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**THE EMERGENCE OF NEW AND SUCCESSFUL
EXPORT ACTIVITIES IN BRAZIL:
FOUR CASE STUDIES FROM THE MANUFACTURING AND THE
AGRICULTURAL SECTOR**

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Abstract*

This paper investigates the emergence of new successful export activities in Brazil through the analysis of four industry case studies: furniture, swimwear, soybeans and grapes. Extensive secondary data research was done to study industries' historical development and to understand the elements that affect the discovery of new export-oriented activities and their diffusion in the economy. Detailed analysis was carried out to identify the role of public sector in the discovery and diffusion process, if any. Comparison of the four experiences show different models of diffusion and demonstrate how barriers to discovery, spillovers and institutions responses varied dramatically among the cases. The paper tries to extract some general conclusions concerning the role of pioneer firms, external actors and public sector institutions. Some lessons learned are presented aiming to help policymakers to design positive policy interventions in Latin America countries.

* This paper was undertaken as part of the Latin American and Caribbean Research Network project "The Emergence of New Successful Export Activities in Latin America."

Introduction

1. Theoretical Framework

Recent contributions from the economics literature (Hausmann and Rodrik, 2003; Hausmann, Pritchett, and Rodrik, 2005; Hausmann, Hwang and Rodrik, 2005) have stressed the importance of structural change, and how the “discovery” of new export activities by firms could be associated to high growth episodes. From this stream of literature derives a new set of intriguing research questions and hypotheses, concerning the ways by which firms in an emerging market start exporting new varieties of products, and the implications to public policymakers and countries’ economic development. Bringing up those unsolved challenges, Hausmann, Pritchett and Rodrik (2005) concluded, using a cross-country growth analysis, that growth accelerations seemed to be mostly driven by idiosyncratic reasons.

In another work, Hausmann, Hwang, and Rodrik (2005) stated that, although country endowments perform an important role, these were far from being the only key factor in determining what a country would produce and export. The authors also emphasized that not all goods had the same impact on economic performance, but producing certain goods could lead to higher economic growth than others. Therefore, “*government policy has a potentially important positive role to play in shaping the production structure*” (p.2).

Hausmann and Rodrik (2003) advocated the existence of a significant element of uncertainty at a disaggregated level as to what a country is “good” at producing, and decided to investigate this specific issue, which they believed could not be appropriately analyzed through neoclassical models of trade and economic growth, especially when related to less favored economies. They stated:

We emphasize that this is a key challenge in the process of transformation into a modern economy. Neither economic theory nor management science is of much help in helping entrepreneurs (or the state) choose appropriate investments among the full range of modern-sector activities, of which there could be tens of thousands, once one moves beyond broad categories such as “labor-intensive products” or “natural-resource based products”. Yet making the right investment decisions is key to future growth, as it determines the pattern of specialization. In these circumstances, there is great social value to discovering that cut flowers, soccer balls, or computer software can be produced at low cost, because this knowledge can orient the investments of other entrepreneurs. But the initial entrepreneur who makes the “discovery” can capture only a small part of the social value that his knowledge generates.... Consequently, entrepreneurship of this type – learning what can be produced – will typically be undersupplied, and economic transformation delayed” (p.605).

In fact, these authors contradicted the belief that, in the case of developing countries, production functions of all existing goods are common knowledge, and thoroughly discuss evidence associated to the adversities encountered when importing technology off-the-shelf. From their point of view, “*there is really no such thing as off-the-shelf technology*” (2003, p. 624), since to be successful, imported technology requires careful and substantial local adaptation, what consequently demands substantial domestic experimentation.

Hausmann, Hwang, and Rodrik (2005), based on what Hausmann and Rodrik (2003) called “cost discovery”, affirmed that an entrepreneur engaged in the production of a certain good for the first time in a developing economy would necessarily encounter substantial cost uncertainty, sentencing:

“If the project is successful, other entrepreneurs learn that the product in question can be profitably produced and emulate the incumbent. In this way, the returns to the pioneer investor’s cost discovery become socialized. If the incumbent ends up with failure, on the other hand, the losses remain private. This knowledge externality implies that investment levels in cost discovery are sub-optimal unless the industry or the government find some way in which the externality can be internalized” (p.2).

Indeed, Hausmann and Rodrik (2003) reinforced that once the initial difficulties associated to adjusting imported technology are tamed by the pioneers, imitators may come along almost immediately, washing away first movers’ profits.

Another interesting assumption brought up by Hausmann and Rodrik (2003) is that potential entrepreneurs in developing countries could be compared to potential innovators in developed countries, as the returns on investments demanded to learn what a country is good at producing could not be entirely appropriated. Nonetheless, they stressed that

“the policy environments facing the ‘innovators’ in the two settings are quite different. Typically, the intellectual property regime protects discoverers of new goods through the issuance of temporary monopolies, i.e., patents. But the investor in the developing country who figures out that an existing good can be produced profitably at home does not normally get such protection, no matter how high the social return” (p.606).

The authors concluded that free entry by competitors worsens even more the situation faced by potential entrepreneurs in developing countries. Public policymakers should thus be aware of such distortions, starting by encouraging entrepreneurship in new activities but later letting unproductive firms and sectors fail.

Concerning the diffusion process, the literature is plenty of examples to clarify its pattern. One major mechanism of diffusion is the turnover of skilled employees who have acquired the necessary expertise on the job. In fact, loosing such employees to later movers proved to be one of the most relevant competitive concerns faced by the pioneers, as indicated by Hausmann and Rodrik (2003). Entrepreneurial spin-offs are another type of diffusion mechanism, although they are sometimes described in the literature as a sort of parasites or as a brain-drain from parent firms (Ferreira, Tavares, and Hesterly, 2006). Geographic proximity may also play a major role in stimulating the development of interactions among players in a cluster, and to accelerate diffusion. These “systemic interactions” – interactions among firms, or between firms and government agencies, universities, research centers, and other institutions – are often the motor of innovation, facilitating the discovery and the diffusion process (Iammavarino, Sanna-Randaccio, and Savona, 2006).

This study is part of a larger research project supported by the Interamerican Development Bank. The aim of this research effort is to contribute to the understanding of the drivers of export growth. The theoretical framework briefly summarized leads to the following research issues that were examined in this paper in four economic sectors:

- The characteristics of the first mover and the challenges it faced.
- The characteristics of imitating firms and the diffusion process, including the channels and the magnitude of spillovers.
- The role of government interventions in encouraging or inhibiting discovery and diffusion.

2. Overview of Brazil's Export Performance

Brazil's dimensions, both in terms of size and population, place the country as a regional leader and one of the main economic powers of Latin America, as well as one of the leading emerging economies in the world. Yet these dimensions do not reflect the country's presence in international trade, which is quite limited: Brazil is responsible for only 0.9% of the world's international trade¹.

Up to the early nineties, Brazil was a closed economy. Economic liberalization in the early 1990s drastically reduced Brazilian import tariffs and exposed the economy to international competition. Brazilian firms accustomed to a highly protected market were obliged to adapt their processes and reduce their costs in order to remain competitive. New investments were made and firms increased their productivity.

The liberalization of the trade regime combined with a tight monetary policy and a fixed exchange rate adopted in 1994 to lower inflation had severe impacts on Brazil's trade balance. Only after 1999, when successive international shocks and pressure upon the country's international reserves led Brazil to abandon its fixed exchange rate for a flexible one, did the situation started to change. In the wake of this devaluation, more Brazilian firms began looking at external markets and developing international business strategies. In 2002, the year that brought leftist President Luiz Inácio Lula da Silva to power, a new monetary crisis depreciated the exchange rate by 53% over a 12-month period, giving even more stimulus to Brazilian exports. In 2003, Brazil achieved its first trade surplus since 1992 and export records have been successively broken ever since.

The economic scenario of the 1990s – high interest rates, an overvalued exchanged rate, increased competitiveness and privatization – affected each economic sector in a different manner. The impact of these factors on each sector depended upon the prevailing capital-production relationship, the elasticity of exports and imports, the greater or lesser relevance of capital opportunity costs per inversion project and the competitive advantages acquired by companies in each of the various sectors. In the cases in which these factors combined to generate long term perspectives, companies became more profitable, the industry became more competitive and the export potential greater (Miranda, 2001). Thus, some sectors became success cases and have obtained high growth rates in the international market: the soybean complex, beef, chicken, steel, aircraft, automobiles and auto parts are good examples of such sectors.

¹World Trade Organization, base year 2004

A preliminary analysis of goods and merchandise data points to the growth of the export base. In 1989, Brazil exported 4,897 types of products (HS 8 digits²), while in 2005 this number had increased to 7,242, representing a growth of 2.5% per year and thereby suggesting the existence of numerous discoveries.

A careful analysis of Brazilian export data shows that the country exports a significantly diversified range of products. Brazil sells agricultural products (soybeans, fruit, sugar, coffee), chemical products, pharmaceutical products, aircraft, automobiles, home appliances, etc. (Table 1). There are almost 10,000 different products exported by more than 15,000 companies. In addition, service sector exports have had significant growth in such areas as financial services, architecture and construction, communication and publicity, tourism, etc (Table 2).

Table 1
Ranking of Brazilian Exports

Commodities	Exports in 2004 (US\$ Billion)	% of Total Brazilian Exports
1 Vehicles and Auto Parts	10,583	11.0
2 Soybeans	10,039	10.4
3 Iron and Steel	7,062	7.3
4 Ores	5,177	5.4
5 Oil	4,295	4.4
6 Aircraft	3,268	3.4
7 Chemicals	3,169	3.3
8 Machinery and Equipment	3,107	3.2
9 Pulp and Paper	2,908	3.0
10 Poultry	2,705	2.8
11 Sugar	2,639	2.7
12 Wood	2,451	2.5
13 Beef	2,409	2.5
14 Coffee	2,024	2.0
15 Footwear	1,898	2.0
16 Aluminum	1,778	1.8
17 Telephone Equipment	1,564	1.6
18 Plastics	1,514	1.6
19 Textiles	1,445	1.5
20 Tobacco	1,38	1.4
21 Leather	1,29	1.3
22 Electrical Equipment	1,137	1.2
23 Orange Juice	1,057	1.0
24 Pumps and Compressors	1,026	1.0
25 Furniture	1,002	1.0
26 Pork	744	0.8
27 Stone	647	0.7
28 Corn	597	0.6
29 Alcohol	461	0.5
30 Gold	412	0.4
31 Cotton	406	0.4
32 Shrimps	391	0.4
33 Refrigerators	362	0.4
34 Ceramics	342	0.3

² Brazil's adoption of the HS system meant a reduction in the number of classified products from 13,179 to 9,386. As a result, counting of the number of the products exported in 1989 based on the NBM classification results in a greater number of products exported that year: 7,392.

35	Pharmaceuticals	270	0.3
36	Glass	266	0.3
37	IT Equipment	237	0.2
38	Fertilizers	223	0.2
39	Fruit	220	0.2
40	Motorcycles	208	0.2
41	Nuts	207	0.2
42	Wheat	207	0.2
43	Cocoa	193	0.2
44	Perfume Products	189	0.2
45	Cooper	187	0.2
46	Rubber	177	0.2
47	Tools	171	0.2
48	Candy	166	0.2
49	Precious Stones and Jewelry	165	0.2
50	Chocolate	121	0.1

Source: Analysis: Foreign Yearbook, 2005 - 2006

Table 2
Services Revenue

Discription	US\$ Million 2005	Annual Average	Standard Growth
Services Revenue	16,095	620	10%
Professional, technical and business services (mail)	3	0	22%
Professional, technical and business services (liberal professional)	455	10	21%
International travels (government travels)	28	1	21%
International travels (credit card)	2,01	99	19%
Professional, technical and business services (project execution)	8	0	18%
Professional, technical and business services (engineering and architectural)	3,372	154	17%
Computing and information technology	88	3	17%
Government	1,194	56	16%
Professional, technical and business services (professional athlete fee)	158	8	15%
Equipment rental	78	5	15%
People to people, culture and recreation - Audiovisual	16	1	15%
Culture and Sporting Events	40	2	14%
Professional, technical and business services (publicity)	116	9	14%
Communication	239	13	13%
Professional, technical and business services (participation in trade fairs and exhibitions)	17	1	13%
International travels (health)	18	1	13%
Professional, technical and business services (Instalation/maintenance of offices and real state)	1,906	108	12%
Royalties and licenses	102	7	12%
Construction	8	2	11%

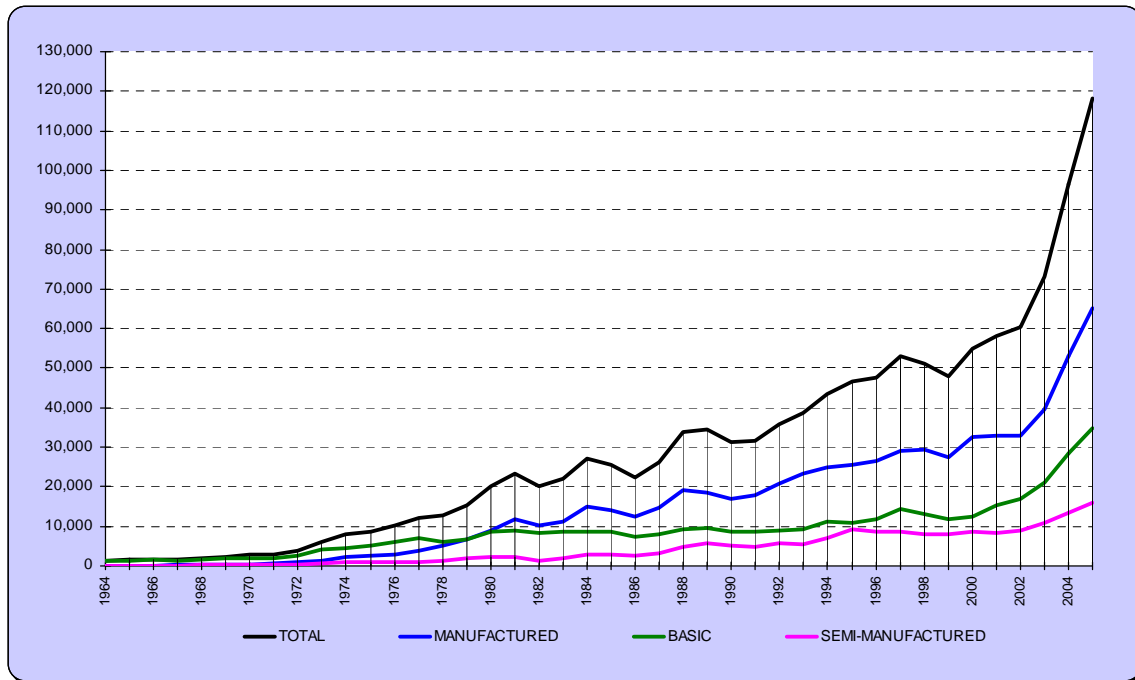
International travels (educational, cultural and sport reasons)	7	0	9%
Financial services	507	23	9%
Trade related	606	25	8%
International travels (tourism)	1,668	38	4%
Insurance	134	5	3%
Transports	3,186	47	3%
International travels (business)	40	0	0%

Source: Brazilian Central Bank

Brazil has positioned itself among the world leaders in some sectors. Agribusiness in Brazil makes up to half of total exports, corresponding to approximately 30% of the Gross National Product, and employs 37% of the economically active population in the country (Jank et al, 2005). Brazil is the world leader in the sugar industry and the largest coffee and orange juice producer; it is also the main exporter of tobacco, soybean, and beef; and one of the leading exporters of shrimp.³ It also has achieved a prominent position in certain industrial sectors. For example, it produces almost 50% of the global short-ranged jet market, due to the operations of EMBRAER.

Nevertheless, qualitative improvements in the range of exports are still necessary. Despite the fact that historical series of exports shows a clear growth trend and the substitution of primary products by manufactured ones, Brazilian performance has been inferior when compared to the global average.

Graph 1
Brazil's Export Performance 1964-2005 (US\$ million FOB)



Source: Ministry of Development, Industry and Foreign Commerce

³ Analysis: Foreign Commerce Yearbook, 2005 – 2006”, from *Análise Editorial*

Only 40.9% of Brazilian exports grew at a rate equal to or higher than that of global exports and of these, only 20.9% were products of medium-high and high technology (Miranda, 2001). The strong dependence on low and medium-low technology products makes low price an important factor in the competitiveness of Brazilian products. As a result, the country's exports can be easily impacted by currency variations and by the entrance of new competitors with a low-cost positioning. This is demonstrated by the decline of Brazilian participation in the U.S. and European markets, which has fallen almost 10 points in the last three years. This slack has almost certainly been taken up by countries such as China and India, whose exports to the United States and the European Union have grown more than Brazilian exports in the same period. Finally, the analysis of Brazilian export performance shows a scenario of strong concentration, with around 75% of total national exports being concentrated in little more than 250 companies.⁴

Another important aspect directly related to the performance of national export companies is the low level of internationalization of these companies. A large number of them still operate solely in Brazil, sending their products abroad directly from their in-country production base.

3. Methodology

The research method used was industry case studies. The first step consisted of the selection of the cases to be studied. The second step was data collection, using both secondary sources and personal interviews, and analysis.

3.1. Case Selection

The selection of sectors to be analyzed was performed in two phases. First, production and exportation data was collected and analyzed for each sector. Following this step and using a list of potential sectors, specialists were interviewed in order to discuss and identify products or sectors that could serve as relevant case studies.

Analysis of Exporting Data

The best option for identifying products that were not produced in Brazil 20 years ago, but which are today are considered major exports is to analyze domestic production information and cross reference that with available data on exports. However, because data on industrial production is not itemized in such a way as to allow the identification of new products, our selection process must primarily rely upon an analysis of export data.

⁴ Analysis: Foreign Commerce Yearbook, 2005 – 2006”, from *Análise Editorial*

Data on the export of merchandise and commodities

Information on the export of merchandise and commodities is made available to the public on the internet through the Foreign Trade Office (SECEX). SECEX data is released on a monthly basis and is separated by state of origin, country of destination and type of product, using an 8-digit code in accordance with the Harmonized Commodity Description and Coding System (HS). Records were only digitalized in 1989, making it possible to build a database for products exported from the country between 1989 and 2005. The result is a usable database comprising 9,605 product types tracked over a 17-year period.

The source of official data also contains the name of export companies, addresses, and the amounts exported by each one. Unfortunately, the complete database is not available to the public. When information on companies is made available, products exported are not reported, making it impossible to build a longitudinal sequence, which contains both the values exported and the companies exporting. As a result, our analysis was limited to an analysis of products.

According to Klinger & Lederman (2004), the level of separation to be used in the analysis is not an obvious choice. Greater separation allows for a more specific study of products by which discoveries can be confirmed and uncertainties cleared up. On the other hand, given an 8-digit classification, differences in products may not be relevant in terms of production and difficulty of discovery. We therefore decided to an intermediate position and opted to analyze data using six digits HS classification.

The six-digit data base contains 5,280 products, the majority of which belong to sectors that enjoy considerable consolidation in the country. It was therefore necessary to apply some filters in order to select more interesting products.

- Filter 1 – Selection of products with an average growth greater than the total of the sequence - The proposal request stated that research should focus on cases which “have recently emerged and experienced strong growth, going from basically zero to becoming a ‘major’ export”. Therefore, the first filter applied to the exportation base is the average growth of the sequence for each of the 5,280 products. Based on the results of this initial filter, products with low levels of growth were then eliminated. Due to the presence of a large number of zeros throughout the sequence, the angular coefficient of the sequence's variation was used as a growth indicator, standardized by an average value of 17 years. Based on this number, all products that had an average growth which was less than the total growth of the sequence (7%) were eliminated. After the implementation of Filter 1, 2,830 products were eliminated and 2,450 potential products remained.
- Filter 2 – Elimination of products with exports totaling less than US\$ 100 million in 2005 (0,085% of Brazilian exports in 2005) - Another reference made in the proposal was that the cases selected should currently be considered a major export product. While it does not specify what, exactly, a "major" export is, the filter is intended to eliminate products whose export value in 2005 was less than US\$ 100 million. The selection of this particular amount is arbitrary, however. We feel that it is a conservative estimate for a relevant product on Brazil's export list, considering that it represents 0.085% of the total

exported by Brazil in 2005. Through the application of Filter 2, 2,337 products were eliminated, leaving 113 potential products.

Data on the export of services

Data on the export of services is available from the Brazilian Central Bank. The historical sequence begins in 1947 and contains 25 categories. Unfortunately, the data available does not allow for a detailed analysis of exported services. However it did point to certain categories that deserved a more detailed examination. It can be noted that the principal technical services sold by Brazil are engineering and architectural services. This, however, has been a strongly consolidated sector in Brazil since the 1970s and it is therefore not applicable to the current study. Another category that has shown considerable growth is that of professional services. However, since no distinction is made between the professionals from different sectors, we could not use this variable in our analysis. Finally, two other categories were shown to be interesting: “computing and information technology” and “publicity”, with an average growth of 17% and 14% respectively.

Consultations with specialists

With the final list of merchandise and goods (including a selection of services from the Brazilian Central Bank) the next stage in the case selection process was consultation with specialists. This stage was extremely important given the long list of finalists produced by the filtering process described above, an often very technical description of the products involved and each sector’s internal specifications, making the process of selecting the most interesting cases quite difficult.⁵

A group of macroeconomic analysts, sector specialists and experts in foreign trade was consulted. First, requests were made for information regarding the most important recently emerging sectors, without presenting our list of finalist sectors. Following this, consultants were asked to give their opinions upon the list of finalists resulting from the selection process described above. Using this sequence of questions, the interviews served to compile a complementary list of potential cases including sectors that were not previously selected using the HS classification system. These cases generally turned up because their classification code did not clearly indicate the product in question or because they had been divided into different classification segments.

Case selection was based in a qualitative analysis of 113 products that remained in the list after the application of the two filters. The final choice is always controversial, given the many possibilities available. The research team had two concerns: (i) to identify the activities in which a discovery marked the beginning of the export process or caused a great expansion of export volumes; (ii) providing a sampling of differentiated cases where specific forms of knowledge could be generated, thereby enriching the final results of the research project. One of the

⁵ According to our experience – and despite the wealth of existing information in the country – specialist consultation has been proven to be most valuable and cost effective research tool. During research previously undertaken by our team, indications from specialists have provided new and important contributions to the list of interesting cases, assisting in the identification of a number of cases that were not revealed by the numbers.

requirements for reference – the identification of products whose domestic production was insignificant 20 years ago – had to be considered less strictly since most industries were installed prior to these last two decades.

Cases Selected

The final list of cases was then discussed with IDB's project coordinators, who had access to another database on Brazilian exports and had the desire to have complementary case analysis from the two Brazilian teams working in the project.

As a result of these successive steps, the following cases were selected for analysis:

- Two manufacturing cases: furniture and swimwear
- Two agribusiness cases: soybeans and grapes

Agribusiness cases

Agribusiness had a major contribution to Brazilian exports growth during the last decades. For this reason, two cases were selected for analysis: soybeans and grapes. The study of agribusiness exports is even more interesting because of the strong government support materialized in EMBRAPA's research and development activities. EMBRAPA is a government research institute that has achieved national and international recognition in the area of tropical agriculture. Soybeans appear as a natural candidate to be studied, with exports of \$ 10 billion in 2004, whose development was strongly supported by EMBRAPA. Since soybeans are considered a more traditional crop, grapes, a non traditional agricultural crop, was also selected. Grape production also received the support of EMBRAPA. This product exports grew from 1.8 million USD in 1989 to 107 million USD in 2005. Interestingly, 95% of grapes exported comes from the Petrolina-Juazeiro region, the only case of dynamic agriculture in Brazil's Northeastern semi-arid region.

Manufacturing cases

To obtain a different perspective, the research team also selected two cases from manufacturing. The manufacturing sector is responsible for 55% of total Brazilian exports. It is a more diversified group, in which the selection of specific industries showed to be particularly difficult, since a number of these industries could actually be interesting and fruitful case studies: vehicles and auto parts, steel, aircraft, some machinery and equipment, paper and pulp, footwear, telephone equipment, plastic, textiles and furniture.

The intention was to exclude those industries were: (i) investment decisions and discoveries are mainly dictated by large multinational firms, such as vehicles and autoparts; (ii) there was only a small number of exporting firms, making it difficult to study diffusion processes (steel, aircraft, paper and pulp, plastics).

The final decision on one of the manufacturing cases was taken after consultation of a database provided by one of the IDB project coordinators, which showed the furniture industry as the second in the Brazilian ranking of export growth between 1980 and 2000.⁶

Finally, qualitative analysis suggested that the study of a smaller but growing industry with differentiated characteristics might shed some light into the diffusion process among small players: the swimwear industry, a segment of the apparel industry. This industry showed substantial growth in its exports, although the total volume is still limited. The interest here derives from being an industry which a high degree of product differentiation and with high added value. By looking at the structuring and professionalization of the industry, new insights can be drawn in the understanding of the phenomena under study, improving in turn our understanding of how a developing country such as Brazil can penetrate more dynamic markets in which less tangible factors such as knowledge and branding are of paramount importance.

3.2. Data Collection and Analysis

Secondary Data

The following secondary sources were used:

- Secondary data from government databases
- Academic studies by various universities and research institutes
- Industry and government agencies publications
- Company sites
- Other information available in the internet
- Monographs, thesis, dissertations etc.

Personal interviews

The most important source of information were personal interviews conducted with government officials, industry representatives, government agencies executives, research institutes' specialists, industry observers, and firm owners and managers. This was especially relevant in the two cases selected from the manufacturing sector, and quite decisive in the swimwear industry, where almost no records exist of its development and exporting. A list of the interviewees can be found in Appendix 1.

The analysis proceeded in two steps: descriptive and analytical. The first – descriptive – step included: (i) the preparation of industry case reports, covering available sales, export and import

⁶ The first product in this ranking was cellular phones, already selected by the other research team.

data, industry organization, and historical background; (ii) a detailed description of the process of discovery and diffusion, including historical information on the role of first movers, immediate followers, and late adopters; (iii) a descriptive account of the role of support institutions, private and public, in the process. The second – analytical – step consisted of: (i) industry case study analysis, including summary tables with the time line of major events shaping the cluster and the industry, diagrams illustrating the connections between various players in the industry, and case-specific conclusions; and (ii) comparison of the four case studies to understand the discovery and diffusion process, extract general conclusions, and discuss policy implications.

CASE 1 – THE BRAZILIAN FURNITURE INDUSTRY

1. General Description

1.1. The Brazilian Furniture Industry

The Brazilian furniture industry comprises around 16,000 firms, of which 10,000 are micro-businesses, 3,500 are small-sized, 1,000 are medium-sized, and 750 are large firms. The vast majority are domestic and family-owned firms. The industry also includes another group of very small firms operating in the informal sector of the economy (estimates are of 6,500 firms).

Table 3 presents the evolution of total sales, exports and imports of the industry, from 2000 to 2005. Total sales increased from 7.6 billion reais in 2000 to an estimate of slightly over 12 billion reais, an increase of almost 60%. Exports, on the other side, more than doubled, moving from US\$ 485 million to \$991 million. The export/sales ratio has grown from 10.1% in 2000 to 22% in 2004, but was expected to have fallen in 2005 to slightly over 18%.

The main competitive advantages of the Brazilian furniture industry are country-specific, such as local availability of raw materials, skilled labor (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).

Table 3
Indicators of the Furniture Industry Performance

Indicators	2000	2001	2002	2003	2004	2005
Total Sales (R\$ millions)	7,599	8,631	10,095	10,756	12,543	12,051*
Exports (US\$ millions)	485	479	533	662	941	991
Imports (US\$ millions)	113	99	78	70	92	108
Exports / Sales (%)	10.1	11.6	15.4	17.2	22.0	18.3*

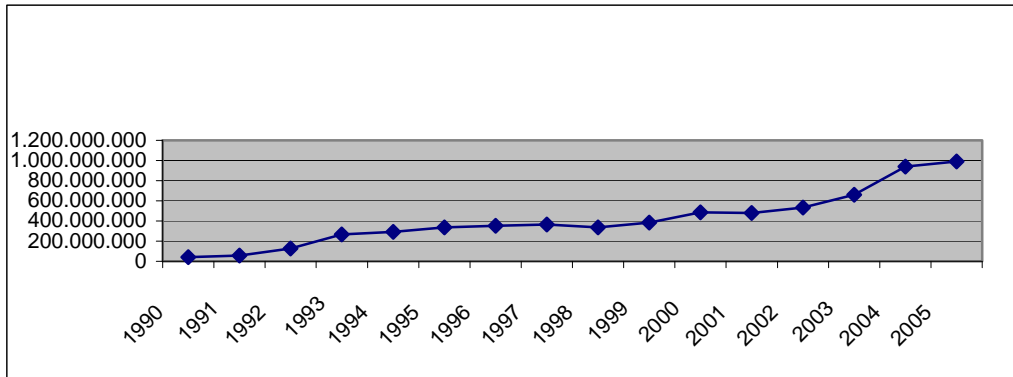
* Estimates

Source: Abimóvel (2005)

The evolution of Brazilian exports of furniture is an interesting case of success. Total exports grew from almost nothing in the early 1990s, to close to one billion dollars in 2005 (Graph 2), with Brazil becoming number 12 in the world ranking, compared to China, number one in the ranking, with total exports of approximately 9 billion.

Main destinations of Brazilian exports of furniture in 2005 were: the United States (39%), France (10%), the United Kingdom (8%), Argentina (5%), and the Netherlands (4%). Although Argentina is presently the largest export market for Brazilian furniture in Latin America, recent anti-dumping measures may reduce the growth of exports to this market in the near future.

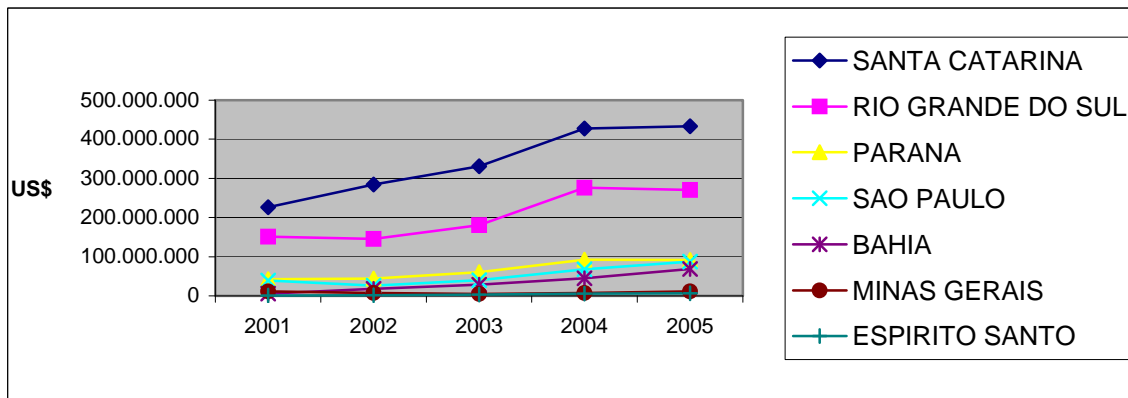
Graph 2
Brazilian Exports of Furniture 1990-2005



Source: Abimóvel (2005)

The distribution of Brazilian exports of furniture by state of origin shows interesting patterns (Graph 3). The state of Santa Catarina has approximately a 50% share of Brazilian exports and the state of Rio Grande do Sul has another 30%.

Graph 3
Evolution of Exports by State of Brazil - 2001-2005



Source: Abimóvel (2005)

Furniture manufacturers are concentrated in production clusters, as indicated in Figure 1 and Table 4. This type of production arrangement is very common in the furniture industry, not only in Brazil, but also in other countries, such as Italy. A typical furniture cluster in Brazil has between 100 to 300 firms.

Figure 1
Map of larger furniture production clusters in Brazil



Source: Abimóvel

The three most important clusters are located in Bento Gonçalves (state of Rio Grande do Sul), in the Metropolitan area of São Paulo, and in São Bento do Sul (state of Santa Catarina). Other important clusters are located in the states of Minas Gerais, Espírito Santo, and Paraná.

The Bento Gonçalves cluster, in the state of Rio Grande do Sul, is located in an area of Italian immigration, also responsible for the best wine in Brazil. The cluster has 370 firms and produces predominantly home furniture made of MDF panels or pine wood. The state of Rio Grande do Sul accounts for 20% of the Brazilian production of furniture, and Bento Gonçalves has a 40% share of the state output. According to Abimóvel, the Brazilian association of the furniture industry, the Bento Gonçalves cluster is well organized, with strong cooperative actions among firms in the cluster. It also works closely with the industry association, Abimóvel. It exported in 2005 27% of total Brazilian exports of furniture.

Table 4
Larger Furniture Clusters in Brazil

Furniture Cluster	State	No. of Firms	No. of Employees
Ubá	Minas Gerais	310	3,150
Bom Despacho	Minas Gerais	117	2,000
Linhares e Colatina	Espírito Santo	130	3,000
Arapongas	Paraná	150	7,980
Votuporanga	São Paulo	85	7,400
Mirassol	São Paulo	210	8,000
Tupã	São Paulo	54	700
São Bento do Sul	Santa Catarina	210	8,500
Bento Gonçalves	Rio Grande do Sul	370	10,500
Lagoa Vermelha	Rio Grande do Sul	60	1,800
Metropolitan Area of São Paulo	São Paulo	3,000	9,000

Source: Abimóvel (2005)

The São Paulo cluster, the second in size, has different characteristics, when compared to all others. It comprises around 3,000 firms, mostly small and medium-sized, dispersed in the Metropolitan area of the city of São Paulo. Most of these firms produce office furniture. Despite its size, the cluster is more oriented towards the domestic market, which may be explained at least partially by the attractiveness of the largest and richest market in South America, the São Paulo state. Exports from the Metropolitan São Paulo cluster in 2005 were 8.8% of total Brazilian exports of furniture.

The São Bento do Sul cluster, the third in size, has also its unique characteristics. It is located in an area of Austrian and German immigration. Although it occupies the third place in the Brazilian ranking of furniture clusters in number of employees, it is the number one exporter of furniture in the country, with 43% of total Brazilian exports of furniture in 2005. Many firms in the cluster export 80 to 100% of their production. One of the firms in the cluster, Artefama, is the largest individual exporter of home furniture in Brazil. Around 80% of the cluster's output is home furniture made of solid pine wood.

According to a high official of Abimóvel, the industry association, the São Bento do Sul cluster is very restricted in terms of contacts with manufacturers belonging to other clusters: "They are very closed. Firms from other clusters have much more interaction among them. But the São Bento do Sul cluster remains quite closed, they only interact among themselves." He attributed such behavior to characteristics of the Germanic culture, as well as to a historic rivalry between Italian and Austrian/German immigration groups. He also indicated that the physical insulation of the cluster might also be associated to this little level of interaction with other firms in the industry. The level of associativism is also considered low, especially when compared to the Bento Gonçalves cluster.

The Paraná cluster, although located in an area characterized by intense forestry activities, has not developed as much. It is responsible for only 9% of total Brazilian exports of furniture. It has specialized in the production of furniture for the low-income market.

Because of its characteristics, the São Bento do Sul cluster was selected for further investigation.

1.2. The São Bento do Sul Furniture Cluster

The São Bento do Sul furniture cluster consists mostly of small and medium-sized Brazilian family-owned and family-operated firms. It is estimated that the cluster is formed by 400 firms, if included those established nearby the cluster (in the areas of Campo Alegre and Rio Negrinho), which employ around 10,000 employees. Home furniture represents around 80% of total furniture production.

The importance of the cluster to the local economy can be better evaluated from Table 5: 40.7% of the total value added is generated in the furniture production chain, with almost 50% of the labor employed in the area.

Table 5
Economic Activity in São Bento do Sul 2005 – (in reais)

Activity	Number of establishments	Employees	Gross Sales	Addes Value.	%
Timber	83	482	62,722,861	14,236,264	1.7
Furniture	257	10,116	1,362,518,442	348,078,125	40.7
Other Inds.	326	5,452	1,203,180,833	283,079,906	33.1
Retailing	1,354	3,018	681,729,166	149,644,816	17.5
Services	618	2,229	126,726,387	58,093,012	6.8
Agriculture	21	21	4,003,986	1,119,470	0.2
Total	2,659	21,318	3,440,881,675	854,251,593	100.0

Source: Amunesc (2006) and Nupin.

Exports from the São Bento do Sul cluster and surroundings are presented in Table 6:

Table 6
Exports of Timber and Furniture from the Region of Alto Vale do Rio Negro - 2005

City	Timber and Furniture Exports US\$1,000	%
São Bento do Sul	229,137	62.2%
Rio Negrinho	127,476	34.6%
Campo Alegre	11,658	3.2%
Total	368,271	100.0%

Source: Anuário Comércio Exterior 2006 and Nupin

Historical Background

Original settlers were immigrants from European countries, mainly Germany, Austria, Czechoslovakia, Poland, and Italy, who brought with them the know-how and the skills to carve the wood. Nevertheless, the dominant cultural influence in the area is Germanic.

The development of the São Bento do Sul furniture cluster can be divided into six stages⁷:

- 1800-1920 – first settlers from Europe, exploiting local natural resources, such as wood;
- 1920s-1950 – emergence of small factories, most of them at the craftsman stage;
- 1950s-1970s – expansion and consolidation of the cluster; production and exports of handicrafts; production of colonial-style furniture;
- 1980s – economic crisis, forcing companies to modernize and restructure production; introduction of pine wood furniture; search for new export markets;
- 1990s – expansion of export activities as a result of new opportunities due to wars in Eastern Europe and the establishment of support institutions to the furniture industry.
- 2000s – continued international expansion, taking advantage of the devaluation of the Brazilian currency; rise of China as a relevant competitor.

Characteristics

The following are relevant characteristics of the São Bento do Sul furniture cluster (Denk, 2006; Lanzer et al, 1997), of which some are strengths and other weaknesses:

Strengths:

- Local availability of raw materials and parts, or easy access to suppliers;
- Local availability of experienced and skilled labor;
- Quality products, recognized as such in international markets;
- Proximity to suppliers of other inputs and components necessary to the production of furniture;
- Local availability of representatives of machinery and equipment manufacturers, as well as producers of certain types of tools and equipment;
- Local availability of specialized services needed for distribution and exporting;
- Presence of support institutions;

⁷ The first five stages are proposed by Denk (2002). The sixth stage was added.

- Presence of technical and educational institutions, including SENAI and FETEP, the Foundation for Education, Technology and Research, and UDESC – the State University of Santa Catarina;
- Recent modernization of factories, with last generation equipment;
- Frequent participation in trade fairs and exhibitions.

Weaknesses:

- Preference for vertical integration, with firms producing their own wood parts, little outsourcing, and low level of specialization within the cluster;
- Lack of skills and competence in design, with strong dependence on foreign design, despite growing interest and concern with developing capabilities in this area;
- Limited market knowledge and marketing know-how, with a passive and dependent presence in international markets;
- Dependence on imported equipment;
- Adoption of a low-cost strategic positioning as compared to a differentiation approach;
- Low level of associativism among local firms;
- Lack of a shared long-term vision for the cluster.

Recent Actions

A number of actions are being implemented to face the challenges and weaknesses of local producers. Among those, the most relevant are:

- Better management training; adoption of more advanced management practices; move from family managers to professional managers;
- Internal actions to develop their own design;
- Investments in technological actualization;
- More emphasis in quality management and quality control.

2. The Discovery And The Diffusion Process: Historical Overview

Indústrias Zipperer was the first mover in the São Bento do Sul furniture cluster. Founded in 1923, the company claims to be the oldest firm in the Brazilian home furniture industry. It had a major impact on four major steps of the development of the furniture cluster of São Bento do Sul: the first one was the use of parts of pine wood that were wasted, up to then, to produce handicrafts; the second was to export these products; the third was the decision to produce colonial-style furniture; and the fourth was the move towards pine wood and its exportation.

Zipperer led other entrepreneurs and local firms in these four stages. The role played by Indústrias Zipperer is broadly recognized by other firm members, industry representatives, and government officials interviewed. Artefama was the immediate follower, became the leading firm in the industry, and also had a major influence in the development of the São Bento do Sul

furniture cluster. It started exporting almost at the same time of Zipperer. Table 7 compares the two companies.

Table 7
Comparison between Zipperer and Artefama

	Zipperer	Artefama
Foundation	1923	1945
Initial product line	Wood handicrafts	Wood handicrafts
First export order	Early 1960s	1965
Beginning of furniture production	Mid-1970s	Early 1970s
First exports of furniture	Mid-1970s	Late 1970s
Start production of pine wood furniture	1979 – visit to Canada to learn production techniques	Late 1980s
First exports of pine wood furniture	1981	Early 1990s
Product lines	bedroom sets, dining rooms, pieces for living rooms, and children bedrooms	bedroom sets, dining rooms, bookshelves, home entertainment centers, and pieces for living rooms
No. of employees	220	1,250
Total sales (in US\$)	6 million	32 million
Export intensity (% of export on total sales)	90%	100%

2.1. Zipperer, the first mover

Indústrias Zipperer was founded in São Bento do Sul by Carlos Zipperer Sobrinho, a descendant of Austrian immigrants, who became a legendary figure in the region. Coming from a family background of finishing carpenters, he started to work as an apprentice at the age of 11. In 1923 he acquired a small plant owned by his boss, which produced small pieces of furniture and windows.

Soon afterwards he started the production of handicrafts made of small pieces of pine wood that were wasted by the timber industry. The idea of using this wood waste to manufacture handicrafts in industrial scale was by itself an innovation. The wood was carved in different ways, creating all kinds of objects for home use, including jewelry boxes, abat-jours, and other decorative items, as well as small pieces of furniture. The company started to sell its products in Rio de Janeiro, at that point the capital of Brazil, in the industrial city of São Paulo, and in the city of Aparecida do Norte, a religious center.

Carlos Zipperer Sobrinho was limited by the technological and human resources available in the region, at this time quite insulated from the rest of the country. To overcome his firm's limitations, he imported books from Germany, developed his own equipment, and trained his new employees. He was also a proactive businessman; he traveled frequently to make contacts and sell his products. The company was also said to be a pioneer in selling wood products

outside the state of Santa Catarina (Denk, 2002; Kormann, 2005). He was later elected mayor of the city of São Bento do Sul, and served the local community in important ways.

Soon Indústrias Zipperer's products became popular among tourists, generating more orders, and stimulating other firms from São Bento do Sul to pursue the same path. According to one of the founder's daughters, Nícia Zschoerper, even at this early period in Indústrias Zipperer's development a number of new firms followed the example, many of them formed by people who had previously worked for Indústrias Zipperer. One specific example of a spin-off was Móveis Serraltense, founded in 1947.

The company started export activities to the U.S., Germany, and England in the 1950s; in the early 1960s it also exported to Japan. According to Denk (2002), it was the first firm in the cluster to export. These were initially unsolicited orders; buyers from other countries contacted Indústrias Zipperer, probably because of products taken by tourists to these countries. Yet Indústrias Zipperer did not remain as a passive exporter: Carlos Zipperer Sobrinho developed strong relationships with buyers in these foreign markets, trying to adapt the products according to their suggestions. For example, the Japanese preferred jewelry boxes with decorations of flowers. Products were exported in small packages by ship.

As competition increased in the 1960s – especially from products made of plastic, a new fashion at the time – Indústrias Zipperer decided to expand the production of furniture. According to Denk (2002), two firms, Indústrias Zipperer and Weihermann, were responsible for the introduction of colonial-style furniture in the cluster. Yet oral reports collected in the research process refer solely to Indústrias Zipperer as responsible for this move.

The plant was modernized and new equipment acquired. A major difficulty, as reported by a manager interviewed, was to convince artisans to adopt new production techniques and accept automation. Once the change from an artisan to an industrial culture was implemented, the company started to grow. It was at this point that the second generation got involved in management functions at Indústrias Zipperer, as Carlos Zipperer Sobrinho, the founder, had serious health problems, which later caused his passing away at the age of 78. The older daughter, Nícia, who was an accountant, took charge of the administration, while the son, Carlos Arlindo, an engineer, was responsible for industrial operations.

In 1972, Indústrias Zipperer became the first São Bento do Sul firm to export a container full of handicrafts. Yet the first attempts by Indústrias Zipperer to export furniture in the mid-1970s were unsuccessful because of the excessive moisture content in the wood due to inadequate drying techniques, a problem that afflicted many Brazilian wood product exporters at that time. Carlos Arlindo Zipperer had to travel to solve problems with customers abroad. Indústrias Zipperer decided then to move from imbuia to mahogany, a wood that was easier to treat and dry. The company also developed its own designs, launching an English-style product line, which was soon copied by local competitors. The company adapted its products to customer requirements, investing in quality improvements, and acquiring production know-how. Efforts were made to export these products to Florida with moderate success. Indústrias Zipperer also continued to produce the colonial-style furniture, which was sold in the domestic market.

In the late 70s, a visit of a Canadian businessman to São Bento do Sul opened new opportunities. This businessman, who owned a large-scale furniture plant in his country, suggested that Indústrias Zipperer should consider using pine wood in the manufacturing of furniture, based on his own experience with this material. Indústrias Zipperer had invested in pine trees reforestation to take advantage of government tax incentives, but the owners had never considered using it for furniture. As a result, in 1979 Carlos Arlindo Zipperer went to Canada to learn the most advanced techniques of using pine wood from reforestation to produce furniture. At this point, rising ecological concerns with the devastation of forests were turning the use of wood from reforested areas into a critical requirement of European and U.S. customers. There were also initial indications of a shortage of native woods in the region, and the use of pine wood was already being considered by local firms, although none had initiated the production of pine wood furniture.

When the son of the founder came back from Canada, Indústrias Zipperer implemented the project to produce furniture made of solid pine wood. The most difficult part of the process was to overcome the local resistance to accept the use of pine wood – considered an inferior type of wood – to manufacture furniture. Second, it was necessary to learn how to manage a pine forest to get the best quality wood. As Zipperer produced and successfully exported this new product line, it started a new cycle in the São Bento do Sul cluster, and other firms followed its example in time.

The first import markets for the new pine wood furniture produced by Zipperer were West Germany, France, and the U.S. With the reunification of Germany, West Germany buyers shifted their orders to firms in East Germany. Zipperer then led other firms into exporting to the U.S. market, which became the number one market. Typically, importers would bring their own designs and specifications, and Zipperer, as well as its followers in the cluster, would manufacture the products.

As São Bento do Sul became known as a cluster of furniture exporters, a number of agents established themselves in the area, and a whole set of new intermediaries facilitated the exporting process. The company started to operate with a few of these export agents, namely Primex-Planor and Zipperer Comercial Exportadora. Although this last agent carried the same name of the company, it did not belong to Indústrias Zipperer.

According to one of the agents interviewed, the firm planned carefully its export activities. A modern plant using the latest equipment and with a high level of operational flexibility was considered the main competitive advantage of Zipperer. Another advantage was the fact that the company had its own pine forests to harvest, producing high quality wood, very similar to the European wood, and thus valued by European customers. During the 80s, 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.

Participation in a trade fair in Germany in the late 80s, together with other producers of furniture from São Bento do Sul, opened new export opportunities to this market. The company also participated in trade fairs in the U.S., in order to increase its exports to that market.

The company benefited from the export boom of the early 2000s. Growing exports, combined with high-quality products, permitted to establish solid relationships with its foreign buyers. Zipperer presently exports 90% of its output. Its main markets are the United States, the United Kingdom, France, Canada, and Germany. It sells to furniture stores, importers, distributors, and mail order firms in its foreign markets. Around 55% of its production is sold to U.S. customers. The company sells the other 10% of its output in the Brazilian market. The most important domestic customer is the retail chain Tok&Stok, which has adapted the Ikea model to the Brazilian market.

The company now faces a number of serious external threats, as well as other firms in the São Bento do Sul cluster, such as the appreciation of the real and price competition from China in every export market. In order to face these challenges, it tried to use new raw materials: lyptus, a new generation of pine tree wood developed by Aracruz Cellulose, and MDF panels. Changes in raw materials caused some problems and delays in the production process, but the company is overcoming these problems. In fact, sales in dollars increased in 2006, reaching an average of 700,000 USD by month, compared to 500,000 USD in the previous year.

Indústrias Zipperer is also facing the challenge of succession, transferring power to the third generation. The founder's son, Carlos Arlindo, sold his part of the business in 2004. The children of Nícia are taking charge of Indústrias Zipperer: one is an industrial designer and the other is a mechanical engineer, specialized in furniture production. An outside consultant has been hired to oversee the transition and help the company with the present hardships.

2.2. Artefama, the immediate follower

Founded in 1945 by four entrepreneurs, Artefama was also initially dedicated to the production of handicraft with pieces of pine that were wasted by the timber industry. The entrepreneurs were young blue collar workers at a local factory who knew how to work with wood and wanted to develop their own business. The original founders sold the business to the three present owners, who have altogether 97% of the company. They also hold top management positions; one is the CEO, and the other two are vice-presidents in charge of commercial activities and administration. The CEO, Mr. Alvaro Weiss, is a descendant of Austrian immigrants.

As the company grew, a new plant was built. Product lines became more diversified, and new handicraft items were launched and sold to stores in Rio de Janeiro, in a similar manner to what happened to Zipperer. The first export order came in 1965.

In the early 1970s the company entered the furniture business and acquired a local plant in the downtown area. This was part of a larger trend that was turning São Bento do Sul into an important cluster of furniture. Exports grew substantially during the next years. At the end of the 1970s, Artefama exported around 10% of its output. In only a few years, the company was exporting around 30% of its production. Artefama used two Brazilian trading companies: Interbras (part of Petrobras, the Brazilian oil and gas state company), and the Matarazzo trading company. The company also sold to an Australian businessman, who exported Artefama's products to his homeland.

Repeated orders were an evidence of the acceptance of Artefama's products in foreign markets, deriving from country-specific advantages, such as quality and cost of raw materials and labor, and firm-specific advantages, such as delivery and technical assistance. By 1990, the firm was exporting around 50% of its total output. Products were exported knocked down to reduce freight costs. This required the company to develop detailed and precise instructions to be used by customers abroad, so that the furniture could be easily assembled. Instructions were provided in English, French, and German.

Although export initiation resulted from unsolicited orders, export development was a strategic choice consciously made by Artefama's management. As the company grew, managers' perception was that there was too much competition in the domestic market for higher-quality furniture. If the company wanted to expand only in Brazil, it would have to supply the lower-end segment of the furniture market. Yet price competition required a low-cost approach to manufacturing, and also, in the perception of Artefama's management, required a sacrifice in quality. Large retailers imposed extremely rigid conditions over domestic suppliers. Companies such as Casas Bahia and Magazine Luiza, who served the lower-income segment of the market, forced manufacturers to finance their sales. Also, these large retailers tended to control a firm's production to the extent that "*you better just give them your factory*".

Managers were aware that exporting was more risky, but believed that there were more opportunities for a company if it really wanted to make it work. In light of these considerations, the company's management made a conscious option to grow by international expansion.

Machinery was imported from Italy to improve production processes and boost productivity. This equipment permitted Artefama to move from furniture that employed whole pieces of wood to the use of particle board. Investments were also made in equipment to dry wood, a major problem that Brazilian exporters faced for decades, since the domestic market did not require the same standards as most export markets, with dryer climates. Electronic control mechanisms started to be used to monitor the drying process. Inventory controls were also implemented to avoid wood to be unnecessarily exposed to external agents.

A major change was implemented during the early 90s, as the company started to manufacture and export products made of pine. Product lines included bedroom sets, dining rooms, bookshelves, home entertainment centers, and pieces for living rooms. The company prided itself of combining high technology and artisan work in its manufacturing processes.

Supplier development occurred during the 90s. Artefama's wood suppliers were from Brazil and Argentina. Suppliers of parts were typically local, since a number of smaller firms grew around the furniture cluster of São Bento do Sul. Packaging suppliers were also developed, both in the area of São Bento do Sul and from other countries. For example, a Mexican supplier was used for certain types of packaging. The firm was also concerned with training the workforce, and supporting their education. It offered a special in-house two-years program in conjunction with SENAI.

In the 1990s, the company exported to Western European countries. Yet despite the opportunities and the desire to expand export activities, the company had to face exchange rate problems. In

fact, until 1999, the overvalued Brazilian currency constituted a major deterrent to the expansion of Artefama's exports. By 1999, however, with the devaluation of the Real, Artefama was ready to conquer new foreign markets. The company had invested in new facilities and equipment, improved productivity, and defined its growth strategy. The president of the company expressed this effort as follows:

“Between 1995 and 1999, we had to work hard to achieve what we did... We had to study thousands of alternatives to become competitive and to have a good product. It all happened in the last ten years.”

Also, during the previous years, Artefama's managers expanded their frame of reference to include international markets as part of their cognitive maps; a new mind-set seemed to be built during these years in such a way that exports were now seen as the best path for the company's future. Very quickly, Artefama exported almost a 100% of its total output. It shipped more than 2,000 containers per year to the United States and Europe, becoming the leading exporter of wood furniture from Brazil. In the early 2000s, the company was selling around 50% of its exports to the United States and 50% to Europe.

Artefama used distributors to export. Artefama's managers saw the company as a manufacturer of wood furniture, not a marketer. The CEO explained the reasons behind this strategic positioning:

“We do not sell directly to stores in foreign markets. We have a mass production plant, for large volumes. This table, I need to produce at least one hundred and fifty units to be price-competitive. These chairs, the minimum is six hundred units. Without volume, I cannot compete on price. So, I have no contact with stores. These agents here in Brazil are responsible for all the contacts and communications, assistance to distributors... The agents themselves are not in contact with the stores.”

The appreciation of the Real in the middle of the 2000s caused Artefama and other firms in the cluster a number of problems, by reducing its price competitiveness in foreign markets, at the same time, they had to face Chinese competition selling at cheaper prices than those Brazilian firms could afford to sell.

As a result of these changes in the environment, by 2005 the percentage sold by Artefama to the U.S. and Europe changed. The increased competition of Chinese furniture in the U.S. reduced Artefama's opportunities in that market. According to Artefama's CEO, Chinese competitive advantages (and, for that matter, Brazilian disadvantages) were country-specific: favorable exchange rate, lower labor costs with longer work hours, lower taxes, access to cheap loans, and a modern port structure. To face these new challenges, Artefama adopted a number of palliative actions, none of which was seen as a definitive solution for the exchange rate problems faced: outsourcing, importing of parts, and exchange rate targets.

Outsourcing was adopted by the Italian furniture industry when these manufacturers had to face price competition from other countries. Italian manufacturers became assemblers of furniture parts that were manufactured by third-parties. Manufacturers were responsible for design and

assembly, while third-parties received all the specifications to produce specific furniture parts. Often manufacturers had to assist smaller suppliers in purchasing, engineering, storage, and packaging. Artefama's CEO was aware of the nature of the Italian production model, and made the following comments:

“It is often said that one problem of the Brazilian furniture industry is excessive vertical integration. We tend to produce our own parts... They use the Italian furniture industry as an example: every stage of the production process is done by third-parties. [They are] assemblers... At some point we have had around ten suppliers that produced parts of furniture for us... But it is not a large percentage, around 90% is still made here. There is always a risk in having outside suppliers.”

Another decision was to import parts from lower-cost producers, such as China. By 2006, a small fraction of furniture parts was imported from China.

A third strategy adopted by the company was to work with exchange rate targets, in order to be better prepared to face fluctuations. The following excerpts from the interview with the CEO illustrate this practice:

“We started to work twelve months ago with an exchange rate target of R\$2.50 per dollar. We planned ourselves to be competitive for this rate. We made it. Then we had to go down to R\$2.25; we made it. Now we are working with an exchange rate of R\$2.00 to be competitive. It can go down to R\$2.00 and we can still survive. We can still operate at a profit. I tell my people in the plant: ‘the rings go, but the fingers remain’⁸. We are doing all this. But the government is not doing its share.”

Cost reductions were obtained by improving production processes. For example, waste of raw materials were minimized: *“The only thing we don't use here at this point is the noise of the equipment...”* Yet, according to Artefama's CEO, other firms in the region were not as careful in planning for an unfavorable exchange rate, and were having a difficult time to cope with the present hardships.

By 2006, Artefama was the largest exporter of wood furniture from Brazil. The company had 1,250 employees, of which around 60 were white-collar workers.

It seems that Artefama's export development benefited from two major aspects. On one side, as the company started to export, managers became increasingly aware of the opportunities available in international markets. The move to furniture manufacturing created a new set of opportunities in international markets. Producing a good quality product, due to a combination of low-cost pine wood and skilled labor, it attracted the interest of large foreign distributors. Good quality products and reliability in delivery schedules at a competitive price permitted the growth of Artefama's export business.

⁸ Old Brazilian say, meaning, you loose your wealth, but you can still work.

2.3. The Diffusion Process

The first evidence of the influence of the first mover appears in the use of wasted pine wood parts to manufacture handicrafts. Artefama seems to have been the immediate follower in manufacturing similar products and exporting these products as early as 1965, only 5 to 6 years after Zipperer. Many other firms followed the example of the pioneer.

As many handicraft products started to be substituted by plastic products in the domestic and international markets, Zipperer increased the production of furniture, and launched, at the same time as another local firm, a “colonial” design. The large demand for this furniture style in Brazil stimulated the emergence of a number of other firms in the São Bento do Sul region.

Simultaneously, a new actor played an important role in the development of the São Bento do Sul cluster. This man was Henry Matarazzo⁹, the owner of a chain of furniture stores in the city of São Paulo (Henry Matarazzo Decorações). Matarazzo “discovered” São Bento do Sul. He brought new furniture designs and had contracts with different firms to produce them. One of the firms was Zipperer. These products targeted the high-end market; they were made of solid imbuia wood and premium- priced.

Artefama’s CEO believes that the expansion of the São Bento do Sul cluster came with the introduction of colonial-style furniture. This was, however, in his judgement, more the result of vicarious learning than of collective actions by local entrepreneurs and businessmen. He observed:

“Many new firms were created during the colonial-style boom. The industry ‘exploded’ during the 70s here in São Bento. Many of these new entrepreneurs were our employees... They saw an opportunity: ‘Ah-ha, a lot of people are earning money, all these new plants, I am going to do the same’. And they left our company and established their new businesses. And then they invited professionals who worked in our plants: ‘Come, here you are going to be a manager, there you are only another one.’ They also copied some of our models. Some survived, others closed. A few succeeded.”

In 1975, during the centennial anniversary of São Bento do Sul, an exhibition was organized which attracted the attention of large retailers to the emerging furniture cluster, at that point still manufacturing colonial-style products from various native woods. The exhibition served as a starting point for many firms to sell their products nationally and even internationally.

In the mid-1970s, the growing shortage of imbuia, a tree native in the region, started to be perceived as a threat to the future of the furniture cluster. The tree was used by local firms to manufacture furniture but was also exported *in natura*. Osvaldo Zipperer, who was at the time the mayor of São Bento do Sul (from 1973 to 1977) and a relative of the Zipperer family from Indústrias Zipperer, in conjunction with a number of local businessmen, made efforts to convince

⁹ Although we were not able to connect Henry Matarazzo to the Matarazzo family of São Paulo, it is believed he belonged to the family. The Matarazzo were Italian immigrants who came to Brazil and became extremely wealthy by investing in various businesses. At one point, the patriarch of the family owned more than one hundred businesses. They have had and still have representatives in almost all sectors of the Brazilian society, from industry to arts and to politics.

the Brazilian government to protect imbuia forests against exporting wood *in natura*, thus protecting local furniture manufacturers and permitting to expand the share of value-added wood exports. Dr. Benedito Fonseca Moreira, at that time the president of CACEX, the government agency in charge of exporting, and a vigorous defender of national interests, accepted the cluster requests, and limited somewhat the exporting of this type of wood. However, he asked the cluster to increase its exports in order to replace the volume lost due to the limitations imposed to green wood exports.

At this point the idea of substituting imbuia by pine wood started to circulate among firms in the cluster. Yet local producers lacked the know-how to correctly manage pine forests to be used for furniture, and did not master the technology to produce furniture from this type of wood. Also, there were no trained workers to deal with this type of wood.

Pine wood had a number of advantages. First, it was a preferred type of wood in the U.S., Northern and Central European countries. Second, the cost of this type of wood in South America was much lower than the one originating from other traditional producers, since pine trees grew two to three times faster. Third, it also permitted to avoid the deployment of local reserves and to preserve local and noble species, which grew much slower. Pine was an easily renewable resource. Pine trees fit perfectly the local environment and were “ecologically correct”, since they could be used to reforest. There were also certain shortcomings. For example, the pine wood from South America tended not to be as hard, exactly because trees grew much faster. Yet even these problems could be to a large extent solved by the adoption of specific forest management techniques.

One important initiative of the local business community was the creation of FETEP – the Foundation for Technical Teaching and Research, inaugurated in December, 1975 in São Bento do Sul, with the mission of developing technical know-how and training workers for the furniture industry. The project was funded by local entrepreneurs and the city government. This foundation conducted studies on the use of pine wood by the furniture industry. FETEP played an important role in helping the industry to improve its production processes and to adopt pine wood, although it was of little help to Zipperer’s earlier moves. Further information on this foundation is presented in section 3.3.

Yet it was only in 1979 that the first firm in the cluster – Zipperer – was successful in producing good quality pine wood furniture, and started to export this product in 1981. Interestingly enough, although Zipperer started to adopt pine wood to manufacture a different style of furniture as early as 1979, when a family member was sent to Canada to learn the use of this new type of wood, other companies remained in the colonial-style furniture until the impact of the economic recession of the 80s, combined with changes in consumer tastes for furniture, forced them to change or succumb. Even Artefama, an early adopter of major innovations introduced by Zipperer, was a late adopter of pine wood furniture. An industry observer described the upheaval in the cluster in the 1980s as follows:

“The local industry suffered a serious crisis because the colonial-style furniture market started to decline. People in the cities, especially the larger ones, wanted smaller, lighter furniture, with different design. And the manufacturers here did not see it coming... They

remained in the same path. But problems started and sales went down. Native woods were getting expensive, with environmental laws limiting their use. You could not just get into the forest and cut your wood, unless you planted new trees. At the end of the 80s, the firms here started to adopt pine wood.”

Despite these efforts, pine wood furniture was not well accepted by consumers in the domestic market during the late 1980s. Apparently the first furniture using pine wood sold in the domestic market did not have good finishing and the wood itself was of bad quality, in such a way that consumers ended by associating pine wood with low quality furniture.¹⁰ As the efforts to sell pine wood furniture in the domestic market failed, companies started to look at alternative export markets. The cluster had already accumulated some export experience from the early handicrafts and the imbuia furniture years. Some of the early adopters of exporting in the cluster are presented in the following table:

Table 8
Adopters of Pine Wood Furniture Exporting in the 1980s in the São Bento do Sul Cluster

Firm	Year of Foundation	Year of Export Initiation	Export Intensity (2006)
Móveis Neumann	1971	1983	70%
Móveis Walfrido	1972	1983	100%
Famossul	1973	1984	100%
Móveis Consular	1973	1986	80%
Móveis Serraltense	1947	1987	Not available

Source: Telephone interviews and Brazilian Exporters Catalog.

An opportunity to expand exports came with the civil wars in the Balkans. 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, the Netherlands, and France came to South America in search of alternative suppliers. In their efforts, they contacted firms in Chile and Brazil. The 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. The population of São Bento do Sul, historically quite insulated from other areas of Brazil, had kept many of its Germanic traditions and inheritance, easily seen in the local architecture, family names, business practices, and the ability to speak German, as well as some other European languages. This cultural identification is seen by many as a major element to foster exporting from the cluster to Europe.

Export agents started to visit the cluster in the early 1990s. According to an industry expert, these export agents were responsible for the “identification of distributors and retailers in foreign markets”. They traveled to the foreign markets and became the most important intermediaries in the export process. Most were foreigners, but some a few companies also developed,

¹⁰ This trend seems to be reversing at this point, but only in specific niches in the domestic market. A large retailer, Tok&Stok, following the Ikea model, helped the recovery of pine wood furniture reputation in the country by selling products specially designed for the middle-class small apartments in large urban areas.

independently from local manufacturers. Also, certain Brazilian general trading companies started their activities in the cluster, such as the Matarazzo trading company. Large U.S. and European distributors established commercial offices in Brazil with purchasing agents responsible for placing orders, following up production schedules, exercising quality control, and supervising transportation to the destination. As a result of these efforts, the first export boom occurred already in 1990-1991. Certain firms sold their one-year production in advance.

To better serve the new export markets, it became necessary to further 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.

Table 9 presents a list of some of the firms in the cluster that started to export in the early 1990s. It should be noted that we were unable to find a firm that started to export between 1994 and the year 2000, suggesting that the appreciation of the Brazilian currency from 1994 to the 1999 devaluation prevented new firms in the cluster to enter the export activity.

Table 9
Adopters of Pine Wood Furniture Exporting in the Early 1990s in the São Bento do Sul Cluster

Firm	Year of Foundation	Year of Export Initiation	Export Intensity (2006)
Intercontinental Indústria de Móveis	1948	1990	50%
Tremóvel Indústria de Móveis	1981	1990	90%
Indústria de Móveis Três Irmãos	1972	1991	100%
Móveis Katzer	1985	1991	100%
IMOCOL – Ind. de Móveis Coloniais	1976	1992	100%
Móveis Clement	1984	1992	100%
Móveis América	1977	1993	100%

Source: Telephone interviews and Brazilian Exporters Catalog.

With the Plano Real, from 1994 to 1997, it became easier to import foreign equipment and technology. In fact, according to industry experts, most firms, even smaller ones, imported equipment from Germany and Italy. Plant automation of larger firms was completed during this period.

Table 10 presents the percentage of firms by size that invested in new equipment and facilities and Table 11 presents the percentage of renewal of equipment and plant.

Table 10
Investment in New Equipment and Facilities 1996/1997
(% of firms)

Group of firms by size	% of firms
Over R\$ 1 million	29%
500,000 – 1 million	14%
250,000 – 499,999	14%
100,000 – 249,999	14%
Less than 100,000	22%
Made investments	93%
Did not invest	7%
Total	100%

Source: Ferreira (1998) *apud* Garcia and Motta (2005).

Table 11
Revamping of Manufacturing Facilities 1996/1997
(% of firms)

Percentage of Revamping	% of firms
Less than 3%	7%
From 3 to 10%	36%
From 10 to 30%	36%
More than 30%	14%
Made investments	93%
Did not invest	7%
Total	100%

Source: Ferreira (1998) *apud* Garcia and Motta (2005)

It should be pointed out that these investments were not unique of firms from the São Bento do Sul cluster, but of firms in the furniture industry all over the country. For example, according to the same study, 100% of the firms from the Bento Gonçalves cluster, 92% from the Paraná cluster, and 80% from the Metropolitan São Paulo cluster also made investments in plant and equipment during the same period.

As the exchange rate became extremely favorable to exporting after the 1999 devaluation, other firms in the São Bento do Sul cluster entered exporting. Profits from export business were reinvested, permitting to complete the modernization of the local industry.

Table 12 presents some of the firms from São Bento do Sul that were late adopters of furniture exporting. These four firms entered the export activity between 2000 and 2004. Again, we did not find any firm that started exporting after 2004, suggesting that once more the appreciation of the Brazilian currency acted as a deterrent to export initiation.

Table 12
Late Adopters of Pine Wood Furniture Exporting in the São Bento do Sul Cluster

Firm	Year of Foundation	Year of Export Initiation	Export Intensity (2006)
Milamóveis	1972	2000	100%
Móveis Irimar	1967	2002	25%
Brasmóveis	1983	2002	100%
Móveis 3J	1986	2004	0%

Source: Telephone interviews and Brazilian Exporters Catalog.

By 2001, the industry started to search for new markets. It is not clear whether this was caused by a search for new opportunities, or a desire to reduce the risks of concentration in the European market. The United States, the largest market for furniture in the world, was prospected. New adaptations were required, since U.S. customers preferred larger furniture of different styles and materials. From 2001 to 2005, exports to the U.S. market grew steadily, with a favorable exchange rate.¹¹

2.4. Present Hardships

From 2005 to 2006, the appreciation of the real negatively impacted Brazilian exports of furniture. Price competition from Chinese exports also made it quite difficult for domestic firms to continue exporting.

Most interviewees believe that the industry is going to face continued hardships during the next ten years. In Artefama's CEO perception, Brazilian furniture is not recognized by its design or specific characteristics; they just had good products at a competitive price. In general, it is believed that the industry will suffer a consolidation process, with weaker and smaller firms disappearing. Firms that were not able to develop differentiated products are now challenged by Chinese competitors and their own survival is at stake.

An industry expert interviewed suggested that the export-oriented strategy of the São Bento do Sul cluster was actually mistaken, since these firms were highly dependent of exchange rate policies. In his view, firms in the cluster made an option for international markets that increased their risk. He claimed that while the average export intensity (percentage of exports on total sales) for the furniture industry in Brazil was around 20%, firms in the São Bento do Sul cluster exported as much as 80% to 100% of their output. Moreover, their products were specifically designed to the European taste:

“They cannot sell their furniture in the domestic market. They are designed to serve the preferences of buyers from other countries. They are finer and lighter than the products sold in the domestic market.”

¹¹ For example, Wal-mart, the giant U.S. retailer, has been purchasing furniture from suppliers in the cluster.

Another industry expert adds that the cluster is not considered anymore an important supplier to the domestic market. Large retailers fear that firms from São Bento do Sul will not continue to supply them when the exchange rate becomes more favorable to exporting.

A major weakness perceived by most interviewees is the lack of a marketing-oriented approach to exporting. Local traditions are strongly production-oriented. São Bento do Sul has demonstrated its capacity of becoming a leading production cluster, but it has delegated the marketing function to intermediaries, keeping little control over the commercialization of its products. One consultant to the industry noted:

“People are not prepared for marketing. Managers from most companies here never visited their customers abroad, never visited their export markets, never visited a store, never talked with a customer. Family owners are involved with production, with operations... And these firms lack management control systems, management indicators, professional evaluations. There are still many paradigms that need to be broken.”

3. Role of Support Institutions

The evidence collected in this case suggests that a number of institutional actors played an important role in the diffusion process.

3.1. Abimóvel, the Furniture Industry Association

The most important institutional actor was Abimóvel – The Brazilian Association of Furniture Manufacturers, founded around 30 years ago, which combines furniture producers and suppliers to the industry. Around 60% of the 16,000 furniture manufacturers in the country operating in the formal sector of the economy, organized in 28 associations, are members of Abimóvel.

Abimóvel has been active in promoting the cooperation with unions, syndicates, and other industry associations. The Executive Superintendent of Abimóvel, Miguel Sanchez, believes that to foster cooperative efforts within the production chain, among firms in production clusters, and between producers and suppliers of equipment is a necessary condition for the growth of the industry in the near future.

Among the most important actions developed by Abimóvel are alliances and partnerships with other institutions, private and public, such as SENAI, the National Service for the Industry; SEBRAE, The Support Agency for Small and Medium-Sized Firms; and CNI – The National Federation of Industries. These partnerships aim at providing management education, technical training, technological development, and information to industry members. In addition, it is Abimóvel’s responsibility to organize and manage FENAVEM, a national exhibition for the Brazilian furniture industry. The association has also been extremely successful in representing the various sub-sectors of the industry with the Brazilian government.

A major initiative at this point is the establishment of standards for the industry, a work that is being carried out by Abimóvel in partnership with ABNT, the Brazilian Association of Technical Norms. This project is still starting.

Abimóvel had a significant role in the diffusion process. Abimóvel's actions directed towards the promotion of exporting started around 1995, according to Miguel Sanchez, when Abimóvel hired a consultant who prepared a study on the industry's present position and future opportunities in exporting. This study included the analysis of export markets, imports, types of products imported, prices, materials etc. The conclusion of the study was that there were substantial opportunities for Brazilian exports because of its intrinsic quality, the availability of raw materials, and cost advantages. This study permitted the creation, three years later, of the Promóvel Program, dedicated to improve the quality standards of Brazilian furniture and to promote exports.

The first edition of Promóvel, between 1998-2000, aimed at achieving total exports volume of 2.5 billion USD in 2000. Another goal was to expand Brazilian exports of furniture to the U.S. market. Other specific goals included:

- Development of technical standards for the manufacturing process
- ISO 9000
- ISO 14000
- Quality and productivity improvements
- Acquisition of foreign know-how
- Trade missions
- Support to participation in trade fairs
- International marketing studies
- Export marketing practices
- Formation of joint export marketing groups (export consortia)
- Development of a Brazilian design
- Creation of business centers in other countries to serve the industry
- Management training
- The restructuring of manufacturing plants

A multidisciplinary research team studied the U.S. market. Between April and May, 1999, the team visited the most important production clusters and made presentations to local firms. At the same time, Promóvel supported another study by four specialists in Brazil and in the U.S.

One of the areas in which Promóvel was especially active was in promoting the development of a Brazilian design, preferably incorporating elements of the Brazilian culture.

The association was also concerned with being environmentally responsible. Officials claimed that the Brazilian furniture industry at this time works mainly with raw materials from reforestation.

In 1999, Abimóvel started to work with APEX, the Brazilian export promotion agency. This partnership became so successful that in 2004 APEX decided that all export initiatives in the

furniture industry using APEX funds should be directed to Abimóvel. As a result, presently every firm or association in the Brazilian furniture industry that wants to have access to APEX export promotion funds has to work with Abimóvel.

Abimóvel has developed, in partnership with APEX – the Brazilian Association of Export Promotion of MDIC, The Ministry of Development, Industry, and External Trade, a new program to boost exports of furniture, named Brazilian Furniture Program. The Brazilian Furniture Program is the third edition of Promóvel for the period 2005-2007, with funds of US\$7.4 million, half of which should come from the government and the other half from firms in the production chain.

Although some goals were not yet achieved, Promóvel had a positive impact on the number of exporting firms. It also apparently was more successful in helping smaller and medium-sized firms, since larger firms had already developed export management know-how and capabilities.

According to Abimóvel officials, the following are indicators of the positive impact of the Program:

- A total of US\$8.6 million were invested in the Program.
- The Program reached around 600 to 700 firms in the furniture industry.
- In certain markets, exports increased substantially, such as in the U.S. and the Middle East.

3.2 Sindusmobil, the São Bento do Sul Industry Association

Another organization that played a significant role in the export development of the furniture industry, this time specifically of São Bento do Sul, was Sindusmobil, the Syndicate of the Construction and Furniture Industries of São Bento do Sul. Of the 400 local firms (including São Bento do Sul and surroundings), however, only 72, or 20%, are members of this syndicate.

There seems to be a resistance against this type of association among firms in the cluster, although there seems to be some sort of “localism” among cluster members. For example, furniture manufacturers in the cluster tend to privilege their suppliers from the same region, even when their prices are not as good as those of suppliers outside the cluster.

The Syndicate is responsible for the organization of a furniture exhibition, Móvel Brasil, every two years, with producers from the São Bento do Sul cluster. It also has a number of partnerships, including a very important one with FETEP (see section 3.3 below). Sindusmobil is also responsible for negotiations with the Workers’ Union. In addition, it supports the development of industry studies and offers legal assistance to member firms at subsidized prices.

3.3. FETEP, the Local Training and Research Center

FETEP, a foundation to foster the teaching and research on technology for the furniture industry, was created in 1975. It was an initiative of Oswaldo Zipperer, a mayor of São Bento do Sul during the period 1973-1977, who initiated the process by pulling together a group of businessmen and the city government to create a center of excellence in furniture technology. The original funding was divided between local firms and the city government¹². This foundation played an important role in the formation of local workers, as well as in the development of technology to manage pine forests. It also helped to solve technical problems associated to the use of pine wood during the 80s.

This institution was in decline in recent years, but seems to have recovered thanks to the support of SENAI, an arm of the Brazilian Federation of Industries, who now manages FETEP¹³. SENAI/FETEP offers at present training programs for blue-collar workers and specialized technicians, and University degrees in association with UDESC, the State University of Santa Catarina, as well as technical assistance by means of a laboratory to test wood and wood products.

3.4. UDESC, the State University

The need for university training in the area of furniture production stimulated local authorities and businessmen to ask the state government to expand state university activities to the Northern part of the state, where São Bento do Sul is located. As a result, the local Commercial and Industrial Association, FETEP, the city government, and UDESC (the State University of Santa Catarina) joined efforts to start university programs in the area.

UDESC started its activities in São Bento do Sul in 1994, offering a bachelor's degree in Mechanic Technology Applied to Furniture Production. In 2002, the University offered a new program in Information Systems Technology. Initially operating in local schools' facilities, UDESC inaugurated its own São Bento do Sul campus in 2005, with eight laboratories and 15 classrooms.

3.5. The Brazilian Government

As to the role of public institutions in supporting the export drive of the furniture industry in general and the São Bento do Sul cluster in particular, it was determined that certain government actions at various levels had a positive impact on the sector.

The special attention given by the federal government by means of the Competitiveness Forum is considered by specialists as an important government incentive. The purpose of the Competitiveness Forum was to increase the international competitiveness of production chains.

¹² 1% of the city budget was allocated to the project (interview with Oswaldo Zipperer).

¹³ SENAI funding comes from a mandatory contribution of Brazilian manufacturing firms.

The furniture industry was chosen to be supported by this program based on its export potential. The Forum was installed in 2001, although preliminary meetings were already conducted in July and August, 2000. A total of US\$ 1.9 billion from BNDES and the private sector was planned to be invested in the furniture industry, \$1 billion in the wood panels industry, \$ 600 million in reforestation, and \$147 million in other suppliers. However, an evaluation of this program by the executives interviewed does not suggest a major impact in the development of exports of the São Bento do Sul cluster.

The most effective government action was through APEX, the government agency for the promotion of exports, and its association with Abimóvel, explained in more detail in section 3.1. Negative aspects that deserve consideration in analyzing the relationship between government actions and the exports of furniture are:

- The negative impact of exchange rate changes on the price competitiveness of manufacturers;
- The high level of taxation, reducing firm and product competitiveness;
- Bureaucratic impediments and delays to the devolution or compensation of export credits earned by manufacturers, amounting in 2005 to something around US\$ 30 million;
- Frequent strikes within the Federal Income Service in ports and airports, and government reaction to these strikes, causing delays in delivery schedules, and corresponding fines imposed by foreign buyers, or extra expenses to meet delivery schedules by using more expensive transportation alternatives;
- Incompetence and bureaucracy in customs service, typically under government administration;
- Bureaucratic and taxation impediments to outsourcing, making it difficult for firms to organize themselves in a supply chain model similar to Italy;
- Lack of government control on exports of green wood or semi-industrialized wood, reducing wood availability in the domestic market, instead of promoting exports of industrialized wood products;
- Lack of specific long-term (15 years) financing from BNDES for reforestation.

In general, interviewees claimed that they would be satisfied with less government interference: “the government may not help, but at least it should not disturb”, said Artefama’s CEO.

4. Counterfactual Analysis

Our counterfactual analysis for this case will use as counter examples:

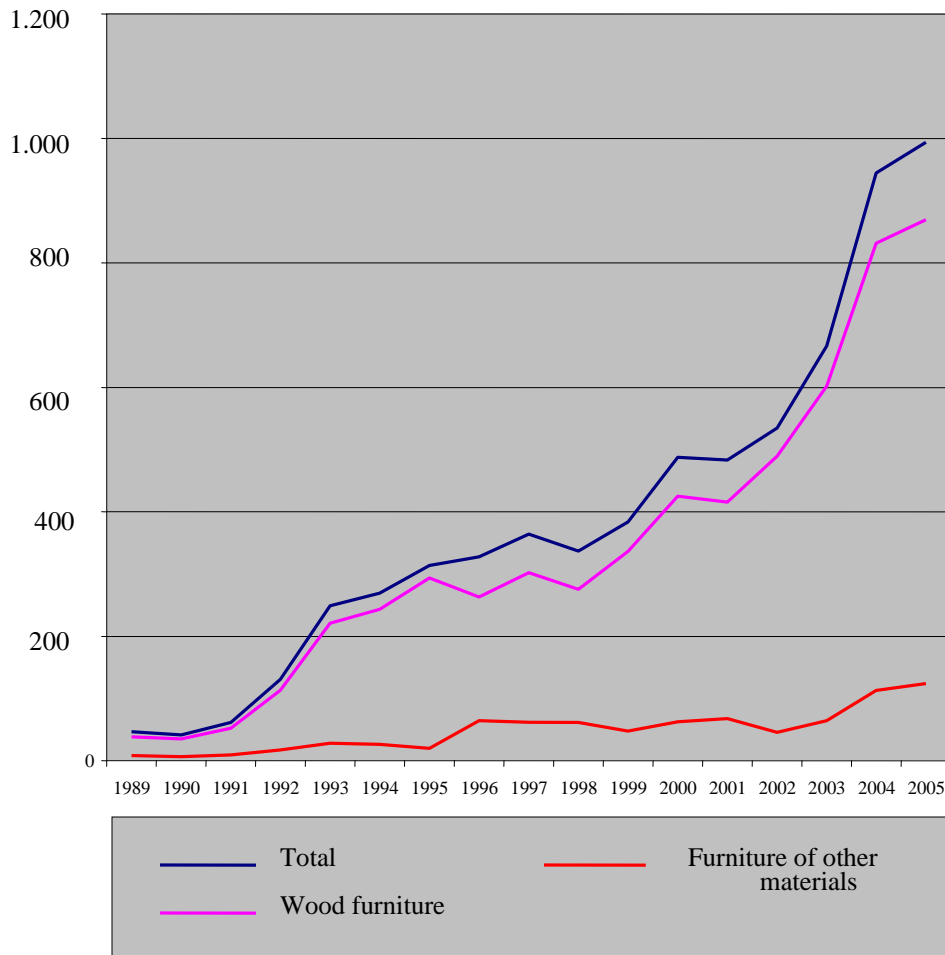
- exports of non wood furniture (mainly office furniture)
- the case of Rudnick, a São Bento do Sul exporter of office furniture and other types of furniture, who is very active in exporting;
- the case of Flexiv, a very successful manufacturer of office furniture from Paraná, located in the city of Curitiba, but that has not succeeded in exporting.

4.1 Exports of Non-Wood Furniture

Other segments of the Brazilian furniture industry were not as successful in developing their exports as the wood furniture in general, and the pine wood in particular. Graph 4 shows clearly that the non wood segment of the furniture industry – typically office furniture – was not capable of developing a strong position in exports. Separate data for the pine wood furniture is not available from government or industry sources.

Graph 4
Exports of Wood Furniture and Furniture of Other Materials

USD million



4.2. Rudnick – a different São Bento do Sul exporter

Other São Bento do Sul firms, although not involved with the exporting of pine wood furniture, also engaged in exporting. We selected the case of Rudnick as a counter example, suggesting that the main reason behind the export success of the São Bento do Sul cluster does not come only from the adoption of pine wood as a raw material, but rather from a certain export mentality that developed in the area and is probably associated with the discovery and diffusion process led by Zipperer first and Artefama in more recent years..

Móveis Rudnick started in 1938, as a cabinet-making carpenter shop, serving the local market. In 1946, the founder, Mr. Leopoldo Rudnick, moved his shop to the present location of the company headquarters. In 1959, his sons joined the company as partners. As the company grew, it expanded its market reach to other areas in Brazil. The company has presently five plants, specialized in different product lines: office furniture, bedroom and living room furniture, kitchen furniture, billiard and snooker tables. Altogether production facilities cover 58.000 squared meters. It also has a reforestation affiliate, covering an area of 12 million squared meters with approximately 500.000 trees.

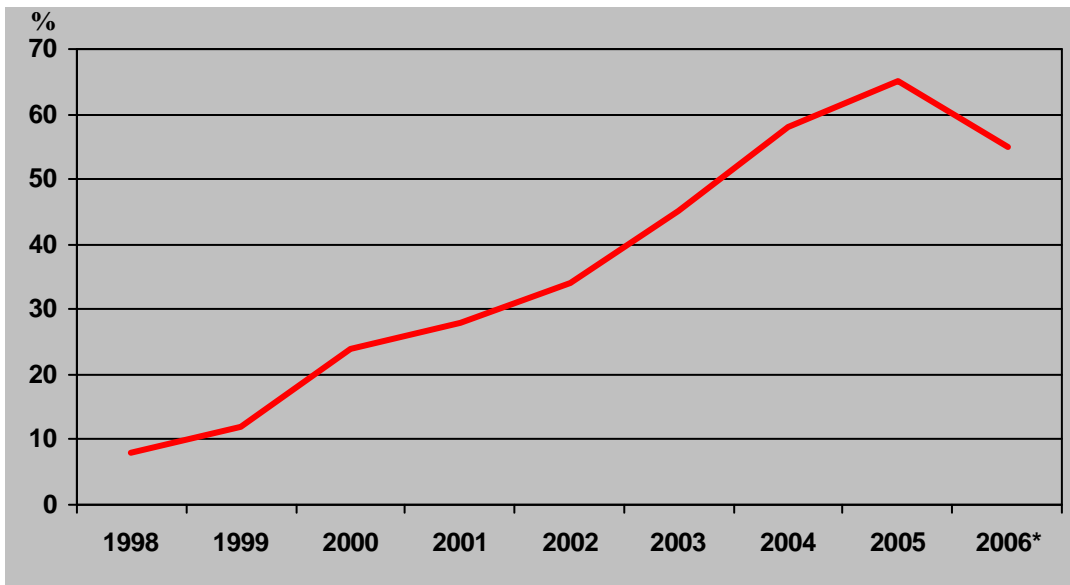
Exports started in a reactive manner, as many other firms in São Bento do Sul. By 1981, a buyer from Brunswick, a U.S. company, visited the São Bento do Sul cluster, looking for suppliers for billiard and snooker tables. Rudnick got the contract and started its export activities. The original tables were made of native woods such as jacaranda and mahogany. Until 1998, Brunswick remained the only foreign customer of the company, with 8% of Rudnick's total sales.

An executive interviewed explained that a reduction of sales in the domestic market by 1998 forced the firm to search for export markets. The company focused in the U.S. market. The 1999 devaluation of the Brazilian currency helped Rudnick, making its products more price-competitive.

In the year 2000, the company was contacted by a U.S. firm specialized in high- quality office furniture. The buyer supplied the design and Rudnick manufactured the product to be sold under this buyer's brand name in the U.S. By 2006, Rudnick provided 80% of the needs of this firm in the specific product line. In sequence, Rudnick started to manufacture as a third-party to another company in the U.S., named Stanley, established in North Carolina.

Exports grew steadily the following years, as foreign buyers continued to approach Rudnick. Nowadays, approximately 95% of its international sales go to the U.S., but the company has also exported sporadically to Canada, France, Holland, Portugal, Angola, Saudi Arabia, Kuwait, Israel, Lebanon, and nine other countries in Latin America. Export intensity (the percentage of exports on total sales) grew from 8% in 1998 to 65% in 2005. The projected export/sales ratio targeted for the near future is 55%. At this ratio, managers believe they will minimize risks due to exchange rate and demand fluctuations. Graph 5 shows the evolution of export intensity at Rudnick.

Graph 5
Export Intensity at Rudnick
(% of Exports on Total Sales, 1998-2006)



* Projected

Source: Company information

Despite these contracts and differentiated product lines (when compared with those produced by other São Bento do Sul manufacturers), Rudnick is also facing the challenges of China's rise in the furniture industry. One interesting aspect raised by an executive interviewed was that American buyers were transferring technology and know-how to China, and Chinese firms seemed to be more ready to learn from foreign buyers than firms in the São Bento do Sul cluster.

In contrast with most other firms from São Bento do Sul, Rudnick developed its own marketing organization to sell to the U.S. directly, consisting of an export manager, three traders working with different product lines (home furniture, office furniture, billiard and snooker tables), and other four employees. Rudnick traders visit foreign buyers, including distributors and stores in the U.S. and other countries. The company is planning to establish a distribution center in Miami until the end of 2006. It is also trying to enter new export markets.

Rudnick can be considered a later adopter of exporting, when compared to other firms in the São Bento do Sul cluster. It is very probable that the experience of other firms in the cluster had an effect in this firm's learning process, even if the executive interviewed did not seem aware of such influence.

4.3. Flexiv, a successful producer that failed to export

Flexiv was founded by Ronaldo Duchesnes, the son of a professor of architecture and movie director who migrated from Czechoslovakia to São Paulo, Brazil. Ronaldo Duchesnes grew up

among friends of his father: other architects, designers, and owners of business in the furniture industry. In 1985, he opened a finishing carpenter shop in the city of Curitiba. With the advent of PCs, Duchesnes became aware that changes in office automation required a new conception of office furniture. During a period of one year he visited design centers in Europe and developed a new product line specially designed to serve these new needs.

In the early 1990s he became acquainted with Régis Dubrule, a Frenchman who had started a very successful chain of furniture stores in Brazil, Tok&Stok, after Flexiv’s participation in a state trade fair. The two companies celebrated a contract and Flexiv started to supply Tok&Stok with a product line comprising 11 items. In the early 2000s, Flexiv decided to expand the business by opening stores under his own brand name to sell his products.

It is only in 2004 that Duchesnes decided to enter foreign markets, taking advantage of the still favorable exchange rate. Flexiv partnered with other local firms, hiring a joint representative that went to the U.S. These efforts were not successful, and the initiative failed. Duchesnes also tried to export to Panama, but he did not succeed either. He believes that the main reasons for his company’s failure in exporting have to do with price competitiveness and lack of market knowledge (specifically the U.S. market).

Flexiv has a differentiated product line, with an emphasis in design. It has earned in recent years a number of national prizes in design, including those offered by Abimóvel, the industry association, by Movelsul, the trade exhibition of Rio Grande do Sul, and by CNI – the National Federation of Industries. At present, Flexiv has a plant in Curitiba and five stores in the cities of Curitiba, Florianópolis, and São Paulo. It also has ten representatives in other cities of Brazil.

4.4. A Comparison of Rudnick’s and Flexiv’s Experiences

Table 13 compares relevant data for the two companies.

Table 13
Comparison between Rudnick and Flexiv

Characteristics	Rudnick	Flexiv
Foundation	1938	1985
Initial product line	Wood furniture (cabinets)	Wood and non wood office furniture
First export order	1981	2004
Product lines	bedroom sets, dining rooms, living rooms, kitchen furniture, office furniture	Office furniture
No.of employees	970	90
Export intensity (% of export on total sales)	55%	0%

It seems that belonging to an exporting cluster might produce valuable spillovers even to firms that are not engaged in manufacturing exactly the same products. Such spillovers include on one side, intangible aspects such as vicarious learning of export opportunities, and export practices, but also more tangible aspects such as those provided by the presence of export agents and importers from foreign countries in the cluster, which transfer technical and marketing

knowledge from one firm to another, and from the foreign market to the cluster. This was the case of Rudnick: the firm benefited from the visit of an export agent as early as 1981, searching for new suppliers in the São Bento do Sul cluster. There can thus be interesting export marketing benefits coming from being a cluster member that are not available to firms outside the cluster. Not having had the benefits of export marketing spillovers, Flexiv was late in searching for export market opportunities. It only did so when the appreciation of the Brazilian currency was already jeopardizing the competitiveness of Brazilian products abroad.

Rudnick did not significantly invest in design, but Flexiv did. One competing explanation for Rudnick’s success and Flexiv’s failure might also be a matter of product adaptation. Rudnick was ready to manufacture specific designs and styles brought by international buyers and to sell under another company’s brand name, while Flexiv wanted to sell abroad its own designs and styles.

5. Synthesis of the Discovery and Diffusion Process in the São Bento do Sul Cluster

The history of the São Bento do Sul cluster shows a very interesting case of a set of “discoveries” followed by a diffusion process that led to the development of a very successful furniture exporting cluster.

Table 14 presents a complete overview in time of the adoption and diffusion process in the São Bento do Sul furniture cluster. Since it was not possible in some cases to determine the exact year of a given event, some of the indications in the table are suppositions from information gathered in the interviews.

Table 14
Time Line for the Discovery and Diffusion Process in the São Bento do Sul Furniture Cluster

Year	Firms Facts	Industry Evolution
1950s	Zipperer exports wood handicrafts to U.S., Germany, and England.	Handicrafts period
1960s	Zipperer exports wood handicrafts to Japan	
↕		
1965	Artefama starts to export wood handicrafts	Production of colonial-style furniture
↕		
1970	Zipperer and Artefama start the production of furniture	
1971		
1972		
1973		
1974	Expansion of the colonial-style furniture market	
1975		Creation of FETEP
1976		Zipperer exports furniture in mahogany to Florida
1977		
1978		Artefama exports furniture
1979	Carlos Arlindo Zipperer visits Canada to learn the use of pine wood in furniture	

Year	Firms Facts	Industry Evolution
1980	Zipperer starts the adoption process of pine wood	Maturity and decline of the colonial-style furniture market
1981	Zipperer exports pine wood furniture Export agents are established in São Bento do Sul	
1982		
1983	FETEP efforts to improve the use of pine wood	
1984		
1985		Adoption of pine wood by other producers
1986		
1987	Artefama starts the production of pine wood furniture.	
1988	Trade fair in Germany.	First export boom
1989	Exports to Germany (Zipperer and others).	
1990		Development of the supply chain
1991	Export agents visit the cluster.	
1992		Investments in plant and equipment
1993		
1994	Artefama starts to export pine wood furniture. UDESC starts programs in furniture production technology.	
1995		
1996		
1997		Accelerated growth of pine wood furniture exports
1998	First edition of Promóvel.	
1999	Study of the U.S. market by Abimóvel.	
2000		
2001	Cluster efforts to reach the U.S. market. 2 nd edition of Promóvel. Competitiveness Forum installed.	
2002	Expansion of cluster exports to the U.S.	
2003		
2004		Crisis
2005	Third edition of Promóvel/Brazilian Furniture Program. New UDESC campus in São Bento do Sul.	
2006		

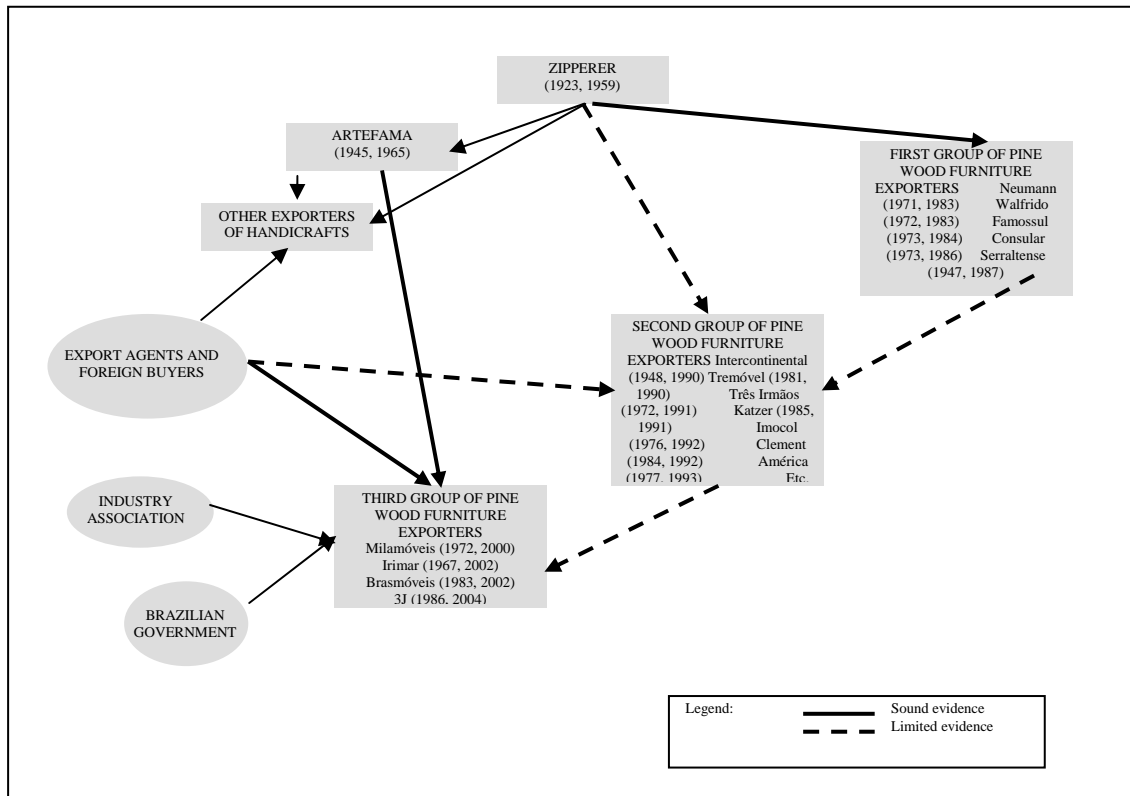
Figure 2 shows a tentative schematic representation of the diffusion process in the São Bento do Sul cluster, based on evidence collected in the interviews and from published information. It is to some extent speculative, because only indirect evidence was available regarding certain aspects. The arrows link the various players in the diffusion process. The legend indicates the type of link: those that come from solid evidence are portrayed as a full line, and those for which there is only limited evidence are represented by a dotted line. The first number in the parenthesis under the firm's name is the year of foundation; the second number is the year when the firm started exporting.

The second group of pine wood furniture exporters, in the early 1990s included Artefama, and thus could not be influenced by this firm. It is believed that Zipperer's experience was still a benchmark for the second group of exporters, but not as important as for the first group. There are also indications that the experience of the early adopters was used by the second group, and that export agents and foreign buyers played an important role in the dissemination of the "discovery".

The third group of pine wood exporters (late adopters) was influenced by Artefama, at this point already the leading firm in the cluster, and by export agents and foreign buyers. This third group might have benefited from the actions of the Brazilian government and the industry association.

The diagram shows that Zipperer was followed by Artefama and other exporters of handicrafts in the earlier period, and that Zipperer had an impact on the first group of pine wood furniture exporters (early adopters) during the 1980s.

Figure 2
A Schematic Representation of the Diffusion Process of Exporting
in the São Bento do Sul Furniture Cluster



An interesting complementary aspect has to do with the diffusion process among clusters. Data available suggests 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 discovery of furniture exports, although this process was more intense in São Bento do Sul first, and Bento Gonçalves second. Other clusters are showing, however, substantial growth: 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 among clusters is still under way. These clusters are located in areas of low-cost labor, indicating a possible transfer of exports to them.

6. Case Study Analysis and Conclusions

The analysis of this case provides solid evidence of the role of the first mover in the furniture cluster of São Bento do Sul, and the subsequent bandwagon effect. The following is a discussion of the main aspects learned from this case, regarding the original research questions, and partial conclusions, limited to this case study.

6.1. *The Nature of the Discovery*

This case study shows a series of “discoveries” that led to the development of a very successful furniture exporting cluster in the Santa Catarina state of Brazil. These discoveries were:

- first, the use of wasted parts of the pine to manufacture handicrafts;
- second, the exportation of these products;
- third, the decision to manufacture colonial-style furniture
- fourth, the move to the production and exportation of pine wood furniture.

There is no question that Zipperer made the four critical steps that allowed the growth of the São Bento do Sul cluster, and Artefama later became the leading firm in the cluster. The two companies inspired other firms to follow their path in different moments of the cluster’s history. In both companies two charismatic figures exerted the role of local leaders in the development of the cluster.

6.2. *First Mover Characteristics*

Zipperer pioneered all the steps that led to the development of the cluster. An entrepreneurial firm, the company was led by its founder during the first three above-mentioned discoveries. The fourth discovery was led by the second generation of the family.

One specific individual, the founder of Zipperer, had a paramount importance in this process. A genuine entrepreneur, he created new opportunities, faced initial problems, developed solutions, accepted risks, and succeeded. He was also a man devoted to his community, and a political figure, as the city’s mayor for a period of time. These characteristics are probably behind the breadth and speed of diffusion of his business experiments. Even after his retirement and death, the company remained for a few years as the flagship firm¹⁴ in the cluster, while the second generation was in command.

Later Zipperer lost the leadership to Artefama, which became the leading firm in the cluster in the 1990s. Artefama’s CEO also had a leading role in the São Bento do Sul cluster. A supporter of a number of initiatives, he is a vice-president of Abimóvel, the Brazilian Association of

¹⁴ The term “flagship firm” is used here following the work of Ferreira, Tavares, and Hesterly (2006), meaning “the company that leads the cluster”, typically a “mother firm” with a large number of spin-offs.

Furniture Manufacturers, and a frequent discussant with the Brazilian government in defense of industry interests.

6.3. First Mover's Motives and External Stimuli

The entrepreneur seemed to be self-motivated in the first two steps of the cluster's development. The first step was to make handicrafts from pine wood. There were already firms in the cluster producing various wood artifacts, using the two most important resources available: wood from local forests and the ability to carve wood. But the entrepreneur innovated by using a raw material that was wasted and had up to that moment no economic value. Even before starting to export, he innovated again by selling to other regions in the country in the 1950s. The significance of this innovation can only be fully appreciated under the light of the physical and cultural insulation of the original community of settlers for more than one century.

The second step was exporting. Zipperer was the first company from the region to export, and was also the first to export a full container of handicraft products. Initially stimulated by unsolicited orders from potential buyers in other countries, the entrepreneur actively pursued these contacts, visiting foreign customers, and started his export business. He thus expanded first from the local to the national market, and then went international. This pattern of firm expansion has been hypothesized by scholars from the Uppsala School in Sweden (Johanson and Vahlne 1977, 1990), with considerable empirical support from various studies. In this case, sequential market expansion was not induced by external stimuli, but was apparently the result of the entrepreneurial spirit.

The third step was the decision to move into colonial-style furniture. Evidences collected suggest that Zipperer was not alone in this effort, although it was the most important actor. Another company in the cluster was also influential at this point, as well as an external actor, a retailer from the city of São Paulo. Despite these influences, there is no question that Zipperer made the most significant moves towards the adoption of this new product. Although this type of furniture could not be successfully exported, it induced an expansion cycle, with many new companies being formed to take advantage of the colonial-style furniture boom. Many of these firms were spin-offs of Zipperer and Artefama.

The fourth and final step was the move towards pine wood furniture and its exportation. The company was then motivated by the desire to export furniture and the understanding that the products it manufactured were not, for a variety of reasons, adequate to foreign markets. Externalities included the growing shortage of native woods, and the influence of a foreign businessman who gave the son of Zipperer's founder the opportunity of visiting his plant in Canada to learn production techniques. Also, the firm had its own pine forests, thanks to government incentives to reforestation. Furthermore, there was a growing awareness within the business community in São Bento do Sul of the shortage of wood and an interest in pine wood. Despite these influences, Zipperer was again the most important factor in the adoption of pine wood, and was a benchmark for other firms in the cluster. This was the last outstanding contribution of Indústrias Zipperer to the cluster development.

6.4. Difficulties Faced by the First Mover

Initial difficulties faced by the entrepreneur were associated to the insulation of São Bento do Sul from the rest of the country, both physically and culturally. The entrepreneur had no access to universities, technical schools, or research centers. During the first step of the cluster development, when he established his firm, he was forced to develop his own techniques from imported German books, and trained his employees.

A second period of technical difficulties happened during the first exports of furniture. The company was not aware, as many other Brazilian exporters of wood products at the time, of the effect of a dryer climate on furniture that was not adequately dried, since the problem did not appear in the wet climates of Brazil, except in the highlands where the city of Brasilia is located. As soon as the company exported a first batch, problems appeared, and the son of the founder went abroad to visit the customer and try to solve the problem. The company changed to a new type of wood, mahogany, and finally moved to pine wood.

Technical difficulties persisted, but the company invested time and money to overcome them. Investments were made in equipment and machinery. Finally, in the early 1980s, the company succeeded in exporting good quality pine wood furniture, paving the way to followers.

6.5. Entry in the First Foreign Market and Subsequent Markets

It is difficult to establish which was “the first foreign market” for the first mover, since there were a number of different moments where the firm had to start a new export business, depending on the product exported. Two specific moments of time seem to be particularly meaningful in terms of “discoveries”:

- first exports of handicrafts;
- first exports of pine wood furniture to West Germany in the early 1980s.

When the company started to export handicrafts, the first foreign markets were the U.S., Germany, and England, followed by Japan. It was not possible to determine which of these markets was first served, since there are no records. Although first exports came from unsolicited orders, substantial efforts were made to develop these foreign markets, including product adaptation and traveling to the foreign market.

Another breakthrough was the exportation of pine wood furniture. This time the first market was West Germany, but soon this market lost its importance, with the reunification of Germany. Importers shifted their orders to firms from East Germany, to support the restructuring of the economy. At this point, Zipperer led again other firms into the U.S. market, which became the number one foreign market for Brazilian exports of pine wood furniture.

6.6. Impact of Diffusion on the First Mover

Why didn't the first mover benefit more from the "discovery" of pine wood furniture production and exportation? Why Artefama grew to become more than five times larger than Zipperer?

Diffusion did not seem to have a negative impact on the first mover. In fact, the problems faced by the pioneering firm seemed to have more to do with succession problems, which halted its development, than with a loss of market share due to the competitive action of imitators.

One reason is exactly the nature of a cluster, characterized by dense agglomeration and a high degree of attractiveness to all sorts of supporting and related activities. This type of industrial organization can be extremely effective in promoting the development of the whole group of firms, by providing economies of scale in production, access to suppliers of various inputs, and by attracting buyers. The growth of the cluster actually tends to have a positive effect on the growth of member firms. Even in the case of spin-offs, which are sometimes seen as "stealing" knowledge or market share, they appeared to be beneficial to the cluster's earlier development. Nevertheless, the positive impact of imitators and spin-offs that mimic the parent company's behavior may turn negative, with the cluster facing the competition of low-cost Chinese products and the appreciation of the Brazilian currency.

The characteristics of family-owned firms may also help to explain why Zipperer did not grow faster. The company did not have the capital to invest in further expansion, and did not have easy and fast access to long-term subsidized debt. The option of accepting partners outside the family is often not considered, because of a desire to keep the company under family control (Barretto and Da Rocha, 2001). Often a family-owned company does not even want to grow. Although we were not able to determine if these reasons actually explain the case of Zipperer in the 1990s, we believe it might have had an impact, especially if one considers the company has been dealing with difficult succession problems, including the withdrawal of the founder's son from the business and the transfer of management to the third generation.

Finally, the expansion of pine wood furniture exports only happened in the 1990s, when Zipperer was already facing the problems of succession, and could not fully benefit from the rapid growth of exports.

6.7. Characteristics of Imitating Firms

Imitating firms did not differ from the pioneer in almost any regard. All the firms in the region had access to the same resources: raw materials, skilled labor, technical know-how. Most firms were entrepreneurial and founded by descendants of European immigrants, mostly from Germany and Austria. The firms initially faced the same challenges and obstacles. They were also typically small, with a few medium-sized firms, at least until the 1990s.

The major difference between the pioneer and its followers as suggested by the research results was leadership. The original entrepreneur, the founder of the pioneering firm, was a classic entrepreneur, as well as a public figure and a community leader. He actively searched for new

opportunities, and found solutions for the problems and limitations he had to face. One of the followers, Artefama, which later became the flagship firm leading the cluster, also had an inspired CEO.

Many imitators were spin-offs of the leading companies, Zipperer and Artefama, or other first adopters, and mimicked their parent firm's behavior. This process of endogenous growth of the cluster by spin-offs also favored imitation.

6.8. Strategies Followed by Imitating Firms

Endogenous spin-offs and isomorphic behavior among firms in the cluster make it possible to look at the firms in the São Bento do Sul as one single unit. In fact, the cluster can be described as a constellation of similar firms.

The strategies followed by imitating firms were basically the same of the pioneer, with very few exceptions. (Rudnick, a company used to develop the counterfactual analysis for this case, is one.) They exported to the same markets; they also moved together to new markets as the demand for their products decreased, for one reason or another. During the early 1980s, for example, the pioneer and the early followers exported to Germany and other Western European countries. In the mid-1980s, as Germans buyers shifted their orders to East Germany, the companies, under the leadership of the pioneering firm, expanded to the U.S. In sequence, firms increased their exports again to Germany, in response to the civil war in the Balkans. Later, under the auspices of a study developed by the industry association, which was made available to all of them, manufacturers expanded their efforts again in the U.S. market.

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 even as laggards, using Rogers (1995) taxonomy. Also, some firms were very fast in adopting certain “discoveries”, and not others. This was the case of Artefama, who was the immediate follower of Zipperer in pine wood handicrafts, but took much more time in adopting an obvious success, pine wood furniture. The later adoption of pine wood furniture by Artefama was probably caused by its moderate success in exporting furniture made of imbuia.

6.9. External Events Influencing Discoveries and Diffusion

Table 15 presents a list of external events that had a positive or negative impact in the process of discovery and diffusion examined.

Table 15**External Events in the Process of Discovery and Diffusion in the São Bento do Sul Cluster**

Steps in the Cluster Development	External Events	Observations
Exports of handicrafts	Competition from products made of plastic	Negative impact
Production of colonial-style furniture	Colonial-style boom in the domestic market	Positive impact
Production of pine-wood furniture	Shortage of native wood (imbuia)	Positive impact
	Government incentives to reforestation	Positive impact
	Requirement of reforested wood to export to the European market	Positive impact
	Reunification of Germany	Negative impact
Exportation of pine wood furniture	Civil wars in the Balkans	Positive impact
	Devaluation of the Brazilian currency	Positive impact
	Competition from Chinese exporters	Negative impact
	Appreciation of the Brazilian currency	Negative impact

Of all the external events that helped to shape the growth of the São Bento do Sul cluster, those that had more impact were the boom in the domestic market for colonial-style furniture in the 1970s, the civil wars in the Balkans, the 1999 devaluation of the Brazilian currency, and the present price competition from Chinese firms.

6.10. Coordination Issues and Spillovers

Two elements can explain the diffusion process: homogeneity and cooperation. Both aspects are the result of specific cultural characteristics of the cluster, its centuries-long insulation, and the degree of interconnectedness among its members, due to kinship, friendship ties, business relationships, church connections, etc. These factors permitted a high level of communication, which in turn facilitated informal coordination among member firms, and also stimulated isomorphic behavior.

It should be noted that firms in the cluster did not value formal mechanisms of coordination, such as syndicates or associations. This was stressed by most people interviewed in the cluster, and was actually reported as a negative characteristic. Yet our research indicated that although joint actions were not common, communication flows were high and isomorphic behavior was the rule, not the exception. Competition and cooperation seemed to coexist side by side in the cluster.

The diffusion process also took place because Zipperer and Artefama, although unwillingly, supplied skilled workers to fulfill the needs of other firms in the region, and stimulated the appearance of new entrepreneurs among their own employees. They also gave the example, and still do, in terms of adoption of innovations and plant modernization.

Spillovers identified in this case were typically horizontal and intra-industry, that is, among competitors, but there were also vertical spillovers, among firms in the supply chain. Technological spillovers seemed to be mainly positive. They include raised productivity of imitators due to improvement in the management of pine wood forests by wood suppliers, or better quality accessories by suppliers of parts. Training effects were identified, as part of the

spin-off process, as well as by means of FETEP, the research and training foundation established and funded by the city and local businessmen. Marketing spillovers could also be identified. They included the transfer of knowledge on exporting and the easier access to export markets, including the access to export agents and distributors that operated in the cluster. As mentioned in the counterfactual analysis, cluster membership tends to facilitate the absorption of positive spillovers, because of the dense agglomeration of firms.

Negative spillovers were not identified, since the “business-stealing effect” (Haddad and Harrison, 1993; Aitken and Harrison, 1999) was not identified in any of the interviews in the cluster. This is probably because the continued export growth in recent years, but might change with the reduction of export growth.

6.11. Role of Private and Public Support Institutions

Support institutions played a role not to start the process, but to stimulate its continuance. Among these, FETEP, originally an initiative of local business owners, had an important role in the early years, mainly in the 80s, in helping imitators to adopt pine wood as a raw material, by helping to solve some of the technical problems involved in its adoption, and training skilled labor. Other support institutions were SENAI, the industry agency for education and development, and UDESC, the State University of Santa Catarina, that established a campus in São Bento do Sul and presently provides well-trained managers and specialized engineers and technicians to the cluster.

Abimóvel, the manufacturers’ association, was especially active after 1998, with the Promóvel Program. Its main role in the diffusion process was to accelerate the adoption of exporting as a business strategy by firms in the industry. Abimóvel provided funds, technical and marketing support. Not by accident, one of the leading businessmen of São Bento do Sul – Alvaro Weiss, the CEO of Artefama – had an important position at Abimóvel. Yet it seems that Abimóvel was more important in fostering the expansion of exports in other furniture clusters than in São Bento do Sul. Its impact on the São Bento do Sul was subsidiary.

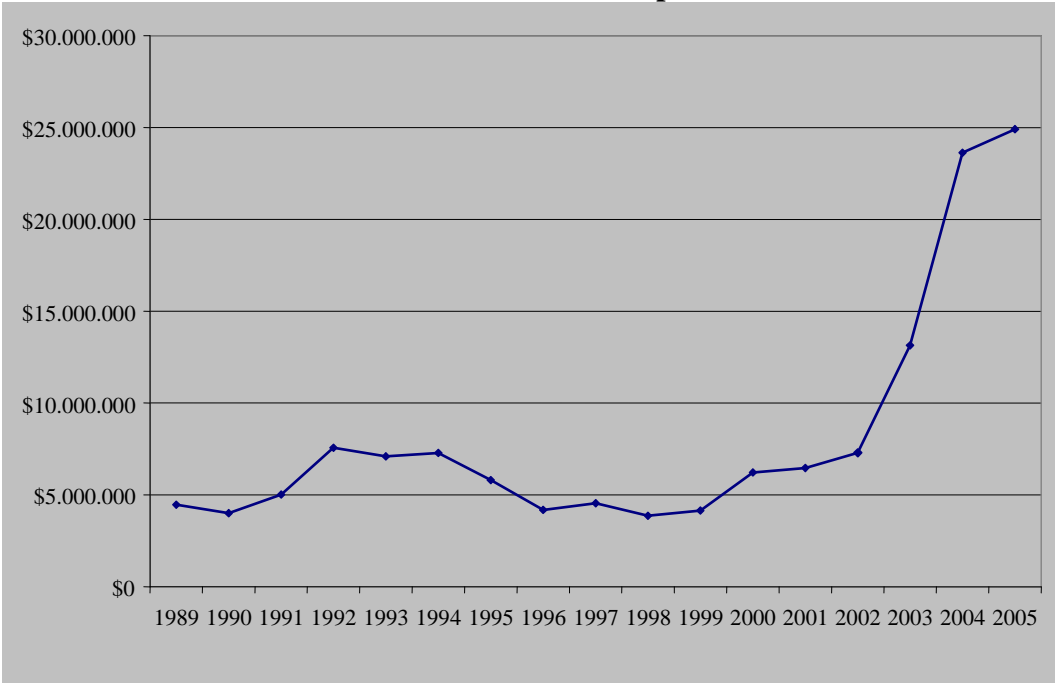
Joint efforts between government agencies and the industry association permitted the creation of a national program for the development of furniture exports. These efforts supported and expanded the scope of the diffusion process, which was already underway, and benefited mostly late adopters and laggards from the São Bento do Sul cluster and other clusters that were starting to export. Despite these positive contributions, managers perceived that the Brazilian government was more a cause of problems to exporting firms than a source of solutions or advantages, as explained in more detail in section 3.5.

CASE 2 – THE SWIMWEAR INDUSTRY

1. General Description

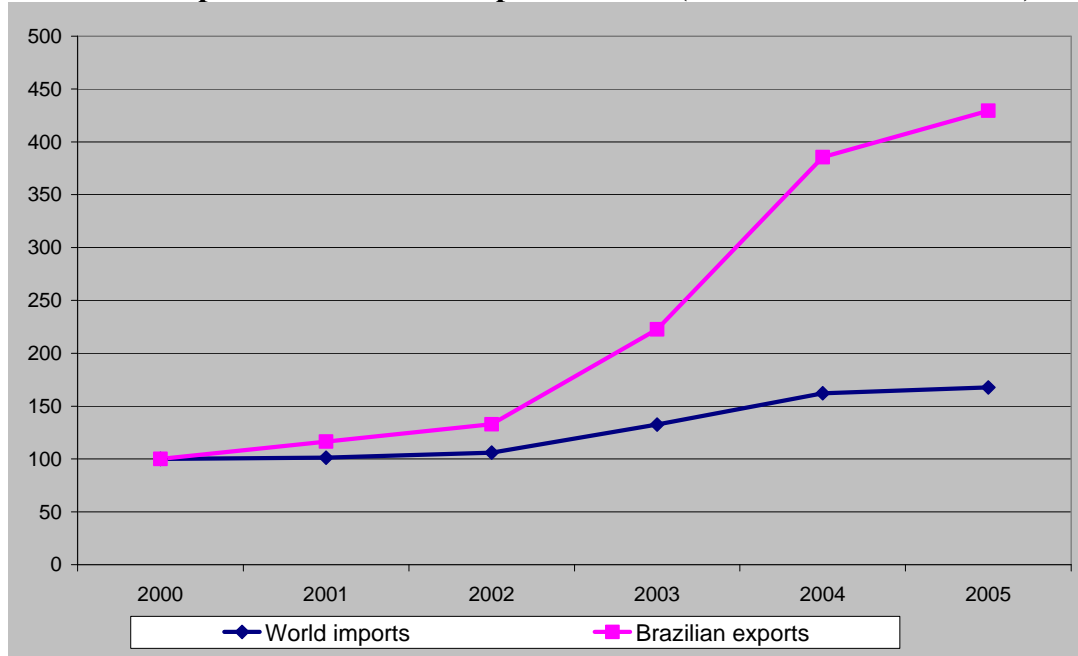
The Brazilian swimwear industry grew exponentially in the last 20 years. Between 2000 and 2005, the sector experienced unprecedented growth and achieved average export growth rates of 32% a year. Official statistics indicate that total exports by the Brazilian swimwear industry reached US\$24.9 million in 2005 (Graphs 6 and 7).

Graph 6
Brazilian Swimwear Exports



Source: ALICE System/SECEX

Graph 7
World Import and Brazilian Export Growth (Index-number 2000=100)



Source: ALICE System/SECEX and Global Trade Information Services

Historical Background

The Brazilian swimwear industry origins date back to the 1950s, when Catalina, a brand owned by the American clothing company Pacific Mills, established a subsidiary in Brazil to manufacture swimsuits. This company became famous for the sponsorship of various beauty competitions, such as Miss America, Miss Universe, and Miss Brazil.

The bikini, a product launched internationally in the 50s, was not accepted in the Brazilian market until the 60s, because of legal and religious impediments to its adoption. First produced domestically or sold in a few stores, the bikini gained acceptance only in the 70s, when the first bikini produced under a designer brand name – Blue Man – became available.¹⁵

During the 1970s, a few companies started the production of swimwear and exported their products in small volumes. It was at this point in time that Brazil became known for the *tanga*, a smaller version of the bikini, and the product became related to Brazil's image (a phenomenon known as the "made-in effect") and, specifically, to the Ipanema beach. One interviewee suggested that the well-known song *Girl of Ipanema* was an additional factor in spreading the international reputation of the Brazilian product. Another interviewee believed there was an influence of Brigitte Bardot, who used to come to one of Brazil's most famous beaches, Buzios, as one of the factors in the creation of the Made in Brazil image of the bikini.

¹⁵ According to David Azulay, founder and CEO of Blue Man (Menos é mais. *Veja*, 11.10.2006, p.107.

During the 1980s, a large number of new firms in the swimwear industry entered the domestic market. Many of them were cottage industries, since the production of swimwear did not require substantial investments or skills, and the product had a large market. Others were small-sized, and a few of them had their own sales outlets. Most of these firms did not actively export. Companies involved with export activities during this period had been typically in operation since the 1970s or even before.

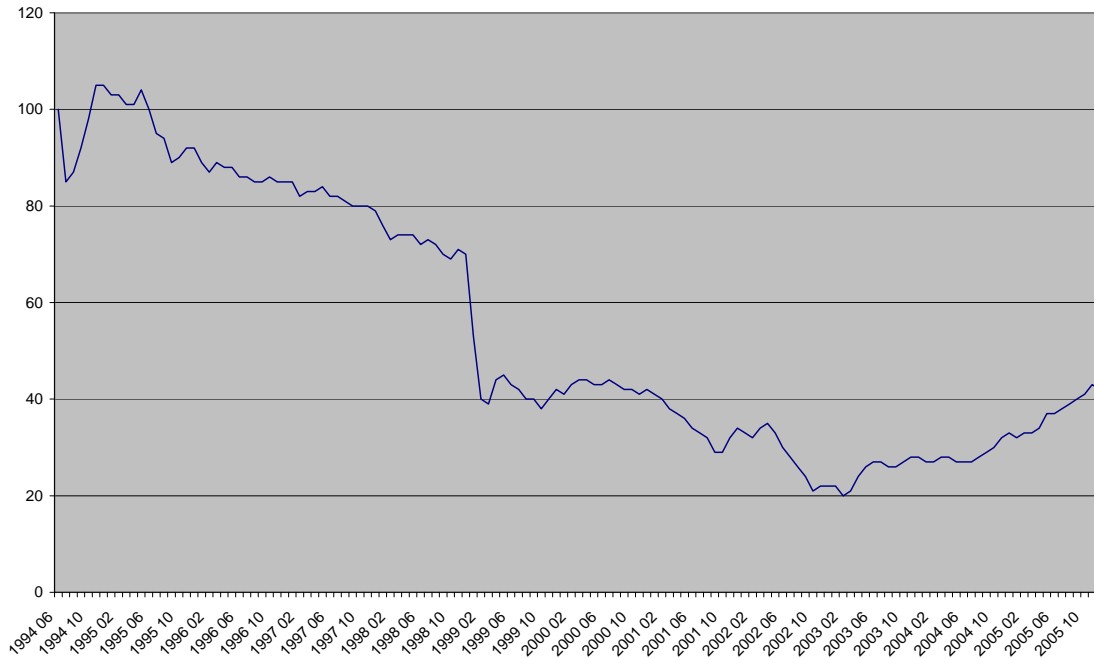
The industry was forced to change during the 1990s due to Brazil's trade liberalization process. Trade liberalization had two main effects on the Brazilian swimwear industry. On one side, liberalization permitted cost reductions, particularly of machinery; on the other, it opened the domestic market to international competition, forcing local manufacturers to cut their prices. The modernization process permitted large productivity gains in the whole textile industry; firms acquired new technologies and invested in advanced training that allowed them to compete internationally. As an example, equipment imported by the apparel industry during this period went from US\$377,365 in 1990 to 737,152 thousand dollars within five years (IEMI, 2006).

Additionally, Brazilian firms were exposed to international competition requiring them to upgrade their products and offer competitive prices. The estimated price of a finished swimwear garment in 1990 was US\$ 10.23; in 2005 this same garment was worth \$4.17. Swimwear production continued to increase since Brazil's trade liberalization in the early 1990s up to 259,400 pieces in 2005 (IEMI, 2006). This value is underestimated since informality in the sector is quite large.

Also characteristic of the 1990s was the increased international exposure of the industry. Additionally, concrete actions had been carried out to strengthen the fashion industry in Brazil, which also benefited swimwear manufacturers. One action that stands out was the creation of the Brazilian Fashion Calendar in 1996. The Brazilian Fashion Calendar encompasses various "fashion week" events that take place in different Brazilian cities. These fashion events played an important role in promoting Brazilian products internationally. According to Paulo Borges, a leading fashion promoter and the man responsible for the creation of the event, the Fashion Calendar also benefited the industry by bringing designers together, thus creating a challenging and creative competitive environment, which in turn stimulated the development of internationally competitive products. The rise of Brazilian top models such as Giselle Bündchen and Adriana Lima in the international fashion world also attracted attention to Brazilian swimwear products.

Exports began to gain momentum with the Brazilian currency devaluation in 1999. The country experienced a decrease in real wages in dollars until it reached a low in 2003 (see Graph 8). The decrease in wage costs – one of the main production factors in the swimwear industry – made Brazilian exports price-competitive. Presently, the industry faces the challenge of the appreciation of the *real*. Few companies are well managed and seem to have the ability to remain exporting with the present exchange rate, according to various interviewees.

Graph 8
Industry Average Real Wage in Dollars (1994/6=100)



Source: IEMI (2006)

Characteristics

The Brazilian domestic market for swimwear products is quite large. Market size played an important role in permitting firms to develop and add value to the final product, thereby stimulating the emergence of current export activities. Beach activities in Brazil can take place almost 365 days a year, contrary to what happens in colder climates, where these activities only take a few months per year.

The Brazilian swimwear industry consists of approximately 700 firms that produce 250 million pieces a year (IEMI, 2006). The industry is formed mainly by micro and small-sized firms, with a large number of cottage industries. Women are a dominant part of the workforce in the industry (70 to 80%). Around 200 firms are presently involved with export activities. The largest exporting firms are concentrated in the states of São Paulo and Rio de Janeiro.

The Brazilian swimwear industry has a heterogeneous profile. Companies in the industry pursue different internationalization strategies. Some manufacturers emphasize brand development and export under their own brand names, while other firms chose to pursue private label strategies. Companies that sell their products under private label contracts produce larger quantities and export to large international companies, which in turn sell these products under their own labels. The number of firms that are capable of selling abroad under their own brand names is small, and their export volumes are typically limited.

It is possible to identify the existence of production clusters in the swimwear industry, although these clusters have very different characteristics from more traditional types of cluster, such as those in the furniture and footwear industries. The two most important beachwear clusters are at this point located in the cities of Rio de Janeiro and São Paulo, but other clusters can be identified all over the country, in most cases in cities located in the coast with nearby beach activities. This case study focused in the Rio de Janeiro and the São Paulo clusters.

1.2. The Rio de Janeiro and the São Paulo Beachwear Clusters

The original beachwear cluster was located in the city of Rio de Janeiro, the most important fashion center of the country, at least until the early 1990s. In the 1990s São Paulo gradually raised as the leading fashion center, even if Rio de Janeiro remained very important.

Besides the city of Rio de Janeiro, there are other eight fashion clusters in the State of Rio de Janeiro, of which one is also a center for the production of swimwear (Cabo Frio). According to FIRJAN, the Federation of Industries of the State of Rio de Janeiro, the average value of the kilogram of textile products produced in the State was US\$ 59.69, compared to an average for the whole country of US\$22.13, an indication of the fashion content of its apparel output.

Among the various initiatives of the last fifteen years to promote the fashion industry in the state of Rio, the following are considered the most important:

- The Fashion Forum, created in 2001, putting together a number of designers, in order to develop actions to promote Brazilian fashion products;
- The Fashion Rio Week, a fashion show created in 2002;
- The Fashion Business, a fashion products exchange center, created in 2003, to facilitate the contact between foreign buyers and firms located in the State.¹⁶

The São Paulo beachwear cluster developed in the 1990s, following the Rio de Janeiro cluster. It differs from the latter in that it has developed a large volume of private label exports, although it also has brand-name designers. The most relevant initiative is the São Paulo Fashion Week, presently the most important even in the Brazilian Fashion Calendar.

2. The Discovery and the Diffusion Process: Historical Overview

Identifying a first mover in the Brazilian swimwear industry is a very 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. Unfortunately, the information given is not very precise. Also, firms are reluctant in supplying information because of intense competition in the domestic market and the fear of supplying critical information to

¹⁶ Between 2002 and 2006, the Fashion Business received almost 400 foreign buyers interested in Brazilian products. To attract buyers, FIRJAN subsidizes the visit of foreign buyers, which are selected by a committee. The 2006 edition of Fashion Business had 150 buyers, generating domestic sales of R\$ 304 million and exports of \$11 million. (Vale mais do que pesa. *O Globo*, 12.01.2007, p.23)

others. Finally, jealousies and rivalry among designers who have created the most successful brand names in the Brazilian market makes it difficult to evaluate reciprocal influences.

Two firms – Blue Man and Bumbum – claim to be the first mover, and most other firms in the industry, although recognizing the pioneering role of the two entrepreneurs, do not see themselves as followers. The following description of firms, historical events, and mutual perceptions sheds some light on this complex diffusion process.

The structure of the industry evolved substantially since the 1970s and other firms have now taken the lead. Companies such as Rosset and TDB focus mainly on private label production export larger volumes. Other firms such as Salinas, Rosa Chá, and Lenny successfully export under their own brand names, but they still have a small share of total Brazilian exports.

2.1. Blue Man, the first mover

The fashion designer David Azulay founded Blue Man in 1972 after a successful launch in the Brazilian market of jeans bikinis he had designed and produced. The first jeans bikini was made for his girlfriend, and was so successful among friends that he decided to sell more units of the same model. Export activities started soon afterwards, in 1974, as a result of unsolicited orders. Flight attendants working for foreign airlines carried back to their countries Blue Man's products to resell or for gift giving. Later on stores that bought Blue Man's products using these flight attendants as intermediaries made direct contact with the company in Brazil to place their orders. Almost at the same time, a tourist from Sweden bought Blue Man's bikinis to resell in his own stores.

Shortly thereafter, the company had an unexpected but extremely favorable exposure in the international media when British journalists working for *The Sun* arrived in Rio to photograph Brazilian women at Ipanema beach. They noticed that many women were wearing the same bikini, a tanga-type model with the American flag. The picture appeared in the cover of *The Sun*, and read: "After Carmen Miranda, Coffee and Pelé, Brazil has created a new success product: the tanga" (Rubim, 2004).

After this publicity in *The Sun*, these journalists were approached by businessmen interested in buying the product. The journalists contacted Azulay back in Brazil, but the deal did not progress. Azulay then flew to London, Paris, and New York to sell his products. His primary motivation was not associated to the conquest of new markets. In fact, Azulay indicated that it was not even the idea of achieving brand recognition, for at the time he had no interest in these matters. His true motivation was a matter of vanity, as he himself recognized: to see "the world wearing his creations", to see his products sold in European stores. A secondary motivation to export was to reduce seasonality in the business; he hoped to sell his products in these foreign markets during the months of March, April, and May.

When traveling to Europe, Azulay did not have previous contacts with distributors and stores abroad. During his trip to London, he paid the journalists to introduce him to various store managers and distributors in London. Then he went to Paris, again without a marketing plan or

contacts, hoping to be received by store managers to offer his products. He ended by contacting an importer who bought 10,000 units. In New York, a friend arranged a contact with the purchasing department of Bloomingdale's, a large department stores chain. Other contacts were made with two other companies generating a few contracts. (Rubim, 2004). In the overall, Azulay's first internationalization attempts were not very successful. Yet initial contacts with distributors were made, generating future sales.

Although initial exports were sporadic, Blue Man won a national award in 1976 as the main swimwear exporter from Brazil. Azulay was invited by the Brazilian Foreign Ministry to participate in an international trade show in Germany. Once again, Azulay did not sell many bikinis but was able to contact distributors; later on some of these contacts turned into business partnerships. In retrospective, Azulay regretted not to take full advantage of these government-sponsored international fairs but he did get additional international exposure.

In the following five years Brazilian beachwear gained more visibility in foreign markets. The domestic market for beachwear also developed, with an increase in the number of brands sold, as well as in product diversification.

During the eighties, Azulay made substantial efforts to adapt his product line to foreign standards in order to satisfy different demands on size and style. But to achieve this goal it was necessary to spend extra time and resources. With a limited staff dedicated to product development, as well as administration, since the company remained a typical entrepreneurial firm, the result was a lower priority to the domestic market. A multiplicity of models and patterns were offered to foreign buyers, reducing economies of scale.

With lower returns and loss of brand equity in the domestic market, Azulay became aware that the firm had neglected the Brazilian market, losing its original positioning, its "*essence*", the main reason for its success. In 1984, Blue Man "*traded Italy for Ipanema*" and returned to the brand's original positioning, adopting a Brazilian tropical style that is still present in its products. The company reduced its international focus and decided to work with a limited number of stores abroad, selling directly and not using intermediaries. It opened a number of stores in the domestic market.

Despite these changes in the company's strategic focus, Blue Man continued to cultivate a presence in the American market, considered its most important foreign market. In 1990, Blue Man opened a store in Miami Beach, but it only lasted six years. In 2000, Blue Man began to export *sungas* (man swimsuits) in a deal with the American company Universal Gear. It also exported directly to companies such as G-Star, Energie, Diesel, Lucky Brand, Calvin Klein, DKNY, Kenneth Cole, Adidas, Y.M.L.A, Body Body Wear and Levi's (Rubim, 2004). In 2004, the company created a website to sell directly to international customers. This time products offered in this virtual catalog were standardized and the company did not invest time and resources adapting to specific customer demands. Blue Man offered three main product lines, each developed to meet the American standards, the European standards, and the Brazilian standards.

In 2006 Blue Man had 22 stores in Brazil and sold 300,000 pieces, with total sales of US\$12.4 million. Exports accounted for less than 10% of its total production. In fact, exports were no longer the firm's priority as in earlier stages of its development. The company adopted a market strategy primarily focused on the domestic market, although it remained receptive to direct sales to foreign customers without using agents or distributors. The company intended to develop the high-end niche, working directly with store owners in foreign markets. Azulay stated that the Brazilian Fashion Calendar was an excellent way to attract the “*right kind of exports*”, that is, buyers from this high-end segment of the market. In 2006, Blue Man was selling directly to stores in L.A., San Francisco, Saint Barth, New York, and Marbella.

Several firms followed Blue Man's initial footsteps. Yet although David Azulay remained a well-known name in the industry, recognized by many as a pioneer, he does not inspire new followers, as he did in the earlier days. New entrants in the industry have adopted different export strategies, mainly private label contracts. Even new firms exporting under their own brand name seem to be following the industry trend, but not necessarily inspired by the pioneer.

2.2. Bumbum, an independent second-mover

Bumbum was founded in 1979 by Cid Pereira (known as Cidinho) an entrepreneur with a previous unsuccessful experience (a fashion store that went bankrupt). Looking for new opportunities, he became aware that most stores in Rio had a small selection of swimwear, but none of them offered customers a full line. Then, in 1979, he started the first Bumbum store in Ipanema, Rio de Janeiro. It was the first store in Brazil specialized in beachwear. His bikinis were sold inside a small cotton sac with the store's logo, which started to be used by consumers to carry objects to the beach (such as sunglasses, suntan products, etc.).

It soon became a fad among the people in Ipanema beach, at that time the trendsetters in beachwear in Brazil. Less than one year later, Bumbum opened its own production facilities in Ipanema. Shortly thereafter he opened a store in Fortaleza, in the Brazilian state of Ceará. First “exports” of Bumbum were similar to Blue Man's. Tourists and flight attendants carried Bumbum's products to other countries. Yet the company made no efforts to export the product. The first step in foreign markets was made in 1985, with the inauguration of a Bumbum store in Ibiza, Spain. The store was located at Calle Mayor, the main street. The choice of Ibiza had to do with the fact that it was considered a fashionable place, where artists and famous people gathered for vacations. The decision to open a store in Ibiza was not taken after careful planning, but was more intuitive, based on the entrepreneur's feelings that it would be as successful as the Ipanema store. He explained his motives as follows:

“And then I traveled to Ibiza with a friend of mine. When I arrived there, I thought: ‘This island is my place. I am going to be here anyway’. I was charmed by the island, with its beautiful people, with a Brazilian-like climate, and Italians, French, people from all nationalities, a Babel tower without clothes, only beachwear.”

At the time, according to Bumbum managers, Brazil was already known in Europe for its bikinis. In fact, when Bumbum started its operations in Ibiza, it had to initiate a legal suit against a Spanish businessman who had registered the Bumbum trademark and logo in that country. Cidinho opened the store in Ibiza in partnership with a friend. He received no support from the government or any other institution. Again, he was a pioneer in this type of specialized retailing, since there were no stores in Ibiza dedicated only to swimwear. Retailing stores in Ibiza only stayed open between May and September of each year, during the summer season. The first year of operation was considered quite successful, but after a while it was felt that the amount of effort required from the owners was excessive for the money earned from the business. Bumbum did not have an administrative structure to support its export activities to Ibiza. After three to four years, the store was closed. Yet Cidinho believes this was an important contribution to the development of the industry:

“I am proud of my participation in this process. I’ve created the concept of fashion swimwear retailing in Brazil, and then in Europe, when I opened my store in Ibiza. After I did it, many entrepreneurs all over the world were jealous, they saw it was something really promising, and now there are thousands of competitors all over the world. When I opened my store in Fortaleza, the same thing happened; a number of new brands appeared, once people realized what I was doing.”

Evaluating his personal influence over other Brazilian swimwear manufacturers, he added: “I did not learn anything with them, but they learned everything with me.” One of the managers in the firm observed that “He turned a bikini into an object of desire”. Also, the company site claims that “it was after Bumbum’s example that all other brands appeared”.

Another store was opened in Los Angeles, California, in 1988, before the Ibiza store was closed. This time there was a demand for Bumbum’s bikinis in the U.S. market, and the decision was whether the store should be located in Miami or Los Angeles. The decision to open the store in Los Angeles was based on what Cidinho himself called “unreasonable” reasons, namely the desire to live new experiences, rather than business profitability. The store, with 300 squared meters, was located in Manhattan Boulevard, “exactly where the American surf was born”. The store was profitable, although operational costs were high. Unfortunately, local people were hired that did not perform well, causing difficulties to the business. Cidinho decided he was “tired of all this” and closed the store.

Depressed with the death of his mother and negative business experiences, Cidinho “abandoned” Bumbum. For a few years he stayed away and got involved with other business activities. Bumbum faced serious problems in the next years, lacking the leadership of the founder. Cidinho attributed some of the problems to the fact that the firm was unfairly excluded from participating in the Rio Fashion Week, because of personal disputes with organizers. He tried to sell the business in the mid-1990s, but was not successful. He was back to Bumbum in the late 1990s. Bumbum export activities in the 2000s were limited to selling to the high-end market. The company exported to the U.S, Canada, Italy, Australia, and Croatia. Cidinho claimed he was not interested in exporting at any cost, but that he wanted to make a nice profit. He explained:

“My focus now is profitability. I will only sell my products to stores that really want them, to whom I can sell for thirty dollars¹⁷. I have no interest in selling for less. I have such an incredible market in Brazil that I don’t need to be concerned. My brand is already established, if I put a store in a good location it is going to sell well. But I still aim at exporting...”

The focus on the high-end segment forced the firm to accept small orders from foreign buyers, which required special production runs, causing difficulties with production schedules. In 2005, the company decided not to prioritize these small orders, and often did not even accept them.

A manager of Lenny, another leading brand name, mentioned that Bumbum tried to export a bikini that was too small even for Brazilian standards, thus causing some problems to firms that followed by establishing an unreal image of the Brazilian product (Rubim, 2004). These comments suggest that the company might have had problems in exporting because the product was not adapted to foreign consumer preferences and habits. This information, however, was not supported by interviews with Bumbum’s owner and managers.

The entrepreneur indicated he feels too old¹⁸ now to engage in new adventures in foreign markets. The lack of government support, the excessive bureaucratic requirements, the lack of financing, the lack of an infrastructure to export, as well as the risks involved were considered insurmountable obstacles by the firm.

In 2006, Bumbum had six stores in Brazil under its own brand name.

2.3. The Diffusion Process

The diffusion process began in the eighties when new firms established production units, opened stores throughout the country, and started to export. It should be noted that most of the companies that entered the market in the 1980s were initially passive exporters, using tourists, flight attendants, surfers, or Brazilians living abroad to sell their products in foreign markets. These exports sales were not accounted for in the official statistics. This is also a characteristic of the domestic apparel market.¹⁹ Companies often exported in response to unsolicited orders, a result of the growing attractiveness of the Brazilian bikini in foreign markets.

In order to export companies had to adapt their products to different consumer needs in foreign markets, especially the bikini’s dimensions. Large bikinis in Brazil were considered small abroad. Large and medium sizes had to be specially developed to satisfy foreign customer preferences. But although certain product adaptations were made, there were no systematic efforts to serve international markets.

¹⁷ He explained that Bumbum’s average price in the domestic market is around 50 dollars.

¹⁸ He is now in his sixties.

¹⁹ Product characteristics – such as small size and non perishability – facilitate informal sales. In fact, a significative amount of Brazilian production is sold via “sacoleiras”, women that buy the product from a small manufacturer and sell it door to door. These transactions are not registered and are part of the large informal sector of the Brazilian economy.

In the 1990s however, firms started to look at exports as a more interesting business. This awareness was associated with the increased international exposure of Brazilian swimwear in foreign markets. Several factors may explain this exposure. One is the fact that some firms hired professional representatives and distributors abroad and participated in international trade shows in order to increase their products exposure and have access to international markets. These companies were successful in achieving international exposure, 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 throughout the world.

Brazilian companies started to influence fashion trends in swimwear, with bikinis with a small cut being referred to as “The Brazilian Cut”. An example is the recent creation of an extra small size for the international market. The Italian fashion magazine *The Best of Intima* referred to Brazil as an “emerging trend-setting country” and reported that “bikinis are the launching tip for the Brazilian fashion industry international recognition”.

The 1999 devaluation, combined with productivity gains of Brazilian firms, made it attractive for large international retailers such as H&M, Target, Victoria’s Secret, Gap, and Zara to outsource production from Brazil. This large-scale private label production is a recent phenomenon, and had an important role in stimulating the consolidation and growth of the Brazilian swimwear industry in recent years. According to Rosset’s CEO:

“[Before] several people started traveling hoping to increase their sales, and others started coming to Brazil to buy [Brazilian swimwear]. But only with the Brazilian currency devaluation against the dollar exports boomed. Yet the results only appeared in 2003 and 2004 because companies were not able to respond immediately to the exchange rate change. Many did not have the know-how, the distribution channels, or the human resources to explore the opportunities.”

As the market developed, some of these firms consolidated their business while others failed. Better structured firms with a higher stake in foreign markets developed a formal distribution network, or opened stores abroad. It should be noted, however, that firms selling under their own brand name tended to destine most of its output to the domestic market, while private label manufacturers tended to have higher export intensity.

Industry specialists believe that a number of factors such as Brazil’s famous beaches, beautiful top models, and warm weather facilitated the association of the product with the country’s image. This association is further supported by the fact that certain Italian and French companies featured Brazil’s name in their labels (Belle Brazil, Okay Brazil and Yes Brazil), as well as by its use in swimwear events organized by global firms such as H&M, which recently promoted a swimwear sale exhibition named “100% Brazil”. As a result, Brazilian bikinis are internationally recognized today for their good quality, fit, and design.

One of the owners of Salinas explained Brazil’s influence in the swimwear industry by comparing it to the most important players in the fashion world:

“Everyone in the fashion industry travels to New York, Paris, and Milan for the latest fashion trends. Yet, people in the industry turn to Brazil for the latest fashion trends in swimwear. It is common knowledge that people prefer Scottish Whiskey, French Perfumes, and Swiss Chocolate, and people prefer Brazilian Swimwear. Brazilian Swimwear products are copied throughout the world. The same models that are produced in Brazil are sold in large department stores in the United States. In addition, international buyers and designers visit Brazil during our fashion weeks and visit local stores and beaches for inspiration and for the latest trends.”

Currently, approximately 200 firms are trying to increase their participation in international markets by selling under their own brand name or to a private label. The motivation of most of these firms is to reduce production and sales seasonality. In addition, the successful trajectory of famous national brands and government support clearly stimulated diffusion. Another group of firms, however, view the domestic market as a better option given its size and potential, as well as current international market conditions.

Firms in the swimwear industry can be classified into four strategic groups, according to their export market strategy:

- firms that export under their own brand name;
- firms that export to a private label;
- small inexperienced firms, organized or not in consortia; and
- firms operating solely in the domestic market.

Only firms in the first category seemed to be directly influenced by the first mover. Each strategic group is examined in some detail.

Group 1: Brand Name Exporters

Approximately fifteen firms exported under their own brand name consistently over the last decades. The average price for each bikini sold by this group is approximately US\$20 to \$30. Companies in this category include: Salinas, Rygy, Lenny, Cia Maritima, Rosa Chá, Poko Pano, Martinica, and Grupo Praia Brasil (which includes the Catalina, Aguia, and Praia Brasil brands).

Many of these companies started their export activities following Blue Man’s initial internationalization strategy, yet they surpassed the first mover’s export volume and overall performance. Market strategies followed differed to some extent. Some firms sold to the high-end market while other specialized in specific product-market niches. An example of the adoption of a focus strategy is Submarine. This company produces children’s swimwear and sell its products to the high-end segment of the market. Contrary to most others, it does not sell in the domestic market, concentrating its marketing budget in international promotions and trade shows.

The growth of these companies has been somewhat limited due to low capital availability. These companies have to invest in foreign markets using their own resources since cheap financing for international activities has not been available.

In sequence we present in more detail the cases of Salinas, Lenny²⁰, and Rosa Chá, three of the most important brand name manufacturers and exporters, and the case of Vix, a strategic outlier.

- Salinas

Salinas was founded in 1982 by the fashion designer Jacqueline De Biase and her husband, Antonio De Biase. She had worked as a model for Blue Man for some years before she decided to open her own business. First selling to stores specialized in beachwear, the company started its own retailing chain in 1985. In the early 1990s the company was responding to unsolicited orders typically placed by Brazilians living abroad. For example, Salinas' products were sold in Portugal by a Brazilian who was a personal friend of De Biase (Rubim, 2004).

In 1996 De Biase hired Rosana Lara, a former executive of Blue Man, with the mission of developing new markets both in Brazil and abroad. Lara was in charge of the internationalization process. In her view, the main reason to internationalize was the desire to reduce idle capacity during certain months of the year, when sales usually went down because consumers would wait for the next summer collection (Rubim, 2004).

Lara kept De Biase's personal connection in Portugal as an intermediary, and immediately started to export to Chile and Venezuela. But the target market was the U.S. because of its large size and potential. In Lara's perception, to develop this market it was necessary to have a subsidiary in the U.S. This was accomplished by opening a commercial office in the state of California and hiring an executive to be in charge of the subsidiary. The person chosen was an executive who had worked for Reef Brazil, a beachwear manufacturer. This office was initially responsible for the distribution of the firm's products in the U.S., but later became also in charge of the European market (Rubim, 2004).

As it had previously happened to Blue Man, publicity in a leading American magazine, *Sports Illustrated*, fueled international growth. In 1997, this magazine portrayed in its cover a famous top model using a Salinas' product. This event opened new opportunities for the firm abroad. Salinas started to sell under its own brand name to large American department store chains such as Bloomingdale's and Macy's, and to a leading retailer and catalog firm, Victoria's Secret (Rubim, 2004).

Salinas had to adapt its products to the U.S. market, by creating larger sizes. Smaller sizes sold in Brazil were discontinued from export orders. It also developed a new product line specially designed to serve the U.S. consumer preferences.

²⁰ These two cases were studied by Rubim (2004), the main source of information for earlier years. Last years information in the case of Salinas was obtained by a personal interview with company executives.

After 2004 Salinas expanded its presence in the U.S. market by opening a store in La Jolla, San Diego, California. When this initiative failed, the company did not give up and hired another professional to help the company access the US trade show circuits. In 2006 the company exported 33% of its production of 600.000 pieces to 39 countries and is considered Brazil's by many as largest brand name exporter of beachwear. It had 20 stores in Brazil.

- Lenny

The fashion designer Lenny Niemeyer started to produce swimwear in the early 1980s in a small office in Rio de Janeiro, selling to specialized retailers in the domestic market. The company moved to a small plant in 1985. In 1987, she opened a wholesale office in Ipanema. In 1993, the first store was opened under the brand name Lenny. In this same year the company made its first exports, responding to unsolicited orders from personal friends of the designer visiting or living abroad.

These first export sales were the primary motivation for the company to later pursue exporting in a more structured manner. Yet although the decision to pursue export activities was not taken because of seasonality concerns, exporting did help the firm to reduce idle capacity during certain months of the year (Rubim, 2004).

First proactive firm initiatives were successful in generating orders, but the company had problems with payment defaults. This experience supported the decision to use local distributors in the U.S. market. In 2000, Lenny established a partnership with Vix Swim Wear (see next section), which distributed Lenny's products initially under Vix's brand name, and later under the Lenny brand name (2003). Vix also sold to Victoria's Secret under its own brand name and as a private label.

In 2003, the company decided to enter the European market. A distributor was chosen to support the firm export activities in this market, called Jofima. The strategy adopted was to open seasonal stores, stores that would remain open only during Summer months, and re-open the next year. The first store was opened in Portugal.

The company received a number of export awards: a Brazilian award for export development (1995); The Quality Brazil Award – International Exporters Service (2001); The Export Rio Award (2001, 2002, 2003).

In 2006, Lenny had 17 stores in Brazil under its brand name. The company had its products sold in large retailers in international markets under its own brand name. Among the most prestigious stores carrying Lenny's products were Bloomingdale's, Barney's, Donna Karan, Harrods, Selfridges, and Au Bon Marché. It had representatives in the U.S., Canada, The Caribbean, and Europe.²¹

²¹ www.lenny.com.br

- Rosa Chá

Rosa Chá started in 1989 when Amir Slama received four sewing machines from his father, who owned a small apparel plant in São Paulo. The company started to produce under a private label. In 1993, the company opened its first store in São Paulo. The origins and growth of Rosa Chá are associated to the increased importance of the city of São Paulo as a fashion center.²²

In 1997 the company made its first exports to the U.S. Three years later, Slama participated for the first time in the New York Fashion Show, one of the most important fashion events in the world. This experience opened new opportunities in export markets. In February 2002 Rosa Chá entered the European market. Only a few months later, in December, it opened its first store in Lisbon. The next year the company started to sell to the French department stores chain Printemps, and opened its second international store in Miami. In 2005, it had its first fashion show in Paris and launched a product line under the Naomi Campbell name.

The company has three different sets of specifications: Brazilian, European, and American. Every collection is developed using the three sets of product specifications. The average cost of each piece was estimated in US\$40.

According to a consultant interviewed, the company was the first among the leading brand-name manufacturers to develop formal export marketing planning before entering international markets.

In 2006 Rosa Chá had distributors in the U.S., Europe, Australia, Japan and Hong Kong. It exported to the U.S., England, France, Italy, Japan, Lebanon, Mexico, Portugal, Saudi Arabia, South Africa, and Sweden. It had its own stores in Brazil and sold under its brand name in another 380 stores in Brazil. Total production is estimated in 470,000 pieces per year of which around 10% are exported.

- Vix

An alternative but promising strategy was followed by a company named Vix. The Brazilian fashion designer Paula Harmany created Vix in 1998 with the vision that it could be profitable to sell swimwear produced in Brazil in the U.S. She had noticed that bikinis were sold for about US\$100 in the U.S., while they could be purchased in Brazil for \$15.

Harmany lives in the U.S., where she designs her own collections and sells Brazilian-made bikinis. Her collections are manufactured in Rio de Janeiro. Vix became one of the leading companies in the Brazilian ranking of swimwear exporters, with a strategy that combines the benefits of low production costs in Brazil with the designer's knowledge of the American market. The firm achieved good penetration in the American market supplying 600 retail stores, including Bloomingdale's and Victoria's Secret, and has plans to sell in the Brazilian market in the near future.²³ Vix presently sells not only its own products in the U.S. market but also acts as

²² Yet only in the last five years, according to a consultant interviewed, the São Paulo Fashion Week included beachwear in the show.

²³ "Vix é recordista em exportação de biquínis". *Valor Economico*, 07/27/2006.

a distributor for other Brazilian firms, such as Lenny. It can be considered a typical international new venture.

For some players in the industry, Vix cannot be considered a Brazilian firm. But Vix's business model, separating production and design and with its own distribution network in the U.S., is considered ideal by industry experts and sets an interesting example to be followed.

- Comparison among Firms

Table 16 presents a comparison of major facts in the development of four of the most important firms in this strategic group: Blue Man, Salinas, Lenny, and Rosa Chá, which clearly indicates the chronology of export initiation and development.

Table 16
Comparison among Leading Brand Name Swimwear Manufacturers

Year	Blue Man	Salinas	Lenny	Rosa Chá
1971	Production started in Brazil.			
1972	Foundation of Blue Man			
1974	Sporadic export orders Exposure in UK magazine. Trip to US and Europe			
1982		First production unit in Rio de Janeiro	Lenny starts production in a small office in Rio de Janeiro	
1983	First store opened in Brazil			
1985		First store opened in Rio de Janeiro	Starts to operate a small plant	
1989				Foundation of Rosa Chá
1990	First store opened in the U.S.			
1991		Sporadic exports		
1993			First store opened in Rio de Janeiro Sporadic export orders	First store opened in São Paulo
1995			Wins Brazilian export award	
1996	Store in U.S. closed. Direct exports to foreign customers	Planning and staffing for international activities Regular exports to Chile and Venezuela		Initial export activities
1997		Publicity in <i>Sports Illustrated</i>		Enters the U.S. market

Year	Blue Man	Salinas	Lenny	Rosa Chá
1998		Commercial office in the U.S. Large U.S. customers sell under the firm's own brand name	Problems with payments default by foreign customers	
2000	Contract with large U.S. customer celebrated.	US office starts to coordinate European operations	Partnership with Vix to sell under private label and own brand name	First participation in the New York Fashion Week
2001			Contract with Victoria's Secret to sell under private brand and own brand name Receives Quality Brazil Award	
2002				Enters the European market Opens first franchised store in Lisbon
2003			Distributor in Europe Seasonal store in Portugal	Opens first store in the U.S. Contract with Printemps Dept Stores, France
2004	Introduction of new product line in international markets	Introduction of new product line in international markets.		Contract with Speedo
2005	Use the internet to export	Store in La Jolla, San Diego opened	Seasonal stores in Europe	First fashion show in Paris Launches Naomi Campbell product line
2006	Exports to the U.S., the Caribbean and Spain	Store in the U.S. closed Exports to 39 countries	Not available	Exports to 11 countries

Information on sales and export volumes are often unreliable, making it difficult to evaluate who actually exported how many pieces to which markets. For example, Blue Man presently exports something around 30,000 pieces. Other information suggests that Salinas exports between 100,000 and 200,000 pieces, but it officially stands as the leading brand name exporter in the country. Vix was said to export 480,000 units, and was also said to be the number one exporter in this strategic group. Rosa Chá is said to export around 40,000 to 50,000 pieces. The ranking of these companies in exporting, according to the data available is presented in Table 17.

Table 17
Export Initiation and 2005 Export Volume (Estimated)

Firm	Year of Initial Exports	Export Volume in 2005 (no. of pieces)
Vix	1998	480,000
Salinas	1991	100,000 – 200,000
Rosa Chá	1996	40,000 – 50,000
Blue Man	1974	30,000

Group 2: Private Label Manufacturers

During the last five years a number of Brazilian swimwear manufacturers began to export larger volumes under private label contracts. These companies exported approximately US\$20 million in 2005. They are responsible for the high export growth rates in recent years.

Rosset and TDB are the two most important large-scale private label manufacturers, responsible for US\$19 million worth of private label exports.

- Rosset

Rosset is a textile conglomerate, with 3,800 employees, manufacturing from fabrics to swimwear and lingerie. It claims to be one of the world largest manufacturers of fabrics for the swimwear industry. Very few companies in the swimwear industry are integrated such as Rosset: "We are not a bikini manufacturer, we are an industrial organization that also manufactures swimwear", claimed one of the executives interviewed. Rosset owns Valisere, a traditional manufacturer of lingerie, and Cia Marítima, a brand-name beachwear manufacturer.

Rosset has two major swimwear lines. One is Cia Marítima, which is positioned as a sexy, glamorous product to the high-end segment. Cia Marítima was created in 1990. The brand is not sold in its own stores in the domestic market, like many other brands, but it has an exclusive agreement with the Brazilian retail chain Track & Field. In cities where Track & Field is not established, the company sells to other retailers. First exports of Cia Marítima, in the early 1990s, were to Portugal, in response to unsolicited orders. The company has always used exclusive distributors abroad. It presently exports to more than 30 countries.

Rosset invested heavily in the development of Cia Marítima's image even though it accounts for a small percentage of Rosset's total swimwear exports. The brand also benefited from publicity in international magazines, such as *L'Oficiel*, from France, and *Time Magazine*. Participation in the Brazilian Fashion Calendar was seen as being very helpful to develop the brand image abroad. These fashion shows are broadcasted to a large number of countries by a cable TV channel called Fashion TV. One recent marketing action was to offer Cia Marítima's bikinis as part of a gift bag for the 2006 Oscar winners. The development of Cia Marítima's brand image attracted international buyers although not enough to secure large contracts. Nevertheless, managers believe it has been crucial to promote private label exports.

The other product line is sold under private label contracts, serving large international retailers such as Zara, Victoria's Secret, Gap, Target, and H&M. In general these companies provide their own designs and specifications, and do not buy Rosset's design. Yet Rosset's competence in design is often used by these companies in specific situations. Private label exports started in 2000. The export manager recognized the existence of a "Brazilian boom" after 1999, with foreign buyers searching for new suppliers of swimwear products in Brazil:

"We were lucky that a lot of people were searching for Brazilian products... Because of the Brazilian boom... Brazil started to be seen as a 'cool' country: Havaianas sandals, Gisele Bündchen, soccer..."

Rosset's motivation to enter new markets was the need for growth. Being a large organization, it needed to expand its markets. Executives interviewed believed the same was not true for most Brazilian exporters of swimwear, which are small, and can limit their activities to the domestic market. Another motivation was the growing obstacles to sell fabrics abroad. Value-added products are easier to sell in developed markets, such as the U.S.

According to Rosset, private label customers total between ten to fifteen companies, including H&M, Zara, Target, and Gap. These companies buy from different producers all over the world. They expect high quality and competitive prices from their suppliers. In order to secure these contracts, manufacturers have to undergo a long selection phase in which they must demonstrate that they can meet all the requirements. Companies have to adapt their products to the different requirements of foreign customers and this process is considered lengthy. It took Rosset two full years to secure its first private label contract.

"It was not that easy, because Brazil is not one of their usual suppliers. Target, for example, has a much larger operation in Central America than in Brazil... And their procurement system is very sophisticated, there is not much space for personal interaction, it's all in the Internet. The Brazilian image works well in contacts between designers. Otherwise there are a lot of requirements and specifications and it is very impersonal."

Most Brazilian companies, according to the interviewees, would not be able to comply with the required quality standards and specifications of private label contracts. Also, financing plays an important role, but it is often not available for smaller, weaker firms. Countries that have free-trade agreements have advantages over other countries. For example, the largest exporter of bikinis to the U.S. is Mexico, basically U.S. firms that established plants there because of NAFTA.

With private label exports, Rosset had to make changes in its testing procedures. The laboratory was modernized and new equipment acquired. They believed that the company had many gains with private label exports: increases in quality, changes in production processes, and higher productivity.

The executives interviewed indicated that a number of problems were faced by the industry: the excessive tax burden, the high incidence of labor on total costs, and competition from China. The tax burden on Brazilian products was seen as one of the major problems in reaching a competitive price: 25% of the cost of the Brazilian bikini are taxes, compared to almost 0% in products coming from Morocco, Tunisia, Jordan, etc. Being labor-intensive, the apparel industry has an extra burden because of indirect wages and excessive social welfare benefits, which can double the payroll.

Chinese products were seen as price-competitive, and with good quality in general. Rosset's customers also bought products from China. Gap, for example, used Chinese suppliers of excellent quality. Interviewees claimed that China has a long tradition in manufacturing textile products, but not swimwear. Also, producers of bikinis are typically countries that have a domestic market for this type of product, which is not very much the case of China. As a

consequence, the swimwear market was not really targeted by the Chinese, since they did not have a tradition in design, at least a design that pleases Western consumers. But their quality was considered “better than certain Brazilian manufacturers”, although Brazilian firms were seen as having “a much superior design”. Rosset’s competitive advantages vis-à-vis China, in their view, are the creative design, and the ability to have the desired fabric, since Rosset manufactures its own raw materials.

- TDB

TDB, an integrated manufacturer of textile products for the swimwear industry, is the second largest exporter of private label swimwear from Brazil. Originally a manufacturer of fabrics made of lycra, nylon, and cotton, TDB acquired Tip Top, a company dedicated to the manufacturing of children’s clothes, in 1987. After the acquisition, Tip Top started to produce swimwear for other age segments, including teenagers and adults. Children and teenage swimwear are exported both under its own brand name and under private label contracts. Adult swimwear is sold only in export markets, under private label contracts. Private label products carry the “made in Brazil” label, but they do not carry the TDB brand name.

Tip Top started to export baby clothes in the 1970s, and continued to export after the acquisition by TDB. However, with the appreciation of the Brazilian currency during the mid-1990s, the company was forced to interrupt its export activities until the 1999 devaluation. It was in the early 2000s that TDB (and Tip Top) started to export under private label contracts. The company presently exports to more than 30 countries. Tip Top has around 2,000 employees and two plants.

The manager interviewed saw Brazilian swimwear as having a differentiated image abroad. He believed that the image of the Brazilian product abroad was an important motivator for foreign buyers. The competitive advantages of the Brazilian product in his view are the Brazilian lycra, considered of better quality, or, at least more adequate to the manufacturing of swimwear, and the “Made in Brazil” image:

“The image of Brazil, Brazil as a fashion in every regard... From the São Paulo Fashion Week, to the sensuality of the Brazilian woman, the worker that arrived to power, soccer... Many factors combine to build the image... Gisele Bündchen, with her image of sensuality, the image of the Brazilian woman... People want to project themselves. Because the European woman wants to have the sensuality of the Brazilians... There is an image. Well-known international retailers come here to buy in Brazil, because Brazil is the land of beachwear... The image is very important. Without it, it would be much more difficult to export. The image helps a lot. But it is not enough.”

The “Made in Brazil” image was also seen as a major protection against Chinese competition. In his view, Chinese products are competitive with Brazilian products, but foreign buyers want to diversify their outsourcing, and they also want the “Made in Brazil” label: *“There are companies that buy here because they don’t want the ‘Made in China’ label. This is not to say they don’t buy in China. They buy in China too, they have offices there.”* Despite this “protection”, Chinese

products are perceived as effectively competing with Brazilian firms in private label contracts. He gave an example:

“This week one of our customers called and said he was not going to buy now, he is going to delay his order because he is expecting the delivery of a large order from the East. He has been our customer for some time, he has received a lot of attention, and our products sold very well. What is the explanation? A better opportunity in another country. They forget us and go there. But we do not desist, because soon he will be back. But he will always choose the best deal for him.”

Private label buyers often modify the company’s designs to define their own models to be produced under these contracts. According to the interviewee, foreign buyers from international retailers are impressed with the large manufacturing facilities of TDB.

TDB does not participate in fashion shows in Brazil, but it participates in trade fairs outside the country. The company has a license from Disney-Warner to use its characters in children’s clothes in Brazil. Although they cannot export these products, they often export under contract to other Disney licensees in foreign countries.

- Águia Group

The history of the company starts with the Fischer family in Germany in 1886, with the production of fabrics. Although initially manufacturing only lingerie, in the early 1920s it included a new product line of swimwear, under the brand name Goldfish, and exported to countries all over the world. With the wars in Europe, the family decided to open new factories in Brazil, Argentina, and Uruguay. The Brazilian company was started in 1937 by Jacob Adler in the city of Petrópolis under the name Malharia Águia²⁴. As the company grew, swimwear became the most important product line, and fabrics were discontinued.

In the 1950s the Fischer family from Argentina, who also had the license to produce the American brand Catalina, acquired part of Malharia Águia. Presently the firm, under the name Águia Group, owns three important brand names: Águia, Praia Brasil, and Catalina. The original owner of the Catalina trademark, an American company, disappeared, but the license to use the brand name still exists, and Grupo Águia cannot export to certain countries where there are still licensing agreements, as well as to the United States. The three brand names are positioned to different market segments: Praia Brasil, a more recently launched brand, targets the youth; Águia, the original brand name, targets young ladies; and Catalina serves the traditional or “classic” segment. The company today is the most important manufacturer of the Catalina brand name in the world.

The export manager of the Águia Group was not sure about when Malharia Águia started to export swimwear, but believed that first exports could have happened as early as the 1960s. In her evaluation, however, these first exports were not relevant, neither regular. The real engagement of the Group in exporting only occurred in the early 1980s. Their major export

²⁴ Adler is translated in Portuguese as Águia (or Eagle in English).

market was and still is Italy. Export development happened gradually, especially from 2000 on, mainly because of foreign buyers visiting the company.

Exports to Italy are mainly under a private label contract. Águia manufactures products according to foreign buyers' specifications. The interviewee believes that the exportation of a brand name precedes private label contracts. She argued that the Catalina brand name is well known all over the world, and this brand awareness was a major facilitator for foreign private label contracts. She believes that there is a greater potential for the Praia Brasil brand, compared to the other two product lines. The fashion component of this product line seems to be more attractive to foreign buyers.

Presently the firm exports to Latin America, Europe, Australia, and Japan, both under its own brand name and under private label contracts. In volume, private label exports exceed brand name exports, but brand name exports go to a larger variety of countries and customers. Around 30% of total sales come from foreign markets, and the other 70% from the domestic market. The company received in 2001 the Rio Export Award, as the largest exporter of beachwear of the State of Rio de Janeiro.

The company does not participate in fashion shows in Brazil. Exporting uses distributors abroad. Many contacts are made by the Internet. Potential buyers search for new suppliers in the Internet.

Exchange rate fluctuations are seen as a major threat to the continuity of exports. The interviewee also indicated that the competition from Chinese products is starting to be felt by Águia:

“Last month we had here some customers from Italy and they complained a little about our prices. They said that Chinese products are starting to enter the Italian market, but they have lower quality. But people in Europe are not paying so much attention to quality. They prefer to buy two or three bikinis this summer and the same number the next year. They use during the summer and throw away. That's why buyers want lower prices. But we cannot reduce our prices and our quality, we cannot go back.”

- Other Private Label Exporters

Other exporters are medium-sized private label producers, including Phael, Coco Doce, Estação Sul, and Marcyn. These companies produce smaller quantities than large private labels producers but in many cases export more than other famous Brazilian brands. Most of these companies also produce under private label contracts for large retailers in the domestic market, such as C&A. Therefore, many of these medium-sized producers have experience with compliance matters and are able to produce high-quality products with tight delivery schedules. They have benefited from Brazilian beachwear international recognition and the increased demand for the Brazilian bikini. Some companies actively seek export opportunities such as Coco Doce, while other companies are referred to foreign buyers by larger companies that are not interested in smaller orders, such as Rosset.

Group 3: Small Inexperienced Firms

A third group of firms is composed by small entrepreneurial firms destining most of its output to the domestic market and selling sporadically to tourists or personal contacts abroad. During the past years these firms were encouraged to form export consortia in order to gain access to international markets in conjunction with other firms. The main objective of each consortium is to develop a single collection jointly designed and manufactured and to share international marketing costs. The Brazilian government has been promoting the formation of consortia in order to help small firms to enter foreign export markets. Export marketing groups are seen as a less expensive and risky way of entering export markets, otherwise an extremely costly activity for these firms. By participating in these consortia they would be able to develop better business plans, train their staff, participate in international trade shows, and lower the overall costs of export activities.

These firms are inspired in their attempts to reach foreign markets by the success of leading brands and the desire to reduce production seasonality. This was the impression of Salinas' export manager:

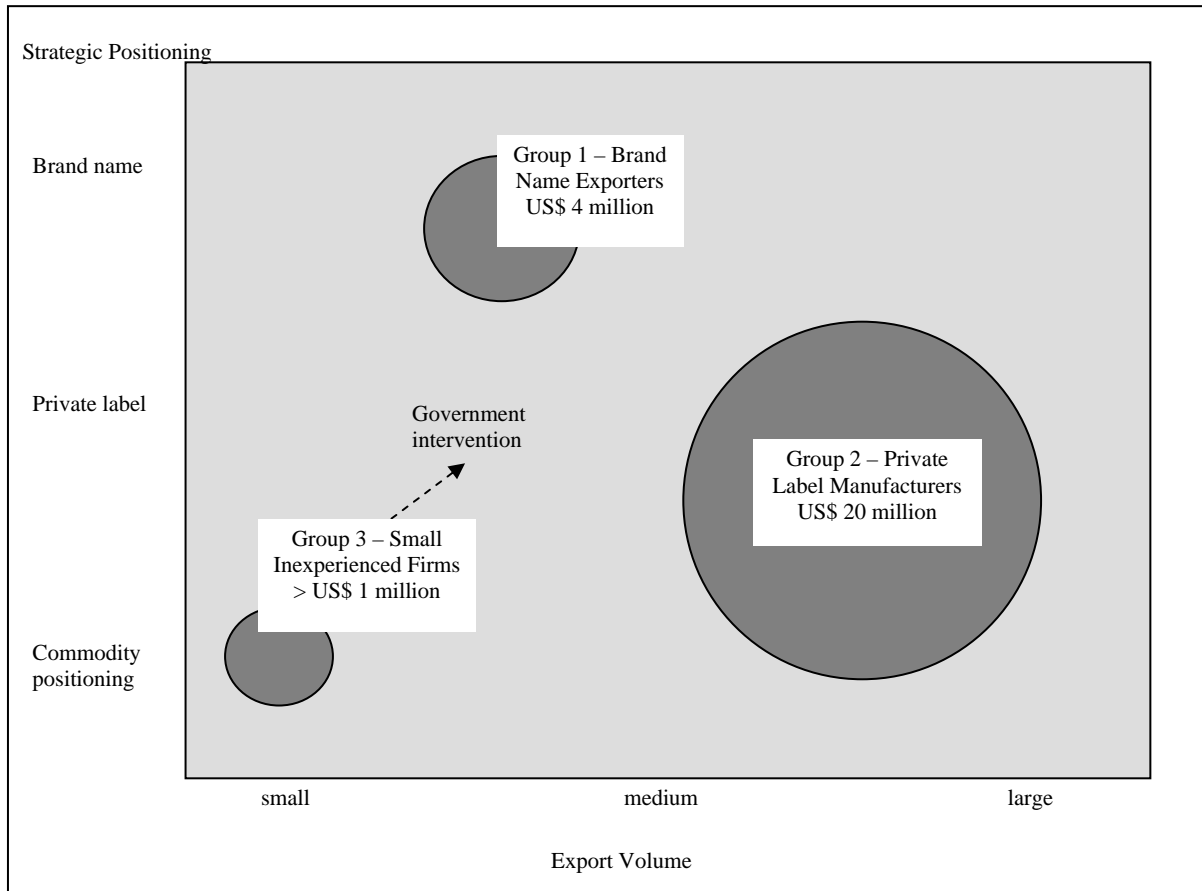
“I am sure that Salinas influenced other companies because these companies often see our name appear in international magazines such as Sports Illustrated. It makes smaller companies believe that there are also good opportunities abroad for them.”

Group 4: Local Sellers

Most firms in the industry prefer to focus exclusively on the domestic market. With a population of 170 million people, an extensive coastline with seven thousand kilometers, and almost 365 days of sun, the Brazilian domestic market for swimwear remains a manufacturer's first option. Several companies have chosen to focus on the domestic market because of their small size, the risks involved in entering foreign markets, and the overvalued Brazilian currency.

Figure 3 presents a strategic groups map for the three strategic groups involved with exporting activities. The two axes stand for export performance, measured by export volume, and strategic positioning, measured by three different strategies: commodity positioning (low-cost strategy), private-label positioning (differentiation strategy under a foreign customer's brand name), and brand-name positioning (differentiation strategy under the exporter's brand name). The size of the circles for each strategic groups does not exactly express differences in export volume. Export volumes for each strategic group is estimated.

Figure 3
Strategic Groups in the Swimwear Industry According to Firms' Export Strategy and Export Performance



At this point the high export performance group is formed by private label manufacturers. The export success of this group is the result of the ability to professionally deliver high-quality fashion products to the customer without marketing investments. Thus these firms could quickly achieve higher volumes since they did not have to create the demand for their own products but benefited from an already established brand name. At this point they are protected by the “made-in effect” and the differential cut of the Brazilian bikini, not yet matched by aggressive foreign suppliers such as Chinese firms.

The second group in volume consists of brand name manufacturers. These companies still export smaller volumes than the private label group since they have to develop the market for their products, which implies to develop brand awareness and channels of distribution to achieve market coverage, a task that requires substantial investments in marketing. Because of the differentiation strategy adopted by these firms, they tend to be better protected against Chinese competition than any other group in the industry.

The last group consists of small firms stimulated by government export promotion programs that enter international markets with undifferentiated products competing on price. These firms are in direct competition with Chinese firms and other low-cost producers. The government is making special efforts to move at least some of them to a higher position in the strategic map (see arrow in the map). This is being done by stimulating the development of differentiated design within each consortium.

Strategic group analysis helps to understand why different groups of firms in the industry achieved better export performance. It also gives some clues to why diffusion benefited more private-label manufacturers at this point. We shall return to this issue in our case conclusions.

3. Role of Support Institutions

3.1. ABEST, The Association of Fashion Designers

ABEST, the Brazilian Association of Fashion Designers, was founded in 2003, aiming at promoting Brazilian design internationally. A non-profit organization, it was initially created by five designers with the purpose of obtaining government support to increase exports of Brazilian fashion products. Four recognized beachwear fashion labels – Lenny, Poko Pano, Rosa Cha, and Salinas – are part of this prestigious and select group of designers.

Currently, ABEST exports to 38 countries and hopes to extend its scope to 96 countries by 2010. Additionally, ABEST has established a partnership with the Ministry of Tourism, in which the two entities will work together to promote Brazilian fashion and tourism. They will do this through publications that draw attention to fashion collections inspired on local tourist attractions. The slogan will read: “Traveling to Brazil is in Fashion”.

3.2. The Brazilian Government

The government did not play an important role in developing Brazilian swimwear exports, although it did offer some support mechanisms to the industry export development. For the most part, the firms themselves played a decisive role in creating and developing foreign markets for Brazilian exports, and it was due to these initiatives that exports grew.

During the last decade, the Brazilian government sponsored a number of activities to support apparel exports, of which the most important were developed by APEX, the government’s agency for the promotion of exports and investments. APEX’s actions in behalf of the industry are carried out in association with ABIT, the Brazilian Textile and Apparel Industry Association. The program has sponsored international trade shows and the participation of export consortia in international fairs. Although this support was initially restricted to firms organized in trade consortia, the requirement changed in the past two years. Financial support to participate in trade shows is now inversely related to firm size. Companies that generate up to R\$ 3.6 million a year

have 50% of their costs covered; firms with a turnover between R\$3.6 and R\$7.2 million get 25%; and large firms that generate more than R\$7.2 million receive around 10%.

APEX also had a partnership with ABEST. Some of the activities promoted by these agencies include international trade shows, fashion shows, and showrooms around the world. In 2005, they invested 5 million reais (approximately 2.5 million USD) in these activities.

Government support was effective in encouraging smaller firms to export. Yet this result is perceived negatively by larger firms exporting brand name products. Managers of these firms feel that government actions encouraged smaller firms to export without being prepared to meet foreign markets requirements. Many of these smaller firms have serious internal problems, such as management limitations that impact on product quality and timely delivery. Their failure in attaining international marketing standards end up affecting the overall image of Brazilian products abroad (the “made-in” image).

One of Salinas’ owners expressed his opinion about government intervention in the industry as follows:

“Brazilian swimwear manufacturing grew spontaneously and its uniqueness is not matched elsewhere. Yet the country was unable to define public policies to support and consolidate this potential. Instead, government interventions work against what has been already achieved. There are thousands of swimwear producers in Brazil, some are excellent and some are mediocre. Brazilian government actions help mediocre producers by giving them money to participate in international trade shows, where they offer low-quality samples at a price of \$5. Unfortunately these samples are copies of pieces produced by established brands that sell their products for \$30 dollars a piece.

These small companies do not have the capabilities to deal with international customers as they are not trained in negotiating and their representatives often do not even speak English. More experienced Brazilian companies are capable of selling their products with value added, but the competition of firms selling apparently similar products for \$5 create serious problems. Some of these companies may succeed, but only temporarily. In fact, most of them are very weak and are unable to comply with on time delivery.

The Brazilian government believes that anyone can export. Attempts are now being made to connect different producing regions with Europe. This is a mistake. It is impossible to sell products with value added when you have mediocre producers imitating higher quality products. What should be supported are brand names that care about quality and delivery. The government helps small producers and penalizes large design companies. Imitators have been very detrimental to the growth of exports of larger established firms.”

Bumbum’s owner also strongly disapproves government actions towards the development of bikini. He gave the example of a program by Banco do Brasil to support micro and small swimwear manufacturers. These were inexperienced companies, which received support from the Bank to participate in trade fairs and exhibitions in foreign countries:

“I was invited as a consultant to participate in a meeting with ten swimwear manufacturers from the city of Cabo Frio with the purpose of creating an export consortium to sell products abroad. And what do they do? They are manufacturers without any experience or tradition, they do not have a production culture, they do not have quality standards, they do not have production engineering... And then Banco do Brasil gives money for these people to participate in a trade fair in Lyon, France, paying the stand, the air trip, other traveling expenses etc., only to burn the Brazilian product image abroad, because these manufacturers are unprepared, they are amateurs...”

A consultant in fashion marketing interviewed suggested that government actions should be directed towards strengthening the leading firms, those that already proved their professionalism and competence in international markets. He believed that the success of the leading firms would bring foreign buyers to the country.

In general, interviewees believed that many of the problems faced by their firms in exporting are not firm-specific or even industry-specific, but are problems of the country, such as high transportation costs, lack of export financing, poor infrastructure in ports and airports, government bureaucracy. For example, the lack of export financing in Brazil forces many businessmen to get financing from the importer, a practice that puts them in an inferior bargaining position. An export manager of one of the brand-name designers expressed his disapproval of government bureaucracy as follows:

“The Brazilian government works against Brazilian firms, contrary to what happens in other countries. You hear about the Exporta Fácil [Easy Export Program]. It is an incredible bureaucracy. It takes hours and hours only to fulfill the forms and then the Brazilian Customs does not accept the form. They do not make it easy for the exporter.”

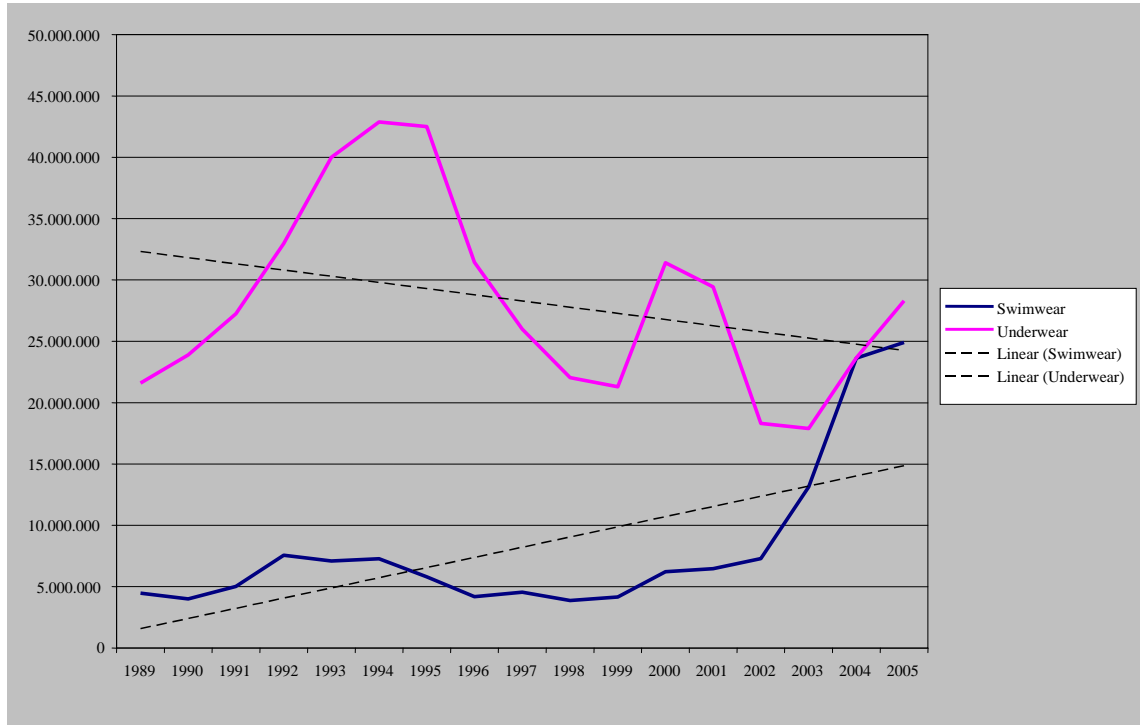
4. Counterfactual Analysis

Our counterfactual analysis for this case used the lingerie industry.

This industry was chosen due to the similarities with the swimwear industry: both possess the same infrastructure and processes. However, swimwear exports have increased consistently, while exports within the lingerie industry (including underwear and sleepwear products) present a declining trend.

Exports for swimwear in 1990 amounted to US\$4 million, while lingerie exports totaled \$21 million. In 2005, swimwear exports increased to \$ 24.9 million while lingerie exports totaled only \$28 million, presenting huge variations along this period (see Graph 9).

Graph 9
Swimwear and Lingerie Exports (1989 – 2005)



Source: ALICE System/SECEX

Also, despite the fact that the lingerie global market is 40 to 50 times larger than the beachwear market, the total value of Brazilian exports for both product categories is very close at this point.

This happened despite the following facts:

- The lingerie industry in Brazil has a much longer tradition than the beachwear industry;
- Firms in the lingerie industry are larger, older, and much more structured than those in the beachwear industry.
- Many firms in the lingerie industry were traditional exporters since the 1970s (e.g. De Millus, Du Loren, Valisere).
- Presently, larger exporters of swimwear in Brazil (private label) are also exporters of lingerie.
- The lingerie industry benefited from spillovers due to the presence of multinational firms in the Brazilian lingerie industry, such as Triumph.
- Firms in the lingerie industry had much better access to export financing because of their size and of being long-established business.

- Similar raw materials are used to manufacture beachwear and underwear products.
- The characteristics of the labor force in the two industries are the same.
- Production processes are similar for the two industries.

Exports of swimwear products have benefited from the “Made in Brazil” effect, but the same image has not been associated to lingerie products exported, which remained undifferentiated from other countries’ exports. Interestingly enough, one of the leading company’s in the lingerie fashion industry in the world is the American firm Victoria’s Secret. This company helped in recent years the “Made in Brazil” effect in beachwear, by selling in its catalogs Brazilian designer bikinis under their own brand name, featuring Brazilian models in Brazilian beaches. It is believed by industry experts that Victoria’s Secret management feels that the Brazilian image has synergy with Victoria’s Secret brand positioning, which is associated to an image of comfort with a touch of sensuality. Yet the company does not promote lingerie products under the Made in Brazil label. This is a clear indication that the Made in Brazil effect in beachwear was not extended to the lingerie industry.

Summarizing, beachwear exporters benefited from the creation of a differentiated image for its products, which permitted them to escape direct price competition from other low-cost producers from emerging countries, while lingerie manufacturers have not been able to achieve the same result, being forced to compete on price.

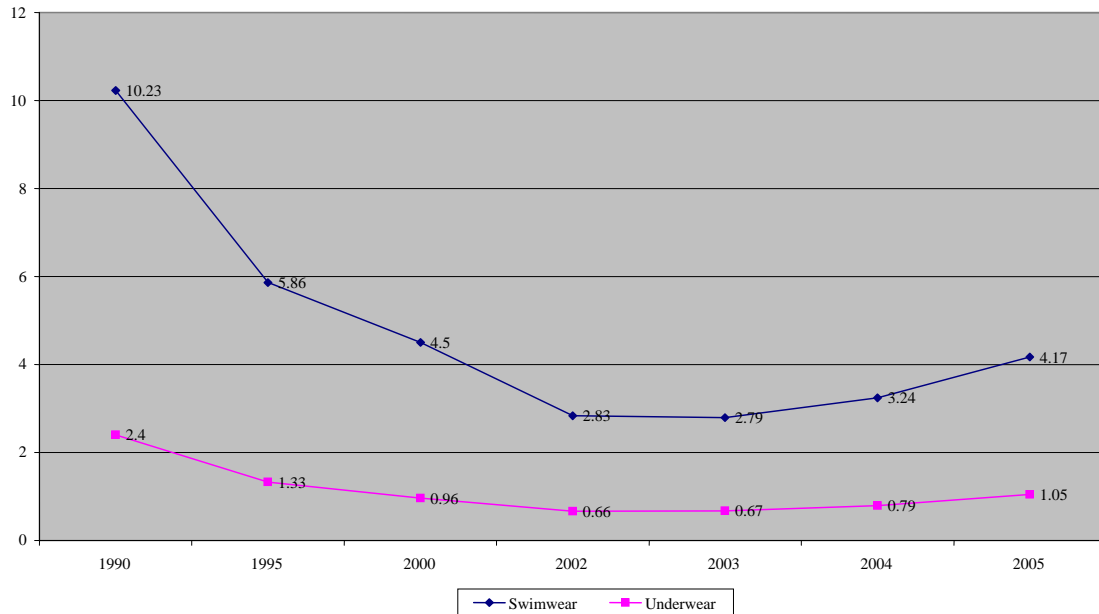
A competitive explanation for this difference in export growth was suggested by Valisere’s CEO, who indicated that China focused more on lingerie because international markets for lingerie products are larger than those for swimwear. Probably for the same reasons, the lingerie market was also targeted by other emerging countries, such as Sri Lanka and India. Thus, according to him, beachwear would have been less impacted by price competition from other emerging countries.

This is not supported, however, by the interviews with the larger private label exporters of beachwear, including Rosset (the owner of Valisere), TDB, and Águia. Interviews with managers from the beachwear product line suggest that they are facing Chinese competition, but that the Made in Brazil label consists to some extent in a “protection” against price competition.

It is not supported either by other evidence collected in this research (see Graph 9). According to the data available, the average international price fell faster for swimwear than for underwear since the 1990s, although both show a recovery after 2003 (Graph 10).

Despite this recovery, both industries ended with an average international price that was less than half the original price in 1990. This strong reduction in average prices is undoubtedly the result of price competition from emerging countries, especially India and China. This evidence thus suggests that price competition impacted both industries in a similar manner.

Graph 10
Average Price of the Finished Product Placed Factory
(US\$/piece)



5. Synthesis of the Discovery and Diffusion Process in the Brazilian Swimwear Industry

The discoveries and the diffusion process of exporting in the Brazilian swimwear industry is quite complex, with a number of different actors intervening at different points in time. Also, the impact of each actor is limited, without any clear flagship firm leading the industry, or its segments, for a long period of time

Table 18 presents the Time Line for the Swimwear Industry, using data collected in interviews, company sites, and other secondary data. Again, specific years had to be in many cases guessed based on different sources.

Table 18
Time Line for the Diffusion and Adoption of Exports as an Innovation by Brazilian Swimwear Manufacturers

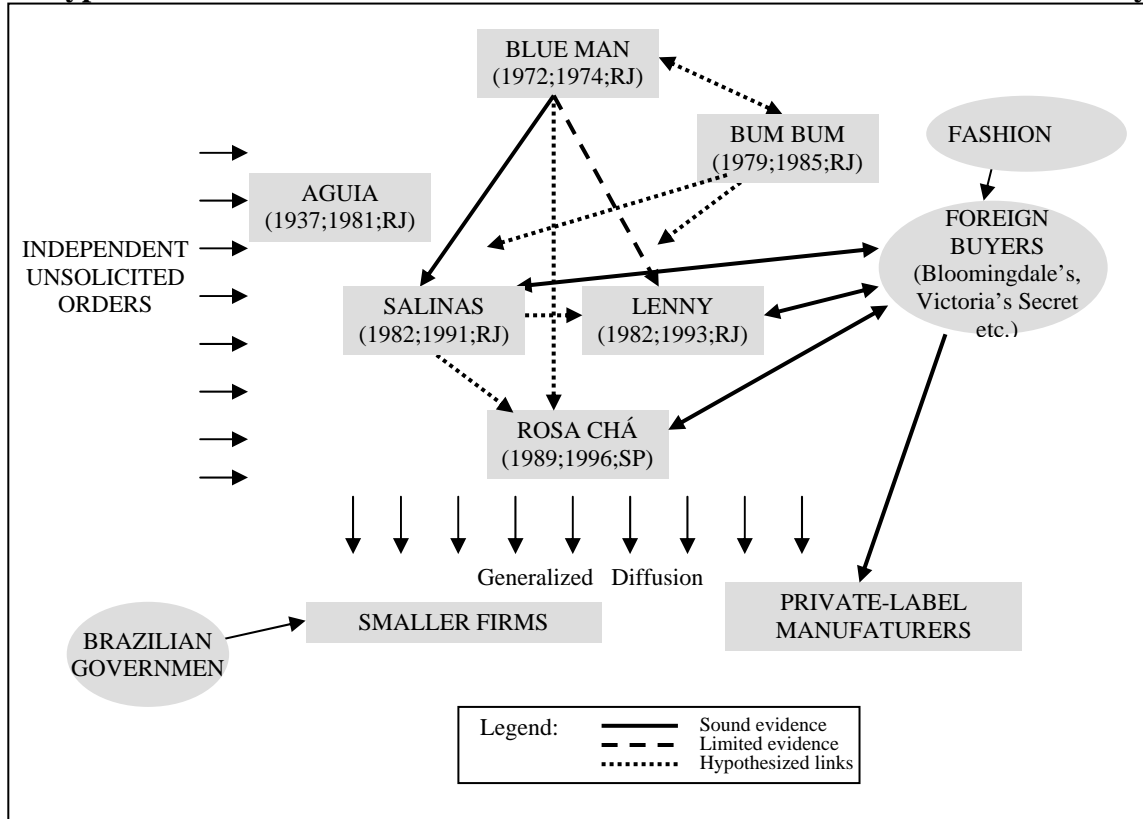
Year	Firm Facts	Industry Events
1968		First fashion fair in Brazil
1969		
1970		ABIT – the Brazilian Textile and Apparel Industry Association is established
1971	David Azulay launches his jeans bikinis	
1972	Blue Man starts operations in Rio de Janeiro.	
1973		
1974	Blue Man’s bikini is featured in a UK publication. David Azulay visits U.S and Europe to sell Blue Man’s products. Blue Man starts export activities.	Bikini introduction phase. Initial export activities – sporadic.
1975		
1976	Blue Man receives Brazilian export award.	
1977		
1978		
1979	Bumbum is created and opens the first store totally dedicated to bikinis in Rio de Janeiro.	
1980		
1981	Águia starts export activities.	
1982	Salinas starts operations in Rio de Janeiro. Lenny starts operations in a small office in Rio de Janeiro.	New entrants in the industry.
1983	Blue Man opens its first store in Rio de Janeiro.	
1984		Domestic market development.
1985	Salinas opens first store in Rio de Janeiro. Lenny moves to a plant in Rio de Janeiro. Bumbum opens a store in Ibiza, Spain.	
1986		
1987		
1988	Bumbum opens a store in Los Angeles, California.	
1989	Rosa Chá starts operations in São Paulo. Bumbum closes the store in Ibiza.	
1990	Blue Man opens a store in Miami, Florida. Cia Marítima is created.	Increased competition.
1991	Salinas starts export activities. Cia Marítima starts export activities.	Cost reduction and price cuts.
1992		
1993	Foundation of Lenny. Lenny opens first store in Rio de Janeiro. Lenny starts export activities. Rosa Chá opens its first store in São Paulo.	Modernization of the industry. Heavy imports of machinery.
1994		
1995	Lenny wins Brazilian export award.	
1996	Blue Man closes store in Miami. Salinas organizes for exporting. Rosa Chá starts export activities.	First Morumbi Fashion Week Creation of the Brazilian Fashion Calendar

Year	Firm Facts	Industry Events
1997	Salinas bikini featured in Sports Illustrated. Rosa Chá enters the U.S. market.	Appreciation of the Brazilian currency
1998	Salinas opens commercial office in the U.S. Lenny has problems with payment defaults. Foundation of Vix to serve the U.S. market.	
1999		1999 Devaluation
2000	Blue Man celebrates contract with Universal Gear. Salinas' U.S. office coordinates sales to Europe. Lenny starts partnership with Vix . Rosa Chá participates in the New York Fashion Week. Rosset starts private label exports.	Export boom starts. São Paulo Fashion Week dedicates a whole day to beachwear.
2001	Lenny celebrates contract with Victoria's Secret. Lenny receives Quality Brazil Award – Exporter's service. TDB starts private label exports.	2001 – Creation of the Fashion Forum in Rio.
2002	Rosa Chá enters the European market. Rosa Chá opens first store in Portugal.	Rise of private label manufacturers
2003	Lenny establishes distributor in Europe. Lenny opens seasonal store in Portugal. Rosa Chá opens first store in the U.S.	2002 – First Rio Fashion Week
2004	Rosa Chá celebrates contract with Speedo.	2003 – Foundation of ABEST (the Brazilian Association of Fashion Designers)
2005	Salinas opens store in La Jolla, San Diego, California. Rosa Chá has first fashion show in Paris. Rosa Chá launches the Naomi Campbell product line.	
2006	Salinas' store in San Diego is closed.	

The following analysis tries to link together the evidence collected during the interviewing process and from secondary data. It is to some extent speculative, since we were only able to obtain indirect clues of certain links between facts. Figure 4 tries to link the various players in the diffusion process of exporting as an innovation in the Brazilian swimwear industry.

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. The first number in the parenthesis under the firm's name is the year of foundation; the second number is the year when the firm started exporting; the next two letters indicate the city where the firm started its operations (RJ = Rio de Janeiro; SP = São Paulo).

Figure 4
A Hypothesized Model of the Diffusion Process in the Brazilian Swimwear Industry



The first mover was Blue Man, the entrepreneurial firm founded by David Azulay. Almost after its inception, the firm received unsolicited orders. Moved by the desire to see his creations in foreign markets, he visited potential customers and started exporting. The immediate follower was Bumbum. As mentioned earlier we do not have enough evidence of Bumbum's role in the diffusion of exporting within the industry. Yet this company contributed significantly to the industry growth. It was the first one to open specialized stores, in Rio de Janeiro and Ibiza, establishing a business model that was followed by Blue Man four years later, and by other firms in the industry until now. In Figure 2 we have represented the link between these two companies by a double-sided arrow. The relationship between these companies' strategies is speculative, since there is no real evidence of such.

Other firms appeared during the 80s, whose export initiation was similar to Blue Man's initial sporadic sales abroad, using friends, relatives, flight attendants, tourists etc. This part of the export adoption process cannot be attributed to Blue Man or Bumbum, and should be seen as random events. In fact, while David Azulay claims that Blue Man influenced these new firms, managers and entrepreneurs in these firms do not recognize such influence. In fact, the only sound evidence of the influence of Blue Man comes from Salinas, whose owner worked as a model for Blue Man, and hired a professional manager from Blue Man to develop Salinas' export activities. Willingly or not, aware or not, this manager brought with her experiential learning in export activities, at least in the U.S., to where Blue Man was already exporting.

One company that seemed to have exported totally independently from others was Malharia Águia, part of the Águia Group. We were not able to determine connections between the first mover and the second mover and this company's export initiation.

We believe the diffusion process continued by the action of foreign buyers working for established retailers who came to Brazil to visit local manufacturers. These buyers were already aware of the cut, fit, and style of the Brazilian product, thanks, among other factors, to Blue Man's and Bumbum's pioneering export activities. These foreign buyers became important actors in the diffusion process.

In the 90s, a number of brand-name firms, particularly Salinas, led a process of structured international expansion, hiring professional managers and planning their export development. An early adopter of exporting, Salinas seems to have also been a role model for other firms in the industry. Cia Marítima started to export almost at the same time as Salinas. Lenny was slightly later in exporting, and it is possible that it was somewhat influenced by Salinas and Blue Man, but we did not get any evidence supporting this hypothesized link.

A later entrant in the industry, Rosa Chá started its operations in São Paulo. This suggests a new step in the diffusion process, moving from Rio de Janeiro, the capital of swimwear fashion, to São Paulo, the industrial center of the country.

At this point, diffusion became generalized and it is extremely difficult to separate reciprocal influences, if they existed. The creation of an annual calendar of fashion shows (The Brazilian Fashion Calendar) also contributed significantly to the diffusion process, attracting foreign buyers and putting them in contact with local firms. It also created a climate that permitted the exchange of experiences, cross-fertilization, and stimuli to creativity and entrepreneurship. At the same time, it increased rivalry in an industry characterized by strong individualism. In fact, articles in newspapers and fashion magazines are full of anecdotal evidence of disputes between designers. One newspaper article referred to these rivalries as the "pins war". And Lenny Niemeyer declared in an interview that the dispute between Rio and São Paulo beachwear designers was an unnecessary "bonfire of the vanities".²⁵ Information also flows among companies by means of consultants and turnover of employees, facilitating the diffusion process.

The years 2000s saw the emergence of a new type of exporter, selling to foreign buyers under private label contracts. These firms export much larger volumes than brand name exporters. 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; on the other, larger-scale producers, who are responsible for the expansion of Brazilian exports in recent years. These two groups have followed different trajectories, and it cannot be said that one had much influence on the other. We hypothesize that private-label producers were influenced by the effects of the generalized diffusion process, at the same time that they were contacted by foreign buyers who already worked with designer firms and searched for larger

²⁵ www.ego.globo.com/entretenimento/ego/entrevista... Access in October 15,2006.

volumes at similar quality and lower prices, or looked for suppliers capable of delivering larger volumes, such as Rosset and TDB.

Finally, the third strategic group, smaller firms without export experience, entered the market in the 1990s. They were influenced by the general diffusion process and benefited from the recent export boom. Government actions had a paramount influence in moving these firms to international markets, by promoting and subsidizing their international marketing activities. Other agents of diffusion have been in place. One is the media specialized in fashion events. Success stories²⁶ are spread by fashion magazines and newspapers. Leading firms in the industry believe that media coverage signaled to new entrants and very small firms the existence of international customers interested in Brazilian swimwear.

Government export promotion campaigns also contributed to the diffusion process by selling the idea that exporting is simple, and often using swimwear manufacturers as examples of success. In fact, to export swimwear in small volumes and sporadically is easy for a small manufacturer because of the small size and weight of the product. This process was made easier by the creation of a fast courier service called Exporta Fácil, which permits to export small orders of less than US\$10,000. Thus many firms could easily become passive exporters, fulfilling small unsolicited orders without having to change their structure and avoiding bureaucratic work.

6. Case Study Analysis and Conclusions

The Brazilian swimwear industry represents a small segment of the domestic and the international apparel industry, but one that attained international recognition. This case study investigated the phenomenon of the international expansion of this small segment of the apparel industry and the reasons behind its success, when compared to other segments, such as the underwear. The assumption here was that the study of this industry's evolution process might bring some light into such reasons.

Research results from this industry study suggest that the understanding of the adoption and diffusion process can be quite complex, especially in an industry where:

- Most firms, especially brand-name designers, are small and entrepreneurial. Most of them are family-type businesses managed by the founder. Exceptions to this are the leading private label exporters, which are larger diversified textile conglomerates.
- Decision-making processes in smaller entrepreneurial firms are typically unstructured and little planning is made. Decisions are often opportunistic and strategies emerge from opportunities and threats faced by each firm.
- There are very few firm or industry records; one has to rely on interviewees' memories collected during personal interviews.

²⁶ These success stories are not always real; they often refer to one single successful transaction, but they may inspire other firms.

- There is intense rivalry among firms and personal jealousies among company owners, typically designers.

6.1. The Nature of the Discovery

The “discoveries” that led to the development of the swimwear industry were:

- the change of the bikini from a commodity to a differentiated product under a recognizable brand name;
- the exporting of the Brazilian bikini as a differentiated product; and
- the creation of brand-name stores specialized in beachwear.

6.2. Was There a First Mover?

There is quite a dispute in the industry if there was in fact a first mover and, if so, who was it. The interview process pointed out to Blue Man as a first mover in the industry. This firm was responsible for the first two above-mentioned steps. The third step was the initiative of another company, Bumbum, the second mover.

Blue Man triggered the industry’s internationalization process during the 1970s and was the first Brazilian company to export and attract attention from international media. David Azulay, Blue Man’s owner, stated that other firms in the industry copied his company’s structure and export strategies. In his perspective, Blue Man was in fact the pioneer in the internationalization process of Brazilian swimwear manufacturers.

How much of an innovator was he? Azulay was the first to sell designer bikinis; until then bikinis were typically an undifferentiated product. He was also without a question the first to actively search for export opportunities. He also was – and still is – one of the leading designers in the Brazilian swimwear industry, responsible for creative collections and fashion shows.

Another important name in the early development of the Brazilian swimwear industry was Bumbum, whose owner also claims to have been the pioneer both in the domestic and in the international market. Bumbum’s main contribution to the industry was a new retailing concept: a store specialized in beachwear. This was also an innovation, since up to that time bikinis were sold in general apparel stores and fashion boutiques with a limited assortment.

An examination of historical events and dates, however, shows that Blue Man came first, both as a domestic manufacturer of brand name bikinis and as an exporter. Nevertheless, our understanding is that Bumbum did not copy Blue Man in its initial steps, either in the domestic or in the international market, although we believe that these companies influenced each other to some extent in their subsequent development. Bumbum’s impact on the industry was due mainly

to the opening of specialized stores – a revolutionary concept at the time that was copied by almost every brand-name manufacturer.

6.3. Influence of the First Mover and the Second Mover on the Diffusion Process

Both Blue Man and Bumbum's owners claim to have been role models for the rest of the industry, and there are good reasons to believe they are both right, at least partially. Yet this influence may be overestimated by them. Although Blue Man is recognized as a pioneer, its export volume remained limited, and it decided to prioritize the domestic market already in the 90s, before the export boom of the years 2000s. Bumbum was even less successful than Blue Man in its international activities. Its growth in the domestic market, and its influence on other designers appears to have been more limited.

Salinas, presently one of the most influential names in the industry, would be one of the companies directly influenced by Blue Man. In this particular case, according to various sources²⁷, a former Blue Man's export specialist was hired by Salinas, and the company adopted an export strategy similar to Blue Man's, as well as some other strategies used by Blue Man. Another indication that Salinas followed Blue Man's model is the fact that the company owner, Jacqueline de Biase, worked as a swimwear model for Blue Man for many years. Azulay himself mentioned this fact, and stated that De Biase "*learned everything from Blue Man*".

On the other side, however, Salina's owners deny any link between their strategy and Blue Man's. They claim that their strategic choices were oriented towards reducing seasonality impacts on the business, and that their learning process was based on trial-and-error. Antonio De Biase, one of Salinas' owners, suggested that "*... exports are a natural option for a company that produces swimwear since it lives from the summer and it must run after it.*" According to Salinas' export manager (formerly a Blue Man employee), Blue Man should not be considered an export role model since the company gave up its internationalization process in the mid-nineties. In addition to Salinas managers' perceptions, most other executives interviewed reported that their firm's management was not influenced by any other firm, its primary motivation to export being the desire to reduce seasonality²⁸, or the desire to take advantage of new opportunities, as foreign buyers visited their firms.

Executives from São Paulo firms tended to see a combined pioneering effect of the Rio de Janeiro original beachwear cluster, but they do not separate one firm's influence from another. Salinas is probably the most often quoted firm from Rio de Janeiro. One top executive of TDB, the second largest private label exporter, attributed the industry's export initiation to the people that carried Brazilian bikinis to sell abroad. He did not recognize one single pioneer, although he was aware of David Azulay's activities:

"David Azulay, from Blue Man, he makes bikinis since the 70s. He had a guy that worked for him who knew everything about bikinis... Azulay did a lot, he knows a lot, but alone he

²⁷ Interview with David Azulay- Blue Man, Rubim (2004) and Bianco, Borges & Carrascosa (2003).

²⁸ Sales during winter months (three months a year) are the equivalent of 20% of summer sales.

is just one drop into this ocean... He was not the only one. He and others. And he was too small at the time.”

Despite these divergent opinions, the pioneering role of Blue Man and Bumbum is recognized by industry experts and specialized media. Both companies made the initial steps to create a Brazilian bikini concept, both in the domestic and in the international market. However, their impact on others was limited to the second generation of designer beachwear firms, and many other factors were responsible for the diffusion process.

6.4. First Mover and Second Mover Characteristics

Both firms – Blue Man and Bumbum – were small entrepreneurial firms, led by the original founder. David Azulay, the owner of Blue Man, was a fashion designer, while Cidinho, the owner of Bumbum, was more of a marketer. Both firms were totally dependent on their founders.

6.5. First Mover and Second Mover Motives and External Stimuli

The motives to enter international markets were in both cases to some extent typical of entrepreneurial behavior.

Azulay entered the swimwear industry by accident, after the initial success of a bikini he had made for a girlfriend. He stated that his main motive to export was “to see the world wearing his creations”, and had nothing to do with rational business motivations. According to a fashion marketing consultant interviewed, the desire to go international is a matter of ego typical of fashion designers. In the case of Blue Man, an external stimulus was the exposure to the international media, which took him to New York, London and Paris, in search of export opportunities.

Cidinho, the second mover, also followed his impulses. He opened a store in Ibiza mainly because “it was the right place” for him. He himself claimed that he decided to open another store in Los Angeles for “unreasonable” reasons, without any concern for profitability at the time.

6.6. Difficulties Faced by the First Mover and the Second Mover

Blue Man’s initial efforts to export were not very successful although he got a few initial orders, and made a number of contacts that proved to be fruitful in the future. His difficulties could have been reduced if the company had had any previous planning of its international activities.

As to Bumbum’s difficulties, they were associated to the nature of an entrepreneurial firm, which had no administrative structure, and basically depended on the owner both for decision-making and for implementation.

6.7. Impact of Diffusion on the First Mover and the Second Mover

Neither Blue Man or Bumbum benefited from being the first and the second mover respectively. Why didn't these firms benefit from their pioneering activities?

The reason again is clear and the same for both companies. These entrepreneurs were not interested in developing a professional firm, but they searched for personal experiences. There was an identification between these companies and their owners, to the extent that the firm served the owners' desires and interests.

David Azulay turned his focus back to the domestic market when he realized Blue Man had lost the lead in the Brazilian market to competitors, due to what he called his "vanity". And Cidinho lost interest in Bumbum, totally leaving it during a period of almost ten years, while he was dedicated to other businesses. Without the owner's support, and without a professional administrative team with the resources and autonomy to manage the firm, Bumbum lost its initial growth impetus.

As a result neither of these two firms had a large share of the industry exports in the following years, remaining as passive exporters. For both of them the international market became unimportant.

6.8. Characteristics of Later Entrants in Exporting

We cannot use the term "imitating firms" to describe the companies that entered the export activity at a later point in time. In fact, as previously discussed, the only firm that seemed to have received a direct influence from Blue Man was Salinas, and even this firm does not recognize such influence as relevant. In fact, it is possible that Salinas itself, together with Lenny and Rosa Chá, had more influence over other firms than Blue Man and Bumbum themselves. To some extent, it could be said that these later entrants received some of the influence of the first and the second mover, but translated these experiences into their own strategy in ways that were more creative than simple imitation.

This second generation of brand-name manufacturers – Salinas, Lenny, Rosa Chá, etc. – was also entrepreneurial, but these firms' administrative processes were better structured. Quite early in their development they hired professional managers to conduct the administrative aspects of the business. Also, at least in two cases – Salinas and Rosa Chá – there was formal export planning before entering international markets.

6.9. Strategies Followed by Later Entrants

We have developed in section 2 a more detailed analysis of the strategic behavior of later entrants in exporting. There are four strategic groups in the industry, three of which are involved with export activities. Each strategic group follows different export strategies.

Private label exporters presently have the largest export volume. The two most important firms in this category are part of larger textile conglomerates that also manufacture fabrics for the swimwear industry and integrated vertically to take advantage of its own production and expand the final market for it. These firms entered exporting mostly in response to opportunities coming from foreign demand after the 1999 devaluation. They were not directly influenced by the first and the second mover, but they benefited from the international awareness of Brazilian swimwear. They are threatened by Chinese competition, although the Made in Brazil label gives them a certain protection.

Brand-name manufacturers were the ones that suffered most the influence of the first and the second mover. They tend to sell under their own brand-name and export small volumes to the high-end market. In general, only a small amount of their production is exported. Because of differentiation, they are less vulnerable to Chinese competition.

Small firms export in joint cooperative marketing groups under the auspices of the Brazilian government. These firms are the most vulnerable to Chinese competition, since their quality is low and they compete on price.

6.10. External Events Influencing Discoveries and Diffusion

The three discoveries did not seem to be much influenced by external events. Yet the diffusion process was strongly influenced by one major externality: the “Made in Brazil” effect.

How was this “Made in” image created? All the interviewees recognized the existence of this effect on their companies’ exports, with the exception of the first and the second mover, who were not seriously involved with exporting activities at the time this effect was underway.

A number of factors seemed to explain how bikinis, and swimwear, became associated to the country image:

- the natural association between Brazil and its beautiful tropical beaches, specially those in Rio de Janeiro, first Copacabana and later Ipanema;
- early events such as the presence of the French actress Brigitte Bardot in Buzios in the 60s and the song *Girl of Ipanema*;
- the actions of the first mover, Blue Man, and the second mover, Bumbum, and their exposure to the international media;
- creation of Brazilian fashion shows and their broadcasting by cable TV;
- further media exposure of the second-generation brand names;
- the ascent of Brazilian top models, especially Gisele Bündchen;

- the use of Brazil as the environment for swimwear catalogs by the American firm Victoria's Secret in its catalogs;
- the use of Brazil's name by Italian and French firms in their labels and events associated to swimwear.

The “Made in Brazil” effect seems to have influenced more bikinis than other kind of swimwear, but the latter also benefited from this influence. For example, the exportation of man's swimming suits also increased, and they are also featured in foreign retailers' catalogs in association with Brazil. Yet the made in effect did not seem to impact related products, such as underwear (see counterfactual analysis in section 4).

6.11. Coordination Issues and Spillovers

One characteristic of the swimwear industry is the absence of one or more flagship firms leading the industry, as identified in the previous case. No firm was recognized as the industry leader in any moment in time, although various players in the industry influenced others in various moments. Even when considering the Rio de Janeiro and the São Paulo clusters, no leaders can be identified.

A major element in the coordination of industry activities was the Brazilian Fashion Calendar, and, specifically, the Rio de Janeiro and the São Paulo Fashion Shows. In the opinion of a fashion marketing consultant interviewed for this research project, however, unfortunately these shows have “owners”²⁹, and although these two people have played a relevant role in the development of the fashion industry in Brazil, in other countries it is usually a non profit agency or the government that are in charge of organizing these events. The “personalization” of these events generates unnecessary disputes, with designers claiming they have been unfairly excluded from the show.

Positive spillovers came again as a result of the action of foreign buyers, that brought models, designs, fabrics, etc. An outstanding testimony was given by Rosset's managers, the leading private label exporter, who claimed that the company learned a lot from selling to international retailers, thus increasing its productivity and quality. 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. Positive spillovers to other manufacturers also come from the improved quality of beachwear fabrics produced by companies such as Rosset and TDB, which are sold to the rest of the industry.

6.12. Role of Private and Public Support Institutions

²⁹ Paulo Borges and Eloisa Simão are the promoters and organizers of the São Paulo Fashion Week and the Rio Fashion Week respectively.

Government actions were not associated to the development of the industry exports, although smaller firms that were late entrants benefited from them.

An alert should be given when considering the Brazilian government role in the diffusion process. Designer exporters have complained that the present characteristics of government export promotion programs for the swimwear industry are prejudicial to the industry. While brand-name exporters lack sufficient government support, it is much more generously given to firms that do lack the minimum requirements to compete internationally, firms that otherwise would not be able to export. These companies sell low-quality products which are unauthorized copies of well-known brands, damaging the country's image. This heterogeneity among firms in the Brazilian swimwear industry is said to be behind its international fame of creative design but uneven quality and lack of compliance with delivery schedules.

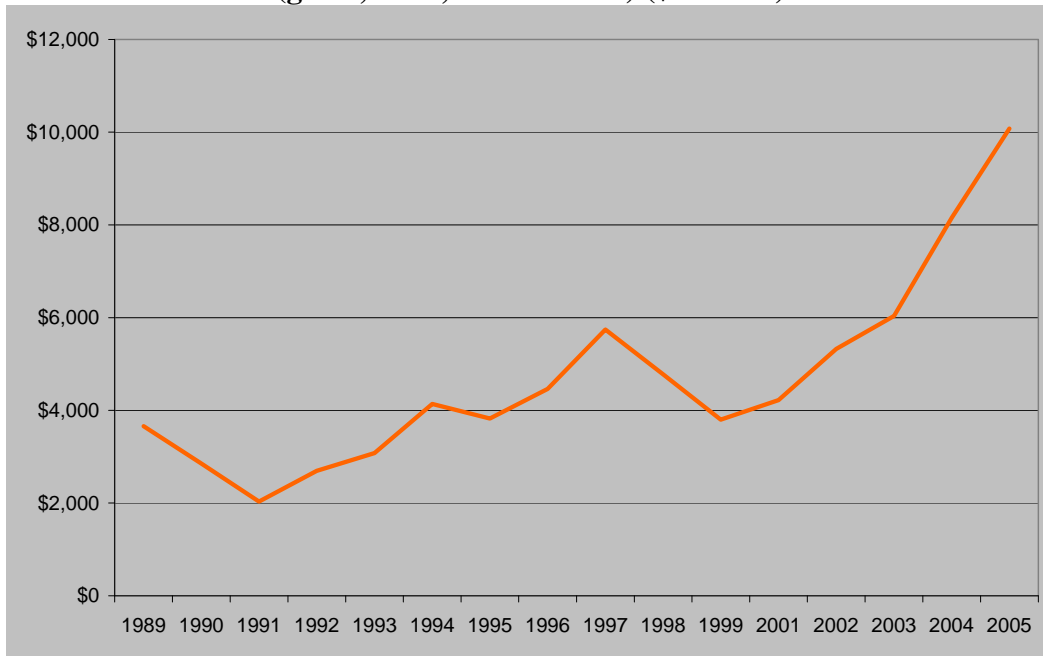
The Brazilian swimwear industry emerged and grew substantially during the last 17 years, but it cannot be listed yet as a true export success. It is rather in its initial development path to conquer international markets. The international presence of Brazilian firms is still fragile, and part of its recent growth is a result of the devaluation of the Brazilian currency. Government export promotion seems to be causing unexpected negative effects that need to be controlled. Threats in the near future are the appreciation of the real and the growing competition from Chinese firms.

CASE 3 – SOYBEANS IN THE SAVANNAHS

1. General Description

Soybean is one of the most illustrative example of Brazil's competitiveness in agribusiness, and the best example of EMBRAPA's technological success. Brazil ranks second in terms of soybean production, and it is the world's largest soy exporter, with over US\$10 billion in soybean exports in 2005 (Graph 11). Soybeans are the second export product of the country, with 10.4% of total Brazilian exports. Between 1994 and 2004, soybean exports doubled. Of total soybeans exports in 2004, grain corresponded to 54%, bran and flour 33%, and oil 13%. Around 60% of Brazilian production is exported. Part of this performance is due to the agricultural technology developed by EMBRAPA, an institution that promoted a dramatic expansion in the Brazilian agricultural sector and generated an enormous increase in agricultural productivity. Other factors such as public support, international demand, and trade policies have also influenced the sector's development.

Graph 11
Brazilian Exports of Soybean Products
(grain, bran, flour and oil) (\$ million)



Source: ALICE System/SECEX

To illustrate the role played by EMBRAPA in the Brazilian agricultural sector, crop yields rose by 65% between 1988 and 2003, from 1,693 kilos to 2,800 kilos per hectare, while in the USA, the world's largest soybean producer, productivity has increased by only 6.5% in the last ten years. Such gains in productivity coupled with an increase in the planted area enabled the Brazilian soybean production to grow by an average of 20.7 millions of tons per year. The Brazilian soybean producers rely on technology improvements, which are the main competitive advantage of the Brazilian agriculture, while producers in other countries are dependent on production and marketing subsidies to stay in the market (Jank and Nassar, 2005).

Examples of technologies that have been applied to soybean production and that have been developed by EMBRAPA in its 33 years of existence include the development of 200 different types of soybeans, the inoculation of nitrogen-fixing bacteria before sowing, which serves as a substitute for the use of nitrogen fertilizers, and the development of fungus resistant varieties. Together, these technologies represent savings of about US\$1.8 billion a year.³⁰

³⁰ Portal Exame (www.exame.com.br)

2. The Discovery and the Diffusion Process: Historical Overview

The process of discovery and diffusion of soybeans as an exporting crop was led by the Brazilian government, which developed and implemented a whole set of policies and actions to promote its development.

In the 1970s the Brazilian government decided to expand the agricultural frontier to make the country self-sufficient in food products. The government viewed the expansion of the agricultural output as a necessity for the supply of inputs to exporting industries and for the food consumption needs of the increasing urban population (Bertrand et al., 1987). The purpose was to develop the Brazilian *cerrado* region (savannahs), mostly located in tropical areas, which covers a considerable part of the country's territory, and which up to that point was not used for commercial agriculture purposes. The savannahs had low fertility soils and were located in regions with irregular rainfall.

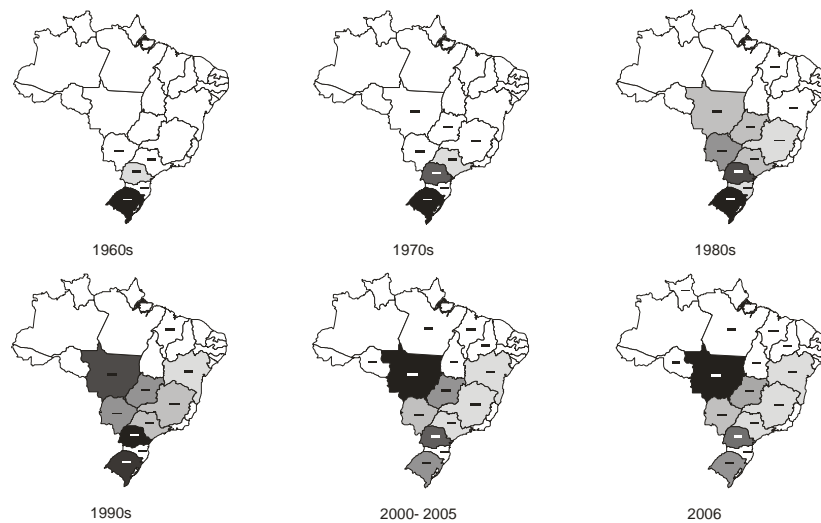
The decision to develop the savannahs was based on two other reasons. First, a window of opportunity in the foreign market opened in 1968, when a huge crop failure drastically raised the prices of almost all international trade commodities. This price increase turned the Brazilian production in the savannahs profitable despite its low productivity. Second, the development of the Brazilian agriculture was considered strategic, and several government officials wanted to invest funds in national agricultural public research. Such vision turned into more concrete actions during President Geisel's government (1974-1978), which put into office Alyson Paolinelli as the Ministry of Agriculture, a former Secretary of Agriculture of the Minas Gerais State. Paolinelli had previous experience with programs that tried to exploit the economic potential of the Brazilian savannahs. He was one of the main supporters of EMBRAPA and worked for the investment of huge amounts of resources in human capital development. During his mandate, more than 1,500 researchers enrolled in post-graduated programs abroad.

Soybean was considered a strategic crop that deserved investments as a result of the increasing international demand for this product. At that time, foreign markets had been avid for a new protein source to substitute fish flour, and soybean was already cultivated in the South of Brazil, a temperate climate region. However, little land was available for the expansion of production in the South. Farmable land could only be found in the Mid-West, a region covered by savannahs, which was not considered suitable for agricultural production due to the poor quality of its soil. Furthermore, soybean production was considered to be a temperate climate crop. Thus, it was necessary to overcome two challenges in order to make soybean production in the savannahs viable: to create new soybean varieties adapted to low latitudes, and to develop better conservation and handling techniques, and better fertilizing and ploughing processes to increase soil fertility.

One can distinguish two major phases in the development of soybean as a large-scale crop in Brazil. The first phase started in the mid-seventies during the military regime and was marked by heavy state intervention and support. The second phase in soybean production began in the early 90s after the economic liberalization.

The systematic expansion of the soybean sector in Brazil started in the early seventies. The development of soybean varieties suitable for the savannahs and soil correction made possible for the agricultural frontier to move towards the Mid-West. This phase is characterized by a great expansion in the cultivated area, which increased two-fold in fifteen years, from 6.9 million hectares in 1976 to 12.9 million hectares in 1989 (Conab, 2005). The agricultural frontier began to expand during the seventies from the Rio Grande do Sul State to the Paraná State – a transition climate zone between the temperate and the tropical climate – and to a lesser degree to the São Paulo State. In the eighties, soybean production spread to Minas Gerais, Mato Grosso do Sul, and Goiás states, but the Southern states (Rio Grande do Sul and Paraná) remained the main soybean producers (Figure 5). The development of agricultural technology was the first step in the exploration of the savannah region, which also rested on several other public policies that aimed at attracting entrepreneurs.

Figure 5
Soybean Geographical Distribution in Brazil



Source: CONAB/Dall’Agnol/EMBRAPA Soja

2.1. The First Movers

There is no single individual or company that can be selected as the first mover in the soybean sector. Yet, it is possible to identify the type of rural grower that initiated the migration process that shaped the movement to the *cerrado*.

The production of Brazilian soy during the 1960s and 1970s was concentrated in the north of the Rio Grande do Sul state, where the productive organization was the small family-owned farm (with a maximum of 50 hectares). The growth of family farms demanded the fiscal expansion of the properties and therefore land in Rio Grande do Sul became scarce. This led to the expansion towards other states. The first growers that left Rio Grande do Sul migrated towards Santa Catarina and Paraná. However, the land available was not enough to serve all needs. Starting in the 1960s, producers from Rio Grande do Sul began to occupy the South of the Mato Grosso do Sul state. This area was known as the Dourados region. It was located at similar latitude, and was appropriate for soybean cultivation. In the *cerrado*, growers were able to buy for the same amount of money plots of land twenty times larger than in their home state (D'Carli, 2005).

This movement was intensified in 1973 with the explosion of the soybean price in the Chicago stock exchange, when the price of a ton of beans increased 150% in less than three months. A researcher from EMBRAPA, Amélio Dall'agnol, made the following remarks concerning the 1973 commodity prices:

“There was a great frustration concerning fish flour in Peru, the main protein source to feed animals up to that time. When the available volume of fish flour decreased, the demand for soybeans exploded. At that time soybean production was one fifth of what it is today. When this demand suddenly increased to 12 million tons of soy flour... one can understand why the price increased.”

Price increases led to more demand for land in the *cerrado* region. It also led to investments of larger producers from Rio Grande do Sul. The larger producers from the Southern part of the country owned land that had approximately 500 to 1,000 hectares. The group of settlers that moved to the *cerrado* region was formed by large and small farmers, but it was a very selective group. Both small and large farmers possessed a large degree of efficiency with their crops, and could only be differentiated by the amounts of money they had available for investment. Larger producers had achieved larger profits after the increase of soybean prices in the early 1970s. The new producers from the South already had experience with soybean production, and knew how to handle both the machinery and the inputs, and had no adoption barriers to the new growing techniques (Macedo, 1998).

Original producers from the South of Brazil (the “*gaúchos*”) also had previous experience and knowledge of channels of distribution for the product. Soybeans had always been sold in foreign markets using international trading companies, cooperatives, and national processors. During the 1970s, a large part of the soy exported from Brazil was commercialized by cooperatives.

At the same time these events were taking place, international trading companies increased their participation, and today they are the main soy marketers in the country. In addition, large national processing firms, such as the Maggi Group and Caramuru, started to sell their output, and to resale the production of smaller farmers in the region.

2.2. The Immediate Followers

The idea of moving production to the *cerrado* region was diffused through local family networks. Success stories of rural producers that left the South in search for more land inspired families and friends of those who had already gone. These people followed the footsteps of the pioneers and established farms in the *cerrado*. The following extracts from an interview with a researcher from EMBRAPA illustrate this trend:

“As a member of a family of Rio Grande do Sul moved to the cerrado and did well, the whole family would follow. This was a normal process, I know this because I am from a small community in Rio Grande do Sul, and I know that the fever started in the Eastern part of Paraná. It was the first fever, everyone would go and buy land because one person would go and confirm that the land was good. They would say that the terrain was flatter and that the land was fertile. This soon attracted one after the other. From a community of 100 families, 50 would go to the same place. This is what happened.”

The migratory process that began during the 1960s and 1970s by agricultural producers from the South towards the *cerrado* in search of cheap land continued throughout the 1980s.

When a rural producer arrived to the lower latitudes of the *cerrado*, he/she encountered two main problems: first, poor soil without nutrients, and second, the lack of soybean varieties adapted to the latitude of the region. Growers did not have any information that would let them know if soybean cultivation would go well in that specific region. In fact, in the very beginning they were not successful with their crops, since the soybean varieties that were planted flourished prematurely. This led to the cultivation of rice, due to its resistance to weak soils with low levels of fertility.

After one or two harvests of rice, growers started to gravitate towards soybeans, putting pressure on research institutions for help in developing varieties that would adapt to the region’s environment as well techniques to improve the soil. The research institutions that were sought after included the Research Department of the Ministry of Agriculture, national companies of agricultural research, and later EMBRAPA. EMBRAPA’s creation in 1973 was useful in bringing together research material that was already available in other public research institutions and universities. Its creation also proved to be valuable in showing growers that production was possible with what was already available.

2.3. The Diffusion Process

Despite initial challenges, soybean producers persisted. Large soybean production remained restricted to four countries: U.S., Brazil, Argentina, and China, even though only the first three were exporters. These factors encouraged Brazilian producers to bet on soybean production. It was always cultivated with the goal of exporting the product. Amélio Dall’agnol, an EMBRAPA researcher, explained:

“Ever since soybeans appeared in Brazil, it has been a product that has been easily sold. There are no market problems, it does not depend on the domestic market, it is

completely influenced by the international market and it is marketed in dollars. There isn't another product sold internationally in the way soybeans are.”³¹

By the end of the first phase, soybean production had succeeded in reaching maturity in Brazil. Soybean production increased ten times between 1970 and 1980. By the 1980s Brazil had already become the world's second largest soybean producer, and had a market share of 18.7%, much larger than in 1970, when Brazilian soybean production accounted only for 3.6% of the world's production (Santos and Bacha, 2003).

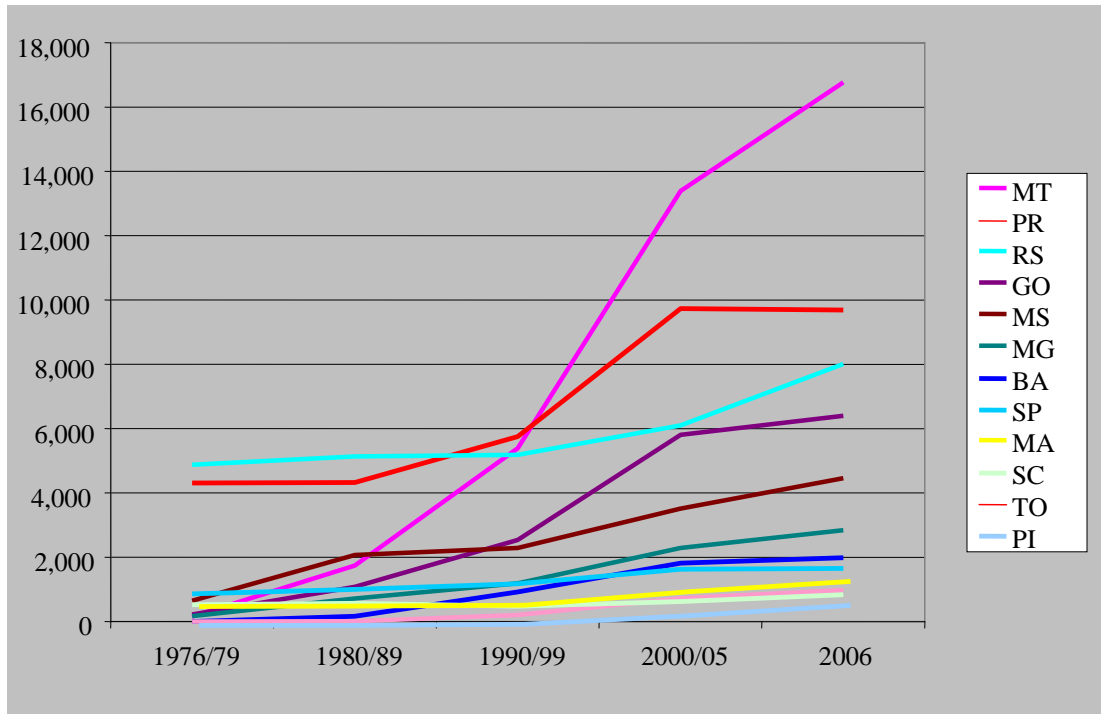
The success of the soybean production also led to several spillovers to a range of inputs and services. As a result, between 1970 and 1982, the production of vegetable oils, fertilizers, seeds, chemical products, machinery, animal food, chicken, pork, transportation and storing services rose dramatically. The increasing demand for those products led to the assembling of a strong agricultural infrastructure (D'Carli, 2005).

This was the starting point in the creation of a huge industrial complex for soybean and other types of seed-crushing plants, as well as for oil extraction and bran production. The availability of large amounts of soybean and corn bran allowed the development of modern pork, bovine, chicken, and milk production, which in turn increased the profitability of the grain value chain. Several municipalities were created around the different production and processing areas of soy (D'Carli, 2005).

The second phase, starting in 1990, is characterized by a substantial increase in productivity, which rose from 1,740 kg/ha in 1989/1990 to 2,329 kg/ha in 2003/2004, the prominence of Mato Grosso as the leading soybean producer in the country (Graph 12), and a reduction in government support.

³¹ Note that the easiness with which soybeans are sold goes along with the lack of protectionist measures against grains, as well as a lack of health requirements, different from meat and dairy markets.

Graph 12
Evolution of Soybeans Production by State of Brazil (thousand tons)



Source: CONAB

The deregulation of the domestic market, foreign investment liberalization, political changes in commerce, and the creation of Mercosur in 1991 contributed to the increase of industry competitiveness. As a result, production subsidies which guaranteed minimum prices for soy disappeared and subsidized credit was drastically reduced, from more than 35 billion reais in 1980 to less than 10 billion in 1990, almost reaching zero by 1998 (Bernardes, 2005). Producers were forced to become competitive by increasing their productivity (the productivity level of the eighties did not guarantee profitability).

A reduction in government investment capacity also negatively impacted rural extension services.³² EMATER, the main public agricultural extension company, interrupted its activities in 1991. With the extinction of EMATER, smaller farmers had to use state rural extension services, whose quality varied considerably from one unit to another, and that were not able to absorb the farmers' demand due to lack of resources. The private sector started to play the government's role in rural expansion (both in extension and working capital). Farmers allocated their own personnel to keep in touch directly with EMBRAPA in order to learn new technologies being developed. Producer cooperatives were another relevant source of technology diffusion in some regions.

³² EMBRATER, the main public agricultural extension company, interrupted its activities in 1991. Other state extension institutions continued working but at drastically different levels depending on the state.

In the mid-1990s the appreciation of the Brazilian currency brought new challenges to the industry. Currency appreciation made Brazilian commodities less competitive in international markets. In addition, the tight monetary policy used to restrain inflation allowed the interest rate index to reach historical highs, thus increasing the cost of credit. This new context called for efficiency gains. In order to become more competitive, farmers started investing in machinery and industrial equipment. The incorporation of technology became a continuous process. As a result, there were substantial gains in productivity, and productivity gains became the major driver of increases in soybean production.

During this new phase, the state of Mato Grosso turned into the main producer of soy in Brazil. This was due to its natural advantages including: perfect climate for summer crops, low prices of land, and good quality soil, which favored the mechanization of production. Mato Grosso's success as a soy producing state triggered the development of other sectors, such as agricultural machinery and animal production. This process generated an agglutinating effect. Poultry and beef industries, and large soy processing and crushing industries migrated towards the region in order to reduce transportation costs. These trends started during the eighties and increased during the nineties and the first years of the present decade.³³

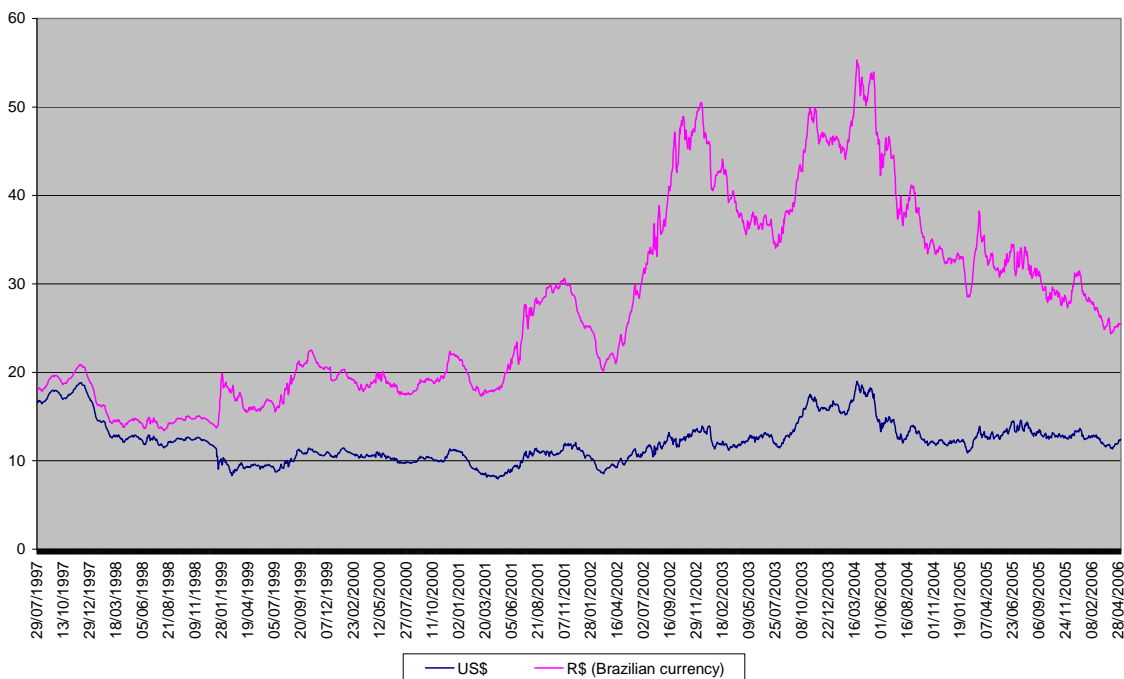
Many companies developed, especially after 1995. Four soybean processing multinationals (Bunge, Dreyfus, ADM, and Cargill) purchased 12 Brazilian firms and increased their crushing capacity to 43% of the total industry capacity in 1997, compared to the 31% in 1995 (Jank et al, 2001). These multinationals took over the role of financing production. The importance of the sale of soy futures promoted by these crushing companies can be seen in the situation of the Mato Grosso state: in 2005, they financed 70% of its soy production. This took place even with these crushing companies charging higher interest rates than Banco do Brasil, because they had fewer requirements for larger loans.³⁴

By the end of the nineties, other important actions implemented benefited the sector. First, in 1997 the government eliminated export taxes on commodities, cutting costs by 10-20%. Second, there was an increase in the soybean world price in 1996/1997. Finally, in 1999, the Real devaluation took place. The devaluations between 1999 and 2002 strongly increased the competitiveness of Brazilian soybean in foreign markets. Graph 13 illustrates the increases in the international soybean price between 1997 and the end of 2003. It also shows the large price gains in reais that the two devaluations brought to Brazilian growers. With high world prices and the weakest domestic currency in the history of the Real, these years were called the Golden Age of the Brazilian Soybean.

³³ Despite the fact that soybeans production in Brazil is mainly oriented towards exporting, the growth of industries based on meat and the high internal consumption of soy oil for cooking gave the domestic market also a large share of domestic production (30% according to Dall'agnol).

³⁴ Banco do Brasil is the largest bank in the country and is the responsible for the financing of the poultry sector. The crushing industries granted loans with 15% and 17% interest rates a year, while Banco do Brasil charged between 8,75% and 13%. (Bernardes, 2005).

Graph 13
Daily Value in Reais and Dollars of the Sac of Soybeans in the Paraná Port



Source: CEPEA / ESALQ

During the 1990s, with the relative increase in land prices in the *cerrado* of the Central region of Brazil, new areas of the *cerrado* in the Northeast started to be occupied by soybean plantations. This was especially true in the states of Bahia, Maranhão, and Piauí. The growers that explored these new cultivation areas were initially the same *gaúchos*, or the generations that followed the pioneers. The *cerrados* are the last agricultural frontier in the world.

Since 2002, Brazil became the leading world exporter of soybeans, with 31% of global exports. Argentina, the United States, and Brazil have around 90% of global exports. This recent performance of Brazilian exports of soybeans was also the result of various factors, such as climatic problems that affected U.S. crops, and the expansion of Chinese protein consumption.³⁵ Future challenges are the appreciation of the Brazilian currency and commercial barriers in developed countries, specially to value-added products. Also, the country urgently needs investments in infrastructure, mainly in transportation systems (roads, railways, ports), in order to remain competitive.

³⁵ *Anuário Análise Comércio Exterior 2005-2006*. São Paulo, Análise Editorial, 2006, p.183.

3. Role of Support Institutions

3.1. The Brazilian Government

Contrary to the two manufacturing cases earlier examined in this report, the Brazilian government played a very important role in the “discovery” and diffusion of soybeans production and exports. A large amount of resources was allocated to the development of soybeans agriculture and exportation. Two specific agencies related to the federal government had a very important role in this process: EMBRAPA and EMATER

EMBRAPA is the Brazilian federal agency for agricultural research, under the Ministry of Agriculture. It was created in 1973 and has presently 37 research centers with 8,600 employees, of which 2,220 are researchers, 53% with PhD degrees. Its present budget is around 1 billion reais.

In 1975, EMBRAPA – SOJA (a division inside EMBRAPA dedicated to soybean) was created with the mission to “tropicalize” soybean. Similarly, in 1975 EMBRAPA – CERRADO (a division inside EMBRAPA dedicated to the savannahs development) was created to develop better soil handling techniques to make commercial agriculture viable in the savannah region. Other EMBRAPA units joined efforts, such as EMBRAPA Agropecuária Oeste (West Agricultural EMBRAPA). In 1980, EMBRAPA – SOJA succeeded in creating the first soybean variety exclusively developed for the Brazilian savannahs soil, which supported the first phase in the soybean production expansion that lasted until the end of the 1980s. Throughout the years, other varieties that were even more fertile and adaptable were developed.

Government’s role in the development of soybeans production and exportation was not restricted to technology development and diffusion. One of the main government policies for soybean development was the creation of special and subsidized credit lines that allowed farmers to finance investment and adopt new technologies during the first phase of soybean development.³⁶ Credit was granted exclusively to farmers willing to adopt the technologies developed by EMBRAPA. These credit lines facilitated technological adoption and were supported by EMATER, the public agency responsible for rural extension.

The technology diffusion process was managed by EMATER until 1991, when the agency was closed. The research made at EMBRAPA was diffused also through extension agencies in the states. The government trained agents in a system of technological packages, which consisted of a number of technologies considered adequate for a particular agricultural producing area after careful study of available resources and characteristics of the area. It is important to highlight that the main rural producers had sufficient resources to hire their own staff and did not need to use public services for rural extension.

³⁶ Credit to buy land was not granted because land prices in the region were already very low.

In addition, the government invested in basic transportation infrastructure and set policies for price control, which affected almost all producers. Important programs to stimulate production associated to credit were launched. The first set of programs was created in 1971. This included the Mid-West Development Program (Prodoeste), which aimed at fostering the regional integration and infrastructure, and the Brazilian Savannahs Development Program (Polcentro), which aimed at modernizing the local agricultural plantations by means of rural credit (Mueller, 1990). Proagro was established in 1973, which consisted in a type of insurance for the producer, with an additional amount paid to the producer to cover agricultural defrayal costs, in cases of natural disasters, pests and sicknesses that could affect assets, herds, or harvests. Additionally, the program guaranteed coverage for resources used by the producer in defraying agricultural costs due to losses for the aforementioned reasons. Another program was formalized in 1978 – the Japan-Brazil Savannahs Development Program (Prodecet) – which planned the settlement of landless farmers in new productive areas in the Brazilian savannahs region. Programs such as Prodecet, Polcentro, and Prodoeste also provided subsidies to remove vegetation from the *cerrado*, buy fertilizers, and other financing options for the construction of silos, as well as tax benefits.

Cooperatives were another form of organization and support stimulated by the government for the development of soybean cultivation and of the savannahs area was the cooperative. Soybean cultivation in the Brazilian savannahs is largely cited as an example of the consolidation of cooperativism in the 1970s. *Gaúcho* farmers used to organize into cooperatives to buy large properties and divide them (Macedo, 1998). The Agricultural Promotional Company (CAMPO), with resources from Prodecet, organized these cooperatives, providing land, tools, and a supply contract with the Japanese government. These programs were supported by the Ministry of Agriculture and financed by the Japanese government.

During the 1990s, government support to the sector was substantially reduced. An exception was the credit program for agricultural mechanization known as Moderfrota, created in 2000. This program was managed by the National Economic and Social Development Bank (BNDES). Until the creation of the program, heavy agricultural machinery was financed by BNDES using a special credit line (Finame) created in 1996. Moderfrota brought producers more advantageous conditions: a lower than ever interest rate (between 9.75% to 12.75% a year, compared to Finame's 13.95%).

Moderfrota played a fundamental role in the modernization of Brazilian agricultural machinery with direct impact on productivity, which increased from 2.18 t/ha to 2.60 t/ha between the harvests of 2000/2001 and 2003/2004. Until 2003, the program had already permitted the renewal of around 20% of the agricultural fleet and until 2005 it had financed approximately US\$ 5.84 billion (Lopes, 2005).

4. Counterfactual Analysis

Soybean is a commodity with large international demand produced in temperate regions of the country, which received sizeable R&D investments from the government to increase crop productivity. However, soybean is not the only commodity with such characteristics. Wheat is very similar in the way it is harvested; it is also cultivated in temperate regions, has strong international demand, and received government grants for research and development. However, wheat exports do not measure up to soybeans, with irregular export levels that have reached US\$102 million in 2005. Brazil still is a net importer of wheat, having imported almost US\$764 million of the grain in 2005. Following is a brief overview of wheat production in Brazil. The major points highlighted as success factors of soy production are revisited.

Wheat is responsible for approximately 35% of the world's total grain trade.³⁷ In 2005/2006, China stood out as one of the world's leading producers of wheat, harvesting approximately 97 million tons; it was followed by the U.S. with 57 million tons and Russia with 48 million tons. The European Union produces another large portion of total world output, with 123 million tons. Within Latin America, Argentina is the region's largest producer, with 12 million tons. The main wheat exporters include the United States with 27.5 million tons, Canada and Australia, with 16.5 million tons each, followed by the European Union with 14.5 million, and Russia with another 10 million tons.³⁸

Brazilian production reached approximately 6 million tons in 2005, an insufficient volume to supply the domestic market, which demands approximately 11 million tons a year. In 2002, wheat imports totaled 6.5 million tons, at a cost of US\$ 878 million, or 1.9% of the country's total imports. Wheat remains the second largest commodity import for Brazil, right below oil. Brazil's largest wheat producing regions are in Rio Grande do Sul and in Paraná.

Domestic wheat production fluctuated during the last years. This lack of regularity in supply has generated substantial market uncertainty. Unlike soybean producers, domestic wheat producers did not create a reputation for quality and regularity, and were thus unable to competitively position their product in international markets.

The instability of wheat crops is related to production volatility. Soybean and wheat do not require specific assets and they are considered complementary crops (they do not compete with each other since they are cultivated in different seasons). Therefore, it was expected that wheat would enjoy the same success as soybeans. But wheat lost to other crops that proved to be more profitable because they adapted better to climatic and land conditions in the highlands: leguminous plants like black beans, potato crops, carrots crops, as well as other vegetables. The cultivation of leguminous plants and vegetables has increased substantially, and it demands severing a cycle of production when a type of "hay" is introduced, which is the case of wheat. Therefore, wheat production became erratic, regardless of the technological advances achieved in this area.

³⁷ *Estado de São Paulo*, June 11, 2003.

³⁸ Source: ABITRIGO.

There are four commercial types of wheat, of which one corresponds to more than half of the Brazilian production, and is used to manufacture bread. Not all four types can be produced in Brazil at this point, due to climatic and land conditions. This is the case of Durum wheat, used abroad for the production of dough. Durum wheat must be cultivated in dry regions and is very sensitive to illnesses. This type of wheat has not shown good adaptation to Brazilian environmental conditions. Even if these problems were solved, Brazil does not have industrial facilities to process Durum wheat.

4.1. Producer Profile

Soybean and wheat production were started by the same type of producer: the *gauchos* from the South of Brazil. Soybean production expanded to the Central region of the country and the tropical savannahs, while wheat production remained in the Southern region, mainly in Paraná.

Because of these distinct expansion patterns, wheat producers differ from soy producers in the size of their properties. This is due to the scarcity of land available and the high land prices in the South for the production of wheat, compared to a good number of soy producers in the Brazilian savannahs with large properties.

Agricultural producers from the South of Brazil are recognized for their good technical and educational level, being receptive to the introduction of new technologies, and for their entrepreneurial spirit. They are behind both wheat and soybeans production.

It is also important to highlight that wheat was the first crop in which technological developments were introduced to improve its commercial potential. Wheat was part of the genesis of agricultural cooperativism. Beginning in the 1950s, agricultural cooperatives were formed, with wheat as their main or only source of profits.

4.2. Role of the Brazilian Government

During the 1970s, government stimulated wheat production, moved by the desire of supplying the domestic market. The military government considered self-sufficiency in wheat a strategic goal for the country's development and for national sovereignty. Tight controls were established, with the total volume of wheat grinded registered and flour imports prohibited. Because of government intervention, wheat prices in the domestic market differed substantially from international prices.

Processing plants adopted specific measures in order to break the rules imposed by the government. The government then decided to intervene by means of Law n° 210/1967. The country was divided in eight consumption zones with wheat quotas. This led to a reduction of the number of processing plants between the years 1967 and 1990, from 420 to 178.³⁹

³⁹ *BNDES Setorial*, Rio de Janeiro, n. 18, p. 193-220.

The government also defined the types of flour to be produced, as well as the prices of wheat products. Banco do Brasil became responsible for the purchasing of domestic wheat, and a committee was created to manage international purchasing. Domestic and international wheat were purchased by the government and sold to processing plants during 23 years. These policies discouraged quality investments, since quality improvements could not be transferred to prices.

A number of concurrent actions were taken to stimulate technological advancement in the Brazilian wheat production. In 1974, CNPT, EMBRAPA's National Research Center for Wheat, was created. EMBRAPA did genetic research to adapt the crops to Brazilian environmental conditions, and developed management techniques to permit the exploration of different soils and climates.

Wheat production expanded and almost reached self-sufficiency during the period from 1986 to 1990. Prices were kept artificially high, and credit was made available. Producers were encouraged to abandon regular technologies they used and urged to adopt technology packages that were compatible with higher prices (and higher returns). Once again, the mechanism adopted isolated internal market prices from international parity. Producers responded with the expansion of crops that had guaranteed prices.

In 1990, the situation radically changed, with the end of this quota system. Prices were liberalized in 1991, leading to a restructuring of the industry and a reduction of production. The combined effect of decades of self-sufficiency programs, consumption subsidies, price controls, and government intervention in the market was an industry unprepared for competition.

It is thus possible to identify three wheat production periods in Brazil. The first two are characterized by government intervention. The first phase covers the period between 1970 and 1984, when production reached 2 million tons per year. The second phase, between 1985 and 1989, was characterized by an increase in the cultivation area and almost reaching self-sufficiency, with wheat production surpassing 6 million tons per year. The third and current period began in the 1990s, leading to a reduction in production and a restructuring of the industry.

4.3. A Comparison of the Two Products

By briefly analyzing wheat production trajectory, it is clear that both crops had a number of aspects in common:

- Both received strong government support since the early 1970s, and both were considered priorities.
- Both crops benefited from advanced research from EMBRAPA.
- Farmers involved with both types of crops had a similar profile, and both crops used skilled labor capable of adopting technical advances.

The two products differ, however, in two crucial aspects:

- The domestic market for wheat was huge and exceeded domestic production. In contrast, there was a larger supply of soybeans than the domestic market could absorb. This led to much higher levels of return from soybeans than in the case of wheat.
- Excessive government intervention in the wheat sector, which was not paralleled in the soybeans sector, made producers less competitive, discouraging investments in quality and productivity.

Table 19 compares soybeans and wheat.

Table 19
A Comparison between Soybeans and Wheat

	Soybeans	Wheat
2005/2006 Crop (tons)	53,053,000	4,873,100
2005 Exports (millions of dollars)	5,345 (4,132 of flour and oil)	102.5
2005 Imports (millions of dollars)	83.8 (38.4 of flour and oil)	763.7
Main Producing States	Paraná, Mato Grosso, Rio Grande do Sul, Goiás and São Paulo	Rio Grande do Sul and Paraná
Main Producers	US, Brazil, Argentina, China and India.	E.U., China, India, U.S., and Russia.
Main Exporters	U.S., Brazil, Argentina, Paraguay and the E.U.	U.S., EU, Canada, Australia and Russia
Average International Price (2005)	US\$235.01/ton	US\$130.67/ton
Agricultural research	Large government efforts beginning in the 1970s. After the commercial liberalization of the 1990s, larger private sector participation. EMBRAPA's role still relevant.	Large government efforts beginning in the 1970s. EMBRAPA's role still relevant.
Government Intervention	Price controls and restrictions to international trade until economic liberalization. Credit and insurance; Subsidies for the purchase of agricultural machinery.	Excessive government intervention. Credit and insurance; subsidies for the purchase of agricultural machinery.
Producers Profile	<i>Gaúchos</i> and their descendants. Receptive to the introduction of new technologies. Entrepreneurial spirit.	<i>Gaúchos</i> and their descendants. Receptive to the introduction of new technologies. Entrepreneurial spirit.

Source: ABIOVE, ABTRIGO, SECEX/MIDIC, CONAB

5. Case Study Analysis and Conclusions

This case study did not permit the identification of a first mover. It shows, however, the relevant role played by the Brazilian government in promoting the expansion of the agricultural frontier to the *cerrado* region. The case of soybeans can be seen as a government-led effort to expand Brazilian production and exportation of this crop.

5.1. *The Nature of the Discovery*

The discovery in this case was basically the use of the *cerrados* region to produce soybeans to be exported to international markets.

This “discovery” would not have been successful without government intervention, the most important of which was the role played by EMBRAPA in developing soybean varieties adapted to the *cerrados* climate and soils.

5.2. *First Movers Characteristics*

The analysis of this case did not permit the identification of one individual or company that was a first mover. Rather, a large group of individuals migrated from the South of Brazil to the *cerrados* region in search of new land.

The pioneers in the cultivation of soybeans were the *gaúchos*, inhabitants of the state of Rio Grande do Sul, that had some experience with these crops in the Southern part of Brazil, a region with adequate climate and conditions for soybean agriculture. They had a higher than average level of education, and extensive experience with farm production and equipment. Such experience and technical capabilities allowed them to experiment with soybean cultivation in other regions of the country at a time when international markets started to demand higher volumes of soybeans.

Gaúcho pioneers inspired the movement of other populations from the Southern regions of the country to the Mid-Western regions and, more recently, to the Central and Northeast regions of Brazil. The success of these adventurers spread by word-of-mouth and by personal mechanisms of network diffusion, such as friends and family.

5.3. *First Movers’ Motives and External Stimuli*

The motivations that drove the first *gaúcho* producers to the *cerrado* can be summarized in three elements: the scarcity and high cost of lands in the South, government incentives of various sorts, and international demand.

Gaúcho families proliferated and their properties could no longer absorb new family members. In fact, the continuous division of land in the South created very small properties – called

“*minifúndios*” – that were too small to be productive, or even to generate enough income to a family of average size. As a result, the high cost of land in the South was prohibitive to many young people trying to establish their own families. This encouraged farmers from the South to look for more land at cheaper prices.

Larger farmers also participated in the first phase of the development of the *cerrado* region. They bought larger pieces of land, but they were not very different in their characteristics from smaller farmers.

Structural factors provided the basis and the encouragement to develop soybean production. The growing international demand was crucial for the development of this crop in new latitudes of the Brazilian territory. The government invested heavily in this region with a strategic vision of the expansion of the agricultural frontier. Heavy investments in agricultural technology during the 1970s and the early 1980s allowed for drastic cost reductions for domestic growers, making possible the exploration of the *cerrado*. These innovations were carried out by research institutions such as EMBRAPA. They were important for the first steps of this process. Other government actions can be seen in a variety of subsidized credit lines available to Brazilian agricultural producers, offered by means of various programs.

It is also important to note that soybean production in Brazil was from the very beginning a very dynamic activity. Large private firms provided credit and channels of distribution. This was possible because of large international trading companies operating in the Brazilian market that were in charge of a large part of the international soybean commerce.

5.4. Difficulties faced by First Movers

First movers had to face the challenge of transplanting a crop that worked very well in the good soil and temperate climate of Rio Grande do Sul to the *cerrados* region, much drier and warmer, and with a soil considered up to that point of poor quality. In fact the low price of land in the *cerrados* was exactly because of these characteristics.

Two challenges had to be faced before the *cerrados* could be used for the production of soybeans:

- To create soybean varieties adapted to the *cerrados* climate;
- To develop soil management techniques that permitted to increase the productivity of the land in the *cerrados*.

In fact, first movers faced the failure of their initial soybean crops and moved to rice. Yet they remained interested in soybeans because of its extraordinary potential and they put pressure on research institutions to help solve initial problems.

5.5. Impact of Diffusion on First Movers

First movers did collect the benefits of their pioneer move to the *cerrados*. There were no histories of failure and bankrupt, although we are sure that these must have happened in one case or another. In general, however, positive word-of-mouth and the growing number of followers suggest positive outcomes for the pioneers.

5.6. Characteristics of Imitators

Imitators were not different from the original settlers in the *cerrado* region. They were also *gauchos*. In fact, they tended to come from the same regions, often from the same towns and surroundings, in such a way that family and neighborhood networks were transplanted to the new environment. According to the interviews, it was often the case where half of the population of a given area in Rio Grande do Sul would move in successive waves to a specific area of the *cerrados*, forming a new community with the same kin and neighborhood ties.

This type of migration reduced uncertainties and difficulties for the followers, since they could quickly learn from first movers. Also, first movers would be more open to transferring their experiential knowledge, since they were connected by kinship and friendship bonds to the newcomers.

5.7. Strategies Followed by Imitators

Imitators were not different from first movers, and they imitated them. There are no specific differences that were determined to exist between first movers and followers' strategies.

5.8. External Events Influencing Discoveries and Diffusion

Table 20 lists the main external events influencing the discovery and the diffusion process of soybeans in the *cerrados*.

Phases in the Cerrado Development	Externalities	Observations
Phase 1 (1970s-1989)	1968 world crops failure	Positive impact
	Growing international demand for soybeans	Positive impact
Phase 2 (1990-2006)	1973 price increase	Positive impact
	1996/97 increase in international prices	Positive impact
	Climatic problems in the U.S.	Positive impact
	Devaluation of the Brazilian currency	Positive impact
	Expansion of the Chinese economy	Positive impact
	Appreciation of the Brazilian currency	Negative impact

The growing international demand for soybeans was probably the most important externality in the early phase of soybean cultivation in the *cerrados*. Together with price increases it stimulated farmers to accept risks.

Presently, the expansion of the Chinese economy and its insatiable demand for proteins permit the sector to continue to expand, despite the negative impact of the appreciation of the Brazilian currency.

5.9. Coordination Issues and Spillovers

Coordination issues were in large part handled by informal networks, during the early phase of the settlement in the *cerrado* region. Also, the formation of cooperatives of producers helped to organize production and to access foreign markets.

Technology transfer was coordinated by EMATER, the government diffusion agency, which played a very important role in various aspects of the technology transfer process. The extinction of EMATER in 1991 was said to have made much more difficult the transfer from EMBRAPA to farmers. Yet it probably did not affect as much soybean farmers, since they were already in an advanced phase of development.

Even in the initial phase of soybeans production in the *cerrados*, there were already several positive spillovers. For example, between 1970 and 1982, there was a substantial increase in the production of various related industries such as: vegetable oils, fertilizers, seeds, chemical products, machinery, animal food, chicken, pork, transportation and storing services. In some cases these industries were suppliers to the soybean industry. In other cases, soybean products were inputs in other industries' value chain. Altogether, it permitted the creation or expansion of a large variety of new economic activities.

There were also spillovers to other non-related activities, under the form of advantages from technological advancement in various production processes, such as oil extraction from other types of seed-crushing plants; advances in fertilization technologies that could also be applied to other crops, etc.

Finally, the migration created a number of new municipalities, which required infrastructure and all kinds of support services, public and private.

5.10. Role of Private and Public Support Institutions

The role of the Brazilian government in this process cannot be underestimated. By supporting soybeans growers until the liberalization in 1991, it permitted an infant sector to grow, stimulating individual entrepreneurs to accept risks that would be otherwise difficult to deal with. Also, the end of government protection permitted the industry to become fully competitive. A more detailed review of this activities was presented in section 3.1.

The most important government action however was developed by EMBRAPA, the research agency of the Ministry of Agriculture, which has a large part of the responsibility for the success history of soybeans cultivation in the *cerrados* of Brazil.

CASE 4 - FRUITS IN THE PETROLINA-JUAZEIRO REGION

1. General Description

Brazilian fruit production boomed during the last two decades. Total fruit exports increased from \$185 million in 1989 to \$ 676.8 million in 2005⁴⁰. Grape exports have been one of the most successful cases, having increased from \$1.8 millions in 1989 to \$107.2 million in 2005.⁴¹ The region of Petrolina and Juazeiro, which is part of the San Francisco river basin, in the Northeastern states of Bahia and Pernambuco, is responsible for this export performance. Growers in Petrolina-Juazeiro produced 95% of the country's table grape exports in 2005. In the region, over 600 growers cultivated 6,000 hectares of grapes, and hundreds of other farmers produced mango, bananas, coconuts, watermelons, and other crops. These crops employ more than 29,000 workers in the region (Gomes, 2004).

The region's good climate, its state-of-the-art irrigation system, and advances in biotechnology have allowed yields in this area to be much higher than those of the Southeastern region of Brazil. These districts are blessed with a continuous supply of sun, about 3,000 hours, or 300 sunny days per year, fertile soil, and low levels of humidity (Hirsch, 2005). All these factors are beneficial to certain crops, creating an environment resistant to plagues and disease. Such favorable weather conditions enable farmers to harvest two to three times a year and to supply the European Union during marketing windows, particularly the month of November, when production worldwide is low. Brazil's strategic access to the European market during the off-season allows to get better prices for its exports.

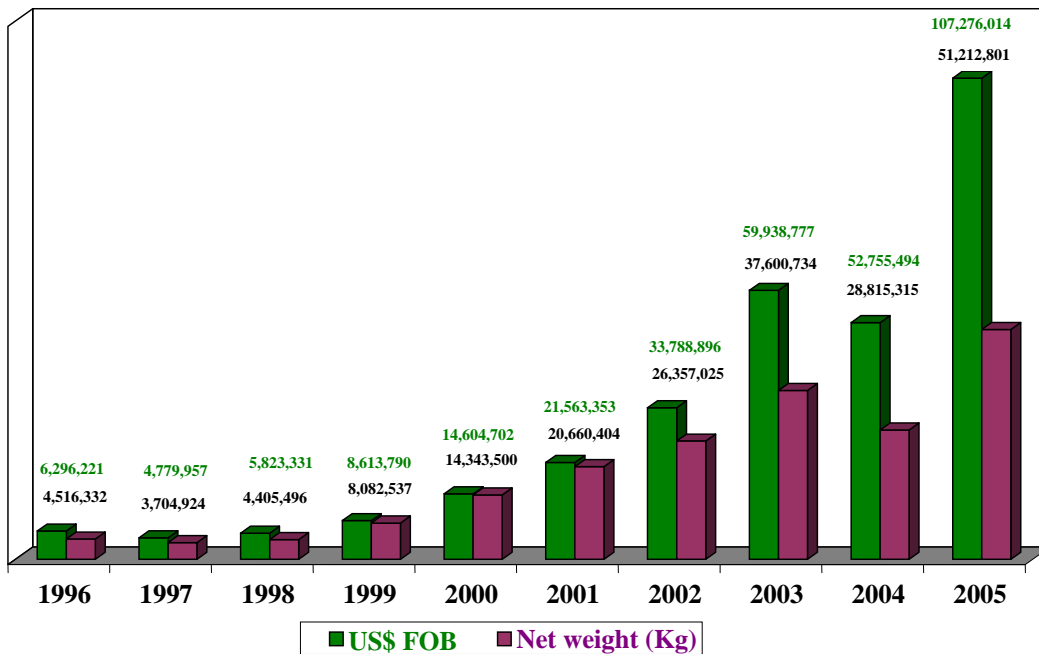
The region, described as an open-air greenhouse by *The Economist*, changed due to irrigation projects implemented during the sixties and seventies. Since the early 1990s it became one of Brazil's most successful fruit exporters. Since then, the region has been exporting high quality fresh fruit to several countries including Europe and the United States.

We have selected to analyze grape exports from the Petrolina – Juazeiro region as an additional case study related to the development of agricultural exports in Brazil. Graph 14 shows the evolution of grape exports from this region.

⁴⁰ It is estimated that the world's fresh fruit market represented over US\$20 billion in 2004.

⁴¹ ALICE System/SECEX

Graph 14
Grape Exports from Petrolina-Juazeiro (1996-2005)
(value and weight)



Source: SECEX/DATAFRUTA-IBRAF

Background

The development process in the Petrolina-Juazeiro region began in the late 1960s, when this area was no different than most rural areas in Northeast Brazil, underdeveloped, and lacking basic infrastructure. Government infrastructure investments, particularly large-scale irrigation projects (reservoirs, delivery canals, and land settlement-like irrigation schemes), triggered the region's development. CODEVASF, a federal government agency created to promote the development of the São Francisco River Basin, carried out most of these projects.

In Petrolina – Juazeiro, CODEVASF expropriated land and implemented six large projects. The expropriated land consisted of lots that contained 6 to 200 hectares, and covered a total of 38,000 hectares (Damiani, 1999). These lots were distributed to small and large farmers. CODEVASF also built irrigation infrastructure to channel water from the Sobradinho dam to each individual lot, and facilitated credit and market access to small farmers⁴² (Gomes, 2004).

The initial CODEVASF's strategy was the establishment of a tomato-processing industry during the early 1980s. Yet, this industry turned out to generate limited results and not to deliver the expected development effects.

⁴² This was especially true for tomato growers.

According to Damiani (1999), the Pernambuco state was at the time the second largest tomato producer in Brazil, and CODEVASF decided to promote the cultivation of tomatoes for industrial use. CODEVASF attracted tomato-processing industries to the region with the idea that producers in Petrolina-Juazeiro would use irrigation and thus could obtain tomatoes during the off-season when the tomato processing industry could not purchase the crops in other regions. CODEVASF thus hoped to stimulate the industrial development of the region.

However, the conditions that gave rise to the tomato boom changed dramatically during the late 1980s, and drastically reduced these crops. A series of factors led to its deterioration. First, the emergence of a new pest (named “traça”) harmed tomato crops in 1988, leading to very low yields and big losses. Farmers were forced to use expensive pesticides, thus increasing production costs, even though the processing industry had supplied technological packages to target pests since the early 1990s. Second, as a consequence of these events, the trust relationship between farmers and the processing industry deteriorated. Lastly, the federal government implemented lower tariffs for imports, which made imported tomato products more competitive than domestic ones. The presence of the tomato industry was crucial for the Petrolina-Juazeiro region, for it played an important role in the learning process of the production of irrigated crops. It was by this process that producers learned important techniques that were later on applied to other crops that became important export products.

The region was also an important melon producer before it became a leader in grape and mango production. Yet, production problems due to the heterogeneity of products and the inability to guarantee a certain level of quality led to a decrease in prices, and production was interrupted. Grapes and mangoes then became the main export products of the region. Investments in production began during the 1980s, but it was only during the late 1990s that exports started to grow due to the introduction of seedless grapes. The grape export growth trajectory was only interrupted in 2004 mostly due to weather fluctuations: strong and abnormal rainfall, and the rise of humidity levels, which damaged some of the crops.

2. The Discovery and the Diffusion Process: Historical Overview

The first firm to export grapes in the region was Cotia, a São Paulo-based cooperative founded in the 1950s by Japanese immigrants that was the largest agricultural cooperative in the world in the 1980s. Cotia began its work in the Petrolina-Juazeiro region in 1978, when it leased an area of 1,927 hectares (834 of them irrigated), establishing 36 of its members from São Paulo and Paraná (Damiani, 1999). The first grape exports took place in 1985 after previous attempts with other fruits.

Cotia already had some experience exporting fruits (including grapes) in other regions of the country, but it was not the first to produce grapes in the region. When Cotia arrived in Petrolina – Juazeiro, Fazenda Milano had already been producing grapes for the domestic market. These first attempts to produce grapes started in the 1950s, but experienced several adaptation problems given the region’s tropical climate. Molina, a Spanish national, was in fact the first grower to cultivate grapes in a large commercial scale starting in 1958. Yet these first attempts did not generate an enduring cultivation of grapes, neither the output was successfully exported.

Other firms followed Cotia, as well as smaller local farmers. But it was only in the 2000s, after Cotia had bankrupted, that the exporting of seedless grapes, introduced in the end of the 1990s, led to outstanding export growth rates.

2.1. COTIA, the First Mover

Cotia was attracted to the region because of its dry climate, and of CODEVASF's policies aimed at bringing new firms to the region.

In the end of the 1970s, Cotia already exported grapes produced in the São Miguel and São Paulo regions to the United Kingdom and the Netherlands. Yet, this production was constantly damaged by excessive rainfall in those regions. Knowing the problem, and with a South African experience in mind, a British customer suggested that the cooperative should look for a region with less rainfall.

COTIA had previous knowledge of the fruit production potential of the Petrolina – Juazeiro region. In fact, the cooperative had bought melon produced by two irrigated projects in the Northeast since the mid-1970s. In addition, managers knew that the region could produce table grapes all year round.

At the same time, CODEVASF's officials were trying to draw potential investors to the agency's irrigation projects in the Northeast. Cotia's success was recognized all over Brazil, and the cooperative was known as an important exporter of several agricultural products (e.g., coffee, soybean, apples, and cantaloupes). It was also recognized for buying production from affiliated farmers and successfully exporting their output. CODEVASF believed that Cotia could play a leading role in diversifying the crops produced in its irrigation projects, not only in Petrolina-Juazeiro, but also in the other regions of the São Francisco Basin where the agency was initiating new irrigation projects. With this potential in mind, CODEVASF offered Cotia an irrigated area.

In addition, according to Damiani (1999), one of the strongest appeals to Cotia was the possibility of its members' children to own land in the area. These young men were interested in becoming farmers themselves, but had difficulties in finding low-priced land in the São Paulo and Paraná states.

Grapes were not the first product to be produced and exported by Cotia members in the Petrolina-Juazeiro region. Its members first attempted the cultivation of tomato and melon crops in the region and failed for the reasons earlier described (see section 1).

Tomato production had been heavily promoted by CODEVASF in the beginning of the Petrolina-Juazeiro development, but production and market conditions changed dramatically during the late 1980s, and drastically reduced this type of crop.

Melon production was started in the early 1980s by a group of Cotia growers who sooner became the main suppliers for the domestic market, and the only producers from Petrolina-Juazeiro to export melon to Europe. The initial success of Cotia growers and the good prices obtained for

their fruit inspired other growers. The subsequent increase in production attracted several exporters from São Paulo and other cities of the Northeastern states. By 1984, Petrolina-Juazeiro had turned into the main Brazilian exporter of melon.

But the entry of new producers (most of them settlers from other regions) brought a large variety of production techniques (e.g., different varieties, application of several fertilizers and pesticides, etc.). Accordingly, the quality of production was very diverse, and the region produced different types of melons, with different taste. New problems arose, since it was not possible to assure the quality of the melons exported, leading to a substantial decrease in price, as bad quality fruit was being shipped to Europe. In 1986, the price of melons decreased dramatically and reached levels that could no longer cover export costs. This decrease in prices led to the collapse of the crop and to the default of many small farmers that participated in government-sponsored irrigation projects. Melon cultivation declined from 1987 on and production never recovered to its original levels. Melon production in the area covers less than 1,200 hectares (Damiani, 1999)

It was at this point that Cotia got directly involved with the cultivation of grapes in the region. The main uncertainty Cotia faced with regards to grape exports was in production. Even though grapes had already been produced in the region, many problems still remained. Some producers were unsure about producing in sandy terrains. The production technology had to be adapted (and continues to be adapted until today). Initially, the grapes were too small and productivity was low. New levels of productivity were reached due to the use of new processes and new technology.

The cooperative did not face many obstacles in marketing its grape production. Cotia had a long experience exporting agricultural output, including coffee, soybean, and fresh fruits like melon and apples, crops that its members already grew in other regions. Among the distribution channels utilized was an international office in Rotterdam, established during the mid-1960s to market the cooperative's output in Europe. With this office, Cotia was able to maintain a direct relationship with several buyers, who often visited production sites in Brazil.

Since production was labor and technology intensive, Cotia's members had to hire people and train them in order to properly cultivate the grapes. This led to the creation of a qualified labor force. One of the most important growers in the region, Nelson Costa, commented Cotia's role in the region:

“Cotia was an inspiration for the region. They arrived in the region and contacted the families there. They hired and trained these people, and the people learned. COTIA began an extraordinary process: education for the use of agricultural techniques. These included pruning and the know-how to manage the vineyards. Cotia's contributions to the region are outstanding. They professionalized and provided a higher standard of living to people of the semi-arid Northeastern region of the country, who prior to Cotia's arrival had lived without any expectations of professional development.”

Cotia spread its experience and expanded the agricultural frontiers of Brazil until 1994, when it collapsed because of an overextended bureaucracy, and financial problems. The group of

producers in Petrolina-Juazeiro that were members of Cotia created the Agricultural Cooperative of Juazeiro (CAJ), which has presently eighty members.

2.2. The Diffusion Process

Cotia's example was followed by many others. At first, smaller local farmers started to cultivate grapes. In sequence, the region underwent two important expansion periods, one from the end of the 1980s to the end of the 1990s; and the second from the end of the 1990s to the present days, with the introduction of seedless grapes.

The first period took place at the end of the 1980s, when different companies were attracted to the region by Cotia's success. The companies that arrived and invested in the region following Cotia were quite different from those in other areas of the Northeast. These were firms from other sectors⁴³, mainly from industrial sectors, which had capital, and an entrepreneurial vision of agriculture. Additionally, they had a strong desire to export their products.

By the mid-1980s, not only the members of Cotia were growing grapes in the Petrolina – Juazeiro region, but also six or seven other firms with large farms. The quality of production of most producers was very heterogeneous, each one obtaining fruit of both very good and very poor quality. The earlier failure in exporting melon was a reminder that the same problems could emerge again, once many producers with different product quality were exporting to the same markets from the same region.

Avoiding these potential problems would require cooperating with other exporters to work out a way of jointly achieving similar quality standards in production, classification, and packaging. Cotia managers concluded that they would need to become more involved in agricultural production to help other farmers with production technology, and to coordinate a joint effort with the other exporters, by supporting the creation of an association of fruit exporters.

As a result, in 1992 seven table grape producers created the Brazilian Grapes Marketing Association (BGMA). Even though, BGMA's creation was Cotia's initiative, the association was established as a special division of Valexport, the association of the San Francisco Valley Exporters, created in 1988. BGMA became part of Valexport to avoid having decisions monopolized by Cotia. Despite of it, Cotia continued to play a crucial role in BGMA's evolution. Cotia provided BGMA managers and information to help address issues related to the export of fresh agricultural products. In addition, BGMA used Cotia's offices in Rotterdam, taking advantage of the cooperative's contacts with European buyers.

BGMA played a crucial role since then in the export growth of seedless grapes from the region. Producers agreed to enforce certain quality standards, and designed a joint production and marketing strategy. The idea was to avoid predatory competition and to market a common brand. They also made joint contracts for transportation and packaging materials and negotiated with the government infrastructure investments in the region. A brand name was developed under which the authorized production of BGMA members was sold in foreign markets.

⁴³ One of the companies that was attracted to the region was Carrefour.

Sound policies of quality control were adopted with penalties to those who did not comply with the rules. The production was sampled and inspected by a quality control team, following specific rules dictated by a quality manual. Producers that did not adhere to the standards set by the association were not allowed to export. (BGMA's president is proud to state that every producer that did not comply with the rules at any point was penalized, regardless its political importance.) Foreign buyers also monitored quality and complaints in European and U.S. supermarkets. Distributors were informed of any problems and this information was sent to BGMA, which in turn informed the faulty producers, that were then subject to price penalties.

The first expansion phase started in the late 1980s and continued throughout the 1990s, with a rather slow progression. Macroeconomic conditions, particularly the appreciation of the Real, made exports less attractive during the second half of the 1990s.

A second expansion started by the end of the 1990s, with the introduction of seedless grapes. These crops were extremely attractive because of their high returns (about three times more profitable than the common grape). But there were technological challenges to overcome before the crop could be adopted. EMBRAPA had already been involved with seedless grape (Thompson type) experiments in the Southern regions of the country. Some farmers imported samples of a seedless grape species developed in California, and planted them in an experimental area with the financial support of SEBRAE, the Brazilian support service for small and medium-sized enterprises. Other entrepreneurs planted seedless grapes at their own risk. By the end of the 1990s, after a trial-and-error period, seedless grape crops in the region succeeded, and were responsible for an increase of more than 1000% in the region's exports.

The production of seedless grapes during production periods different from those of other producing countries was three times more profitable than common grapes. With this profitability prospect, the cultivated area in the region rapidly increased from 4,200 to 12,000 hectares. The region's climatic conditions allowed for a grape plant to begin producing fruit within approximately a year and a half. This constitutes half the time a regular grape plant would need to produce fruit in other regions of the world. This condition facilitated the learning experience and permitted that the necessary adaptations could be introduced at a much lower cost and risk.

The results were dramatic. Grape exports jumped from US\$8.6 million in 1999 to \$107.2 million in 2005. During this period new farmers came to the region, following the steps of those already successfully established there.

Today, BGMA is responsible for 60% of the region's grape exports. The rest comes from small and large producers that sell their products to other exporters or directly to importers. The association developed the North-American, Canadian, Russian, and Spanish markets, and continues to carry out an important role in opening new markets. In 2006, it was negotiating with China.

Currently, BGMA encompasses 22 firms with 150 producers. In the last three years BGMA has not accepted new members since, according to its president, "*BGMA's main objective is not to be São Francisco Valley's main producer, but the best producer in the area*".

3. Role of Support Institutions

The Brazilian government made substantial contributions to the development of the Petrolina – Juazeiro region. The most important government agency was CODEVASF (The San Francisco River Valley Development Agency), but other institutions such as Banco do Nordeste (a regional development bank), SEBRAE (the support agency for smaller firms), and EMBRAPA (the federal agricultural research agency) also contributed to the region's success. Some of the government interventions resulted from strategic decisions, while others were indirect effects of the policies implemented.

3.1. CODEVASF, the regional development agency

There are four main ways in which CODEVASF influenced the development of the region. First, it was responsible for the construction of the entire irrigation infrastructure and covered water costs for an extended period of time in order to increase the attractiveness of the region to investors. Second, the institution played an active role selecting and monitoring agricultural firms that got established in the region, which included attracting the pioneer firm. Third, CODEVASF promoted the diversification of cultures in the region, and stimulated investment of high-value export crops. Lastly, the institution supported the creation of Valexport, the San Francisco Valley association of exporters, and the creation of BGMA, the joint export marketing association.

CODEVASF attracted several firms to the region with a policy of mixing large firms with small producers in the distribution of land. As a result, small farmers and larger firms interacted, which in turn stimulated a shared learning process. Large and medium-sized firms brought capital and technology to the region and small farmers were able to incorporate these technologies, and develop new crops. Octavio Damiani, a researcher on the development of the region, highlighted the diverse profile of the firms attracted to the region:

“Several firms that were established in Petrolina came from other industries. This means that they had capital but also had a business vision. The traditional Latin American businessman always wants the State to pay for everything. This did not happen in this particular case. In this case, entrepreneurs from Petrolina – Juazeiro were very open-minded. This was also very important... Also these entrepreneurs were aware of their reputation abroad because they lived of their exports. This is why they were concerned with not generating a negative image. For example, they did not employ child labor and tried to prevent strikes because they were aware that these could lead to a negative perception of them. So, I believe that the type of entrepreneur that arrived to the region was key in terms of the development of the region. I believe, once again, that CODEVASF was very important in attracting these types of firms.”

These actions meant a radical departure from the usual practices applied to the management of land settlement projects in Brazil and other regions, where the main beneficiaries tended to be landless farmers who only cultivated traditional crops. Additionally, CODEVASF created a

competitive environment in the region as it had firms competing for subsidies, and granted these to those with the best project proposals.

Another area in which CODEVASF contributed was in promoting crop diversification. With the failure of tomato production in the region, CODEVASF started to promote the diversification of crops among individual farmers and firms. Highly inspired by the Chilean success, which was widely known by the executive team of CODEVASF, the central offices of CODEVASF in Brasilia created a task force in 1986 with this purpose.

The task force organized workshops to promote high value perennial crops with high export potential such as grapes, mango, and banana. Most of the workshops and meetings organized were held in the cities of Petrolina and Juazeiro. The main objective of these workshops and meetings was to discuss possibilities and challenges of selling the region's agricultural products in foreign markets. Often, CODEVASF would invite international and local specialists to lecture about a wide range of issues of interest to exporters. Some of the issues discussed during these workshops and meetings included the following: consumer tastes in specific export markets, rules governing imports of fresh fruits in European countries and the United States, and the organization of agricultural markets in the main importing countries.

CODEVASF also stimulated the creation of Valexport by supporting and advocating its advantages, and by giving financial and technical support to the association during its initial stages. The institution argued that growers needed an association for at least the following powerful reasons: a) to collect information and search for export markets; and b) to press the federal government to carry out policies and other interventions that helped fruit producers to export, such as investments in infrastructure.

Valexport's role in export development is however controversial. Some interviewees believed that Valexport played a fundamental role in promoting exports, introducing quality controls, and attracting public investments, but an important entrepreneur in the region and long-time member of Cotia argued that the most important actions in this direction, such as the creation of BGMA, were more an initiative of Cotia than of Valexport.

3.2. Banco do Nordeste, the regional development bank

In addition to the role played by CODEVASF, the development of agribusiness in the region was also supported by the Banco do Nordeste, one of the main public banks in the Northeastern region.

The Bank had an instrumental role in providing credit to farmers, but was also actively engaged in technology transfer. According to Damiani (1999), at the same time Banco do Nordeste was involved in the process of providing credit to firms and settlers, which enabled them to grow perennial crops, it also acted as an intermediary in the transfer of technology between these players. This process was associated to the Bank's credit application process, which required firms applying for credit to detail the technology to be used in their projects. At the same time, the Bank required that small farmers used the same technologies that large firms were using in

order to grant them credit lines. Bank officers often visited these firms to assess the status of the different project proposals, becoming the first to know about new technological advances by firms in the region.

3.3. EMBRAPA, the federal agricultural research agency

EMBRAPA had a minor role in the export development of seedless grapes. The EMBRAPA office in the region was focused on products for non-irrigated areas. Only by the end of the 1990s EMBRAPA SEMI-ARIDO division re-evaluated its priority list, and started to develop research on irrigated agriculture, becoming actively involved in the study of export crops.

4. Counterfactual Analysis

Petrolina – Juazeiro is not the only case of government-sponsored investments in irrigation infrastructure in the Northeast. The federal government also made heavy investments in roads, electrification, and irrigation infrastructure in other regions in the São Francisco River Basin, which include the North of Minas Gerais and the Lower São Francisco region. However, these two regions achieved different outcomes than Petrolina – Juazeiro, the only region that had a breakthrough in exports. This section analyzes the differences among these three areas, which followed distinct development patterns, although they have been subjected to the same macroeconomic conditions, the same regional policies of the federal government, and to several similar interventions of federal government agencies.

4.1 Production Processes and Practices in the Three Regions

The Petrolina – Juazeiro region had different productive structures, market access techniques, and revenues when compared to the Lower São Francisco and North of Minas Gerais regions.

Petrolina – Juazeiro developed a diversified agriculture that included crops both for export (grapes and mango), and for the domestic market (banana, passion fruit, guava, tomato, melon, watermelon, and onion, among others). In contrast, farmers in the Lower São Francisco focused on cultivating low-quality rice for regional markets. The North of Minas Gerais region showed an intermediate pattern, with farmers growing mainly banana, plus a mix of substantially smaller areas of beans, corn, table grapes, and mango. Most of their production was sold in the domestic market.

Petrolina – Juazeiro farmers obtained higher yields from irrigated crops than those from the North of Minas Gerais and the Lower São Francisco regions. Actually, these two other regions obtained even lower yields than other regions of irrigated crops in Brazil. Furthermore, irrigated agriculture in Petrolina – Juazeiro led to widespread increases in wages, upskilling of labor, and improvement in labor standards. In contrast, most wage workers in both the North of Minas Gerais and the Lower São Francisco were temporary, earned low wages (frequently lower than

the legal minimum), were not registered, did not receive fringe benefits, and worked in poor conditions.

These divergent trajectories required different technologies and investments. In Petrolina-Juazeiro, export crops cultivated demanded new production technologies, investments in expensive post-harvest facilities, and a skilled workforce in order to attain the desired quality standards. In turn, growers from the Lower São Francisco have been slow to adopt new technologies and preferred to sell their product output to markets that were not as demanding in quality. In the North of Minas Gerais, producers obtained intermediate quality levels, good enough for demanding markets in the cities of Belo Horizonte and Rio de Janeiro, but not good enough to export.

Table 21 summarizes the above discussion.

Table 21
Production Aspects in Three Regions of the San Francisco Basin

	Petrolina – Juazeiro	North of Minas Gerais	Lower São Francisco
Type of crops	Diversified crops (grapes, mango, banana, passion fruit, guava, tomato, melon, watermelon, onion, etc.)	Mainly rice	Mostly traditional crops (banana, beans, corn, table grapes, mango)
Markets served	Export markets (grapes & mango); Domestic market (others)	Local markets	Regional markets; some exporting
Technology-intensity	Higher	Lower	lower
Quality	High	Low	Intermediary
Productivity	High	Low	Low
Labor force	Mostly permanent, registered, well-trained, well-paid	Mostly temporary, low wages, not registered, no fringe benefits, no training	Mostly temporary, low wages, not registered, no fringe benefits, no training

4.2. Main Drivers of Development in the Three Regions

The Lower São Francisco and the North of Minas Gerais regions did not attract a firm that could play the leading role that Cotia played in Petrolina – Juazeiro. In fact, Cotia could have created units in the Lower San Francisco and North of Minas Gerais regions. However, two fundamental factors in attracting Cotia to Petrolina – Juazeiro included the dry climate and the land structure in the area developed by CODEVASF, and these two factors were not present in the other two regions.

The three areas share some climatic similarities, but have some important differences. The three are located in the São Francisco River Basin and have a semi-arid climate. Moreover, the three of them have poor soils, though there are some differences in soil fertility. The Lower São Francisco region had the least fertile soil, followed by Petrolina – Juazeiro, and the North of

Minas Gerais. Also, the Lower São Francisco had an important proportion (75%) of soils of low permeability, which are very appropriate for the cultivation of crops irrigated with inundation (Damiani, 1999).

Despite these similarities, the three regions are different in one important characteristic: rainfall. Petrolina – Juazeiro had a lower rainfall (450 mm annually) than the North of Minas Gerais (650 mm) and the Lower São Francisco (800 mm) (Damiani, 1999). The lower rainfall of Petrolina – Juazeiro turned out to be an advantage when producing with irrigation because it reduces the costs of controlling pests and allows farmers to grow various crops all year round rather than in a particular season. This enables producers to get two to three harvests a year from each plant and to produce during some periods of the year in which competitors in international markets would not be able to do so. The possibility of harvesting more than one time per year helps to reduce production seasonality and allows farmers to employ workers almost all year round, permitting more investment in human capital. Also, since the low rain fall was one of the main characteristics that Cotia was looking for in a region, this was crucial for the cooperative's decision to go to Petrolina – Juazeiro.

CODEVASF integrated innovative principles to the management of irrigation projects in Petrolina and Juazeiro, but these were not carried out in the Lower São Francisco and North of Minas Gerais regions.⁴⁴

First, CODEVASF's irrigation project in the Petrolina – Juazeiro region included a mix of small farmers and agricultural firms. Since the institution was concerned with attracting flagship firms, which could play the role of bringing capital, as well as production and marketing know-how, CODEVASF decided to focus its attention on medium-sized firms. With this particular focus, it also imposed land size limits to avoid the concentration of land in the hands of a few large firms. Cotia, the pioneer firm in grape exports, is an example of the effectiveness of this measure. In contrast, CODEVASF provided land only to landless settlers in the Lower São Francisco region, although in the North of Minas Gerais, CODEVASF's irrigation projects included both landless settlers and firms, but the number of firms was substantially smaller than in Petrolina – Juazeiro.

Second, in Petrolina – Juazeiro, CODEVASF introduced the provision of subsidies and distributed these according to farmer's size, fostering competition among them. It did not provide firms with across-the-board subsidies. Instead, it selected agricultural and agro-processing firms from outside Petrolina – Juazeiro, which already possessed technology and marketing know-how. The attractiveness for outside firms was the subsidized leased land and the irrigation infrastructure. These firms were required to build their own farm-level irrigation infrastructure and had to pay for training in crop and irrigation technologies in addition to agricultural extension. In contrast, CODEVASF only partially selected firms in the North of Minas Gerais, and did not do this at all in the Lower São Francisco region.

Third, CODEVASF required certain performance levels from agricultural firms that received subsidies. Firms that received subsidized land and irrigation infrastructure were required to meet production targets. If these targets were not reached, firms would be fined or forced to leave.

⁴⁴ These arguments are presented by Damiani (1999).

Furthermore, CODEVASF offered five-year renewable leasing contracts, allowing firms to buy land only upon completion of the leasing period and based on good performance (Damiani, 1999). In contrast, the agency did not monitor firms' performance in the North of Minas Gerais.

Fourth, the institution allowed turnover and even encouraged it in irrigation projects in Petrolina – Juazeiro. This was in sharp contrast to what other federal government agencies were doing in their settlement projects. Ten years after the establishment of irrigation projects, turnover among firms varied between 25% and 50%, including mostly firms that did not comply with their project proposals; turnover among individual settlers reached 60%. Turnover also took place in CODEVASF's projects in the North of Minas Gerais and in the Lower São Francisco. Yet, turnover was negatively viewed by officials of the agency's local branches in both regions. Avoni Santos, the superintendent of CAJ and the actual president of BGMA, commented on the distinct policies of settlement implemented by CODEVASF in different areas of the Northeast:

“The climate is only one aspect, you must adapt your crops to the climate. The other issue is that you must have an entrepreneurial mind. Here in Petrolina-Juazeiro, it worked because we had large firms with an entrepreneurial vision, not with that mindset that ‘I have an hectare here, and I will survive because the government will subsidize me’. Here we had some projects that were a mix, an industry area here, a colono⁴⁵ area there. The colono area there is abandoned. This is because the colono's mentality is like that. They think that: ‘the government put me here, it has to subsidize me, I don't pay water, I don't pay electricity either, the loans that I got, I don't pay ‘them either because its from the government... And government paternalism did not help things to work out. Here you could also have had that situation, but what happened here? Some of these areas also belonged to colonos. Some entrepreneurs started to buy. The colonos sold their land, and you could buy land of different sizes and add them up to have something larger. Then the problem took a different dimension. Now, if you have a philosophy of land reform such as today, you go nowhere. It's a model that needs to be looked at. You have to see if you have trained people, capable of producing, and then you provide the support needed.”

5. Case Study Analysis and Conclusions

The development of the Petrolina – Juazeiro region is a rare example of a joint-effort by public and private actors. This partnership led to the successful development of a region now considered an Oasis of wealth in the Brazilian Northeast, the country's poorest region.

The public sector, by means of CODEVASF, played a crucial role in creating infrastructure, attracting leading firms, and diffusing knowledge throughout the region. Additionally, companies were stimulated to continually invest in more profitable crops and in supporting the creation of an association that would promote the sector's interests in exporting.

⁴⁵ Name used to designate individual settlers.

Yet, all the aforementioned efforts might not have succeeded, had it not been for Cotia, the pioneer cooperative enterprise that acted as an important catalyzer in the whole process.

5.1. The Nature of the Discovery

The discovery, in this case, was the production of seedless grapes in the region of Petrolina – Juazeiro to serve export markets.

The original production of grapes in the area was not considered a “discovery”, since the product was basically transplanted from other areas to the San Francisco River Basin, specifically to the Petrolina – Juazeiro region. Initial efforts were not very successful and did not include any relevant breakthroughs that led to subsequent developments. For this reason, there is a consensus that the first mover was in fact Cotia.

Cotia’s main role in the discovery and diffusion process included:

- to recognize the region’s potential for export crops;
- to adapt technology to the region’s climate;
- to develop foreign markets; and
- to disseminate to other growers its production techniques and its international marketing knowledge.

By means of these actions, the cooperative led other growers in the region to generate a very successful agricultural cluster.

Cotia played a leading role in the export success of Petrolina – Juazeiro, as expected by CODEVASF. While operating in the region, the cooperative demonstrated the export potential of the region and also trained the labor force in the production and marketing of agricultural products, opening up markets for other producers. It played a very important role in the diffusion of knowledge.

5.2. First Mover Characteristics

Cotia was already an outstanding organization at the time of the discovery. Started in São Paulo by Japanese immigrants, it became the largest agricultural cooperative in the world in the 1980s. Despite its giant size, Cotia’s managers were quite entrepreneurial.

Cotia pioneered several initiatives in the expansion of Brazilian agriculture. Another example of Cotia’s pioneering role can be found in soybeans production in Barreiras, Bahia, which is considered one of the new agricultural frontiers of soybean production in Brazil. It also played an important role in apple production in Santa Catarina, the country’s main apple exporting state.

5.3. First Mover's Motives and External Stimuli

Cotia became the first mover for three specific and easily identifiable reasons:

- The cooperative was searching at the time for a new area, with a dryer climate, to plant grapes;
- There was an interest in developing new cultivation areas to expand the agricultural frontier and give the younger generation of the members' families an opportunity to own their own land;
- The cooperative was contacted by CODEVASF, which offered attractive opportunities.

Together, these reasons were more than enough to move Cotia to the Petrolina-Juazeiro region.

5.4. Difficulties faced by the First Mover

Cotia did not have to face any marketing difficulties, since it already had an office outside Brazil, and had accumulated experience for many years in the exporting of fresh agricultural products. In fact Cotia had a trading company that operated all over the world.

Main difficulties faced by Cotia came from technical problems, related to the management of the soil and the adaptation of grape varieties to the region. These were dealt with by trial-and-error, and by the transfer of technology and know-how obtained in other areas of the country.

5.5. Impact of Diffusion on the First Mover

Cotia did not survive to the turbulent Brazilian business environment, and went bankrupt in 1994. Main problems were its excessive bureaucracy, combined with inadequate financial management practices.

Being a cooperative, Cotia could disappear without the loss of its various achievements in the agricultural area. In the specific case of Cotia members in the Petrolina – Juazeiro region, the evidences collected in this research suggest that they strongly benefited from the cooperative's initiatives, and did collect the awards for their entrepreneurship in the Petrolina – Juazeiro region. They reorganized in a much smaller cooperative, The Agricultural Cooperative of Juazeiro, that continued to act in a similar manner. Presently, the president of this cooperative is also the head of BGMA, the joint export marketing association.

5.6. Characteristics of Imitators

There were basically two kinds of imitators: individual settlers and firms.

Individuals settlers were typically people from the region, but sometimes also from other parts of the country, especially from other regions of the Northeast. These settlers did not have much technical know-how to be used in irrigated agriculture, and strongly benefited from the association with larger agricultural firms. Apparently a number of the initial individual settlers in the region sold their land to others.

Firms came typically from outside the region, commonly from the South and Southeast, and were medium and large-sized organizations from various sectors. These companies were carefully selected by CODEVASF, and brought capital, technology, and management know-how that were later transferred to other firms in the region.

5.7. Strategies Followed by Imitators

Imitators used exactly the same strategies as the first mover. The main producers decided to standardize their production and to develop joint export marketing activities in order to increase their export potential and avoid negative spillovers from one operation into another.

The first step was product standardization, combined with rigid specifications and quality control mechanisms. Once production practices were standardized and growers were getting essentially the same product quality, the next step was to develop a joint marketing strategy. Marketing and sales were carried by BGMA, the joint export marketing association that was put together by Cotia with the support of CODEVASF. In fact, one of the major contributions of the first mover was the transfer of marketing know-how to other firms, by means of BGMA. Not only the first mover shared its marketing know-how, but it also shared its export marketing facilities with BGMA. In addition, a brand name was created to serve as an umbrella for the products of all BGMA members. This brand name – Copacabana Gold – became a synonym of quality for foreign buyers.

As other firms entered the region, they also could become members of BGMA, meaning that they would have to follow the same strategies. It should be noted however that since 2003, as reported in section 2.2, BGMA was not accepting new members.

5.8. External Events Influencing Discoveries and Diffusion

Table 22 presents the external events identified in the recent historical development of the Petrolina – Juazeiro region. None of these, however, had a major impact on the discovery, although the 1999 devaluation triggered the second phase of expansion of the region.

Table 22
External Events in the Process of Discovery and Diffusion in the Petrolina – Juazeiro Region

Crops	Externalities	Observations
Tomato Crops	1988 pest (“traça”)	Negative impact
Melon Crops	Competition from imported tomato products	Negative impact
	1994 Appreciation of the Brazilian currency	Negative impact
Grapes Crops	1999 Devaluation of the Brazilian currency	Positive impact
	Abnormal rainfall in 2004	Negative impact
	2004 Appreciation of the Brazilian currency	Negative impact

5.9. Coordination Issues and Spillovers

The failures experienced with previous crops – tomato and melon – were important learning experiences. The earlier failure with exporting melon motivated Cotia managers to make a joint effort to avoid similar problems, leading to the creation of a growers’ association to resolve collective problems and commercialize the crops. During the 1990s this association played a crucial role in expanding exports from the region. BGMA is perhaps the biggest success case of joint export marketing groups in Brazil. Additionally, the cooperation between growers and public institutions was decisive to the success of exports.

All these cooperative efforts were promoted by the pioneer firm and stimulated by CODEVASF. Producers were aware that cooperation was important in order to succeed because their prior experiences had proven that success was unattainable without cooperation.

Spillovers were mainly the result of Cotia’s efforts to promote collective action and its efforts to train local workers in the use of agricultural techniques. One of the major positive spillovers, in fact, was the emergence of a well-trained and better paid workforce, different in almost every regard from the typical agricultural worker of the Northeast region of Brazil.

CODEVASF itself actively stimulated spillovers from firms to local settlers, under the form of technical and marketing know-how. This was achieved by mixing together the two groups.

5.10. Role of Private and Public Support Institutions

As in the soybeans case, public institutions had a major role in the development of grape exports from the Petrolina – Juazeiro region. Section 3 presented a detailed account of these institutions actions, particularly of CODEVASF’s. Section 4 also discussed the impact of different strategies used by CODEVASF in the development of other areas of the São Francisco Basin.

In summary, CODEVASF’s actions had a positive impact on the development of the region because of three aspects:

- It provided the necessary incentives to attract potential investors with an interesting profile to the region;

- It stimulated these newcomers to bring capital and technology and share their knowledge with locals;
- It applied effective selection and control mechanisms that stimulated production, penalized speculation, and delivered highly competent producers with an entrepreneurial mind-set.

CONCLUSIONS

This section presents the overall conclusions emanating from the study. It is organized in four sub-sections. The first sub-section summarizes and compares the findings from the two manufacturing sectors studied. The second section does the same for the two agricultural sectors investigated. The third section presents the general lessons learned, and the fourth section explores public policy issues.

1. Summary of Findings: Manufacturing

The two manufacturing industries selected for this investigation present very different profiles and trajectories. Strengths and weaknesses can be better understood in light of the following comparison, which tries to extract the main issues learned from the two cases.

1.1 Relevant Sector Characteristics

A number of observations can be made concerning the discoveries and the diffusion process in the two manufacturing industries examined. First, the nature of the industry, or the cluster, and its historical development must be taken into consideration. Both industries – the furniture industry and the swimwear industry – are fragmented, and both are formed mainly by small and medium-sized firms. But similarities end here. While firms in the furniture industry tend to pass from one generation to another, leading firms in the swimwear industry are entrepreneurial, based on the founder-designer talents, or large textile conglomerates that integrated forward to produce swimwear. Because the swimwear industry is a young industry in Brazil, and in designer firms the first generation of entrepreneurs is still in command, it is hard to predict whether the designer firms will disappear, pass to a next generation, or to new owners.

As to industry organization, the furniture industry tends to be organized in production clusters, while the swimwear industry tends to be organized in marketing clusters, typically a large city. The spatial organization of the swimwear industry does not show the same type of dense agglomeration of the furniture industry, mainly because supply chain requirements are not very important. The logic of clustering in the swimwear industry is rather based on the proximity of fashion centers, where designers can be close to other designers and to the consumer market. This is why the birth of the swimwear industry is associated to the city of Rio de Janeiro, specifically to the vicinity of Ipanema beach, in the 1970s, expanding to São Paulo in the 1980s, as the latter became a leading fashion center.

The historical development of the clusters in both industries also differs substantially. The furniture cluster of São Bento do Sul had its origin in a combination of natural resources (forests) and skills of the local labor (the ability to carve wood). The original community lived almost completely insulated from other areas of the country for more than a century, in such a way that most of the original commerce was within the region. In fact, one of the “innovations” by the first mover was exactly selling to other regions in the country. The common Germanic origin and

culture, the century-long insulation, and intermarriages combined to generate a very homogeneous cluster.

The Rio de Janeiro swimwear cluster, on the other hand, stands as almost a perfect counterexample. Competitive advantages of the cluster are associated to 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 clusters came mainly from new entrants, which may not have had any previous contact with established firms. Interactions between firms competing in the industry were quite unusual, at least until a channel of communication was established by means of a calendar of fashion shows, where designers were forced to some sort of interaction.

Firms in the Rio de Janeiro and in the São Paulo swimwear clusters are also more spread geographically, within the limits of the city, although the larger brand-name manufacturers tend to have stores in the same commercial areas, often in the same area of a shopping center, side by side. The most important element to shape the nature of the Rio de Janeiro swimwear cluster is the entrepreneurial character of the incumbent firms with their founder-designers, characterized by a strong individualistic orientation, while large-scale operations seem to be the main aspect of the São Paulo cluster.

But although there is very little cooperation among firms in the swimwear industry, fashion shows played a role in defining the boundaries of each regional cluster, and permitting the necessary interactions for industry development. They created a climate that encouraged the exchange of experiences, creativity, cross-fertilization, and entrepreneurship, which in turn stimulated the development of internationally competitive products. At the same time, they increased rivalry in an industry characterized by strong individualism. It can be said that competition, rather than cooperation, drives the industry.

1.2. The Role of First Movers

The role of the first mover and the immediate follower in export development was also extremely different in the two industries: while they played an important role in the furniture cluster, setting examples, generating spin-offs, and actively influencing other firms to export, in the swimwear cluster they remained as benchmarks, or abstract symbols of international market opportunities. In the furniture industry, the pioneer accepted the responsibility for the diffusion of business innovations, particularly exporting; in the swimwear industry, the first mover and the immediate follower not only did not interfere in the diffusion process, but were rather antagonistic to it.

Flagship firms – firms leading the cluster – were of paramount importance to the development of the furniture cluster. The two flagship firms had greater influence in different periods of time: while one is certainly behind the first and the second wave of adopters of exporting in the cluster, the other influenced at least the third wave. Also, both CEOs were respected business leaders in the cluster, and they made substantial efforts to engage other firms in exporting, believing this was the path to the cluster's success. Again, the picture extracted from the swimwear industry is the opposite. It is difficult to identify flagship firms. The two firms identified as pioneers – first

mover and immediate follower – in the swimwear industry had a limited influence over the other firms. In fact, almost every firm interviewed in the swimwear industry claims not to have been influenced by any other firm, but having influenced other firms.

In both industries, first movers acted on their own, and faced the difficulties and challenges using their own ingenuity. For example, to acquire technical knowledge, the first mover in the furniture industry had to import books from Germany, a quite difficult process at the time. He also had to adapt the information acquired in these books to his own needs, designing his own equipment, and training his employees. In the next step, the change to pine wood furniture, again the pioneering firm took the initiative to send a family member to acquire technical knowledge in a foreign market. Only later other initiatives were taken to improve technical know-how within the cluster. Similarly, the first mover in the swimwear industry traveled to visit foreign buyers without having any previous contacts, only with a handful of samples to show.

First movers in neither case were the main beneficiaries of their discoveries. Part of the reason seems to be associated to idiosyncratic preferences and external events not related to the diffusion process. In the case of the first mover in the furniture cluster, succession problems halted its development and the firm lost the lead. In the case of the swimwear industry, the entrepreneur was never able to build a professional organization that could take full advantage of the industry's export development. In this case, his organization was too small and too entrepreneurial to lead the industry. The fact that this is an industry characterized by designer firms does not in itself explain the lack of firm growth, since some of the largest conglomerates in the international fashion industry had their origins in one designer.

The growth of the furniture cluster was based on spin-offs, which tended to mimic their mother companies products and business strategy. The relationship between the original “mothers” and the spin-offs tended to be friendly. Flagship firms were nurturing towards their spin-offs, although not willing to stimulate them. In fact, managers' attitudes towards spin-offs in both firms were a combination of acceptance and pride. These factors contributed to build trust and foster informal cooperation within the cluster. On the negative side, isomorphic behavior may threaten the ability of the cluster to adapt to changes in the environment. The danger of mimicking behavior when a cluster generates a large amount of endogenous spin-offs, rather than attract external entrepreneurs (Ferreira, Tavares, and Hesterly, 2006), clearly appears in the case of the furniture cluster, with new firms imitating successful business strategies adopted by flagship firms. The positive attitude towards spin-offs and the desire to help other firms in the cluster to engage in exporting may be associated to specific characteristics of the furniture cluster, its Germanic culture, its insulation, and the fact that the same families have lived in the area for generations, creating various types of social links between individuals, such as kinship, friendship, church connections, etc. In support to this contention we have the fact that while there seems to be a high level of informal cooperation and cohesion within the cluster, formal mechanisms of cooperation, such as associations, were said not to be very effective. It should be noted however that one of the CEOs had a major role in the diffusion of exporting to other furniture clusters.

Spin-offs were quite unusual in the swimwear industry, and when they appeared, the relationship between the original firm and the spin-off was antagonistic. Rivalry and jealousies among

designers and their firms are the result of a very individualistic environment. Nevertheless, certain aspects suggest substantial dynamism. First, there is much more diversity in the swimwear clusters than in the furniture cluster. Exporting firms adopt a variety of business strategies and search for product differentiation, although very small firms tend to copy styles and designs. Second, new entrants tend to come from outside the swimwear industry, bringing new experiences and ideas.

1.3. The Role of External Actors

Research results confirmed the importance of external actors in both industries in transferring know-how and facilitating export initiation and diffusion. In the furniture cluster, external actors were foreign buyers working for large international distributors and retailers, and export agents who established themselves in the region. Buying agents working for international distributors and retailers brought new technologies, materials, production requirements, designs, and accessories. Export agents, domestic or foreign-owned, were responsible for broadening market opportunities available to the firms in the cluster by identifying new markets and distributors. Their impact on the furniture cluster was even more important because firms are production-oriented, and tend to delegate marketing functions to intermediaries.

In the swimwear industry, foreign buyers carried innovations from one to another firm, promoting export product standardization, and the transfer of technical know-how. Aware of the opportunities for outsourcing in Brazil, they were responsible for the initiation of many firms in exporting.

Positive spillovers came from the action of these external agents. One way was the need to comply to more strict product specifications, requiring an upgrade in raw materials used in manufacturing the final product. In both industries the whole supply chain was upgraded due to these positive spillovers.

1.4. The Role of Public Support Institutions

Public support institutions played a subsidiary role in the diffusion process of exporting as a business strategy in both industries.

In the furniture cluster, public institutions only interfered in the later stages of the adoption process, once the cluster was already intensely involved with exporting, with a large number of firms exporting 80 to 100 percent of their output. In fact, the furniture cluster itself generated the resources and skills necessary to develop its export activities. Government actions were directed more towards transferring the cluster's experience to other clusters and firms than to support the original exporters.

In the swimwear cluster the role of public support institutions was similar. Government actions aimed at stimulating smaller firms to export by offering incentives to the formation of export consortia, and by supporting their participation in international fairs and exhibitions. It had little

impact on the export initiation and development of larger firms in the industry. In fact, government actions were directed towards the transfer of experiences from larger established firms to new entrants.

1.5. Two Models of Diffusion?

The diffusion of exporting as a business strategy in both industries shows remarkable differences. In the furniture industry, the process was carried out by respected business and community leaders, who accepted this responsibility, and social institutions were in charge of promoting diffusion. The cluster can be metaphorically associated to a “constellation”, because of its homogeneity.

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. 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 term “the constellation model” to describe our conceptualization of the furniture industry, studied under the perspective of the selected cluster. In fact, the cluster studied can be seen almost as a unit in itself, and could therefore be studied as such. We have already explored the reasons that seemed to shape isomorphic strategic behavior within the cluster, including the presence of endogenous spin-offs. 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 increased.

As to the swimwear industry, we used the term “*the lonely stars model*” to describe its dynamics. Looking at the industry, one finds no homogeneity in strategic behavior, but four rather heterogeneous strategic groups. Cooperation between firms in the industry is almost nonexistent, and new entrants seem to come from outside the industry. Firms do not mimick 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 of innovations, but diversity increases the chances of industry and cluster survival, since there are always new business experiments underway

Table 23 compares the two experiences and summarizes the above discussion.

Table 23
A Comparison of the Two Experiences: Furniture vs Swimwear

The Furniture Industry “The Constellation Model”	The Swimwear Industry “The Lonely Stars Model”
<u>Industry Organization</u> Organized in production clusters Integrated supply chain Fragmented industry	<u>Industry Organization</u> Organized in marketing clusters Independence of supply chains Fragmented industry
<u>Cultural Aspects</u> Shared history; geographic insulation Cooperation within the cluster; relationships More collectivist More production-oriented Long-lasting family businesses	<u>Cultural Aspects</u> Independent origin; spread geographically Rivalry/jealousy among firms/designers Strongly individualistic More marketing-oriented Dependence on a founder-designer
<u>Diffusion Process</u> Led by respected leaders Pioneer took responsibility for diffusion Social institutions promoted diffusion Diffusion process can be tracked	<u>Diffusion Process</u> Started by independent “stars” Pioneer did not interfere in diffusion External agents and government promoted diffusion Diffusion process cannot be clearly tracked

2. Summary of Findings: Agriculture

The two agricultural sectors selected for this study are not as divergent as the two manufacturing sectors, but they also had their own distinctive trajectories.

2.1 Relevant Sector Characteristics

The two sectors selected for study, soybeans and grapes, have in common the fact that they are both export industries, with a significant percentage of its output sold in foreign markets. Yet soybeans is the second largest Brazilian export product, with total exports in 2005 of US\$ 10 billion, while the exports of grapes reached only US\$107 million in the same year, the equivalent of approximately 15% of all fruits exported from Brazil. Soybeans exported from Brazil come from a vast territory, with several producing regions in different parts of the country, although the largest export crops come from the *cerrados* region. However, 95% of table grapes exported come from a specific region, the Petrolina – Juazeiro region in the São Francisco Basin.

Soybeans cultivation was already successfully carried out in the South of Brazil before the expansion to the savannahs. It was already a modern export-oriented sector, using modern technology. Therefore, the country already had marketing know-how to export soybeans. In contrast, grapes cultivation occurred in the South of Brazil, but typically grapes were not exported, possibly because of a lack of country competitive advantage, and the fact that the domestic market could absorb the production. One important producing area was the Vale dos Vinhedos, in Rio Grande do Sul, up to that point the best land to produce grapes for the production of wine in the country. There was almost no tradition of exporting grapes in Brazil,

except in very specific cases. The first mover in the grapes case was one of the very few firms with a history of successfully exporting grapes and other fresh fruits.

The origins of these new growing areas (in the savannahs and in the semi-arid) is also very different. Soybeans farms in the *cerrados* were established by individual settlers in search of less expensive land. Grapes production in the São Francisco Valley was the result of investments of existing firms from the Southeast and South of the country in response to government incentives.

Both growing areas were new, since their occupation and effective economic exploration only started in the 1970s, thanks to development policies implemented by the federal government. Both regions – the savannahs and the semi-arid in the São Francisco Valley – had low or irregular levels of rainfall and low fertility, requiring substantial investments in irrigation and fertilizers, and the development of varieties adapted to the local soil and humidity conditions.

In the case of soybean growers, most of them had previous experience with this culture in their original state, while most firms that entered the new cultivation area of Petrolina – Juazeiro, with the exception of the first mover – did not have previous experience with this agricultural product, or in some cases, with agriculture at all.

2.2. The Role of First Movers

First movers had almost opposite characteristics in the two agricultural sectors.

In the case of soybeans, first movers were individual settlers, sometimes whole families, who moved from the state of Rio Grande do Sul to the state of Mato Grosso and surroundings, starting in the 1970s. There were both small and larger farmers that moved to the *cerrado*. There was not one individual that can be singled out, or at least there are no written records or testimonies of such.

Also, the gauchos had a tradition of migrating to other parts of the country. This internal migration can be seen as a continuous wave of settlers to that region, in search of cheaper land and opportunities. To some extent, the *cerrado* region was a sort of agricultural Eldorado, attracting people from all ages, to try a new life in a different environment. Word-of-mouth and personal connections permitted the continuity of the migration process. Once the news that the land was good, and that soybeans could be cultivated and exported arrived to the original municipalities from where these settlers came from, relatives, friends, and neighbors followed, preferably buying new land close to the first ones to migrate, reestablishing the original kin and vicinity ties in the new land. They actually transplanted to a large extent their original social environment to the new physical environment in the savannahs.

A totally different picture appears in the case of grapes cultivation in the São Francisco Valley. This time earlier growers were firms from the Southeast and South of the country attracted mainly by incentives offered by the government, mainly under the form of large irrigation projects and subsidized water costs. There was in fact one firm in this case that was identified as the first mover. This firm was a giant cooperative organization with headquarters in São Paulo,

searching for land in the semi-arid to plant grapes. The first mover played an extremely important role in the irrigated project of Petrolina – Juazeiro, mainly because it was the only firm with technical and marketing know-how that could be useful in the project. Also, the first mover was willing to share its know-how with other firms in the region, forming a very successful joint export cooperative group. The reasons why the first mover was so ready to cooperate derive from a previous failure with another crop in the region attributed to lack of cooperation among growers, and to its own nature as a cooperative. In fact, the concept of cooperativism includes the idea of sharing and of joint action.

First movers in each case had very different characteristics. The early *gauchos* who migrated to the savannahs were experienced farmers, and updated in terms of the technology used in modern agriculture. They were said to be adventurous and entrepreneurial, motivated by the desire to buy new land and profit from export crops. The first firms to move to the semi-arid region of the São Francisco Valley were large and medium-sized, and they brought capital to the new irrigation project in the area, but in general had no experience with the cultivation of fresh fruits to export, except the first mover. They were motivated by the classic capitalist desire of making profits from this new activity. In both cases government actions were of extraordinary importance to make these two areas attractive to newcomers.

Difficulties faced by first movers were in both cases dominantly technical, including the need to learn soil management techniques, and the need to develop new varieties adapted to the region. These obstacles were not insurmountable. In the case of soybeans, two factors helped: the increased international price of the commodity permitted to accept the risks of experimentation, and the support of the Brazilian federal agricultural research agency. In the case of grapes, the first mover was responsible for most of the required adaptations.

As far as it is possible to determine, the first *gauchos* that moved to the *cerrados* succeeded, and the best evidence available is the word-of-mouth that attracted followers to the region. Yet the lack of specific information (e.g. family or farm names) does not permit to confirm this supposition. In the case of grapes, the first mover, Cotia, failed for reasons other than this initiative, but its members reorganized in a smaller cooperative representing the growers of Petrolina – Juazeiro. While it existed, the cooperative did collect the positive results of its efforts in the region through its local members. After its extinction, the new cooperative continued to generate profits and to take advantage of this successful economic experiment.

2.3. The Role of External Actors

Contrary to the experience of the two manufacturing sectors previously examined, external actors had very little importance either in the discoveries or in the diffusion process in the two agricultural sectors.

Nevertheless, there were a few exceptions in the soybeans case. The soybean processing industry played an important role in the 1990s. As this industry consolidated and multinational companies bought a number of local firms, these multinationals were financing more than two-thirds of

soybeans production in the state of Mato Grosso. International trading companies also played a role in the commercialization of Brazilian soy.

2.4. The Role of Public Support Institutions

Once again in contrast with the evidence collected for the two manufacturing cases, the two agricultural cases are examples of very successful interventions by government agencies.

In the soybeans sector, the process started with a vision, shared by various high officials during the military government, of the strategic role of agriculture in the country's development, and the need to expand the agricultural frontier. A natural consequence was to envisage the expansion of soybeans cultivation to the savannahs region of the *cerrados*. Investments aimed at creating a modern agricultural sector, with state-of-the-art technology. First, heavy investments were made in the development of agricultural technology to explore the *cerrados*, and in rural extension services to support diffusion. Incentives were offered to attract settlers and to stimulate production and exports. Furthermore, investments were made in the transportation infrastructure, and the government made available subsidized credit and insurance to growers. Finally, a program for the modernization of agricultural equipment permitted a substantial increase in productivity. These investments led to the emergence of a huge industrial complex associated to the industrialization of soybeans, expanded the supply chain for the whole soybean agricultural and industrial complex, and stimulated the development of a number of related industries.

In the grapes case, the most important government actions included investments in infrastructure, especially in irrigation, and subsidized water cost for an extended period of time. In addition, the government development agency in charge of the project used a very effective strategy to attract and select candidates to participate in the project. The firms selected brought capital and management know-how. One of the firms, identified as the first mover, also brought the technical and marketing know-how necessary to export fresh fruits. The development agency also planned the transfer of know-how from the newcomers to the local farmers, by mixing their lots in the region. Finally, the agency supported and stimulated cooperative efforts among growers.

One aspect that should be pointed out is that in both cases government did not protect weak players in either sector. In the grapes case, firms that did not comply with the norms received penalties or were excluded. In the soybeans case, at a given point in time government support was drastically reduced, with firms having to take responsibility for their own future. This type of government actions permitted to develop two sectors that remained extremely competitive, even after government support was reduced or eliminated.

2.5. Two Models of Diffusion?

Again, in the two cases of agricultural products, we are faced with two models of diffusion, both from the perspective of the types of actors, their specific actions, and the consequences of diffusion.

In the soybeans sector, diffusion occurred mainly thanks to word-of-mouth carried by large personal networks that linked the gauchos in the cerrado to their original settlements in Rio Grande do Sul. This search for a modern Eldorado, as we put it previously, resulted in a continuous migration, in which successive waves of migrants settled in the cerrado, often close to a network of friends and relatives that had already moved to the area. Diffusion was extraordinarily helped by the first settlers, who transferred to the newcomers their successful experiences. Diffusion was also promoted by the Brazilian government, formally using the rural extension services agency. Finally, cooperatives of producers were created to facilitate production and exporting, which also played an important role in diffusion.

The cultivation of grapes in the semi-arid of the São Francisco Valley was a totally different experience. First, as already stressed in previous sections of this report, it attracted already established large and medium-sized firms from the South and Southeast of the country, which brought capital and management know-how. Second, among these firms, one was the first mover, and couldn't have been better selected by the government development agency in charge of the irrigation project in the area. It was the one firm in Brazil at that point that had the capital, the resources, the technical know-how, and the specific export marketing experience that was needed to make the project successful. Third, the development agency was particularly careful in mixing the planted areas that were distributed to local settlers with the larger areas allocated to the firms, in order to facilitate the transfer of know-how, a practice that is considered by experts in agricultural development as a key factor in the success of diffusion. Moreover, the benefits of this successful economic experiment were extended to the local population, which profited from a general improvement in income, education, and social status.

The extent of the *cerrado* experience of diffusion, however, is not comparable to the experience in the semi-arid: it was much broader, involved many more settlers, generated an extraordinary amount of positive spillovers for the country, and definitely changed the face of one of the last agricultural frontiers, from previously sterile, unproductive land into one of the most competitive and technologically-advanced agricultural areas in the world.

On the other side, although the grapes experiment in the semi-arid was extremely successful, economic development was encapsulated in a small area, and did not really change the economic and social landscape of the broader region. The extent of spillovers was also quite limited. This is why we called this model “an island of prosperity” in an environment that remained essentially poor, although other successful experiences existed in the São Francisco Valley, such as the cultivation and exportation of mangos, and the cultivation of grapes for the production of sparkling wine.

Table 24 summarizes this discussion.

Table 24
A Comparison of the Two Experiences: Soybeans vs Grapes

The Soybeans Sector “The New El Dorado”	The Grapes Sector “An Island of Prosperity”
<u>Sector Organization</u> Small and large farms State-of-the-art technology Export oriented	<u>Sector Organization</u> Small and large farms Technology varies substantially in the industry Typically domestically-oriented
<u>Cultural Aspects in the Savannahs</u> Gaúchos migration Informal cooperation among settlers Cooperativism	<u>Cultural Aspects in the Semi-Arid</u> Firms from the Southeast and South Formal cooperation among firms Cooperativism
<u>Diffusion Process</u> No individuals or firms were identified as first movers Government promoted discovery and diffusion Word-of-mouth promoted diffusion Pioneers cooperated for diffusion Diffusion process cannot be tracked Diffusion transformed the region	<u>Diffusion Process</u> Led by a large and competent first mover Pioneer took responsibility for diffusion Government supported diffusion Diffusion process can be clearly tracked Changes were encapsulated.

3. General Conclusions and Lessons Extracted from the Study

This study’s results provided valuable insights that could hardly be obtained if the sectors selected were more similar. Differences help to understand the specificities of each sector, as well as separate what seems to be industry-specific from what seems to be of a more general nature.

3.1. Barriers to Discovery

The examination of the four cases selected for this study suggests that the main barriers to discovery came either from the lack of marketing knowledge or technical knowledge, although technical difficulties seemed to be a much more important barrier in three of the four cases examined.

Three of the cases studied showed technical difficulties coming from the need to adapt to certain conditions in the natural environment: either to learn how to manage pine wood forests in Brazil, or to develop new varieties of plants to fit different soil and humidity conditions in the savannahs or in the semi-arid. In the case of the furniture industry, there was also a need to acquire the technical know-how to produce a high-quality product. These technical barriers were by no means insurmountable, but first movers typically did not have the resources to solve these technical problems, except in the case of grapes.

Marketing challenges only characterized one case, in which the first mover was a small entrepreneurial company and there were no established channels of distribution to export his products.

3.2. Facilitators and Obstacles to the Diffusion Process

The study permitted to identify a number of factors that influenced the diffusion process, either by accelerating or reducing its speed:

- Cultural aspects seem to play an important role in the diffusion process. A more cooperative culture (furniture, grapes, soybeans) seems to facilitate diffusion, in opposition to a more individualist culture (swimwear).
- The presence of flagship firms seems to facilitate diffusion (furniture, grapes). Flagship firms tend to actively promote diffusion among the cluster, the industry, or the region. By contrast, weak flagship firms (swimwear) could be associated to a longer, more complex, or erratic diffusion process.
- Spin-offs seem to facilitate diffusion when parent companies see the spin-off as acceptable or legitimate (furniture), but to generate more “noise” when parent companies see them as negative outcomes (swimwear).
- Social ties between individuals can be a major factor in facilitating the diffusion process (furniture, soybeans). Social ties originate from kinship, intermarriages, vicinity, church, or previous employment relationships.
- Isomorphic strategic behavior (imitation of first movers’ strategies) can be interpreted as the result of a successful diffusion process (furniture, grapes); but it can also be seen as increasing the risk of failure for the cluster or the industry. By contrast, divergent strategic behavior (swimwear) 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.
- Foreign buyers and export agents can play an important role in the diffusion of technical and export marketing know-how (furniture, swimwear), but they typically only play this role in later phases of the diffusion process.
- Research institutes may play an important role in helping to overcome technological challenges, facilitating diffusion (soybeans).
- Channels of communication, formal or informal, have to be established to facilitate the diffusion process. Formal channels of communication included structured joint marketing activities (fashion shows in the swimwear industry), joint export marketing organizations (grapes), other types of producers’ associations, government advertising and publicity, etc. Informal channels included personal networks of friends and relatives, generalized word-of-mouth, and the action of export agents and foreign buyers.

3.3. The Importance of Spillovers and Market Failures

Positive spillovers were identified in all the cases studied. The two types of spillovers referred to in the literature occurred: horizontal (intra-industry) and vertical (in the supply chain). There were also spillovers to other industries. Positive spillovers were more effectively absorbed in those industries in which a higher level of horizontal or vertical cooperation existed among firms. The dominant type of cooperation, however, could be either less formal (furniture, soybeans), or more formal (grapes, soybeans).

Spillovers were very large in the case of soybeans. As detailed in earlier parts of this paper, spillovers included the emergence of a whole industrial complex for the processing of soybeans, the emergence of related industries to which soy was a major input, and the expansion and development of all kinds of firms in the supply chain. The expansion of the soybeans to the savannahs was also responsible for the appearance of a number of cities and towns of various sizes, and industrial districts.

Market failures were an important learning mechanism in at least one of the cases studied. The most outstanding experience came from producers in the Petrolina – Juazeiro region. Their first experience of growing tomatoes failed because of the unexpected competition of imported tomato products, which benefited from the trade liberalization in the early 1990s. The following crop was melon, and this one failed because of a lack of coordination among producers, which caused international prices to fall below cost. Growers learned from these experiences, and this experiential learning showed them that a joint effort was necessary to succeed. This attitude permitted not only to form a very successful export group, but also allowed the establishment of unusual cooperative relationships between firms and local farmers, and firms and local employees. Another example is the end of the colonial-style furniture boom in the domestic market, and its impact on the furniture cluster studied. This change in consumer preferences forced companies to move to pine wood furniture, accelerating the adoption and diffusion of its production and exportation. Also, changes in supply caused by the failure of other world crops in 1968 had an impact in stimulating the move to the *cerrado* region to cultivate and export soybeans.

3.4. Institutional Responses

Institutional actions sometimes anticipated innovators' needs, and other times were a response to the active search of solutions by innovators. Some of these actions were extremely positive, while others had negative effects. We shall first refer to the successful government interventions in the two agricultural sectors; then we will focus the less ambitious but still successful intervention in the furniture sector; and finally we will discuss the less efficient government interventions in the swimwear sector

The expansion of soybeans cultivation to the *cerrado* region is an outstanding example of successful government intervention. In this case, government tended to respond to first movers demands, although certain actions were taken in anticipation, such as the creation of certain incentives to attract settlers to the region. The original settlers were aware of the possibility of

developing new varieties that could adapt to local climatic conditions, and actively put pressure on universities and research institutes that were working on these issues to solve their technical difficulties. The creation of the federal agricultural research agency was to some extent a vision shared by certain high officials, but also responded to the demand for technological solutions. Even before the agency was sufficiently organized to generate its own solutions, it compiled the results of research efforts that had already been made by several other research organizations, and made them available to innovators. It permitted these pioneers to take advantage of already existing knowledge. Later on this agency was responsible for a large number of agricultural developments that helped the sector to increase its productivity and attain superior levels of product quality.

In the case of grapes cultivation, however, the development agency in charge of the irrigation project in the semi-arid region carefully planned its actions in anticipation of newcomers' needs, by developing the irrigation infrastructure and a detailed plan to attract investors from the more developed regions of the country. It also reacted – typically in a fast and effective way – to specific needs of the firms, as the project evolved.

In both cases these interventions were heavy and directed towards: (i) removing the barriers that were faced or could be faced by innovators, in the areas of infrastructure and research and development; (ii) protecting innovators against initial failures; (iii) increasing innovators' payoff; and (iv) stimulating diffusion.

In the case of soybeans, there were no entry barriers, probably because of the very large availability of land in the *cerrado* region. Settlers moved to the region and acquired their land. In the grapes case, because of limitations in the amount of irrigated land available for the specific project, the development agency in charge had certain selection criteria, and chose the firms that would be involved with the specific economic experiment.

In addition, government intervention was not directed towards protecting inefficient firms in the longer term. In both cases government intervention was substantially reduced, permitting these sectors to become fully competitive.

Government intervention in the furniture industry was limited to the later steps of the adoption process. In this case, the federal government acted in conjunction with the industry association to subsidize certain marketing activities, such as design, participation in trade fairs and exhibitions, etc. Although the amounts involved were more limited, the fact that the government did not directly intervene, but used industry representatives to allocate the money among firms guaranteed, to some extent, that these subsidies had a broader reach and were more effectively used, without undesirable consequences, such as the ones now seen in the swimwear industry.

Government actions in the swimwear industry aimed at stimulating micro and small-sized firms to join export consortia. These efforts have had limited success, since the amount presently exported by these consortia is considered insignificant. Moreover, these smaller manufacturers are to large extent copycats that do not have their own design, but copy models and styles developed by successful designer firms to export at lower prices. Their quality is considered below international standards, damaging the image of Brazilian swimwear products abroad. This

is a clear example of how ineffective government actions can: (i) promote early entry, restricting the benefits that can be obtained by legitimate firms; (ii) increase the social cost of intervention, by stimulating copycats (Hausmann and Rodrik, 2003); (iii) threatening the continuity of exports, by damaging the “Made in Brazil” image. It should be noted that the “Made in Brazil” image of swimwear products – a result of decades of fortuitous events and private actions – is the main differentiation factor protecting Brazilian manufacturers against the competition of Chinese products.

4. Public Policy Issues

The literature is full of examples of how government intervention can have positive and negative impact on economic development. Interventions need to be extremely careful in order to produce the desired effects, since often unexpected results confront policymakers’ choices. Part of the reason is that economics is not an exact science – economic agents may react in directions that are unpredictable – and externalities may play a role in shaping future outcomes. Nevertheless, despite certain unpredictability of the outcomes of a given government intervention, learning from other experiences can be a useful way to improve public policies. Specifically, the study of how government actions impacted on high-growth episodes may help positive policy interventions in the future.

Public policymakers can benefit from some of the lessons extracted from the study of these four cases of success. We believe that the lessons learned are not limited to the cases studied, and that they can be useful to policymakers in other emerging countries. Yet caution is necessary in using these results; each situation needs to be carefully studied before applying any mechanisms of public intervention.

The following discussion will look specifically at four issues: (i) attraction and selection of firms; (ii) type of support; (iii) penalties to failure; (iv) length of intervention. Practical considerations are also emphasized.

Attraction and Selection of Firms

One of the most important issues in government interventions aimed at nurturing a sector seems to be the ability to attract and support the “right” kind of firms. The evidence available from this project suggests that this might be one of the most relevant issues to be previously dealt with in an economic development project.

The selection process can be more difficult when all firms are very small, and there are no indications of which firms (or individual entrepreneurs) are better prospects for government intervention. In this case, the only solution seems to be to make resources available to all firms (or individual entrepreneurs) in a sector, and carefully monitor the use of these resources, by establishing intermediary goals that have to be achieved in terms of results. The emergence of leading firms also should be carefully monitored, to take advantage of their potential as leaders of the specific business community. It should be noted that innovating firms do not always become flagship firms, since the latter have to show the ability to lead other firms or

entrepreneurs into the specific business adventure, and facilitate the diffusion of the economic experiment.

Another situation can be when there are no firms or entrepreneurs already engaged in the specific sector or project, and it is necessary to attract them. In this case, development agencies should have strict criteria for the profile of flagship firms – firms that could lead the development project⁴⁶. This means that the main difficulties to be faced by the newcomers should be previously identified by development agencies. The selection of firms should then include those that bring with them the technical or marketing know-how that could be helpful in overcoming the specific initial barriers to the “discovery”. The case of grapes cultivation in the semi-arid of Brazil clearly shows the importance of these preconditions in the success of the project.

When the discovery and the diffusion process is already underway, a question is whether the government should or should not interfere to support further diffusion. If the government chooses for one reason or another to interfere, it seems that a wise decision is to delegate the selection of beneficiaries of public support to the industry. This was successfully done in the case of the furniture industry, where the industry association became the sole entry to submit applications to the government export promotion program. By doing this government agencies avoid the danger of selecting copycats or inefficient firms, as well as of reducing the payoffs to innovators (Hausmann and Rodrik, 2003). One word of caution: it is necessary that the association or organization chosen to be the channel for incumbent firms to apply to government funds represents the relevant segments of the industry.

Another solution when the discoveries and the diffusion process are underway is to support those firms that are already successful. In this case the selection process is easy, and firms are rewarded for their earlier accomplishments with further support. In the swimwear case, support to laggards – typically smaller, inefficient firms – may threaten previous industry accomplishments in international markets.

It is often the case that government agencies do not have people with the training and experience necessary to make effective firm selection of the kind suggested here. There are however consulting firms in the private sector that are experienced in understanding the specific business capabilities required for business success in a new project, and could identify targeted prospects to receive government incentives or subsidies. More cooperation between government agencies and these consulting firms could thus lead to better selection processes.

Type of Support

The type of support to be offered by government agencies varies according to the stage in the discovery and diffusion process. Government intervention in the cases examined typically aimed at:

⁴⁶ We extend here the use of the term flagship firm to the situation of a development project. We believe that geographical clustering helps the emergence of flagship firms, but it is not impossible to have them when this condition is not present.

- removing entry barriers;
- protecting innovators against initial failures;
- increasing innovators' payoff;
- stimulating communication and the transfer of know-how;
- subsidizing international marketing activities;
- stimulating laggards

When investing in a new project, government intervention should be directed towards removing relevant entry barriers to innovating firms. This was successfully done in the two agricultural cases examined, as government invested in infrastructure and R&D to permit the development of new agricultural areas in the cerrados and in the semi-arid region of Brazil. Additional incentives could be directed to protect innovators against initial failures and increasing their payoff.

A much more difficult task for public policymakers is related to mechanisms to stimulate the right kind of diffusion of a new economic experiment, in which innovating firms are already engaged. The dangers of inefficient and even predatory intervention are huge. One way of dealing with the problem is by delegating to the industry itself the implementation of diffusion mechanisms, guaranteeing transparency and fairness, and controlling results.

This support should be directed to those areas in which more difficulties are faced by incumbent firms, either technical or marketing difficulties. In both manufacturing cases at this point, it seems that marketing difficulties are more important obstacles to further export development than technical difficulties.

Technical support could be given by investing in the upgrading of existing technical schools, or creating new ones. In the manufacturing sector, issues such as design and packaging are extremely important for successful exporting. Testing laboratories could also be needed and could be developed as a joint effort of leading firms in the industry. These types of incentives tend to have a broad long-term impact on the industry and have the advantage of not protecting inefficient firms.

Marketing support for export activities could come under the form of marketing research, warehousing, and showroom facilities in foreign markets, marketing campaigns, organization of trade fairs, etc. It is advisable that foreign marketing research agencies are hired to develop the specific studies, under the general coordination of a Brazilian team composed by industry members and marketing experts. Government could also finance joint warehousing, commercial, and showroom facilities in a few key international locations (such as Miami, New York, Los Angeles, London etc.), that could be leased, rented, or simply used by exporters. Again, these types of incentives do help to remove serious obstacles faced by exporters, but they have the advantage of supporting firms that are more capable.

Another issue is whether government interventions aimed at expanding the scope of the diffusion process should be directed towards late movers, or laggards, by subsidizing their earlier efforts. Our research points out to a negative answer to this question. Yet since this is based in one industry case, it is clear that further research is necessary to support our contention.

Penalties to Failure and Length of Intervention

A very interesting policy that has not been frequently used by the Brazilian government refers to penalties to those firms that receive public support and fail to achieve the previously established goals. This type of discipline was historically used in South Korea and produced in general good results. In one of the cases examined, penalties were applied to failing firms, and this is believed to have generated a stronger group of firms leading the recent growth of table grapes exportation.

In the soybeans sector, market discipline was imposed by the early 1990s economic liberalization, which substantially reduced government intervention, thus permitting the final consolidation of a very healthy and competitive agricultural and industrial complex. These research findings support Hausmann and Rodrik's (2003) contention that the lack of discipline is behind the limited success of many government interventions in Latin America.

A final issue has to do with the negative impact of the State on the competitiveness of Brazilian firms. Among those, managers interviewed pointed out to exchange rate policies, high level of taxation, bureaucratic impediments, lack of transportation infrastructure, bottlenecks in ports and airports services, and incompetence and bureaucracy in customs. In fact, many managers agreed that the productive sector would strongly benefit if policymakers draw their attention to the removal of these obstacles to the expansion of export activities, rather than to further government interference.

APPENDIX 1 – EXPERTS AND ENTREPRENEURS INTERVIEWED:

Agribusiness Sector

Alberto Galvão
Valexport
Interview Date: October, 4th, 2006

Alysson Paolinelli
Former Ministry of Agriculture
Interview Date: July 25th, 2006

Amélio Dall’Agnol
EMBRAPA
Interview Date: October 5th, 2006

Andreas Troncoso Vilas
Former EMBRAPA employee. Independent consultant
Interview Date: July 5th, 2006

Avoni Santos
Superintendent of the Juazeiro’s
Agricultural Cooperative and President of
the Brazilian Grape Marketing Association
(BGMA)
Interview Date: December, 8th, 2006

Carlos Eduardo Lazarini da Fonseca
EMBRAPA’s Research and Development
Superintendent
Interview Date: July 3rd, 2006

Clemente Ribeiro dos Santos
Valexport
Interview Date: August 3rd, 2006

Edilson Pepino Fragalle
EMBRAPA’s Public Relations Chief
Interview Date: June 6th, 2006

Eduardo Sarmento
EMBRAPA
Interview Date: June 22nd, 2006

Eliseu Alves
EMBRAPA’s former President and
CODEVASF’s former Director
Interview Date: July 4th, 2006

Evandro Chartuni Mantovani
EMBRAPA’s Strategy and Management
Superintendence Chief
Interview Date: July 4th, 2006

Flavio Ávila
EMBRAPA’s Impact Assessment
Officer
Interview Date: July 4th, 2006

Gilberto Cunha
EMBRAPA Wheat’s Chief Executive
Interview Date: December 18th, 2006

Goethe Coelho
Soybean Producer
Interview Date: September 15th, 2006

José Ramalho
Ministry of Agriculture Officer
Interview Date: July 5th, 2006

José Roberto Rodrigues Peres
EMBRAPA’s Technology Transfer Division
Chief
Interview Date: July 3rd, 2006

Marcos Jank
ICONE
Interview Date: October 6th, 2006

Maria Cristina
EMBRAPA’s Technology Transfer Division
Journalist
Interview Date: June 9th, 2006

Mário Jales
ICONE
Interview Date: July 24th, 2006

Mauro Lopes
FINAME's Expert, BNDES
Interview Date: December, 11th, 2006

Nelson Costa
Nova Fronteiras's Director
Interview Date: October 6th, 2006

Octávio Damiani
Independent Consultant
Interview Date: July 21st, 2006

Swimwear Industry

Alexandre Manetti
Rosa Chá Europe
Interview Date: July 6th, 2006

Antonio Celso de Souza e Silva
Bumbum's Consultant
Interview Date: December 12th, 2006

Antônio De Biasi
Salina's Owner
Interview Date: July 6th, 2006

Carlos Queiroz
Rosset's Private Label Export Manager
Interview Date: July 4th, 2006

Cidinho
Bumbum's Owner
Interview Date: December 12th, 2006

Cora Cristina
Poko Pano's Sales and Export
Representative
Interview Date: July 7th, 2006

Pedro Gama
EMBRAPA
Interview Date: September 27th, 2006

Pedro Sá
Fruit Trader in Petrolina-Juazeiro region
Interview Date: July 12th, 2006

Sérgio Bortoloso
Soybean Producer
Interview Date: September 8th, 2006

Vânia Castiglioni
EMBRAPA - SOYBEAN's Chief Executive
Interview Date: July 10th, 2006

David Azulay
Blue Man's Owner
Interview Date: July 27th, 2006

Diogo Maraccini
Maraccini's Owner and Blue Beach's
International Sales Representative
Interview Date: July 5th, 2006

Gláucia Marchese
Choice's Private Label Agent
Interview Date: July 5th, 2006

Marcelo Soriano
Submarine's Owner
Interview Date: July 4th, 2006

Marcilene
Feriado Nacional
Interview Date: June 21st, 2006

Mariana Kulberg
Praia Brasil Clothes (Águia Group) Export
Manager
Interview Date: July 12th, 2006

Maria Tereza de Queiroz
CIA. Marítima's International Brand
Manager
Interview Date: July 4th, 2006

Rosana Lara
Salina's Export Manager
Interview Date: September, 26th 2006

Samuel Belfer
TDB's Export Manager
Interview Date: July 4th, 2006

Vivian Costa
Bumbum's Marketing Manager
Interview Date: December 12th, 2006

Wood Furniture Sector

Miguel Sanchez Junior
ABIMÓVEL – Brazilian Furniture Industry
Association
Executive Superintendent
Interviews Dates: July 18th and October 10th,
2006

Álvaro Weiss
INDÚSTRIAS ARTEFAMA S/A
Chief Executive Officer and Regional Vice-
President of ABIMÓVEL – São Bento do
Sul
Interview Date: July 31st, 2006

Célia Regina Kemper
SINDUSMOBIL – Syndicate of the Furniture
Industry of São Bento do Sul
Executive Secretary
Interview Date: July 31st, 2006

Adelino Denk
AMC Assessoria Empresarial
Independent Consultant (Industry's Expert)
Interview Date: August 1st, 2006

Ana Carolina Zipperer
INDÚSTRIAS ZIPPERER S/A
Manager and one of the Owners (former
CEO's daughter)
Interview Date: August 1st, 2006

Andreia Myszka
INDÚSTRIAS ZIPPERER S/A
Trader – Commercial Department
Interview Date: August 1st, 2006

Joelma Lucia da Silva
MÓVEIS RUDNICK S.A.
Trader – Export Department
Interview Date: August 2nd, 2006

Nícia Terezinha Zschoerper
INDÚSTRIAS ZIPPERER S/A
Former CEO and founder's daughter
Interview Date: September 28th, 2006

Oswaldo Zipperer
ZIPPERER COMERCIAL
EXPORTADORA LTDA
Founder and present Financial Director
Interview Date: October 10th, 2006

Ronaldo Duschenes
FLEXIV
Flexiv's Founder and CEO and VP of FIEP
– Industries' Federation of the Estate of
Paraná
Interview Date: October 13th, 2006

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