Path Dependence and Internationalisation:
The Case of a UK Firm in Brazil[1]

Autoria: Sérgio Fernando Loureiro Rezende

Abstract

This article deals with the concept of path dependence in the internationalisation of the firm. Originally formulated by scholars interested in the adoption and development of new technologies, the concept of path dependence has more recently spread to a number of fields such as business studies. In particular, a number of scholars working on behavioural models of the internationalisation of the firm have noticed that internationalisation processes are markedly path dependent to the extent that they are driven by a self-reinforcing mechanism of knowledge development. As a result, they are often viewed as gradual processes of resources commitment. Here, we supplement this view by claiming that path dependence can also shed some light on more discontinuous, truncated internationalisation processes. Our view is that a particular internationalisation process, regarded as a sequence of modes of operation, is embedded in other internationalisation processes that evolve in overlapping temporal and spatial contexts. Due to this mutual interdependence, internationalisation processes eventually alternate periods of gradual evolution with discontinuous phases. An in-depth, longitudinal case study of a UK manufacturing firm that entered and has evolved in Brazil for over a hundred years illustrates the co-evolution of path-dependent internationalisation processes.

1 – Introduction

Recently, internationalisation processes have been explicitly associated with the idea of path dependence. For example, in examining sequential foreign market entries, Chang and Rosenweig (2001) concluded that market entry decisions were path dependent because they were shaped by previous experiential knowledge. At the line of business level, the authors showed that an entry mode tested in the past was used afterward such as a first entry by acquisition was followed by subsequent acquisitions.

Eriksson *et al.* (2000) and Forsgren (2002) suggest that the internationalisation processes analysed in the light of the Uppsala model are also markedly path dependent. Accordingly, the Uppsala model has unravelled the existence of two aspects of internationalisation that reinforce each other, i.e. market knowledge and market commitment interact with commitment decisions and current activities in a particular foreign market. The main claim is that commitment decisions and current activities not only result from accumulated knowledge and past market commitment, but also determine the level of knowledge and market commitment to be made in the future (Johanson and Vahlne, 1977). In other words, there seems to be a self-reinforcing mechanism of knowledge development through which the future acquisition of knowledge is delimited by current operations which are, in turn, shaped by past knowledge development. This mechanism drives the firm to commit resources to a particular foreign market gradually.

Although the link between path dependence and internationalisation is welcome, i.e. it can effectively contribute to increase our knowledge of internationalisation processes, research on this topic is still in its infancy (Eriksson *et al.*, 2000). As a consequence, some questions remain unanswered. Is the concept of path dependence confined to more gradual internationalisation processes? Or, alternatively, is path dependence a useful concept for examining discontinuous internationalisation processes? If so, what are the sources of these discontinuities?

This article sheds some light on these questions by suggesting that path dependence opens room for understanding not only incremental, but also more discontinuous, truncated internationalisation processes. Our general claim is that because a particular internationalisation process is spatially and temporally related to other internationalisation processes, diversionary and more abrupt events are likely to occur, i.e. events that drive the firm to take a different and original path (Abbott, 1997). In this case, it can be said that the internationalisation of the firm is characterised by discontinuities.

This article is divided as follows: In the first section we briefly make some considerations on the notion of path dependence. In the second section, we propose a framework for analysing path-dependent internationalisation processes. This framework is theoretically aligned to behavioural models of internationalisation such as the Uppsala model (Johanson and Vahlne, 1977; 1990) and rests on two assumptions: i) internationalisation processes are dynamic phenomena (Hagen, 1996) and ii) internationalisation processes can be explained at the level of relationships (Blomstermo *et al.*, 2002; Andersen and Buvik, 2002). In the third section, we introduce a case study of a UK manufacturing firm that entered and has evolved in the Brazilian market. In the fourth section, the case is discussed in the light of the framework proposed earlier. The last section contains the conclusions and suggests implications for future research.

2 – Brief Considerations of Path Dependence

Originally, the concept of path dependence comes from studies on adoption and development of new technologies, the QWERTY keyboard being the classical example (David, 1985). The general claim is that small wins in the beginning of the trajectory of a particular technology magnify over time through self-reinforcing mechanisms, thus inhibiting the rise of technological alternatives (Arthur, 1994). Interestingly, historical contingencies sometimes favour inferior technologies, that is to say, solutions that do not represent the most efficient use and allocation of resources.

From these studies, it is commonly agreed that path dependence represents sequences of events characterised by two distinct properties. First, unlike the neoclassical economists' view, events are unable to shake free from the influence of history. The past forecloses the options available in the present and therefore is responsible for its taken-for-granted nature (George and Jones, 2002). In the world of history a particular sequence of events is not only influenced by systematic and more predictable forces, but also by random forces such as 'luck' and chance (Barney, 1986; Arthur, 1994). Secondly, events in a path-dependence sequence are not serially independent. A small change in the order of events may cause a different outcome (Haydu, 1998). For example, a particular sequence of events is characterised by events A-B-C with D being the outcome. If the order of events changes to B-A-C the outcome is likely to be different from D.

Recently, Mahoney (2000) has broadened the concept of path dependence by proposing the existence of two types of sequences: self-reinforcing and reactive. The former is characterised by contingent initial events which reproduce and reinforce themselves through self-reinforcing mechanisms such as sunk costs and learning curves (Aminzade, 1992). By contrast, the latter involves transformation and reversals of early events. In reactive sequences, initial events do not necessarily generate positive feedback, but powerful responses that have the causal power to redirect the sequence to a different path.

More importantly, Mahoney (2000) claims that path-dependent sequences are spatially and temporally related to each other. Sequences of events confront and combine at certain points and, as a result, a number of outcomes are likely to occur. For example, if the original sequences shake at the point but stick to their original paths afterwards, there will be no enduring consequences for either sequence. Alternatively, the combination of sequences may produce radical events and the resulting sequences will follow alternative paths, i.e. paths that are substantially different from the paths the sequences would have followed if they had not collided (Hakansson and Waluswski, 2002).

Put another way, that path-dependent sequences are interrelated means that they may display mixed patterns of evolution. Subject to the points where they meet, also dubbed critical junctures (Mahoney, 2000), they may alter patterns of evolution, by for example, changing from self-reinforcing to reactive and vice-versa. These critical junctures are liable to space and timing. This means that where and when sequences of events collide are of critical importance (Hakansson and Lundgren, 1997). This is the subject of the next section, where we propose to conceptualise internationalisation processes as path-dependent sequences of modes of operation driven by three types of relationships embedded in distinct spatial and temporal contexts (Yeung, 1998; Abbott, 2001).

3 – Space and Time in Path-Dependent Internationalisation Processes

Based on Welch and Luostarinen (1988), internationalisation is defined here as the extension of a firm's operations to foreign territories. Although internationalisation as a spatial- and temporal-embedded process can be manifested through a number of different events, we have chosen the mode of operation to illustrate this process. In doing so, we view internationalisation processes as path-dependent sequences of modes of operation in which spatiality and temporality matter (Hakansson and Lundgren, 1997).

3.1 – The Mode of Operation and the Relationships

According to Jarillo and Martinez (1991), the mode of operation is characterised by three dimensions: i) the degree of externalisation of activities in each country; ii) the degree of localisation of activities in each country; and iii) the degree of integration of activities across different countries.

The degree of externalisation of activities in each country means the extent to which the firm performs activities in the value chain internally or externally. For example, manufacturing facilities undertaken fully in-house means a low degree of externalisation of activities. The degree of localisation of activities in each country refers to the extent through which the firm transfers activities in the value chain to a particular foreign market. The higher the value-added activities carried out by a particular subsidiary unit such as manufacturing or R&D, the higher the degree of localisation of activities. The third and last dimension, the degree of integration of activities across different countries, has to do with the extent to which international operations are interrelated (Porter, 1986).

The relational and path-dependent framework proposed here suggests that the mode of operation is affected by three types of relationships that a particular subsidiary, henceforth called 'focal subsidiary', articulates in different contexts: i) the HQ; ii) external actors; and iii) sister subsidiaries. The HQ relationships are usually characterised by the control through which the HQ possesses critical resources and is usually in charge of co-ordinating the development of subsidiary units. It is suggested that the HQ degree of the control of the various units varies enormously, depending on the HQ degree of knowledge of the subsidiary network context (Holm *et al.*, 1995).

The second type of relationship refers to external actors, defined as those actors not directly controlled by the firm such as buyers and suppliers. Although this type of relationship is not explicitly considered in the Uppsala model (Johanson and Vahlne, 1990), recent studies on internationalisation processes have attempted to consider the role of external actors in the internationalisation of the firm (Hadjikhani and Johanson, 2002). For example, in their study on mature supplier and customer relationships in international markets, Chetty and Eriksson (2002: 319) concluded that "the dynamics of experiential knowledge generation seems to take place in the mutual relationship development, not so much within each of the firms that develop this relationship". Lamb and Liesch (2002:9) also propose that internationalisation processes result from knowledge developed among firms. They say that "market knowledge available to a firm can reflect the shared and collective aspects of all firms interacting, possibility through a network, rather than being attributed to a solitary actor".

The third and last type of relationship is that of sister subsidiaries to whom the focal subsidiary is connected. Sister subsidiaries do not necessarily refer to foreign-based units because these units can be geographically embedded in the foreign market where the focal subsidiary is implanted. For example, two or more units may be established in the same country, each one being in charge of a business division or unit (Clark *et al.*, 1997).

Sister subsidiary relationships have not yet been explicitly acknowledged in studies on internationalisation processes, although research on subsidiary development has shown that the focal subsidiary can affect sister subsidiaries located in third countries and vice-versa. Birkinshaw (1996; 1998) claims that subsidiary units can take on more responsibilities beyond the geographically local scope, by for example exporting, co-ordinating sales and manufacturing activities of sister subsidiaries or carrying out any other activity that goes beyond the focal subsidiary country of origin.

3.2 The Spatial and Temporal Dimensions

The conceptualisation of internationalisation processes as path-dependent sequences of modes of operation influenced by three types of relationships points to the spatial and temporal dimensions (Hakansson and Lundgren, 1997). To begin with, the space dimension refers to the geographical context where the mode of operation is embedded. According to Yeung (1998) the mode of operation is not independent of the geography because it does not operate in a spatial vacuum. By contrast, it is manifested in a specific geographical context which is often associated with nation states or countries (Pitelis, 2000). The degree of localisation and externalisation of activities of the mode of operation discussed earlier are fully consistent with this notion (Yeung, 1998)[2].

More specifically, our relational framework proposes that the mode of operation results from HQ, external actors and subsidiary relationships that are subject to the specificities of the territory where they are embedded. The mode of operation, in turn, sets the rules for the further reproduction and articulation of these relationships.

These relationships are, in fact, part of networks that may span across a number of geographical contexts. Networks are not independent of each other because a particular actor can simultaneously belong to different networks. For example, the first-tier supplier of subsidiary A can also be the second-tier supplier of subsidiary B located in a third country. Mattsson (1998) has introduced the terms 'overlap' and 'overlapping' to illustrate this interdependence of networks. Accordingly, overlap is a static measure that indicates that networks are spatially overlapped. Network overlaps alter as time passes through the process of overlapping.

The idea that the mode of operation results from relationships embedded in different, yet overlapping networks means that sequences of modes of operation co-evolve in spatially interdependent contexts (Mahoney, 2000). A particular sequence is part of other sequences that may take place in different territories and, therefore, is subject to changes triggered in a number of countries. For example, acquisitions carried out in Europe may affect the sequence of modes of operation geographically embedded in Latin America.

Recently, Andersson (2002: 366) has examined this issue whilst studying the internationalisation of wholesalers. He claims that their internationalisation processes are interconnected and consequently occur concurrently. He goes on to say that "one implication of this view of an increased complexity in the internationalisation of the firm is that a firm's gradual, increased involvement in foreign countries needs to be replaced by a view where regions and regionalisation of activities become important and where internationalisation is viewed as a global activity".

If paths in space are associated with the mode of operation and the relationships that account for this particular institutional arrangement, paths in time refer to the history of the mode of operation and relationship development. Accordingly, the past of the mode of operation, i.e. how events unfold over time, is crucial to the understanding of path-dependent internationalisation processes[3].

More specifically, our relational framework indicates that relationships are not necessarily exercised at the moment of the modal change, nor distributed homogeneously over the sequence of modes of operation. Relationships can sometimes be concatenated in a distant period of time from the modal change. In this case, there will be a significant time lag between the development of relationships and the selection of a particular mode of operation. For example, the HQ engages in relations with external actors embedded in a particular geographical context, which do not involve economic exchanges (Holmlund and Kock, 1998). They can, for instance, be related to information exchange. Later, these relations evolve by paving the way for the occurrence of economic exchanges. This means that conditions have been created for the establishment of a particular mode of operation. Put differently, the mode of operation will result from relationships that have been developed gradually. The forces are slow-moving to the extent that they unfold over the 'long-term'. In hindsight, their effects are to be classified as remote because there is an important time lag between the establishment of the relationships and the mode of operation (Pierson, 2000).

As relationships are developed at different times, they are not necessarily distributed homogeneously over the sequence of modes of operation. A particular relationship can be activated first and subsequently get other relationships exercised (Hakansson and Waluszewski, 2002). For example, a particular subsidiary operates in a South American country, such as Chile, through manufacturing facilities undertaken fully in-house whose output goes to the local market. Later, a sister subsidiary, such as the Brazilian unit, assumes control over all Latin American subsidiaries and launches a manufacturing rationalisation programme. This involves closing down some manufacturing facilities by concentrating production output in some units. The Chilean subsidiary is affected by this programme to the extent that it is compelled to reduce levels of value added to the group. Instead of manufacturing, this unit will be selling products and services produced by other units. In this case, the relationships between sister subsidiaries (Chile and Brazil) are only exercised in an advanced stage of the internationalisation process of the Chilean subsidiary, i.e. after this unit has already established manufacturing facilities.

Time in path-dependent internationalisation processes also refers to critical junctures of a particular sequence of modes of operation (Mahoney, 2000). If paths in space are associated with sequences that are spatially interconnected, paths in time correspond to the moment these sequences meet. At critical junctures changes in the direction of the sequence of the mode of operation may take place. If this occurs, the sequence will take a path that does not bear the imprint of earlier choices. Mahoney (2000) suggests that critical junctures are liable to timing. An earlier or later critical juncture may originate a different sequence of modes of operation.

Finally, paths in time point at the individuality of sequences of modes of operation (Hakansson and Lundgren, 1997). The history of the mode of operation with expected and unexpected forces influencing the concatenation of relationships embedded in multiple geographical contexts creates singular path-dependent processes of internationalisation. "It is in these unique sequences of events at explanations to the outcome of dynamic processes should be sought. The particular travel travelled, with its uniqueness and dependency on chance will make all difference" (Hakansson and Lundgren, 1997: 132).

In order to illustrate the spatial and temporal dimensions in path-dependent internationalisation processes, the following section presents a case of a UK manufacturing firm, henceforth called GD, that entered and has evolved in the Brazilian market. Archival data and interviews with executives of GD carried out in England and Brazil in 1999 were used to construct the case study. The case reported here is extracted from a large research project that analysed thirteen processes of internationalisation of UK firms in Brazil. Following the framework proposed in the last section, the case of GD is described through the mode of operation, viewed as a manifestation of GD's internationalisation process in Brazil. As the narrative advances, the emphasis is placed on the relationships that were articulated 'between' and 'at' each modal change.

4 – The Internationalisation of GD in Brazil

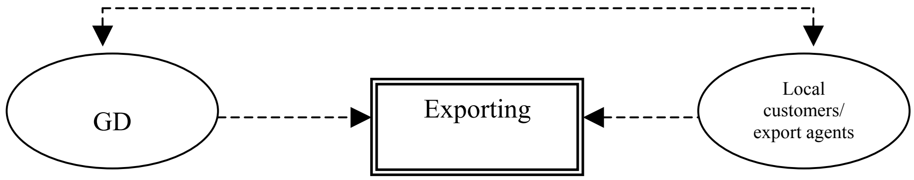
GD's history dates back to 1826, when it was founded in the North of England with the aim of manufacturing glass. GD was responsible for one of the major breakthroughs in the glass industry's history when, in 1952, one of its directors conceived a new process of producing glass, subsequently called the 'float process'[4]. After the initial development of the float process, GD decided to license the float technology to its major competitors. Due to large capital requirements, GD could not afford to market it on its own or to promote subsequent developments. In 1999 GD operated twenty-three float plants in eleven countries and had stakes in ten more plants. It also ran 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: 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.

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 assert whether this order came from Brazil or not. It appears that it came from Argentine, which was a much more promising market at that time. From 1917 until 1945, for example, 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

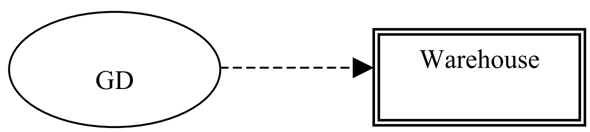
South America, including the Brazilian market, was through the exporting of glass. In this process, the HQ and external actors represented by local customers and export agents played the key roles (figure 1).

Figure 1 – GD: Entry - Exporting



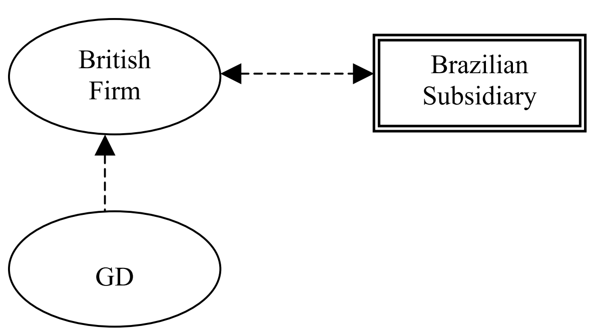
Exporting remained the mode of operation for nearly thirty years. By 1923 the export sales to Brazil had increased substantially, which drove GD to open a warehouse in Rio de Janeiro with the aim of co-ordinating exports and serving as a distribution channel in the Brazilian market. In this sense, GD 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 2).

Figure 2 – 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 incidentally represented more of a commitment to the Brazilian market. One of the subsidiaries of the acquiree was implanted in the Brazilian market and was responsible for producing and providing safety glass to the local automotive industry. When this British firm was acquired in the UK, its Brazilian operations were transferred to GD's Brazilian operations. In this respect, GD switched the mode of operation in Brazil due to an event triggered in the UK (figure 3).

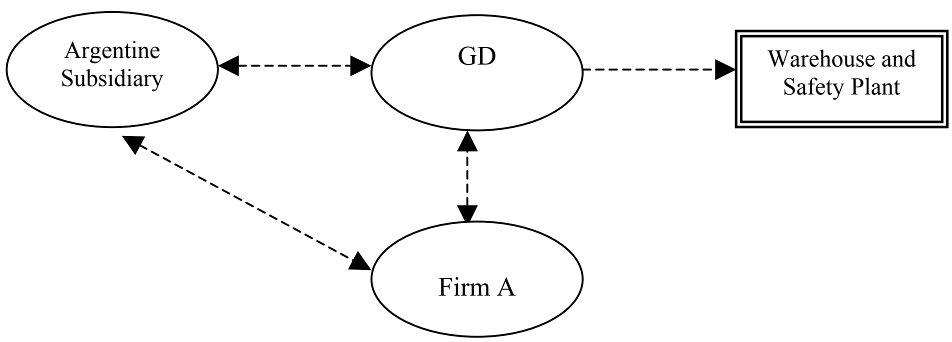
Figure 3 – GD: Second Modal Change – FDI through Acquisition



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 regards to the former, 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 enough due to local sources of sheet glass. He also considered the possibility that GD had swapped interests with Firm A, which was its partner in Argentine. 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. Therefore, the exit from Brazil was carried out by the HQ. External actors represented by one of GD's competitors must be taken into account if we consider that GD swapped interests with Firm A (figure 4).

Figure 4 – 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 country from the one where GD had previously operated. The automotive industry was consolidated, surpassing the Argentine one, and the construction industry had also developed considerably. GD, scanning for potential investments worldwide realised that the Brazilian market was definitely one of the markets where it should be operating[5]. In order to enter this market, GD involved itself in an intricate process whereby it simultaneously acquired two Brazilian firms that processed glass, embarked upon a joint venture with Firm A for manufacturing float glass, and licensed 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 was a sleeping partner (30%). The Belgian glassmaker had control over Firm B and was also in charge of providing it with technology and technical support.

In the late 1970s, the group of which the Belgian glassmaker was part decided to exit the glass business in order to focus its activities on the food industry. At that time, one of GD's directors was a member of the Belgian glassmaker's board and would, hence, 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[6], decided to buy Firm B, each one having 50% of the ordinary shares. Shortly afterwards, GD bought the German firm, thus becoming Firm B's only shareholder.

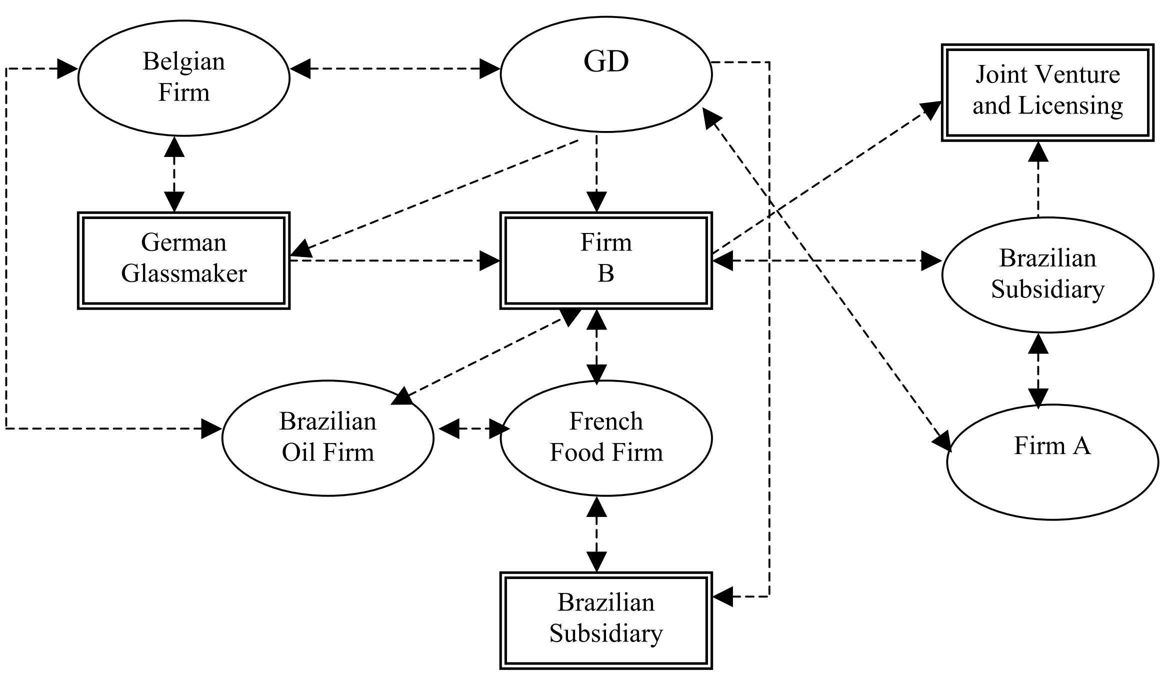
Having sold its shares in Firm B to GD, the French food firm did not hesitate to sell another firm it owned in Brazil. This firm operated in downstream value chain activities and was 100% owned. Thus, the acquisition of the two Brazilian glassmakers involved three phases: i-) GD, in conjunction with the German glassmaker, bought Firm B; ii-) GD managed to buy 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 such a size that its players could only reap substantial economies of scale in upstream activities through a float process. However, as a float plant involved high risks due to its costs, around $170 million, no single firm was prepared to take the risk of discovering that a potential competitor was also considering manufacturing float glass in Brazil. A joint solution seemed to be the best option.

Firm A, one of GD's major world competitors, has operated in Brazil in upstream and downstream activities for a long time. Owning 70% of a very 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 50% of 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 5).

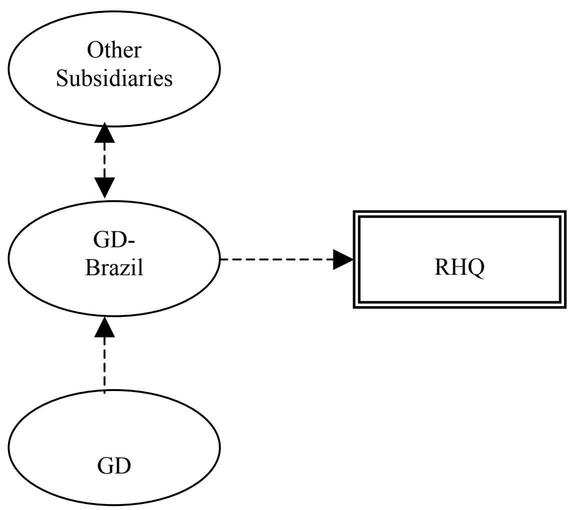
Figure 5 – GD: Re-entry into Brazil



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 plant 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, which is hosted by the Brazilian subsidiary. The RHQ is responsible for co-ordinating and controlling all subsidiary units located in that continent. It is also in charge of rationalising the South American operations in terms of manufacturing and flows of products. This intermediate structure means that all South American subsidiary units report to the Brazilian subsidiary which subsequently reports to the HQ. The Brazilian subsidiary is now connected to other South American units through control relationships. In terms of the framework developed earlier, the last modal change refers to changes in the degree of integration of activities (figure 6).

Figure 6 – GD: Modal Change - RHQ



5 – Case Analysis

In the last section, we described the internationalisation of GD in the Brazilian market by focusing on the sequence of modes of operation and on the relationships that were concatenated during this process. The sequence is represented by two entries and four modal changes in which the HQ, external actors and sister subsidiary relationships were articulated in distinct spatial and temporal contexts. In this part of the article, our aim is to show how this internationalisation process can be conceptualised as paths in space and time.

To begin with, the events that characterise the internationalisation process of GD in Brazil, i.e. the modes of operation, are not serially independent at all. This means that some modes of operation are interlocked in a chain of events in which the previous mode is important to understand the following ones. For example, the history of GD in Brazil started when it received an unsolicited order of glass. Over the years, this fortuitous order increased substantially in volume, paving the way for the establishment of the Brazilian operations, which were initially represented by the warehouse. In other words, GD operated in Brazil for nearly 30 years through exporting and this experience might have been important for the firm. GD accumulated knowledge of the Brazilian market and this knowledge was used later, when GD established the warehouse. In this particular case, the entry mode (exporting) preconditioned the following mode of operation (warehouse) through a self-reinforcing mechanism of knowledge development (Johanson and Vahlne, 1977).

Secondly, the path-dependent sequence of modes of operation in Brazil evolved in parallel with other sequences of modes of operation embedded in a number of countries. This means that the internationalisation process of the Brazilian subsidiary was concurrent with the internationalisation processes of sister subsidiaries, such as the Argentine operations, and of external actors, such as competitors. The coupling of these different internationalisation processes was liable to timing, i.e. relationships that accounted for the modal change were articulated in different periods over the sequences. For example, the second modal choice resulted from relationships between the HQ and external actors that developed in a distant context from Brazil. The initial change was triggered in the UK where GD acquired a firm that operated in a number of countries, including Brazil. By that time, the activities of the Brazilian operations had been restricted to distribution of glass to the local market. With the acquisition of the British firm by the HQ, the Brazilian operations became involved with manufacturing. This means that the Brazilian operations increased the degree of localisation of activities to Brazil by moving from distribution to manufacturing activities.

Although the second modal change nicely illustrates that path-dependent sequences of modes of operation are embedded in other sequences of modes of operation whose coupling varies in space and time, the re-entry of GD into Brazil is the best example of this issue. This process resulted from very complex and time-consuming negotiations involving different actors who had developed relationships in various countries over the long-term. For example, the relationships between the Belgian firm and GD allowed the latter to buy Firm B. The acquisition of Firm B, in turn, triggered another acquisition in Brazil. One of the shareholders of Firm B had a plant in Brazil for processing glass, which depended upon the Belgian firm's technology. When the Belgian firm sold its Firm B shares to GD, the other shareholder immediately agreed to sell its own plant.

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

In this respect, the re-entry into Brazil resulted from relationships among actors with their own internationalisation processes embedded in different, yet overlapping networks. Because these actors were to some extent dependent upon each other, the internationalisation of GD in Brazil would only evolve if it was simultaneously connected to these actors' internationalisation processes. Once all these events "put the key in the lock" (Abbott, 1997: 100), i.e. once all relationships were aligned at a particular time, the re-entry into Brazil took place.

Finally, because path dependent sequences of modes of operation are spatially and temporally interrelated, a particular sequence may alternate periods of gradualism and discontinuity. During the former, self-reinforcing mechanisms, such as the re-use of knowledge, set the rule for subsequent modes of operation. The latter, in turn, portrays sequences in which more abrupt events have the causal power to redirect the sequences towards a new path. In this case, there is not a gradual connection between modes of operation in terms of the degree of localisation, externalisation, and/or integration of activities.

Analysing the sequence of modes of GD in Brazil, it is clear that the first modal change is smooth. As the mode was changed incrementally, GD evolved in Brazil by making small but steady steps. However, the period spanning the second and the third modal changes is characterised by a series of unexpected events that drove GD to a new path. This means that the sequence of modes of operation diverted to a path that was unknown in the beginning of the sequence. Because the third modal change no longer reinforced the previous modes, the connection between them is not of an incremental type. More precisely, the third modal change indicates that GD exited the Brazilian market by selling its sales and manufacturing operations to one of its competitors. Rather than an incremental development, this modal change meant de-internationalisation (Benito and Welch, 1997).

It is interesting to notice that later the sequence of modes of operation in Brazil once again evolved incrementally. For example, the last modal change represented by the establishment of the RHQ was to some extent the recognition by the HQ of the superior capabilities of the Brazilian subsidiary. Operating successfully in both float and processed glass, the Brazilian subsidiary outran sister subsidiaries located in Latin American and, as a result, conquered a regional mandate to co-ordinate them. In terms of the framework developed earlier, this means that, having reached the highest mode of operation in Brazil in terms of the degree of localisation of activities, the Brazilian subsidiary incrementally took on more responsibilities that transcended the geographically local context in which it was implanted.

6 – Final Remarks

This article is in some ways an answer to Eriksson *et al.*’s call (2000) for more research on internationalisation and path dependence, a topic that has received scarce attention in the literature. Unlike the research of Chang and Rosenweig (2001), we have opted for a qualitative approach by reconstructing the internationalisation of a manufacturing UK firm in the Brazilian market. Our general claim is that internationalisation processes can be conceptualised as path-dependent sequences of modes of operation in which the spatial and temporal dimensions are of critical importance. As such, it is suggested here that the concept of path dependence is useful to understand not only gradual, but also discontinuous internationalisation processes. Some implications and suggestions for further research on internationalisation are discussed below.

First, path-dependent internationalisation processes seem to be guided by systematic forces such as the self-reinforcing mechanism of knowledge development proposed in the Uppsala model (Johanson and Vahlne, 1977) as well as by less systematic forces, which we have called ‘random forces’. For example, if one of GD’s directors were not a member of the board of the Belgian firm at the moment the firm decided to divest from the glass business, the history of GD could have been very different.

These forces are considered less systematic because they fall outside the previous knowledge of the researcher, i.e. they can only be understood after the phenomenon has taken place (Arthur, 1989). Or, as Becker (1994: 189) puts it, “we can pick out what was important for the occurrence of an event afterwards, but we can’t specify all those conditions in advance”. If systematic and random forces can be equally relevant in the internationalisation of the firm (Agnal and Axelsson, 2002), it seems appropriate to recommend that further research on internationalisation and path dependence play closer attention to these random forces with the aim of providing a more comprehensive and realistic account of path-dependent internationalisation processes.

Secondly, the relational and path-dependent approach adopted here has also enabled us to view the internationalisation of the firm as part of other internationalisation processes that occur concurrently in distinct spatial and temporal dimensions (Andersson, 2002). In times when operations of firms become more intertwined at a global level (Porter, 1986; Ghoshal and Bartlett, 1990), it seems clear that different internationalisation processes will exert an important influence on each other. For example, the internationalisation process of GD's Brazilian subsidiary was somewhat dependent on the internationalisation process of the Argentine unit. It was also subject to the influence of the internationalisation processes of GD's competitors. In line with this, our research suggests that a particular internationalisation process must be understood as embedded in other internationalisation processes (Kogut, 1983). It results not only from the relationships articulated between the focal subsidiary, the HQ, and local external actors (Johanson and Vahlne, 1990), but also from relationships between sister subsidiaries and external actors located in third countries.

Thirdly, because internationalisation processes are interconnected, path-dependent sequences of modes of operation are not necessarily of a gradual type, but appear to alternate between periods of gradualism and discontinuity. Usually, discontinuities arise at critical junctures, i.e. points where sequences meet (Mahoney, 2000). Our result suggests that the number and magnitude of critical junctures of a particular sequence of modes of operation cannot be predicted beforehand because they are susceptible to relationships articulated in different spatial and temporal contexts. In other words, that relationships are liable to spatiality and temporality makes difficult, even impossible, to say where and when a particular sequence will break off.

Finally, path-dependent internationalisation processes point to the individuality of the paths (Hakansson and Lundgren, 1997). As sequences of modes of operation appear to follow singular trajectories such as GD's, the attempts to search for similar or dissimilar sequences in order to establish patterns of internationalisation seem misleading (Hadjikhani, 1997). A much more fruitful avenue to delve into internationalisation appears to probe the mechanisms that drive the firm to take and eventually change paths. We have observed that relational mechanisms generated by relationships such as HQ, external actors, and sister subsidiaries, whose concatenation varies in space and time open, room to tackle the singularities of internationalisation processes. Future research that further explores this issue will certainly increase our knowledge of the internationalisation of the firm.

7 - Notes

1-We are grateful to Angela Versiani for her comments on earlier versions of this article. We are also indebted to Luis Araujo from whom we have learned a great deal about the internationalisation of the firm. Thanks for CAPES for having funded the research that underpinned this article (grant number 1381/96-98). We bear all responsibility for any mistakes.

2- The only theoretical perspective that explicitly takes into account the role of space in international business is that of the Eclectic Paradigm (Dunning,1980;1988). Broadly, it is suggested that ownership advantages are dependent on location advantages of a particular country.

3- In line with Kutschker and Baurler (1997), time is a missing dimension in internationalisation processes. Blomstermo *et al.* (2002:268) also suggest that the role of time has been unclear. Accordingly, "time is operationalised in three ways: i) number of years in foreign operations; ii)

whether or not previous foreign operations have been carried out; and iii) number of previous entries".
4-According to one of the interviewees, the float process had many advantages over the previous process, called 'sheet process'. For example, it requires a much smaller manufacturing plant as it eliminates the grinding and polishing production phases.
5- At that time the float licenses were coming to an end. In addition to representing a significant decrease in GD's turnover, the end of the float licenses would enable some firms to export and eventually manufacture in countries where they were not allowed to do so due to contractual restrictions.
6-This German firm was also owned by the Belgian glassmaker.

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