better absorption of new knowledge about foreign markets.

We suggest that the rhythm of internationalisation processes can also be related to the intervals between modal changes. Thus the more rhythmic an internationalisation process is, the more similar the intervals between modal changes should be. For example, figure 11 shows the rhythm of two different internationalisation processes. The process depicted on the left is the more rhythmic whereas the one represented on the right side is characterised by irregular intervals between modal changes.

Figure 11 – Rhythm in Internationalisation Processes: Examples of Processes with Similar and Distinct Intervals between Modal Changes



X= mode of operation (localisation, externalisation and integration)
Y= time

Whereas the Uppsala model does not take into account the rhythm of internationalisation processes, the case of GD in the Brazilian market nicely illustrate that modal changes may occur at very different intervals. For example, the time lag between the first and second mode of operation is nearly thirty years whereas the interval between the second and third mode of operation is only one year.

Based on the same arguments underpinning propositions 1 and 2, we suggest that the interdependence of internationalisation processes within MNCs affects their rhythm. Specifically, changes originated in distant spatial contexts within the MNC network are likely to disrupt more rhythmical internationalisation process. In this event, periods when the mode of operation is changed more regularly alternate with phases with no modal change. Our final proposition posits a negative relationship between interdependence and rhythm of internationalisation processes.

> *Proposition 3 – Ceteris paribus, the interdependence of internationalisation processes within a MNC network is negatively related to their rhythm.*

6. Conclusions

In this article we address the interdependence of internationalisation processes within the MNC network. Although scholars such as Johanson & Vahlne (1990) and Mattsson (1998) have claimed that the interdependence between markets is a critical dimension of internationalisation processes, little research has examined this issue in detail.

The behavioural literature on internationalisation, and in particular the Uppsala model, views internationalisation processes as independent, i.e., one internationalisation process would have little impact on another internationalisation process within the MNC network. To some extent this approach reflects a hierarchical view of the firm in which the HQ co-ordinates and controls the simultaneous development of all subsidiaries.

In this paper, we have taken a different view. In order to understand the internationalisation of MNCs, we have attempted to combine the literature on internationalisation processes with the literature on MNCs and subsidiary development. Our point of departure is that the conceptualisation of MNCs as LCSs provides a useful platform to address the issue of independence and interdependence of internationalisation processes within MNCs.

Based on the longitudinal case of a British firm and the evolution of its operations in the Brazilian market, we have suggested that a number of internationalisation processes can co-evolve asymmetrically within the MNC network. At critical junctures, one internationalisation process can influence and be influenced by another internationalisation process and, as a result, its pattern of evolution will vary in terms of uniformity, direction and rhythm.

These results and suggestions have important implications for research on MNCs. They highlight the interdependence of internationalisation processes as a key mechanism in driving the development of MNCs. Accordingly, MNCs' internationalisation processes are not only influenced by driving forces that operate solely in the geographical context where the processes are initially embedded. They can also be affected by a multitude of influences that are originally triggered in other spatial contexts within the MNC network, and that are transmitted to other spatial contexts through direct and indirect relationships between the HQ, external actors and subsidiary units.

This implies that the internationalisation of MNCs is not necessarily the sum of individual internationalisation processes embedded in distinct foreign markets. On the contrary, a more realistic picture of MNCs evolution points to an intricate combination of independent and interdependent internationalisation processes that take place in various spatial and temporal contexts. In summary, the internationalisation of MNCs comprises numerous internationalisation processes following different sequences of modes of operation (Forsgren, 2002).

In suggesting that the interdependence of internationalisation is negatively related to uniformity, direction and rhythm, we are conscious that our research leaves many questions unanswered. For example, how do changes flow within an MNC network? What factors affect the flow of influences within that MNC network?

Recently the international business literature has emphasised the role of knowledge transfer within the MNC network (see e.g. Gupta & Govidarajan, 1991, 2000; Blomstermo & Choi, 2003). We believe that the interdependence of internationalisation processes can affect the accumulation of knowledge at the level of the subsidiary unit as well as the development of inter-subsidiary knowledge. How is this influence manifested in terms of accumulation and/or transfer of knowledge? To what extent is local knowledge dissipated, devalued or bypassed by changes originated elsewhere in the MNC network?

Finally, the literature has advanced a number of typologies for classifying the architecture of a MNCs and its subsidiaries. For example, Porter (1996) classifies MNCs according to the degree of co-ordination and configuration of activities. Gupta et al (1999) use intra-corporate knowledge to distinguish different types of subsidiary. Following this line of argument, we wonder to what extent the interdependence of internationalisation process is contingent on the type of architecture of a MNC. For example, is interdependence likely to be more prevalent in a globally-oriented MNC? If so, to what extent is the internationalisation of a globally-oriented MNC more variable in terms of uniformity, direction and rhythm than the internationalisation of different types of MNC? Much work remains to be done in researching these topics as well as providing a better integration of the literature on internationalisation processes and MNC development.

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