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The diffusion of exporting in Brazilian industrial clusters

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The present research aimed at understanding the process by which firms in a cluster start to export based on systemic interactions, and the process of diffusion of exporting as a business strategy within the cluster. Diffusion was defined, following Rogers' (1995: 5) seminal work, as 'the process by which an innovation is communicated through certain channels over time among the members of a social system'. The research method used was industry case studies and the unit of analysis selected was the cluster. Two manufacturing industries were chosen to be investigated, and within each geographic area clusters were identified as the origin of dynamic export growth in the industry. Players in each industrial cluster, as well as other significant actors, were interviewed. Extensive secondary data research was done to study clusters' historical development. Detailed analysis and a comparison of the experiences permitted the extraction of some general conclusions concerning the similarities and differences between the clusters in terms of the adoption and diffusion of exporting. Results showed that the diffusion of exporting in an industrial cluster is quite similar to the dissemination of technical innovation. Social ties were important to facilitate the diffusion of exporting in one of the clusters studied. Also, the role of domestically-owned flagship firms in leading the internationalization process proved to be important in only one of the clusters, while the role of external actors was fully supported in the two industries studied. Finally, a number of support institutions, private and public, interfered in different stages of the internationalization process. In both industries, the federal government had only a late and limited impact on export initiation and development.

Keywords: industrial clusters; exporting; diffusion; internationalization; Brazil

1. Introduction

Brazil is one of the ten largest economies in the world, and the fifth largest country by population and by territory. It has a diversified and resource-rich economy, with strong agricultural, mining and industrial sectors. The country is self-sufficient in oil and other sources of energy. However, in spite of its size and importance as one of the leading emerging economies in the world, Brazil's participation in global foreign trade is still quite limited: the country has historically participated with around 1% of the world's trade, a situation that has not changed during the last decades. The reasons for this low export performance include macroeconomic factors (such as macroeconomic turbulence, exchange-rate policies, high-interest rates, etc.), market

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factors (size of the domestic market), or firm-related factors (firm size, family ownership, managers' risk aversion or local mind-set). In fact, the country has lagged behind other emerging economies in developing its export activities. In the last decade, only 40.9% of total Brazilian exports grew at a rate equal or higher than global exports (Miranda 2001). This suggests that certain sectors increased their exports faster than others. Also, when examining the scope, size and composition of Brazilian exports, differences among geographic regions become apparent. Owing to Brazil's cultural diversity, regional differences in economic development and natural resources, and even historical developments, certain regions and geographic areas have shown more export dynamism than others. In fact, among the 27 states of Brazil, the five leading exporters, with 70% of total Brazilian exports, are located in the southern part of the country. Furthermore, even within this area high levels of export performance has consistently been concentrated in certain industries and micro-regions.

This is certainly not exclusively a Brazilian phenomenon. A vast body of literature since the 1980s looked at regional development, trying to understand both at a macro- and a micro-region level the various factors that seem to influence the emergence of regional export leaders. The research on Italianate industrial districts is one such perspective, as well as the related literature on industrial clusters. Several scholars have addressed the issue of the role of exports in the development of these industrial agglomerations, using various theoretical lenses. In fact, the industrial district has become 'an emerging research subject in the international business agenda' (Maccarini, Scabini, and Zuchella 2004, 2).

In this paper, we examine the internationalization of firms in industrial clusters from the perspective of the adoption and diffusion of innovations. The movement towards international markets in a cluster is seen as a process starting with the 'discovery' of exporting and its adoption by one or a few innovative firms, and later, in case the experience is successful, the diffusion of this business experiment to other firms in the cluster. This conceptualization of business behaviour emanates from recent work in the field of economics (Hausmann and Rodrik 2003; Hausmann, Pritchett, and Rodrik 2005b).

This paper is structured as follows. In section 2, two research streams relevant to the understanding of clusters' internationalization are examined: the literature on industrial districts, industrial clusters and regional development, and the literature on export behaviour of small- and medium-sized firms, with special emphasis on the role of networks in the internationalization process. The specific research questions of the study are then presented. Section 3 briefly describes the methodological choices of this study. In section 4, the results of the cluster studies in the Brazilian furniture and beachwear industries are reported, and in section 5 the findings are discussed. Finally, in section 6, conclusions are drawn, and limitations and research opportunities are addressed.

2. The internationalization of industrial clusters: literature review

It is well known that there is a tendency for the agglomeration of industrial activity in certain locations, which may in turn stimulate the creation of environmental conditions favourable to further expansion of economic activities in these areas. Porter (1998) defined clusters as the occurrence of critical masses in a certain location

which achieve high competitive performance in a given field. The growth of a cluster can derive from traditional factors, such as favourable environmental conditions, from competitive advantages arising from interactions, knowledge generation and diffusion, and from its attractiveness to outside investors and innovators (Iammarino, Sanna-Randacio, and Savona 2006). The emergence and success of regional clusters, however, are not dependent upon previously existent comparative advantages; they are rather 'social creations', characterized by 'endogenously built up competitive advantages' (Scott and Garofoli 2007, 5).

There are various taxonomies of industrial clusters (Pickernell et al. 2007). Markusen (1996) suggested five different types of industrial districts: Marshallian, Italianate (a variant of the former), hub and spoke, satellite industrial platforms, and state-centred. Pickernell et al. (2007) combined nine indicators to describe eight types of clusters. According to them, Marshallian and Italianate districts are both vertically structured and based on informal and systemic relationships, but they differ in that Marshallian districts are agglomerational, while Italianate districts are relational. Another useful typology is provided by Suzigan, Furtado, and Garcia (2007), with two dimensions (importance to the industry and importance to the region), leading to four types: vectors of local development (low importance to the industry but high to the region); centres of industrial and regional development (high in both dimensions); embryonic (low in both); and advanced vectors (high importance to the industry, but low to the region).

2.1. *The dynamics of industrial clusters*

Geographic proximity plays a major role in stimulating interactions among players, and in attracting new entrants. Such 'systemic interactions' are seen as the motor of innovation (Brusco 1990; Porter 1990; Iammarino, Sanna-Randacio, and Savona 2006). Inter-firm linkages can be internal to the cluster, or external. Social networks permit trust to be built among members, reducing opportunistic behaviour, and fostering collaboration. Such relational assets are even more important because they permit the transfer of tacit knowledge, that is, non-codified knowledge, which cannot be easily acquired, except by means of social relationships nurtured by spatial proximity (Maskell and Malmberg 1999; MacKinnon, Cumbers, and Chapman 2002). The specific history of a cluster, the process by which ties among individuals and among firms were established, the types of institutions of collective governance, the nature and scope of collective projects, among others, can impact the level and type of co-operation within the cluster (Gaggio 2006). Although clusters foster firm co-operation, competition is also an essential element to a cluster's success (Porter 1998).

Knowledge spillovers are conceptualized as transfers of knowledge without a direct or adequate compensation to the producer of that knowledge (Caniëls and Romijn 2005). These transfers include not only technical know-how, but also 'productive and managerial techniques, market outlets, local resources, competencies, and so on' (Scott and Garofoli 2007, 10). These other types of spillovers are by no means less important, since often firms in a cluster, especially smaller firms, lack not only technical, but also managerial know-how.

Flagship firms, because of their leading position, are very important in disseminating innovations in a cluster. Andersen and Christensen (2005, 1263),

building on previous contributions from various authors, consider role and position as 'dialectical concepts', in the sense that a specific position is associated with a given role. We can therefore look at the flagship firm from this perspective.

The concept of a flagship firm was originally developed by Rugman and D'Cruz (1997, 2000), who saw these firms as leaders of vertically-integrated business networks. Other authors have described the flagship firm's position as being 'at the heart of the network' (Ernst and Kim 2002, 1422), or as occupying 'strategically central positions' (Lazerson and Lorenzoni 1999, 362). According to Rugman and D'Cruz (1997, 2000), these firms are responsible for (1) co-ordinating the network; and (2) providing strategic leadership to the other network members (that is, formulating a strategy for the network and overseeing the implementation of the strategy by other members). Flagship firms are expected to relate to other players in the business environment, establishing alliances with non-business institutions (such as universities and research institutes, universities and technical schools, and government agencies), and co-operative relationships with competitors (such as joint ventures, joint research activities, consortia, etc.). They should also co-ordinate the flows of information among the various actors. Among the advantages provided by a flagship firm to network members, the most important would be the offering of synergistic benefits, long-term vision, and business stability, as a return for following the network strategy (Girod and Rugman 2005). Therefore, the strategy formulated by the flagship firm would affect the growth and strategic direction of the members of a network (Ernst and Kim 2002). This view of flagship firms assumes strategic asymmetry, that is 'a substantial or almost complete measure of control' by the leading firm over the strategy and the work of other network members (Rugman and D'Cruz 1997, 405).

Elaborating on the concept first proposed by Rugman and D'Cruz (1997, 2000) in the context of multinational enterprises, Ferreira, Tavares, and Hesterly (2006, 92) used 'a more minimalist conceptualization', defining a flagship firm as 'the company that leads the cluster'. For these authors, the flagship firm is also positioned 'at the core of the cluster'. However, their conceptualization differs from the previous perspective in that it does not need to formally co-ordinate the cluster, neither it is necessarily a multinational company. The role of the flagship firm in this model is seen within a 'decentralized configuration', in opposition to Rugman and D'Cruz (1997, 2000). A flagship company would typically be a 'mother firm' with a large number of spin-offs. It would serve as a role model for other firms in a cluster. When there is a high level of specialization and vertical linkages among firms, it may be in the interest of the flagship firm to deliberately transfer know-how to other firms in the value chain (Scott and Garofoli 2007). Also, because they generate a number of spin-offs, which in turn will later generate their own spin-offs, they – often involuntarily – share their knowledge with their progeny.

Gupta and Subramanian (2008) also discussed the position and the role of flagship firms in industrial clusters. For them, flagship firms are leaders that enjoy a 'focal position' in a cluster, with the responsibility of absorbing, accumulating, and integrating innovations within the cluster. They observed, however, that in emerging economies flagship firms are often undercapitalized and non-business institutions are not strong enough to provide the necessary support to the cluster. In these circumstances, connecting to global networks could be a wise strategic move to attain cluster growth and development. This could be achieved by exploring the ties

of leading firms with other actors outside the cluster, including international firms (Lazerson and Lorenzoni 1999).

Knowledge dissemination could occur by means of employees who leave incumbent firms to start their own businesses. Entrepreneurial spin-offs are sometimes described in the literature as a sort of 'parasite' or as a 'brain-drain' from parent firms (Phillips 2002). There has been some speculation on how flagship firms in a cluster relate to their spin-offs, since the latter are often responsible for the loss of competitive advantages by the pioneering firm. Ferreira, Tavares, and Hesterly (2006) found empirical evidence of a 'motherhood model', in which employees exit a leading firm to create their own with the support of the parent. Therefore, the relationship between parent and spin-offs may foster co-operation and facilitate the dissemination of knowledge. As to other start-ups, especially new entrants in the cluster, they tend to rely less on knowledge spillovers from incumbent firms.

The role of entrepreneurs as innovators in industrial clusters is of paramount importance. In developing countries, entrepreneurs can act as innovators when they start to manufacture a product that has never been produced in the area, or when they 'discover' the exportability of a given product. Once a firm successfully develops a new product or export activity, 'other entrepreneurs learn that the product in question can be profitably produced [exported] and emulate the incumbent', potentially washing away the innovator's advantages (Hausmann, Hwang, and Rodrik 2005a, 2). When the innovator is a flagship firm in a cluster, however, it is believed that the dissemination of this type of knowledge reinforces both innovators' and followers' advantages (Vázquez-Barquero 2007).

Another major mechanism of knowledge dissemination is the turnover of skilled employees who acquired expertise and know-how working for established firms. These employees form a pool of experts in specialized product lines (Markusen 1996), constituting a rich and highly-skilled labour market. As these employees are hired by late movers, the advantages of pioneering firms are transferred to other firms (Hausmann and Rodrik 2003).

Clusters benefit also from external actors, such as foreign buyers, local institutions, and government agencies. Seminal work on the Italian industrial districts in the late 1970s and 1980s linked the role of internal and external actors to growth accelerations (Beccatini 1990; Brusco 1990). Schmitz (1995, 1999a, 1999b) studied the Sinos Valley footwear cluster in Brazil, examining the role of leading firms and export agents in its development, as well as the failure of the state to support the cluster in a period of crisis. Ellis (2003) explored how international intermediaries acted as 'triggers', helping firms to mobilize resources and energies to export.

Clusters, however, are not always successful, and they may stagnate or decline. Several factors can contribute to such an outcome, among which are isomorphism and path dependence. Isomorphism refers to firms mimicking another firm (DiMaggio and Powell 1991), which is seen as a role model. As a result, the cluster becomes very homogeneous in terms of products, processes, etc. This can have both positive (such as the ability to serve larger orders) and negative outcomes (more vulnerability to changes in demand or technology). As to path-dependent behaviour, it occurs when firms, or clusters, are locked into a pattern that showed to be previously successful but that is no longer appropriate for their prosperity, or even

survival (Meyer-Stamer 1998; Maskell and Malmberg 1999). The literature offers examples of path-dependent behaviour among firms in certain Brazilian clusters (Meyer-Stamer 1998).

2.2. SMEs internationalization: individual or collective processes

The literature on the internationalization of the firm provides a broad set of theoretical models and empirical studies on how a small- or medium-sized firm starts and develops its international operations. The most influential theoretical contribution is probably the Internationalization Process Model (IP Model) developed by Uppsala scholars (Johanson and Vahlne 1977). According to the model, a firm starts its operations in the domestic market and internationalization occurs at a later stage as a result of incremental decisions. Once the company acquires experience in foreign markets, it increases its commitment to international operations. Empirical tests of the model have produced 'considerable, although not undisputed' evidence (Björkman and Forsgren 2000, 11)

The IP model is a learning model (Forsgren 2002). Market knowledge, a crucial element of the model (Steen and Liesch 2007), can be either experiential or objective. The model suggests that experiential knowledge, due to its tacit nature, cannot be transferred from one market to another and from one individual to another. Therefore, firms have to move gradually in their international expansion, as they acquire experience. Forsgren (2002, 261) considered that the IP model over-emphasized experiential learning, but other types of learning could play a role in the firm's internationalization process, such as 'learning through imitation', or 'learning through incorporating people or organizations'. Also, there is growing evidence that market knowledge acquisition is the result of collective action, rather than a single firm's behaviour (Lamb and Liesch 2002). In later writings, Johanson and Vahlne (1990, 2006) incorporated to their model the issue of knowledge development as a consequence of relationships among firms.

Other models of export development advanced during the late 1970s and 1980s are often referred to as 'stage models', or I-models (Andersen 1993), because they looked at firm internationalization as an innovation process. Cavusgil (1980), in particular, saw the initial involvement with exporting as the result of non-deliberate steps, in which external events (such as contacts with export intermediaries) and firm characteristics (such as manager characteristics or firm advantages) played a role in moving the firm to foreign markets.

Despite the value of these contributions, the view of the firm as a sole actor did not allow a broader understanding of how firms in a cluster internationalized. Nevertheless, later developments in the area of internationalization and networks since the late 1980s permitted to see the process of 'discovery' and adoption of exporting in the context of a group of actors, and not as an individual phenomenon (Bonaccorsi 1992), as early studies had envisaged. In network theory, relationships with suppliers, customers, or distributors are seen as valuable intangible assets, by which a firm may gain access to new technologies and markets (Johansson and Mattson 1988; Christensen and Lindmark 1993; Chetty and Holm 2000). Networks are often in the first steps of a firm's internationalization process (Welch and Luostarinen 1993). The degree of network internationalization affects the individual firm's ability to internationalize. Firms may internationalize with their network, as

part of a supply chain, or following a large customer; or they may use their managers' social networks to get started in foreign markets (Johanson and Vahlne 1990; Bonaccorsi 1992; Bell 1995). Recent research on new international ventures or 'born global' firms highlighted the crucial role of networks in their accelerated internationalization patterns (Sharma and Blomstermo 2003).

Despite these conceptual advances, even network studies often tended to look at internationalization from the perspective of a single actor, and firm membership in networks as part of the entrepreneur's social capital (Coviello and Munro 1997; Blomstermo et al. 2004). In fact, the process by which a whole network internationalizes has only been systematically considered in the industrial districts literature.

The study of the internationalization of an industrial district or cluster has been conducted from two major perspectives: the individual firm as a member of the cluster, and the cluster as a unit in itself. The first perspective focuses on how a firm can internationalize taking advantage of cluster-specific advantages, including the access to international knowledge gained by leading firms, and the presence of export agents and other intermediaries who already have ties with other firms in the cluster. Researchers following this approach have shown that firms in an industrial district tend to present higher export intensity, have a higher probability of becoming exporters (Becchetti and Rossi 2000), export more products with higher-added value (Becchetti, De Panizza, and Oropallo 2007), and internationalize faster (Fernhaber, Gilbert, and McDougall 2007; Zuchella and Servais 2007) than their counterparts dispersed in other locations. The other perspective looks at the cluster as 'a subject capable of its own collective internationalization process' (Maccarini, Scabini, and Zuchella 2004, 2). Examples of this perspective are the studies on the role of internationalization in promoting structural changes in a cluster (Bertolini and Giovannetti 2006), and on the impact of internationalization on social relationships of local firms (DeMartino, Reid, and Zyglidopoulos 2006). This perspective is adopted in the present study.

This paper addresses the issue of the 'discovery', adoption and diffusion of exporting in industrial clusters. Diffusion is defined, following Rogers (1995, 5), as 'the process by which an innovation is communicated through certain channels over time among the members of a social system'. In this sense, diffusion is seen as 'a type of social change', because it causes alterations 'in the structure and function of a social system' (Rogers 1995, 6), and it can be spontaneous or directed. The terms 'diffusion' and 'dissemination' are used here as very close synonyms, following Rogers (1995). There is a time lag in adoption, and some firms can be described as early adopters, while others should be seen as late adopters, and others as laggards, using Rogers' (1995) taxonomy.

The conceptualization of a flagship firm in this study follows the 'minimalist' approach suggested by Ferreira, Tavares, and Hesterly (2006). A flagship firm is seen as a focal firm in the cluster, which leads other firms in the cluster in terms of technical and marketing innovations (and, specifically, exporting), at least for a period of time. The flagship firm is not necessarily a 'co-ordinator' of the cluster's strategic moves, neither has it the mechanisms to impose a certain discipline to other cluster members, but it plays a major role in the strategic direction taken by other firms by influencing them and eliciting imitation. It has leadership, not authority, over other cluster members.

The following research questions guided the study:

- How does the ‘discovery’ and subsequent diffusion of exporting as a business strategy occur in an industrial cluster?
- What is the role played by internal and external actors, and by public and private support institutions in the ‘discovery’ and diffusion of exporting in an industrial cluster?

3. Method

Since Beccattini’s (1979) seminal work advocated the use of industrial districts as a crucial unit of analysis, several authors have studied industrial clusters, or industrial districts, as an entity in itself. In this study, two manufacturing industries were chosen to be investigated, the furniture industry and the beachwear industry, and within each one a geographic cluster was identified as the origin of dynamic export growth in the industry: the São Bento do Sul wood furniture cluster and the Rio de Janeiro beachwear cluster. In addition, the São Paulo beachwear cluster was also studied, since the diffusion process at a certain point in time spread from Rio de Janeiro to São Paulo.

Secondary sources were used, including government databases; articles in the press; academic studies; industry and government agencies’ publications; company sites; information available on the internet; and monographs, theses, and dissertations. In the case of the São Bento do Sul furniture cluster, extensive records were available since the furniture industry represents the main economic activity of the region, and a number of actors have written several accounts of their own and their firms’ experiences and history. As to the Rio de Janeiro and the São Paulo beachwear clusters, very few industry records were available.

Interviews were conducted with various players in each industry and cluster from June to December 2006. A total of 14 personal interviews in the furniture industry and 16 personal interviews in the beachwear industry were conducted, covering the most important manufacturers, traders, industry organizations, and consultants to the industry. Some firms were interviewed more than once. In the furniture industry, shorter interviews were also conducted by telephone with another 15 firms in the cluster, mainly to get specific information on when and how they had initiated their export activities, year of foundation, and other export information. In the beachwear industry, four telephone interviews were made with organizers of fashion weeks and other actors in the fashion world. Each personal interview lasted between one and two hours. All interviews were recorded and transcripts were made. Several consultations with interviewees by telephone and e-mail were made to check conflicting information as fieldwork and data analysis progressed.

The analysis proceeded in two steps: descriptive and analytical. The first – descriptive – step included: (1) the preparation of industry and cluster reports, covering general data and historical background; (2) a detailed description of the process of discovery, adoption, and diffusion of exporting in the cluster, including historical information on the role of flagship firms, immediate followers, and late adopters; (3) a descriptive account of the role of external agents, and support institutions, private and public, in the process. The second – analytical – step consisted of: (1) case study analysis, including summary tables with the time line of major events, and diagrams to illustrate the connections between various players in

the industry; and (2) comparison of the case studies to understand the diffusion process and extract general conclusions.

4. Results

4.1. Industry and cluster background

The Brazilian furniture industry comprises around 16,000 firms, the vast majority of which are domestic small- and medium-sized firms, family-owned and family-operated firms (Table 1). Main competitive advantages of the industry are country-specific, such as local availability of raw materials, skilled labour (typically of European origin), and cost advantages (a forest takes 12 to 15 years to grow in Brazil, compared to 30 to 50 years in Europe). Total exports grew from almost nothing in the early 1990s, to close to one billion dollars in 2005, with Brazil becoming number 12 in the world ranking, compared to China, number one in the ranking, with total exports of approximately 9 billion. The industry export/sales ratio increased from 10.1% in 2000 to 22% in 2004, but was believed to have fallen in 2005 to 18%. Furniture manufacturers are concentrated in production clusters. The São Bento do Sul cluster, the third in size in Brazil, also holds the third place in the Brazilian ranking of furniture clusters in terms of number of people employed, but it is the number one exporter, with 43% of total Brazilian exports of furniture in 2005. Many firms in the cluster export 80 to 100% of their production, one being the largest individual exporter of home furniture in Brazil. It is estimated that it is formed by 400 firms, including those established nearby. The dominant cultural influence in the area is European (Germanic). The original community lived almost completely insulated from other areas of the country for more than a century.

The Brazilian swimwear industry followed a different trajectory. It grew exponentially in the last 20 years. Between 2000 and 2005, the sector achieved average export growth rates of 32% a year, with total exports reaching US\$ 24.9 million in 2005. The Brazilian swimwear industry constitutes a small segment of the domestic apparel industry, but one that achieved international recognition based on design. The industry consists of approximately 700 firms, mostly small-sized and entrepreneurial, with the largest exporting firms concentrated in the cities of São Paulo and Rio de Janeiro. The Rio de Janeiro cluster was the first to develop and it is still the most influential in terms of design, although the São Paulo cluster is far

Table 1. Distribution of firms in the furniture industry according to the number of employees (2005).

Number of employees	No.	%
Up to 9 employees	10 830	67.2
10–49 employees	3573	22.2
50–99 employees	957	5.9
100 or more	752	4.7
Total	16 112	100.0

Source: ABIMÓVEL (the Brazilian furniture industry association).

Note: Only 322 firms had annual turnover over US\$ 5 million dollars in 2005. The largest exporter, Artefama, had around 1300 employees in 2005, and Zipperer Industries had around 250.

larger in terms of volume and exports, and it is in a close dispute for leadership in design.

4.2. The 'discovery' of exporting and the diffusion process in the furniture cluster

The pioneer in the development of the São Bento do Sul furniture cluster exports was a firm named Zipperer Industries, founded by a descendant of Austrian immigrants, who became a legendary figure in the region. He initiated the production of handicrafts made of small pieces of pine wood that were wasted by the timber industry. The company was a pioneer in selling wood products outside the state of Santa Catarina, serving as a role model for other firms to pursue the same path. It was the first in the cluster to export in 1959. As competition in the handicraft business grew in the 1960s, it increased the production of furniture, introducing new designs, which were later copied by other firms. The first attempts by Zipperer Industries to export furniture in the 1970s were not very successful. In the mid-1970s, the growing shortage of native woods increased the attractiveness of using pine wood from reforestation. Zipperer gained access to Canadian technology, built a modern plant with last generation equipment, and a high level of operational flexibility, and started exporting. During the 1980s, the company was quite successful in selling to the European market and developed a reputation as a reliable supplier of quality products at a competitive price. As Zipperer produced and successfully exported this new product line, other firms in time followed its example. The company benefited from the export boom of the early 2000s. Growing exports, combined with high-quality products, permitted the establishment of solid relationships with foreign buyers. By 2005, it exported around 90% of its output. Despite its success up to the early 2000s, succession problems jeopardized its role as a flagship firm in the cluster, and halted its growth. Nevertheless, the role played by Zipperer Industries in the development of the cluster is broadly recognized by other cluster members and industry representatives interviewed.

The immediate follower in exporting from the cluster was a company called Artefama. Founded in 1945 by four entrepreneurs, it was subsequently sold to new owners of Austrian origin. Artefama was also initially dedicated to the production of pine wood handicraft. As the company grew, a new plant was built, product lines became more diversified, and new handicraft items were launched and sold to stores outside the state, in a manner similar to Zipperer. The first export order came in 1965. In the early 1970s the company entered the furniture business and in the late 1980s, it started to manufacture and export products made of pine. By 1999, Artefama had invested in new facilities and equipment, improved productivity, and defined its growth strategy. By 2006, the firm was the largest exporter of wood furniture from Brazil, exporting almost 100% of its output. It became a role model and a trend-setter in the cluster.

There is no question that Zipperer made the four critical steps that permitted the growth of the São Bento do Sul cluster: the use of wasted parts of the pine to manufacture handicrafts, the exporting of these products, the initiation of colonial-style furniture production, and the production and exporting of pine wood furniture. Also, Zipperer provided the initial pool of trained workmen and entrepreneurs to other firms in the region. In sequence, Artefama had a similar role, taking the position of flagship firm, and leading the cluster in its recent export drive.

The company was not an innovator, but became a more successful exporter than the pioneer. Both CEOs were respected business leaders, and they made substantial efforts to engage other firms in exporting, believing that this was the path to the cluster's success. Examples of voluntary actions of these CEOs were the engagement in political and associative activity in the community, proactive initiatives in educational, training and research activities, participation in business associations, organization of foreign business missions, etc. Both firms generated a large number of spin-offs, and provided highly-skilled employees for the cluster.

Environmental factors also played a role. The collapse of Soviet Union and the subsequent civil wars in the Balkans helped Brazilian exports of furniture. East European countries were traditional exporters of this type of furniture to many countries in Western Europe. With the rupture of the established political order, these suppliers were unable to accept orders and meet deadlines. Buyers from Germany and the Netherlands, who worked for large international distributors and retailers, came to South America in search of alternative suppliers. Contacts in Brazil with the São Bento do Sul firms were extremely successful because of cultural similarities, and the use of German as a business language.

International and domestic export intermediaries also played an important role in the cluster development. Export agents established in the region, domestic or foreign-owned, were responsible for identifying new markets and distributors. To better serve the new export markets, it became necessary to improve the quality of the pine wood furniture. Importers played a major role during this stage, bringing new technical standards. New accessories and parts had to be specially designed and developed to meet buyers' requirements. Domestic wood panel suppliers also improved the quality of their products. By 1994, the cluster had attained international product quality standards. A number of firms in the cluster started to export in the early 1990s. From 1994 to 1997, 93% of the firms in the cluster made investments in equipment. Plant automation of larger firms was completed during this period. As the exchange rate became favourable to exporting after the 1999 devaluation of the Brazilian currency, other firms in the cluster entered exporting. Profits from the export business were reinvested, permitting completion of the modernization of the local industry.

Support institutions had an influence in the adoption of exporting by other firms. Abimóvel, the manufacturers' association, was especially active after 1998. Its main role in the diffusion process was to accelerate the adoption of exporting in the industry by providing funds, technical and marketing support. Joint efforts between government agencies and the industry association permitted the creation in 2004 of a national programme for the development of furniture exports. Other support institutions were SENAI, the Brazilian industry agency for education and development, and UDESC, the State University of Santa Catarina.

An interesting complementary aspect has to do with the adoption of exporting by other clusters. Data available suggest that the clusters of São Bento do Sul (43% of total Brazilian exports of furniture in 2005) and Bento Gonçalves (27%) were earlier movers in the adoption of exporting, although this process was more intense in São Bento do Sul. Other clusters showed substantial growth in recent years: the Bahia cluster had the largest increase in exports in 2005, 50.6%, followed by Minas Gerais with 44%, and Ceará with 43%, suggesting that the diffusion process of exporting was spreading to other clusters. The same pattern continued in 2006. Since these

other clusters are located in low-cost labour areas, this is probably an indication of a shift of export orders to them.

4.3. *The 'discovery' of exporting and the diffusion process in the swimwear clusters*

Identifying a first mover within the Brazilian swimwear industry is a complex task, since most companies are small and there are almost no records of industry evolution. The information comes from various sources but ultimately from the firms themselves; one has to rely on interviewees' memories collected from personal interviews. Unfortunately, firms are reluctant in supplying information because of intense competition in the domestic market and the fear of supplying critical information to others. Also, jealousies and rivalry among designers make it difficult to evaluate reciprocal influences.

Despite these observations, it was possible to identify a company named Blue Man as the first mover. Founded in the early 1970s, Blue Man was apparently the first domestic company to launch a bikini under a designer brand name in the Brazilian market. Export activities started in 1974, as a result of unsolicited orders. Shortly thereafter, the company had an unexpected but extremely favourable exposure in the international media. This was followed by a trip to London, Paris, and New York, to make business contacts and sell the company's products. The company owner, David Azulay, a designer and entrepreneur, was not very successful in his early internationalization attempts. Although initial exports were sporadic, export development in the next two years gave Blue Man a national award in 1976 as the main swimwear exporter from Brazil. During the 1980s, Blue Man made substantial efforts to adapt its product line to foreign standards in order to satisfy different demands on size and style, and in 1990 it opened a store in Miami. However, with limited staff, scarce financial resources, and diminishing economies of scale, the company could not afford to serve both the domestic and the international markets. Lower returns and the loss of brand equity forced the firm to reduce its international focus, closing the Miami store (1996), and limiting the number of foreign customers served. By 2006, it exported less than 10% of its production.

Another company – Bumbum – was the immediate follower, and although it had a considerable influence over other firms in the domestic market, mainly because it was the first to open a store under its own brand name, it failed in early attempts to sell abroad, and discontinued international activities. Other firms appeared during the 1980s, whose export initiation was similar to Blue Man's initial sporadic sales abroad. Many started their export activities following Blue Man's initial internationalization strategy, yet they surpassed the first mover's export volume and overall performance. In fact, although David Azulay claims that Blue Man influenced these firms, their owners do not recognize such influence. The only sound evidence of the influence of Blue Man comes from another designer company, Salinas. This company – presently one of the most admired in the industry – was influenced by the first mover, and can be considered a spin-off, but even this firm did not recognize the influence of the first and the second movers as relevant to its own development. It is possible that other cases of spin-offs exist, but it was difficult to determine whether the owners or executives came from another firm, because of the desire to be 'original'.

The industry was forced to change during the early 1990s due to Brazil's trade liberalization process, which permitted cost reductions, but also opened the domestic market to international competition, forcing local manufacturers to cut prices. The modernization process allowed large productivity gains in the textile industry; firms acquired new technologies and invested in training. Also characteristic of the 1990s was the increased international exposure of the industry. Several factors may explain this phenomenon. One is the fact that a number of brand-name firms planned their export development, hiring professionals, contacting distributors abroad, and participating in international trade shows. These companies were successful in selling under their own brand names, even though export volumes were not particularly large. Nevertheless, their products were featured in several international fashion magazines, and served as an inspiration for other swimwear producers world-wide. Approximately 15 designer firms exported under their own brand name consistently over the last two decades.

Export initiation spread from the Rio de Janeiro cluster to São Paulo, in the late 1980s and early 1990s, and from both to other regions of the country. Exports began to gain momentum with the Brazilian currency devaluation in 1999, making it attractive for large international retailers to outsource production from Brazil. Foreign buyers were already aware of the cut, fit and style of the Brazilian product. The creation of an annual calendar of fashion shows in 1996 contributed to attract foreign buyers, putting them in contact with domestic firms. The rise of Brazilian top models in the international fashion world also attracted attention to Brazilian swimwear products.

The early 2000s saw the emergence of a new type of exporter, selling under private label contracts. They exported approximately US\$ 20 million in 2005, or 80% of total exports. There were two large-scale manufacturers in this strategic group, and a few medium-sized private label producers. The latter actively sought export opportunities, or were referred to foreign buyers by larger companies not interested in smaller orders. Foreign buyers carried innovations from one to another firm, promoting export product standardization, and the dissemination of technical know-how. They also brought models, designs, fabrics, etc. Aware of opportunities for outsourcing in Brazil, they were responsible for the initiation of many firms in exporting. It is believed that private label manufacturers had more opportunity to learn from foreign buyers because of the need to comply to rigorous specifications, while brand-name manufacturers typically sold their own models and styles. Firms also benefited from the improved quality of fabrics produced by textile companies with a private-label swimwear division, which were supplied to other firms in the industry.

Thus, at present the two relevant strategic groups in the Brazilian swimwear industry are, on one side, leading designer firms that define fashion trends in Brazil and have a growing influence on international styles, contributing to the international exposure of the made-in-Brazil beachwear, most of them located in Rio de Janeiro; on the other, larger-scale producers, who are responsible for the expansion of Brazilian exports in recent years, most of them located in São Paulo. A third strategic group, smaller firms without export experience, entered international markets in the 1990s. A fourth strategic group was formed by domestic-only players. Other agents influenced the decision process, such as the media specialized in fashion and government export promotion campaigns. The government did not play a

crucial role in developing Brazilian swimwear exports, although it did offer support mechanisms to the industry export development, including the participation in international trade shows, fashion shows, and showrooms, and the formation of export consortia. These actions had little impact on the export initiation and development of larger firms in the industry, and were directed towards promoting the exports of smaller firms.

5. Discussion

The following analysis tries to link together the evidence collected during the interviewing process and from secondary data. It is to some extent speculative, because we were only able to obtain indirect clues of links between certain firms. Figure 1 depicts a tentative representation of the diffusion of exporting in the São Bento do Sul furniture cluster, and Figure 2 does the same for the Rio de Janeiro and the São Paulo swimwear clusters. The arrows link the various players in the diffusion process of exporting. The legend indicates the type of links that come from solid evidence, those for which there is only limited evidence, and those that are only hypothesized links based on indirect clues obtained in the research process.

5.1. The nature of industries and clusters

Both industries are fragmented, and both are formed mainly by small- and medium-sized firms. However, similarities end here. While leading firms in the furniture industry are family-owned and passed from one generation to another, leading firms

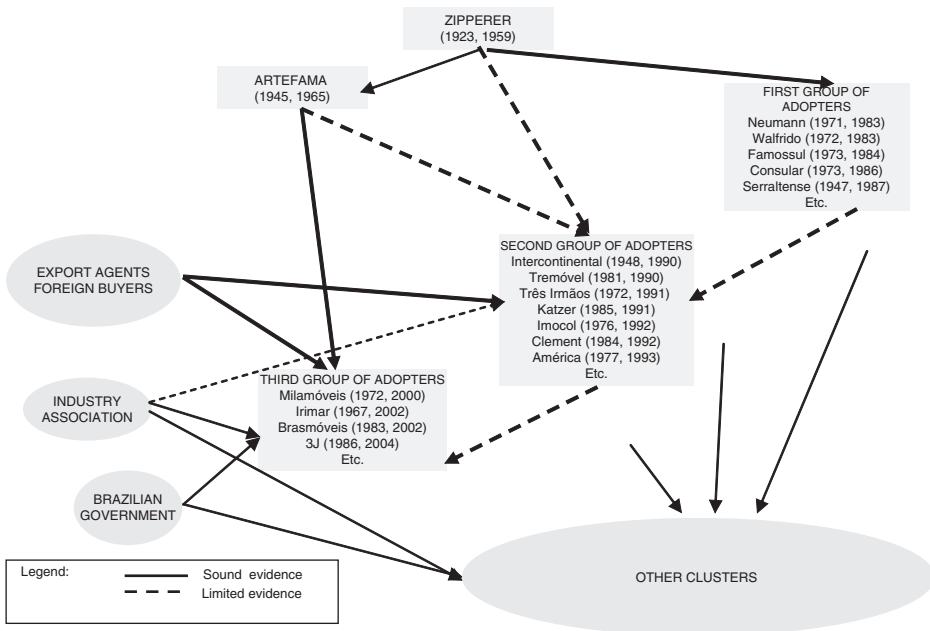


Figure 1. Schematic representation of the diffusion process in the furniture cluster.
 Note: The first number in the parentheses refers to the year of foundation; the second number, to the year the firm started its export activities.

in the swimwear industry are still entrepreneurial, based on the founder-designer talents, or large textile conglomerates that integrated forward to produce swimwear.

The clusters studied differ in several other aspects. Although none of them perfectly fits the ideal types described in the literature, the furniture cluster of São Bento do Sul resembles more closely the Italianate district, while the Rio de Janeiro and the São Paulo beachwear clusters are more similar to the Marshallian type (Markusen 1996), in the sense that the first is relational and the second, agglomerative (Pickernell et al. 2007). Additionally, using Suzigan, Furtado, and Garcia (2007) typology, the São Bento do Sul furniture cluster can be considered a 'center of industrial and regional development', because of its importance both to the region and to the industry, while the two beachwear clusters can be categorized as 'advanced vectors', because, although playing a crucial role in the industry, they are located in very large cities, where other economic activities are dominant. In fact, beachwear production and exports are marginal to the economies of Rio de Janeiro and São Paulo.

The furniture cluster benefits from dense agglomerations of inter-related economic activities, providing highly-skilled labour, and permitting the dissemination of technical and marketing information. Compared to furniture, beachwear production requires less specialized labour skills, machinery, and supplies, benefiting less from dense agglomeration of related firms. Beachwear clusters benefit, however, from the proximity to a large market. Furthermore, the cities of Rio de Janeiro and São Paulo are fashion centres, where other fashion industries also compete, facilitating the dissemination of knowledge on new trends, materials, etc.

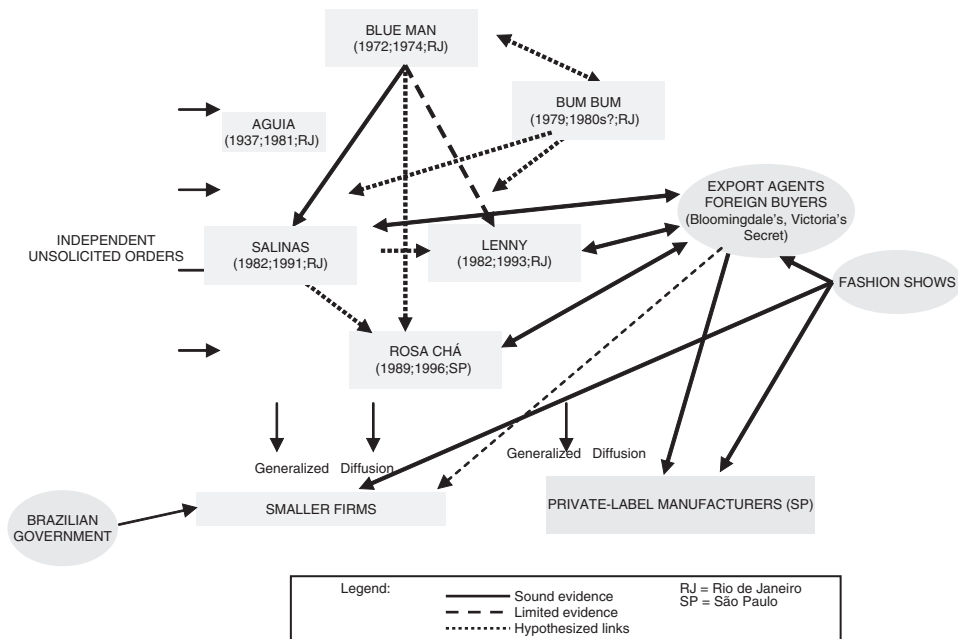


Figure 2. Schematic representation of the diffusion process in the swimwear clusters. Note: The first number in the parentheses refers to the year of foundation; the second number, to the year the firm started its export activities.

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The historical development of the clusters in both industries also differs substantially. In the furniture cluster, the common Germanic/European origin and culture, the century-long insulation, the access to the same natural resources, and the various types of social links between individuals combined to generate a very homogeneous and self-contained cluster. The Rio de Janeiro swimwear cluster, on the other hand, stands as almost a perfect counterexample. Competitive advantages of the Rio de Janeiro cluster are associated with design. As to the São Paulo cluster, its main advantages derive from the ability to produce in larger scales for private label contracts. The expansion of the two beachwear clusters came mainly from new entrants, often without any previous relevant contact with incumbent firms.

The diverse characteristics of the two clusters shaped the way by which interactions among actors developed (Gaggio 2006). In the furniture cluster, social and economic inter-linkages existed among the various actors. There were many examples of co-operative behaviour in the furniture cluster, even if firms were still to a large extent vertically integrated (as most firms in Brazil), a result of decades-long import substitution policies and government intervention (Meyer-Stamer 1998). Although there seemed to be a high level of informal co-operation and cohesion in the cluster, formal mechanisms of co-operation, such as associations, were said not to be very effective. Nevertheless, business leaders in São Bento do Sul seemed quite aware of the need to strengthen formal co-operation and reduce vertical integration.

Interactions between firms competing in the beachwear industry were quite unusual, at least until a channel of communication was established by means of a calendar of fashion shows. Fashion shows played a role in defining the boundaries of each regional cluster, stimulating interactions. They created a climate that encouraged the exchange of experiences, creativity, cross-fertilization and entrepreneurship. At the same time, they increased rivalry in an industry characterized by strong individualism. Competition, rather than co-operation, drives the beachwear industry.

5.2. *The role of internal and external actors in the diffusion process*

The role of first movers and immediate followers in export development was also quite different; while they played an important role in the furniture cluster, setting examples and actively influencing other firms to export, in the swimwear clusters they remained as benchmarks, or abstract symbols of international market opportunities. Domestically-owned flagship firms were of paramount importance to the development of the furniture cluster. The two flagship firms were more influential in different periods of time: one is certainly behind the first and the second wave of adopters of exporting in the cluster, and the other influenced at least the third wave (Figure 1). Again, the picture extracted from the swimwear industry is quite different. It is difficult to identify flagship firms. The two firms identified as early movers had limited influence over the others. Neither was able to build a professional organization that could lead the industry's export development; they were too small and too entrepreneurial.

First movers in neither case were the main beneficiaries of their 'discoveries'. Yet diffusion did not seem to have a negative impact on the first mover, as hypothesized by Hausmann and Rodrik (2003), and Hausmann, Hwang, and Rodrik (2005a). Knowledge spillovers did not seem to be the reason for the inability of the pioneering

firms to get the full benefits of its business discoveries, but rather firm idiosyncratic factors not related to the diffusion process.

Imitating firms in the furniture cluster did not differ from the pioneer in almost any major aspect. Many imitators were spin-offs of the pioneer and immediate followers, and mimicked their parent firm's behaviour. The strategies followed by imitating firms were basically the same as the pioneer, with very few exceptions. They produced similar products, used the same raw materials, exported to the same markets, and moved together to new markets. The relationship between the original 'mothers' and the spin-offs tended to be friendly (Ferreira, Tavares, and Hesterly 2006), with CEOs proudly pointing out their firm's progeny, although not necessarily willing to stimulate the spin-off process. Three groups of adopters were identified in the furniture industry, which entered the export activity in three different moments in time: the first group in the 1980s; the second in the early 1990s; and the third in the early 2000s. Late adopters do not seem to be younger firms than early adopters (Figure 1).

As to the swimwear clusters, it is not quite appropriate to apply the term 'imitating firms' to companies that entered the export activity at a later point in time. Each strategic group follows different export strategies, and none of these strategies seem to imitate the first movers and its immediate followers. To some extent, later entrants in the designer strategic group were influenced by the first and the second mover (Figure 2), but they translated these experiences into their own strategy in ways that were more creative than simple imitation. In fact, every company owner or manager interviewed refused to admit that they were inspired by a role model in the industry, but almost every major designer believed his/her firm was a role model to others. Although this suggests mutual influence, it is clear that the dissemination of knowledge was not associated to spin-offs or even to turnover of skilled labour, except in one case. Spin-offs were rare in the swimwear industry, and when they appeared, the relationship between the original firm and the spin-off was antagonistic. Entrepreneurs were sarcastic or bitter when referring to imitators. Private-label exporters were influenced by the dissemination of knowledge on exporting in the industry, at the same time that they were contacted by foreign buyers who already worked with designer firms and searched for larger volumes at similar quality and lower prices. Smaller firms were influenced by the general dissemination of knowledge on exporting, and government efforts to increase exports in the industry.

External actors were important in both industries in transferring know-how and facilitating export initiation and diffusion. In both industries the whole supply chain was upgraded due to positive spillovers. The impact of export agents on the furniture cluster was even more important because firms in the cluster are production-oriented, and tend to delegate marketing functions to intermediaries. In the swimwear industry, export agents and foreign buyers were the main communication channel by which diffusion occurred, permitting the dissemination of knowledge on export opportunities and export requirements.

Public support institutions played only a subsidiary role in the dissemination of exporting in both industries. Private support institutions were much more important in facilitating the diffusion process. In the furniture cluster, most advances in the diffusion process came from the cluster itself, and in the swimwear clusters a major element in the co-ordination of industry activities was the Brazilian Fashion

Calendar. The role of public support institutions was similar in both industries. In both cases, federal government agencies supported and expanded the scope of the diffusion process, which was already underway, but they benefited more late adopters and laggards and smaller firms by offering incentives and helping to transfer knowledge from larger established firms to new entrants.

5.3. Two models of diffusion?

The learning and dissemination of exporting in both industries shows remarkable differences. While the diffusion process can be reasonably tracked in the furniture cluster, the paths cannot be clearly identified in the swimwear industry, because of its random, erratic nature.

We used the terms 'the constellation model' to describe our conceptualization of the furniture industry, studied from the perspective of the selected cluster. This cluster can be seen almost as a unit in itself, and could therefore be studied as such. In the furniture industry, the process was carried out by domestically-owned flagship firms, and social institutions were in charge of promoting diffusion. We have already explored the reasons that seemed to shape isomorphic strategic behaviour within the cluster. As firms in the cluster mimicked each other, their individual strategic trajectories became indistinguishable, forming one single strategic group. Despite the advantages for the diffusion of innovations, risks for the cluster increase, since isomorphic behaviour may threaten the ability of the cluster to adapt to changes in the environment. The cluster is also more prone to path-dependent behaviour (Meyer-Stamer 1998), because there are no other successful paths offered by leading firms.

As to the swimwear industry, we used the terms 'the lonely stars model' to describe its dynamics. In the swimwear industry, exporting was initiated by independent 'stars', who did not interfere in diffusion, left mainly to external actors, including foreign buyers and government. Looking at the industry, one finds little homogeneity in strategic behaviour, but four rather heterogeneous strategic groups. Co-operation between firms in the industry is almost non-existent, and new entrants come from outside. Firms do not mimic each other, but search for singularity. This is a weakness to some extent, since it reduces the flow of information and tends to reduce the speed of diffusion, but diversity increases the chances of industry and cluster long-term survival, because of new business experiments underway. Table 2 compares the two industries and Table 3 compares the two diffusion experiences.

6. Final considerations

This research examined the process of diffusion of exporting as a business strategy in Brazilian industrial clusters. The evidence gathered in this research supports the idea that the diffusion of exporting in an industrial cluster follows the same pattern of the dissemination of technological innovations. The clusters selected offer an interesting opportunity for the understanding of the research problem since they are quite different in their formation, development, and characteristics. Although our conclusions are limited to the clusters studied, we believe that they can bring a fresh look into the research on export initiation and development.

Table 2. A comparison of the two industries: furniture vs. swimwear.

The furniture industry 'The Constellation Model'	The swimwear industry 'The Lonely Stars Model'
<i>Industry organization</i>	<i>Industry organization</i>
Located in a medium-sized town	Located in very large cities
Integrated supply chain	Independent supply chains
Fragmented industry	Fragmented industry
<i>Cultural aspects</i>	<i>Cultural aspects</i>
Shared history; geographic insulation	Independent origin; spread geographically
Co-operation within the cluster; relationships	Rivalry/jealousy among firms/designers
Less individualistic	Strongly individualistic
More production-oriented	More marketing-oriented
Long-lasting family businesses	Dependence on a founder-designer

Table 3. A comparison of the diffusion process in the two industries.

The furniture industry 'The Constellation Model'	The swimwear industry 'The Lonely Stars Model'
<i>General characteristics</i>	<i>General characteristics</i>
Led by respected business and community leaders	Started by independent 'stars'
Pioneer took responsibility for diffusion	Pioneer did not interfere in diffusion
Presence of flagship firms	Absence of flagship firms
Diffusion process can be tracked	Diffusion process cannot be clearly tracked
<i>Early diffusion mechanisms</i>	<i>Early diffusion mechanisms</i>
Internal actors promoted diffusion within the cluster	External actors (export agents, promoters of fashion shows) promoted diffusion within the cluster
Large number of spin-offs	Almost no spin-offs; new entrants from outside the industry.
Employee turnover	Limited employee turnover
<i>Late diffusion mechanisms</i>	<i>Late diffusion mechanisms</i>
Role of national industry association in spreading to other clusters	Role of press in spreading to other firms
Government stimulated late adopters	Government strongly supported late adopters

This study's limitations include the fact that only two manufacturing industries were analysed, and within them only three clusters were examined. Yet the clusters studied were responsible for the initiation of the country in producing and exporting the specific products. Another limitation comes from the use of personal interviews to establish the nature and the sequence of past events. But although personal interviews were the major source of information available for one of the industries studied, a wealth of secondary information was available for the other, thus permitting triangulation.

Social ties played a major role in facilitating the diffusion process of exporting in the furniture cluster, but they seemed irrelevant in the swimwear cluster. This could

be associated to the process of formation of each cluster. Other studies have already established the importance of historical background and shared values in shaping the level of co-operation in a community (Gaggio 2006). The influence of a cluster's culture seems to be a factor in the diffusion process, acting as a facilitator or an impediment of systemic interactions among cluster members. Whether the culture will favour co-operation or rivalry, imitation or differentiation, and to what extent national cultural characteristics may impact on the cluster formation and development, particularly its internationalization, are matters to be further investigated. As Maskell and Malmberg (1999, 180) have put it, in a slightly different context, 'history matters'.

The study partially supports the importance of domestically-owned flagship firms (Lazerson and Lorenzoni 1999; Ferreira, Tavares, and Hesterly 2006) in the diffusion of exports within the cluster. Flagship firms only played a significant role in the furniture cluster. We propose that the presence of flagship firms will facilitate diffusion, while its absence could be associated to a longer, or erratic diffusion process. Of course, as indicated by Ferreira, Tavares, and Hesterly (2006), a necessary condition for the appearance of a 'flagship-led cluster' is the existence of a firm that can take the role of flagship. The appearance of flagship firms may be explained by cultural and historical aspects, but it also depends on the ability of the pioneering firms to show how the new knowledge (in this case, exporting to foreign markets) leads to success. Since both firms that played this role in the furniture industry were quite successful in terms of sales growth, at least for a period of time, other firms in the cluster were willing to follow their path. In the swimwear industry, despite public recognition, the export performance of the pioneering firm and of its immediate follower was not in any regard outstanding, thus not inspiring imitative behaviour.

An interesting aspect, which deserves more research, has to do with the type of linkage effects among firms. The furniture cluster of São Bento do Sul is not formed by firms linked by vertical relationships, since most firms are vertically-integrated and produce their own parts and components. The links identified in this research were mainly horizontal, that is, among competitors. Therefore, the bonds between firms were not as stable as in a vertical network, neither the flagship firms could have the power and authority to act as a strategic co-ordinator of the cluster's future directions.

This study also showed that the ability of these flagship firms to foster co-operation within the furniture cluster was very much associated to the quality of their top management. Both firms' CEOs were outstanding members of the local community, respected citizens, and acted proactively in promoting the cluster's development. Under their personal leadership, the firms led the cluster on issues such as the creation or attraction of education and research organizations, collaborative marketing research, joint export activities, the organization of fairs and exhibitions, and other co-operative initiatives to facilitate the cluster's access to foreign buyers and to enhance the cluster's competitiveness.

Finally, flagship firms also acted as 'mother firms', as suggested by Ferreira, Tavares, and Hesterly (2006) in terms of generating entrepreneurial spin-offs. The relationship between parent firms and spin-offs in the cluster also deserves further investigation. To what extent do spin-offs carry experiential knowledge of exporting, or do they only mimic their parent's behaviour?

Isomorphic behaviour can be interpreted as the result of a successful diffusion process; but it can also be seen as increasing the risk of failure for the cluster or the industry (Meyer-Stamer 1998; Maskell and Malmberg 1999). By contrast, divergent strategic behaviour may indicate erratic or uncoordinated diffusion, but it may bring dynamism and innovation to the industry, at the same time it reduces the risk of industry failure. Isomorphism is more intense in the presence of spin-offs. We advance that the presence of spin-offs and, for that matter, of imitators in general can facilitate diffusion when flagship firms see them as acceptable or legitimate, but to generate more barriers to diffusion when incumbents see them as predatory.

The role of external actors (Ellis 2003) was fully supported in this research. Export agents and foreign buyers played a crucial role in diffusion, although not in the early steps of exporting. Foreign buyers were responsible for the codification and transfer of certain types of knowledge on exporting, supplying detailed instructions, standards, models, etc. Once this type of knowledge is codified, it is easier to transfer, and the speed of dissemination (diffusion) increases (Maskell and Malmberg 1999).

Support institutions, such as research centres, technical schools, industry associations, were the result of co-operative actions among firms in the furniture cluster, but were absent in the two swimwear clusters. The most important joint initiative occurred under the auspices of the whole fashion/textile industry, and was mostly external to the swimwear segment of the industry. In spite of this, private action seemed to be much more effective than public efforts in promoting co-operation and permitting several types of knowledge transfer, in the same line as reported by Schmitz (1995, 1999a). Nevertheless, it is necessary to differentiate between public action emanating from local government and from the central (federal) government. Joint efforts between the local government and firms in the cluster appeared very early in the development of the São Bento do Sul furniture cluster, but the role of the central government was limited to the later phases of the diffusion process. In some regards, the federal government actions may have even been detrimental to cluster and industry exports, as they stimulated smaller companies that were unprepared to compete, by offering them incentives under various forms. These firms competed with established Brazilian exporters, copying their products to sell at lower prices, but often inferior quality, possibly damaging the 'made-in' image.

The role of different government spheres in the promotion of exporting needs to be discussed in the context of regional clusters, since their motivations are quite different. While local government tends to share the same concerns of a regional cluster, the central government is often more concerned with the promotion of exporting at a national level. Therefore, the central government interest in developing other clusters may conflict with the cluster's desire of protecting its locational advantages, avoiding the transfer of technical or marketing know-how to other clusters. These and other questions remain open for further investigation.

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