MICROECONOMICS OF COMPETITIVENESS: FIRMS, CLUSTERS AND ECONOMIC DEVELOPMENT

Leather Footwear in Brazil

The Rio Grande do Sul's Cluster

Vinicius Licks

Sílvio Holanda

Leonie Zapata

Adam Pines

05/04/2012

This report has been submitted to Prof. Michael Porter in partial fulfillment of the requirements for the following course: 'Microeconomics of Competitiveness: Firms, Clusters and Economic Development'.

Disclosure: Vinicius Licks and Sílvio Holanda are Brazilian nationals.

Country Overview

Brazil has 26 states and one Federal District. It has been a stable democracy since 1985, overcoming 20 years of military dictatorship. Today it is the fifth largest country in the world in terms of area – occupying 42% of the South American continental landmass. With a nominal GDP of US $1.58 trillion, it is the world's sixth largest economy and is the sixth most populace. In 2010, the Brazilian economy grew at 7.5%

Nearly 40% of its 198 million inhabitants were under the age of 21. The country has improved on some socioeconomic indicators in the past two decades, but Brazil still has an uneven distribution of wealth.

History

Brazil is a former Portuguese colony that gained its independence in 1822.It has long been an exporter state providing raw materials sold commercially around the world. Its population - mixed indigenous and immigrant – has seen huge flux in immigration over the years from Africa, Europe and different parts of Asia/the Middle East. Brazilians are known for maintaining strong relations with the communities from which they and their ancestors emigrated, a characteristic which strongly supported their role in global commerce and trade. Historically, Brazil was an important commodity exporter whose economy had been closely linked to the international cycles of economic activity. Brazil has abundant natural endowments: Exports of wood, sugar, rubber and coffee made it a principle player in the international economy as early as the sixteenth century and played a major role in the industrialization of many of its large cities. The reliance on the commodity exports also made the national economy subject to the financial booms and busts of the rest of the world.

Political Landscape

The political system has gone a long way since the decades of dictatorship which ruled from 1964 to 1985. Following the rule of Luiz Inácio Lula da Silva (Lula), and the recent election of Dilma Rousseff, Brazil's world ranking for rule of law has seen significant rise.

Endowments

Brazil's natural endowments have historically been a driving factor in its global role, and today the economy rests on the foundations of a commerce driven nation. Brazil has over 4,650 miles

of coastline, over 600,000 sq km of arable land, 14% of the world's renewable fresh water, abundant timber forests and a temperate year-round climate. They have vast biodiversity, several of the world wonders, the largest waterfall in the world (Iguacu) and two of the largest natural harbors. In terms of mineral resources, it has abundant natural deposits of quartz, diamonds, chromium, iron ore, phosphates, petroleum, mica, graphite, titanium, copper, gold, oil, bauxite, zinc, tin, and mercury. Finally, the national composition of the Brazilian people could itself be seen as an endowment - an immigrant nation with rich history of international commerce and connections to other countries, Brazilians are well suited and connected for trade and global relations.

Brazil Economic Performance

The government's efforts to open trade with China and other South American partners aided the rapid increase in the demand for Brazilian commodities. In dollar terms, Brazil's exports of goods went from $73 billion in 2003 to $210 billion in 2010, a CAGR of 16% per annum. China also became Brazil's main trading partner in 2009 and the main buyer of Brazilian iron ore, soy, and tobacco. Moreover, in 2011, China became the largest source of FDI to Brazil. Chinese demand for commodities changed Brazil's export profile. Iron ore, petroleum, soy, sugar, and poultry became the largest exports, reducing the significance of airplanes, automobiles, and electronics. Despite the sustained improvement in Brazil's external profile, some feared that the boom in commodity exports could lead to the so-called "Dutch disease," or an appreciation of nominal and real exchange rates to the point where commodities displace manufactured exports and hurt industries outside of the natural resources sectors.

Today, Brazil it leveraging its abundant natural resources and sophisticated human capital and economic policies to compete in the world markets. Brazilian GDP for 2011 was $2.5T and it is the world's 6th largest economy with GDP per capita (PPP) at $10,800 – a dramatic rise in the last decade which began at ~ $7,500. The main components of the Brazilian economy are Agriculture (6% of GDP), with such products as-soybeans, coffee, sugarcane, cocoa, rice, livestock, corn, oranges, cotton, wheat, and tobacco. Industry (27% of GDP): representing- steel, commercial aircraft, chemicals, petrochemicals, footwear, machinery, motors, vehicles, auto parts, consumer durables, cement, and lumber. Services (67% of GDP): representing- mail, telecommunications, banking, energy, commerce, and computing.

Brazil currently holds a $20B trade surplus, stemming from a $202B in yearly exports (2011) and $182B imports (2011). Its major trading partners are China, USA and Argentina.

Brazilian Clusters

The Brazilian export clusters have long been led by the country's natural endowments.

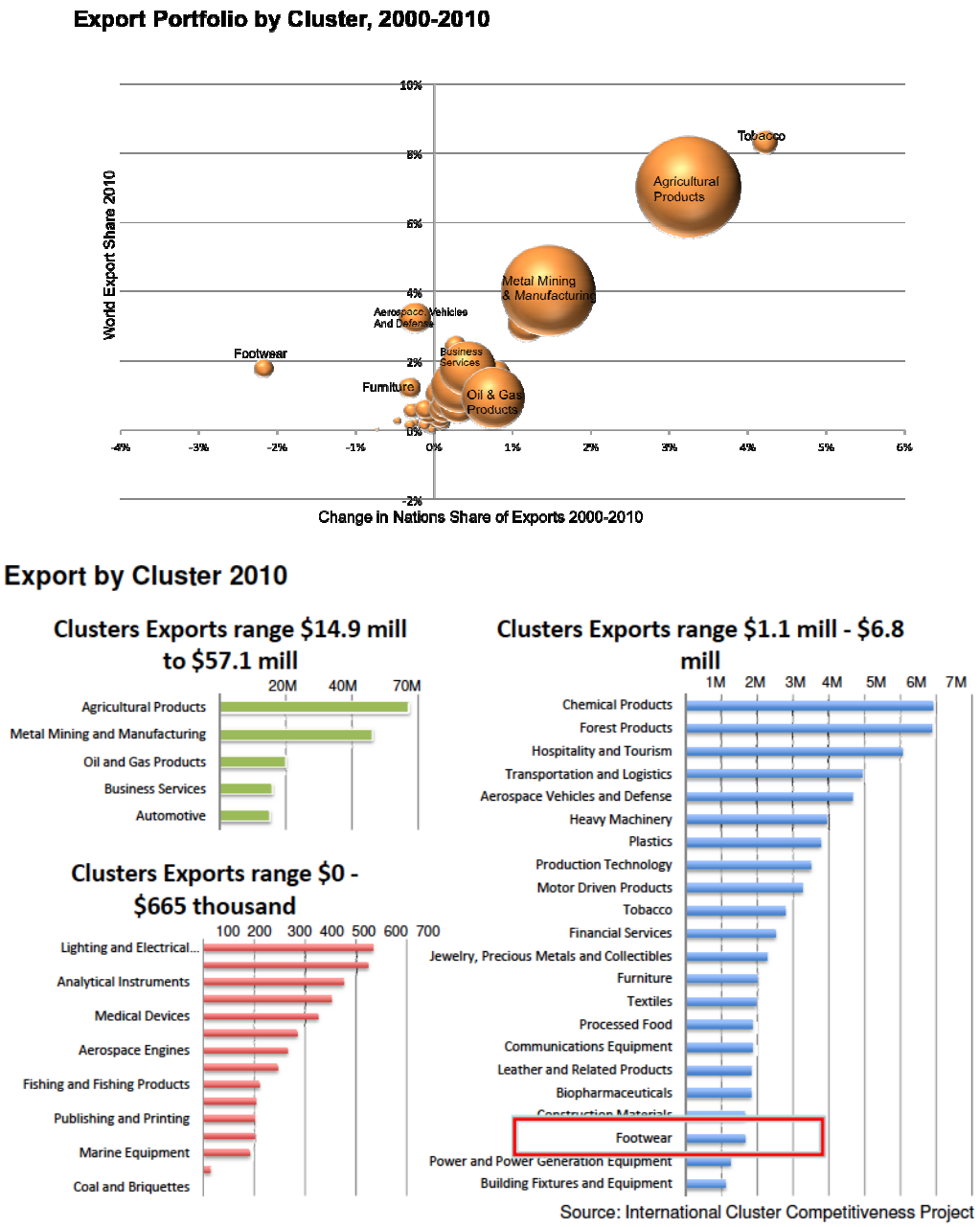


Figure 1: Brazil's exports portfolio arranged by cluster.

Investments in Competitiveness

R&D:With new growth of income, Brazil is investing significantly in Research and Development, 0.9% of GDP in 2011. Such investments far outpace regional competitors such as Mexico, Colombia and Argentina which at most match half of Brazil's proportional investment. Core R&D investments target Science and Technology focus on biofuels agricultural research, deep-sea oil ,production, and remote sensing. Further, Brazil has world class Universities - the only nation in South America whose universities are ranked globally between 101-151.

However, despite these initiatives Brazil has been unsuccessful in translating their investment in research to results. The country still has a low availability of scientists and engineers and has taken very few measures to protect intellectual property. As a result, Brazil's rate of patent registration has been declining over the past ten years, losing ground to Mexico. Additionally, the population ranks on average with the region as to the knowledge Economy index (60, whereas Mexico ranks highest at 72, and Chile lowest at 40).

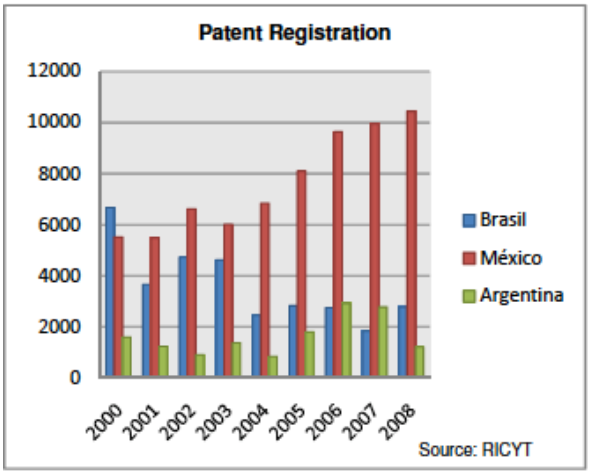


Figure 2: Patent registrations.

National Infrastructure: While the country experiences rapid economic growth and sees significant increases in levels of FDI,its growth is still hampered by poor physical infrastructure and deficiencies in road, ports and airports. One of the glaring criticisms of Brazilian competitiveness has been the level of its infrastructure – a major bottleneck for growth and development. Yet with major world events such as the FIFA World Cup in 2014 and the Summer Olympics in 2016, Brazil is committing nearly $1 Trillion to increase and improve upon roads,

railways, stadiums, hotels and airports, an effort that has sparked considerable interest and attention from international firms contemplating investment.

	BRAZIL	INDIA	CHINA	MEXICO
Quality of port infrastructure	72	53	39	45
Quality of air transport infrastructure	72	46	49	43

Social Improvement Initiatives

The Brazilian government has taken dramatic steps in recent years to reduce the poverty rate. While this has led to a rise of over 40million Brazilians moving into the middle class, little has been done to improve the quality of skills which this population possesses. Education initiatives still lag behind other nations and national productivity remains low compared to other BRIC nations. Even with the successful improvements in lowering poverty, Brazil still has high inequalities and disparities in income

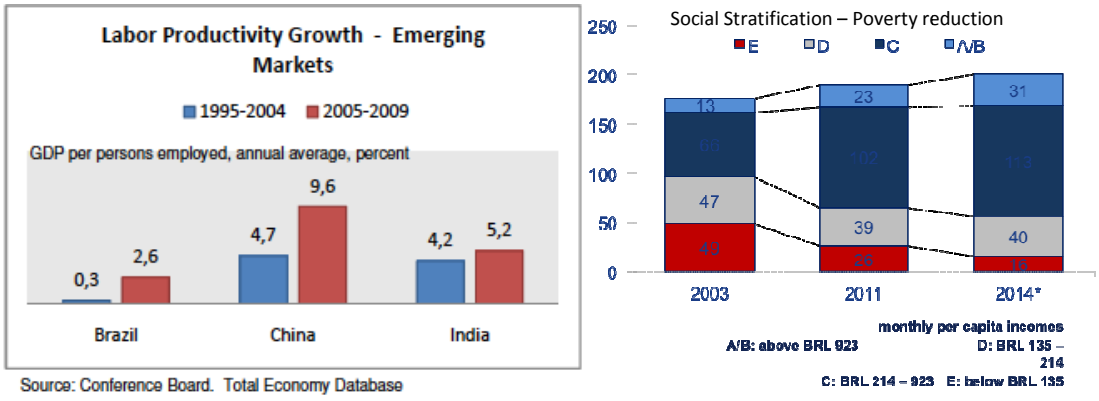


Figure 3: Labor productivity and population composition according to income.

The Government's policies at macroeconomic and financial stability have led to seemingly sustainable economic growth and targeted social policies have all contributed to poverty reduction more equitable wealth distribution. These efforts have led to an increase in middle class spending power.

Education remains a large problem which the Brazilian government has failed to tackle fully. Student enrollment in primary and secondary education has risen, but the level of math and science in schools is deficient. Further, the availability of scientists and engineers lags behind

and tertiary enrolment is not at OECD levels as well as investment in education. In a competitiveness ranking, the quality of Brazil's educational system and quality of math and science education paled in comparison to regional and global emerging economic powerhouses.

	BRAZIL	INDIA	CHINA	MEXICO
Quality of the educational system	63	24	37	57
Quality of math and science education	64	18	20	62

Offsetting these grim indicators are data on the county's superior communications infrastructure and as such the opportunity for access to information beyond what is publically provided.

	BRAZIL	INDIA	CHINA	MEXICO
Communications infrastructure	44	68	49	54
Quality of telephone infrastructure	39	45	47	44
Mobile telephone subscribers per 100 population	54	70	68	62
Personal computers per 100 population	37	66	61	40
Internet users per 100 population	42	71	50	57

Brazil has increased the investment in education to improve access and equity, it is now time to invest in the quality of education and training provided. Through FUNDEF program, Brazil increased primary and secondaryenrollment between1998 and 2000. But poor quality of the education system is still one of the main weaknesses. Currently, since less than half of the working-age population has secondary education and only 10% attain a tertiary degree the country has a low rate of scientists and engineers and needs to recruit foreign talent to sustain its productivity in technology, science and other similar sectors. Nevertheless, the country has improved access and equity in all levels.

On the other hand, labor productivity remains low. Rigid labor structure and an inefficient education system contribute significantly to this deficiency. The manufacturing industry still has not developed home grown higher value added production.

National Competitiveness

The foundations of Brazil's national productivity lay in its macro and microeconomic competitiveness. Its microeconomic competitive rankings show Brazil improving in recent years in terms of the National Business Environment (37) and Company Operations and Strategy (26). Macroeconomic indicators for competitiveness also reflect improved national performance in terms of Social Infrastructure and Political Institutions (48) and Macroeconomic Policy (31). Brazil has substantially improved this latter indicator from 57 in 2001 to 31 in 2011. After a period of hyperinflation at the end of the 1990's, the country managed to stabilize the macroeconomic environment by establishing a flexible exchange rate and rules based fiscal management. A floating exchange rate, inflation targeting and primary fiscal surpluses have been the three pillars of the macroeconomic framework.

Brazil has introduced structural reforms to liberalize the country's trade and investment regimes. These have improved the country's competitive advantage and raised their standing in terms of Company Operations and Strategy (26), Strategy and Operational Effectiveness (28), Organizational Practices (26), and Internationalization of Firms (24).

Since 1994, after the Real Plan, the government has promoted policies that improved investments, exports and production. Brazil has successfully attracted foreign firms to invest in the country as well as local firms have managed to increase outward FDI.

Brazilian Factor Conditions rank 54 in competitiveness bolstered by a sophisticated financial and equity market and an increased access to capital by the local population. The country boasts a relatively good communication infrastructure and its investment in research and development in areas such as renewable energy and auto industry render them a global leader. More importantly, they are self-sufficient in terms of energy supply and processing.

Brazil ranks 54 in Context for Strategy and Rivalry predominately due to it being 10th largest recipient of FDI in the world 2010 with over 30 Billion in new inbound FDI projects (areas of

investment include soybean mills, communications, crude petrol and gas amongst others) and the technology transfer which results from FDI.

However, taxes bare a negative effect on incentives to work and invest in Brazil and tariff rates and trade barriers are a negative impact in some sectors. The rigidity of employment limits business growth, and the low protection of intellectual property hampers the effects of the substantial R&D investments.

Further, Brazilian government regulations and custom procedures significantly hamper the development of businesses, the chances for success of local businesses and their ability to compete on the global market. The figures below reflect the challenges local and incoming businesses face in seeking government assistance or merely in navigating Brazilian bureaucracy.

	BRAZIL	INDIA	CHINA	MEXICO
Administrative infrastructure	71	62	40	36
(Low) Burden of government regulation	72	46	12	41
(Low) Number of procedures required to start a business	72	64	67	40
(Low) Time required to start a business	72	50	57	23

One of the glaring opportunities for the Brazilian government to begin improving local conditions started with lowering import taxes on capital goods in order to increase the attractiveness of new investments in productivity.

To meet these setbacks we suggest the government simplify and lower income and business taxes, reduce export taxes, reduce interest rates and increase availability of capital to finance investments in productivity. Finally, the government should take steps to reduce labor regulation rigidity and cost of hiring / firing.

For Supporting and Related Industries and Clusters Brazil ranks 24 in competitiveness driven largely by the degree of economic diversification and collaboration across the different clusters.

Political stability and systemic implementation of public policy has allowed clusters to develop together with a local supply of quality products, though it is hampered in that businesses do not use latest technology in production process. The situation would be significantly aided by government efforts in promoting the creation of IFC's at emerging clusters and establishing quality certification agencies.

For economic Demand Conditions, Brazil is ranked 32, due to the high safety and environmental standards which meet international standards and the Government's role in technology procurement and ensuring market sophistication. However, ICT promotion is still an area where Brazil lags behind other nations. The key issue to be solved is to bolster the low innovation in the economy (R & D) and one possible avenue would be the careful increase in availability of credit for consumption and an introduction of positive credit scoring regulation so as to generate greater internal demand for Brazilian technologies without further raising the risks of credit defaults.

The Real appreciated significantly against the dollar and workers' wages are increasing. Inflation, although lower than expected, was 5.85% from February 2011-2012. The average for 2011 was 6.63%. In The GCI index Brazil rated 51 in Inflation indicator. Low unemployment (6.4%), wages increases and the real appreciating against the dollar, pressures the economy.

Political Stability

In Latin America, corruption and lack of respect for institutions and laws are major causes that influence low national competitiveness. Brazil has managed to improve, slightly, corruption indicators and government effectiveness, compared to five years ago.

Successes

While FDI inflows to Brazil continue to spike - $65B in 2011 as compared with $5B in 1995, most of these funds target the large commodity driven private sector in Brazils with large global firms such as Petrobras, AmBev, Telemar and Vale.While it is uncertain how quickly government policies will create new jobs and bolster the economy on the lower levels, it is clear is that the government's policies have bolstered the financial performance of these large firms. Over the last five to six years the largest Brazilian firms have seen either positive change or consistent stock prices and their market capitalizations continue to grow.

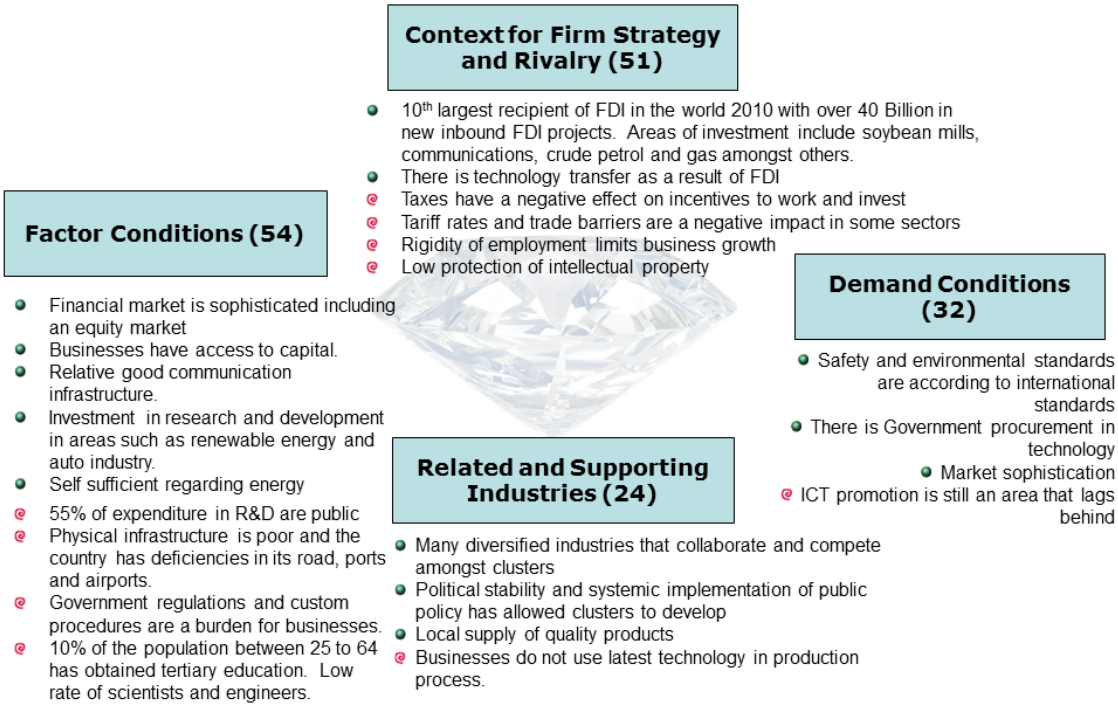


Figure 4: Brazil's national diamond.

World Footwear Industry

Since the 1970s, the developed countries reduced their participation in the footwear production and exports. As a result, developing countries were able to step in and grow in this market mainly due to its lower costs in labor.

The developed countries concentrated on higher aggregate value activities, like creation, design and marketing. Italy and Spain still have significant footwear production, but their strategy has been to shift production to lower costs countries, keeping design and finishing at home.

Since the 1980s, the participation of Asian countries in the footwear industry increased considerably. China and India became major producers and Asia was responsible for 87% of world footwear production in 2010. China is by far the leader producer, being responsible for more than 12.5 billion pairs or 62% of total pairs, followed by India (10.2%). Outside Asia, Brazil is the most important producer, being responsible for 4.4% of world production. (World Footwear Yearbook 2011)

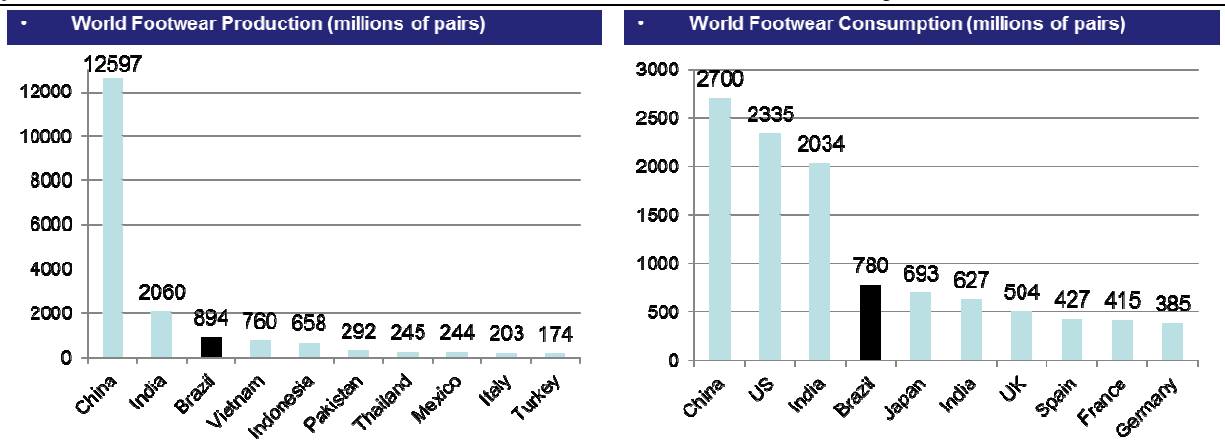


Figure 5: World footwear production and consumption. Source: World Footwear Yearbook (2011).

In the consumption side, the concentration is less pronounced with China, again, as the leader and responsible for 15.2% of world consumption (in pairs), followed by the United States (13.4%) and India (11.7%).

In the last 10 years, world footwear exports increased by 79% in quantity and 108% in value, reaching an all-time high of US$ 85 billion in 2010. On average, there was an annual increase of 6% per year in quantity and 7.6% increase in value. This higher rate of growth in value reflects the increase in the average price of exports experienced in the period. However, this increase was not constant, being very pronounced from 2006 until 2008, followed by significant decreases in 2009 and 2010. Overall, prices increased by 16.4% in the last 10 years.

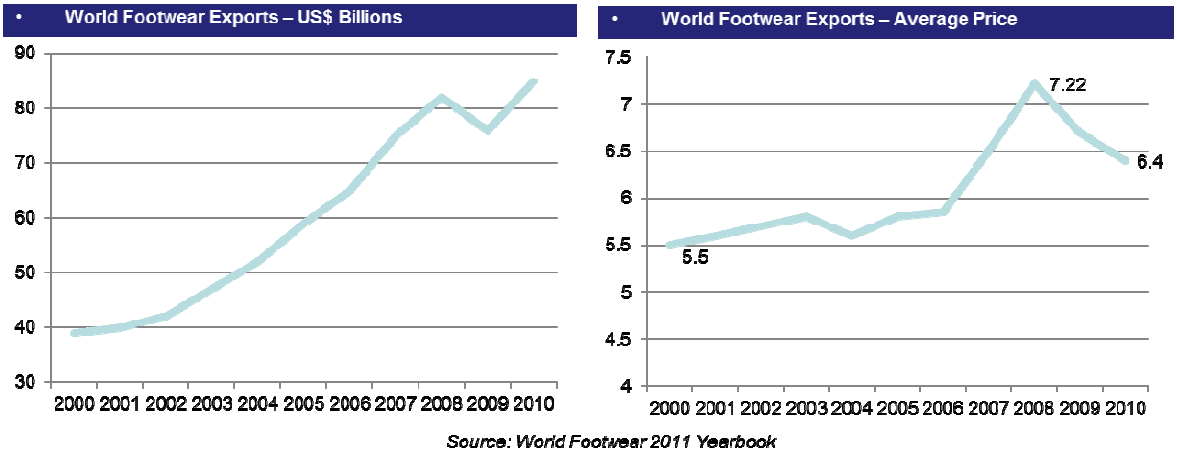


Figure 6: World footwear exports. Source: World Footwear Yearbook (2011).

The composition of exports also changed in the last decade, with an increase in the share of Rubber and Plastic category and a significant decrease in the Leather shoes exports. In 2010, Rubber and Plastic shoes were 54% of total volume exported, up from 43%. Leather shoes, on

the other hand, represented only 17%, down from 30% in 2000. The Other category, which includes Sports shoes, remained fairly stable with a share of 29%. However, it is interesting to note that, even though its exports were reduced significantly, the Leather shoes were still responsible for more than 52% of the value of exports, showing the much higher value of those when compared to the other categories of shoes.

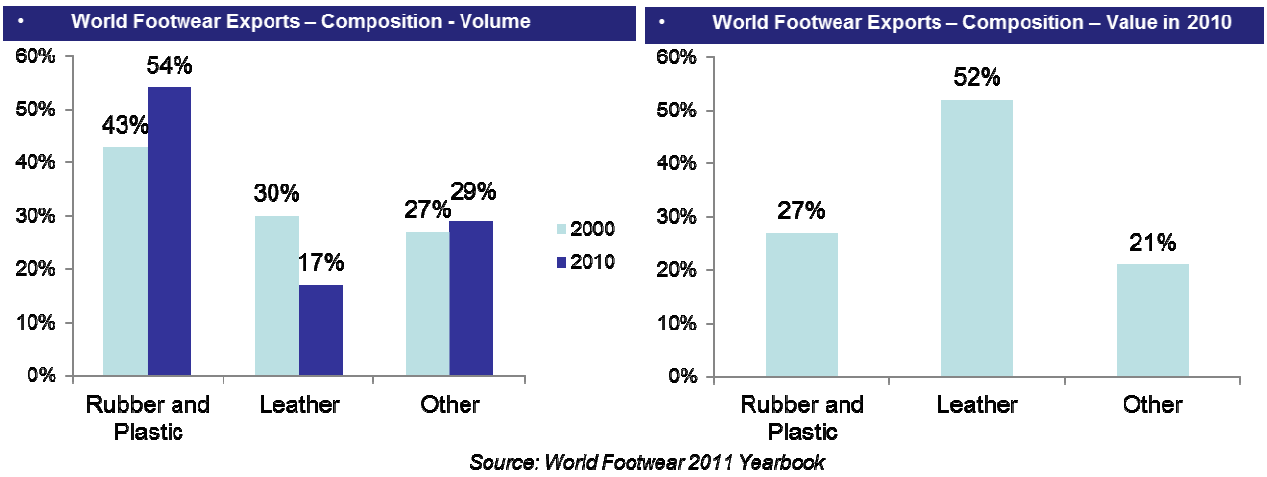


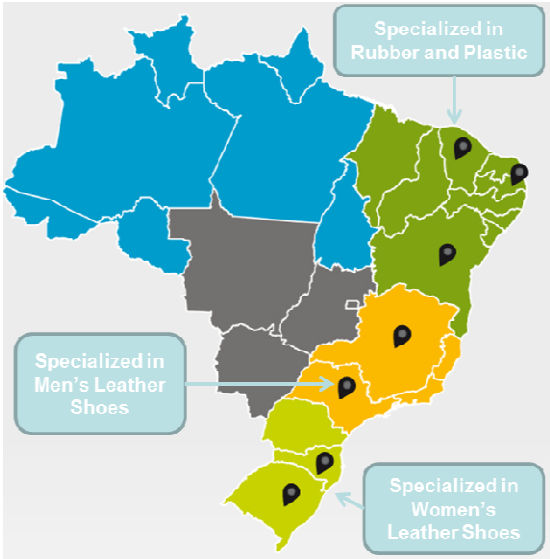
Figure 7: Composition of world footwear exports. Source: World Footwear Yearbook (2011).

This difference in prices also explains why Europe, even though produces far less shoes, still are responsible for 38% in the value of footwear exported, while Asia, that produces more than 85% of world shoes, collects around 56% of the value. This is explained by the fact that European countries have focused on a different mix of products exported, more concentrated in leather shoes that are more expensive than the Rubber and Plastic shoes that is the bulk of Asian production. As a result, the average price of Asian exports remained around US$ 4 while the European exports increased in the last decade to US$ 23. (World Footwear Yearbook 2011)

Overview of the Footwear industry in Brazil

Footwearproduction in Brazil is divided in 3 main regions, each with different characteristics and structures. In 2010, the largest producer of shoes and largest exporter in quantity was the Northeast Region, which includes the producing states of Ceara, Bahia and Paraiba. They were responsible for 45% of production and 71% of exports. However, the industries in this region were specialized in the Rubber and Plastic segment which commands lower export prices, on

average US$ 5.82, yielding only 40% of the total value of Brazilian footwear exports. (ABICALCADOS 2010)



Northeast Region		%
Production (million pairs)	399.2	45%
Export (million pairs)	102.1	71%
Export (million USD)	595	40%
Jobs (thousand)	125.6	36%
Companies	627	8%

Southeast Region		%
Production - pairs (million)	188.5	21%
Export (million pairs)	8.7	6%
Export (million USD)	152.2	10%
Jobs (thousand)	89.7	26%
Companies	4000	48%

South Region		%
Production - pairs (million)	302	34%
Export (million pairs)	31.6	22%
Export (million USD)	732.7	49%
Jobs (thousand)	129.7	37%
Companies	3400	41%

Figure 8: Geographical distribution of footwear clusters in Brazil. Source: Abicalçados (2011)

On the other hand, the Southeast region, and its main producer states of Sao Paulo and Minas Gerais, specialized on the production of men's Leather shoes. This market commands a higher price, making the average export price to surpass US$ 17 in 2010. However, the production of this region is much more domestically focused, with less than 5% of its production being exported.

Finally, the South region, mainly as a result of the production of the state of Rio Grande do Sul, is responsible for 34% of the Brazilian footwear production and for almost half (49%) of its export value. The main reason is the fact that the region is specialized in women's Leather footwear that yields even higher prices, on average US$ 23 in 2010.

Another distinctive difference among the main producing regions is the fact that the industries established in the Northeast region were much larger in size, employing on average 200 people per company, while in the South and Southeast regions the industry is organized around a much

larger number of companies of smaller sizes employing on average, 38 and 22 people respectively.

In the last decade, total footwear production increased at an average of 4.3% per year, a slower pace when compared to world production. In addition to that, this increase did not happen at a constant pace. After a sharp increase in 2003 – mainly due to recovery after a 2002 economic crisis - production was slowly declining until 2009. In 2010, production rebounded, increasing by almost 10%. Exports, on the other hand, even after an increase of 12.6% in 2010, showed an average decline of 2% a year in the last 10 years and represents less than 16% of total production. However, in the last 5 years, exports to France and Italy, two of the most sophisticated markets, have increased 179% and 154%, respectively. This may suggest that local producers may be focusing on the domestic market and higher-end external markets.

Imports showed a significant increase in the period – an average of 18.7% per year – but they still represent less than 4% of total production, accounting for a supply of 29 million pairs.

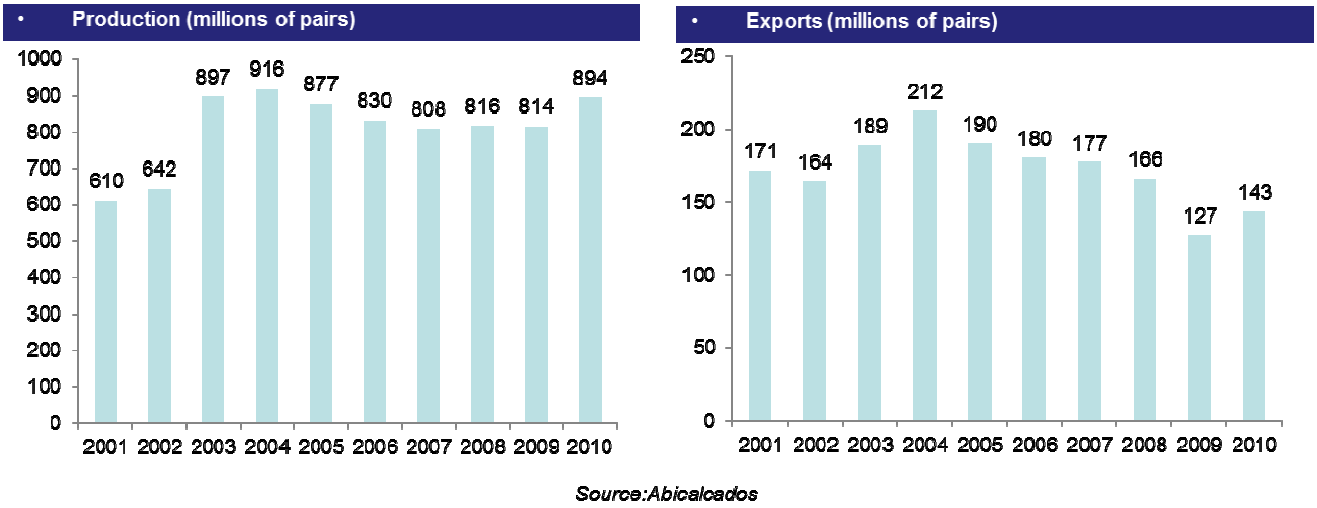


Figure 9: Total production and exported volume. Source: Abicalçados (2011).

The Rio Grande do Sul State and current performance of the cluster

The state of Rio Grande do Sul(RS) has a population of 10.7 million, being the 5th most populated state in the country. It is responsible for 6.7% of the country's GDP. Its economy largely replicates Brazil's composition, with a slight larger share of industries (29%) and a large participation of services (61.5%), and in the last 3 years the performance of the economy has outpaced the country's performance. (FEE 2011)

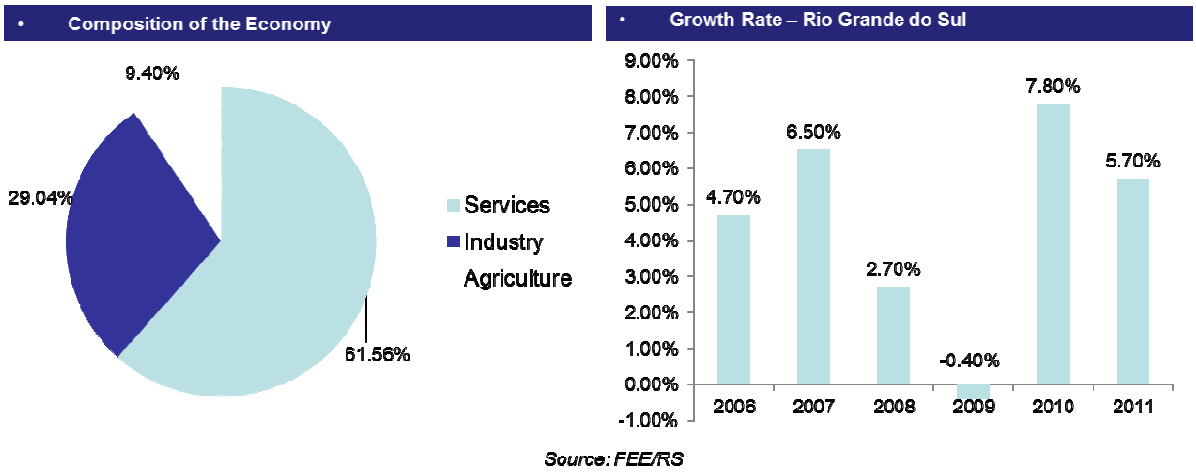


Figure 10: Composition and growth of Rio Grande do Sul's economy. Source: FEE/RS (2011).

The Rio Grande do Sul State has above average social indicators when compared to the country as a whole. It has a relatively high availability of skilled labor in comparison to other states. According to the Municipal Human Development Index, RS has the higher education index and one of the highest Human Development Index in the country. (PNUD 2003)

The state has a long history in the footwear industry, being responsible for over 35% of total employment and production in the industry. From 2004 until 2010, production in the cluster has increased 12.3% in volume and 37.5% in value (CAGR = 5.45%), however, exports fell sharply in the same period (-20.6% in volume and -9% in value) showing a stronger focus in the domestic market.

Even though production and the number of firms in the cluster have increased, employment has fallen 17% in the same period, showing a trend of smaller firms. Part of this can be explained by the sharp increase of wages observed in the cluster. From 2004 to 2010, the average wage in the footwear industries of the state increased 41% in local currency and 135% in dollars.

Evolution of the footwear cluster in Rio Grande do Sul

The footwear industry, which is the theme of this section, can have its origins traced back to the arrival of the first German and Italian immigrants to the state, in 1824 and 1875, respectively. The original intention of the then recent Brazilian Kingdom (independence from Portugal took place in 1822) in promoting immigration was to protect the country from neighboring countries' invasion attempts while at the same time promoting the population of the country's inland. Even though the immigrants originally settled to work as small farmers, their arrival served to diffuse knowledge about industry and crafting techniques that were commonly used in Europe at that time, including techniques about leather tanning and processing as well as the leather footwear, garment and accessories craft. The emergent leather craft shops established by the German immigrants gained momentum during the war against Paraguay, from 1864 to 1870. During that period, leather equipment for horse-riding was suddenly in high demand, which motivated the investment in the expansion of the existing base of leather craft shops and also of tanning plants and a few machine manufacturers around the Sinos Valley Region, in Rio Grande do Sul. After the Paraguay War ended (and with it the demand for leather equipment for horse-riding), entrepreneurs reoriented their resources and capabilities to the production of leather shoes.

We divide the history of the footwear cluster in Rio Grande do Sul, from the 1960s to the present day in four periods:

- Import substitution (pre-1969)
- Rapid export growth (1969-1985)
- Chinese shock (1986-2000)
- Domestic growth (post-2000)

This framing reflects the transformations that occurred in the organization of the cluster's productive structure due to foreign competition, changes in demand and the effect of domestic industrial policies enacted by government.[1]

Import substitution (pre-1969)

[1] This framing is based on (Schmitz, 1995).

The period before 1969 was marked by the formation of a cluster of approximately 400 shoe industries in Rio Grande do Sul, whose production was sold exclusively for the domestic market. During this time, a policy of import substitution enacted by the Federal Government reserved the domestic market exclusively for domestic firms and although there was no competition from abroad, the rivalry among domestic firms was intense. Although firms were small and produced mainly low quality products, forward and backward linkages among firms were substantial and created the incentives for the establishment of specialized local suppliers. Nevertheless, market share expansion was only possible at the expense of competitors in other regions.

Rapid export growth (1969-1985)

This situation started to change in 1969, when the first export contracts were signed with US manufacturers, whose contacts with the cluster were established in large part due to the collective action of a group of local businessmen that actively prospected export opportunities in Europe and the US, by organizing missions to those markets, promoting the cluster abroad and inviting prospect buyers to attend FENAC, the national trade fair.

These groups of firms also cooperated to lobby state and federal government for subsidies and export incentives. It is interesting to note that the main importers in the US were actually US-based manufacturers that off shored their production to Rio Grande do Sul in search of lower costs and then distributed their products to retailers in the US.

Once the first connections were in place, Rio Grande do Sul rapidly grew to become a lead supplier of leather shoes to the US and European markets, with the level of exports growing 25% per year. This growth rate brought with it the possibility to capture gains originating from economies of scale, as the following comment by Hubert Schmitz clear indicates:

> " For most of the 1970s and 1980s there was mainly quantitative growth, that is, expansion of capacity to make low-priced, wage-sensitive shoes. The cluster only changed gear and moved into qualitative growth when it was pushed from the outside to do so."[2]

Product designs and specifications were supplied by the US importers through local agents and therefore there were little incentives for the local development of product and process

[2] (Schmitz, 1995).

innovations or for the emergence of local fashion designers. In order to capture economies of scale, specialization increased and firms shift from small to large structures based on the concepts of Fordism and mass-production.

Transactions among US firms and local suppliers were mediated by export agents, which collected a ten percent commission from the local manufacturers. Despite the animosity from local manufacturers, which perceived them as mere rent-seekers, the export agents played the dual role of quality certifiers and innovation diffusers that became essential for the cluster development. The export agents conducted market research efforts in foreign markets, prospected fashion trends in Europe, provided designs and product specifications and frequently provided technical assistance to local manufacturers. Thus, with scale came mass-production and the erosion of the firms' capabilities to innovate that would limit their strategic options in the future.

Chinese shock (1986-2000)

Disruption in the cluster's export driven mass-production model came during the mid-80s from increased competition from China's lower-priced leather shoe manufacturers. This competition brought a substantial reduction in the Valley's exports and forced local firms to move up-market in search of higher value niches. But that was not an easy task to accomplish without the necessary innovative capabilities that were lost (or maybe were not sufficiently developed) during the earlier stage of transition to mass production.

Meanwhile, increased rivalry among US retailers was reflected and felt in Rio Grande do Sul. Because US retailers were attempting to achieve faster inventory turnovers they started placing smaller orders which needed to be filled in shorter lead times, which was very difficult to achieve under a mass-manufacturing Fordist arrangement. Mass-manufacturers, with their highly specialized production structures and systems were very efficient in turning huge runs of undifferentiated products, but the rigidity that comes with mass-manufacturing became a source of disadvantage when they were required to produce smaller runs in shorter lead times. Only flexible manufacturing arrangements could do the job.

As a result, the export oriented mass-production model became unviable and the large scale firms in the cluster started to turn towards more flexible production models (such as cellular manufacturing) while some were even driven out of the market. In the meantime, smaller firms

that were able to produce efficiently in smaller runs, shorter lead times and good enough quality were rewarded with the chance to serve some niches of the export market left unattended by the mass producers.

Domestic growth (post-2000)

The collapse of the export oriented mass-production model in Rio Grande do Sul, caused by competition from China and changes in the US market, was reinforced by an increasingly appreciated local currency. The appreciation of the Brazilian Real, while fueled by a booming export agriculture sector, added significantly to reduce the competitiveness of firms in the cluster. As the Brazilian Real became more appreciated against other major currencies, Brazilian exports became more expensive, which made it increasingly difficult to compete with China on the US and European markets. On the other hand, as the country's growth process regained its momentum, starting in 2002, domestic demand coming from an emerging middle class became an increasingly important source of vitality for cluster firms. With larger disposable income, the Brazilian middle class constantly increased its annual consumption of shoes, reaching four pairs per capita, in 2010. Small and medium-sized firms in the cluster turned to this opportunity and redirected their productive resources and capabilities to the domestic market.

Although large retail chains continue to expand in Brazil, the domestic retail market is still very fragmented. This fragmentation results in a sales structure composed of thousands of salesmen dedicated to serve the orders from individual retail stores. Such orders are often times small and placed with an uncertain frequency, causing a very volatile demand that requires a production structure that is flexible enough to deliver small production runs in short lead times. Nevertheless, this network of small and medium enterprises coexists with a group of mass-production manufacturers that invested substantially to create and market their own brands, which are distributed in proprietary networks of retail stores.

As a result, in the mid-90's, large scale mass-producers started to relocate their plants from the cluster into the northeastern states of Brazil, such as Ceará, Paraíba and Bahia. Figure 11 illustrates this dynamic. In 2009, although Rio Grande do Sul still concentrated 58% of the Brazilian footwear exports in monetary terms, it lost 28 percentage points during the period 2000-09, mainly to clusters in Ceara, Paraíba and Bahia. Among these rising clusters, Ceará was

responsible for most of the exports in the Northeast states, with a 23% share of exports.

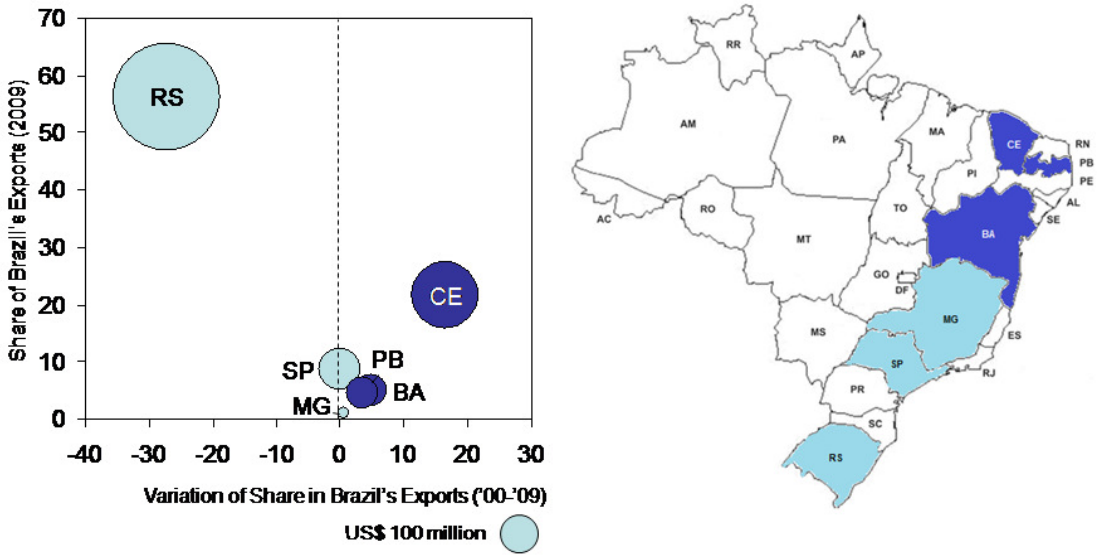


Figure 11: Variation of share (percentage points) of Brazilian footwear exports across the different clusters, from 2000-09. Source: BNDES; Abicalçados. Notes: Share in terms of exports value. Legend: RS (Rio Grande do Sul), CE (Ceará), SP (São Paulo), BA (Bahia), MG (Minas Gerais), PB (Paraíba).

Such migration to the northeast states was motivated mainly by the search for lower-waged labor and lower state level taxes that could put these manufacturers back into a competitive position vis-à-vis their Chinese competitors.

Due to the existence of a large domestic market, analyzing the footwear industry based on export figures can be misleading. Data in Figure 12 suggests that while Brazilian footwear exports reached 127 million units in 2009, that figure represents only 15% of the overall production of 814 million pairs of shoes. From that amount, Rio Grande do Sul was responsible for the production of 294 million units.

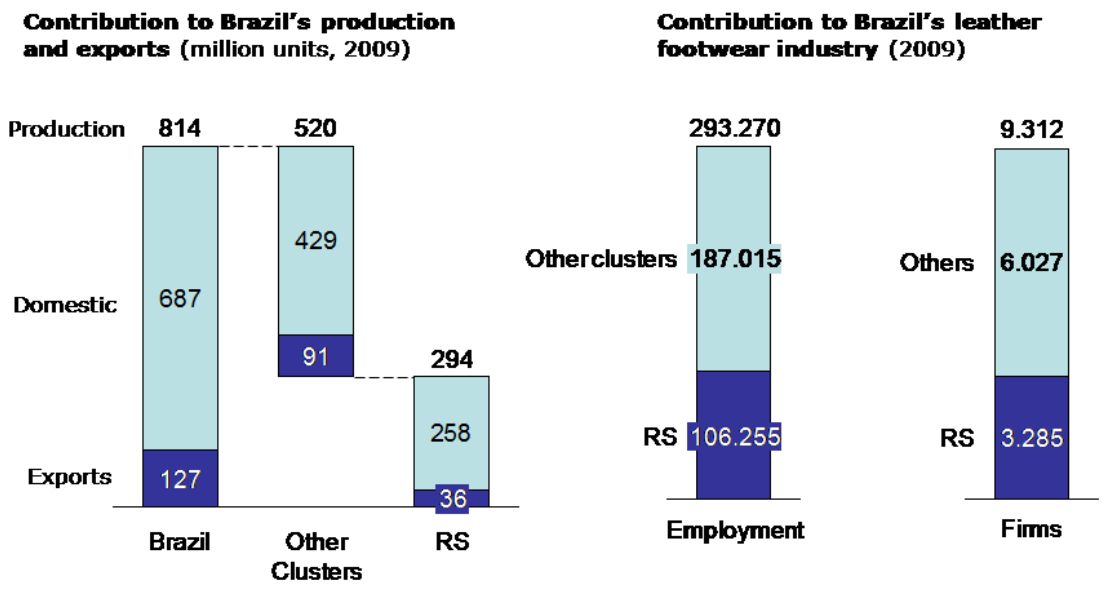


Figure 12: Contribution of Rio Grande do Sul to the Brazilian footwear industry. Source: BNDES; Abicalçados.

Although the cluster is responsible for 58% of exports in value terms, it has produced only 28% of exported units, suggesting that it has specialized in the production of relatively higher valued products than the other clusters, especially in the northeastern states.

Cluster Map

One of the important components to explain the competitiveness of the leather footwear industry in Rio Grande do Sul is the presence of a dense network of small and medium-sized firms distributed across the value chain. As depicted in Figure 9, from input components and materials such as leather, tanning and chemicals to supporting services such as trade agents, fashion and design, advertising agencies and specialized magazines, this geographical agglomeration of related firms facilitate the diffusion of innovation and information. This contributes to the flexibility of the cluster and to its ability to adapt to changes in both the domestic and the external demand conditions.

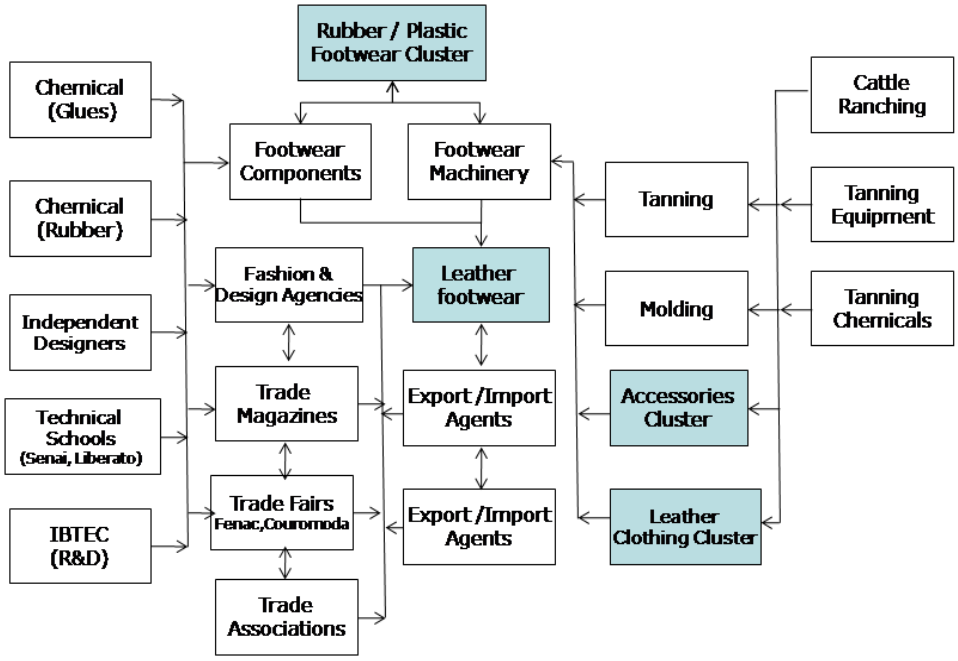


Figure 13: Footwear cluster map. Source: (Nadvi, 1995).

It is also relevant to note that the leather footwear cluster interacts and shares resources and factors with other related clusters established in the state, such as the leather accessories and clothing and the plastic/rubber footwear clusters, as depicted in the cluster map of Figure 13.

Cluster Diamond

Given its relevance to the national footwear industry, which is also evidenced by its participation in the share of jobs (36%) and firms (35%), it is instructive to understand what it is about Rio Grande do Sul that makes it unique to the development of this industry. We attempt to answer that question by looking at the cluster's diamond, depicted in Figure 14 and discussed bellow.

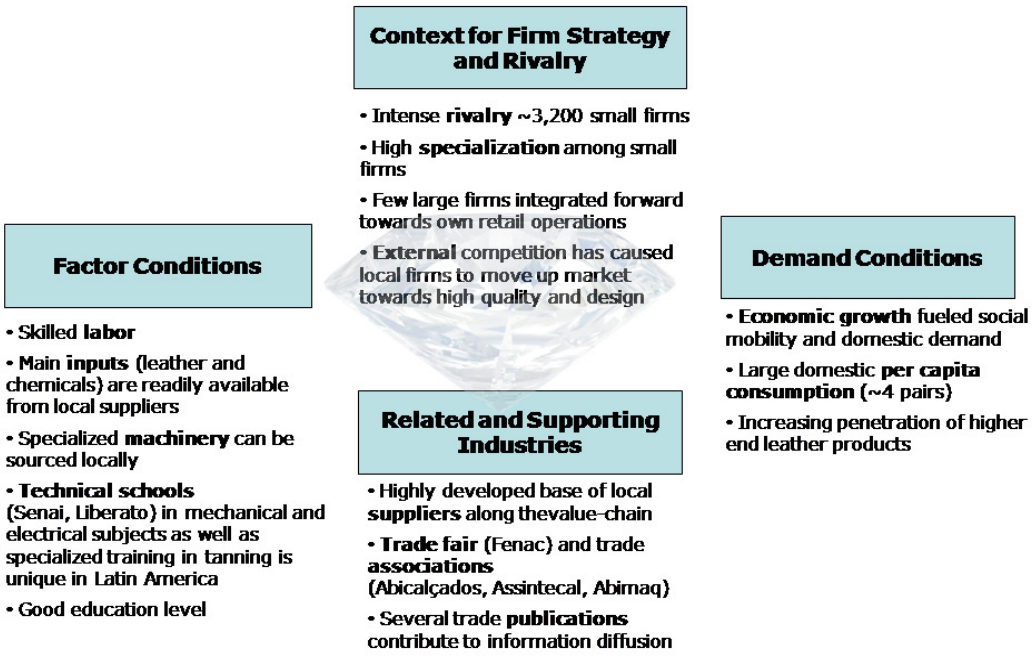


Figure 14: Rio Grande do Sul footwear cluster diamond

Factor Conditions

Cattle ranching was a major economic activity in the state during the 19th century and the availability of crude leather gave rise to the development of a significant tanning industry, brought to Rio Grande do Sul by German immigrants. A modern tanning industry is an essential component to the footwear cluster, since sophisticated product design requires the availability of new varieties of leather, with textures, colors and patterns that fluctuate according to the sazonal demands of the fashion industry. Ever since the period of intense export growth, the tanning industry in the state has developed in order to achieve the necessary technological capacity to develop new varieties of lather with the agility required by the short product development cycles common to fashion-driven industries

The cluster hosts several important technical schools (e.g. Senai and Fundação Liberato) specialized in the tanning industry, automation, mechanics and fashion design that trained the specialized workforce that would contribute to increase the productivity and quality of the processes, as necessary to serve the demand of importers in the US and Europe. The *Centro Tecnológico do Couro, Calçados e Afins (CTCCA),* founded in 1972 and later renamed *Instituto Brasileiro de Tecnologia do Couro, Calçado e Artefatos* (IBTEC), is an R&D center funded by the private sector that was instrumental for the acquisition of the technical expertise and know-

how necessary to upgrade the local firms to the demands of external markets during the rapid export growth period that began in 1969.

Related and supporting industries

As the industry went through a period of extensive specialization, the vertical disaggregation that followed the rapid expansion of the export-driven production created a significant number of component suppliers, firms that specialized in the manufacturing of certain parts of the shoe and directed their efforts to the acquisition of resources and capabilities necessary for making these components.

Institutions for collaboration such as the *Feira Nacional do Calçado* (a trade fair first established in 1967 and that attracted the first foreign buyers that initiated the 'rapid export growth' period of 1969-1985) were instrumental to the development of cluster, as were the export *agents* that we mentioned above. The main producers, as well as suppliers of inputs, components and machinery also formed their own trade associations (e.g. Assintecal, Abicalçados) that became important venues for bringing together the main players and representing the collective interests of the cluster firms.

Demand Conditions

Arguably one of the most commendable economic results showed by Brazil in the last decade has been its success in reducing poverty. As a result of economic growth, from 2003 to 2011, 36 million Brazilians moved out of poverty and another 10 million moved to upper classes. And this is a trend that is expected to continue in the near future.

A consequence of this poverty reduction is that domestic demand tends to increase and also becomes more sophisticated. In the last decade, apparent consumption in the domestic market increased at an average of 6.4%, larger than the increase in the domestic production. Per capita consumption increased almost 14%, reaching an average of 4.1 pairs per inhabitant.

This can also be seen by the increase of average price of production in the country. In 2010 the average price of production reached US$ 13.8, which represents almost a 19% increase in comparison to 2009 average price (US$ 11.6). The same trend can also be observed in the cluster, where the average price of production is even higher than the country average and showed a 45.8% increase since 2003.

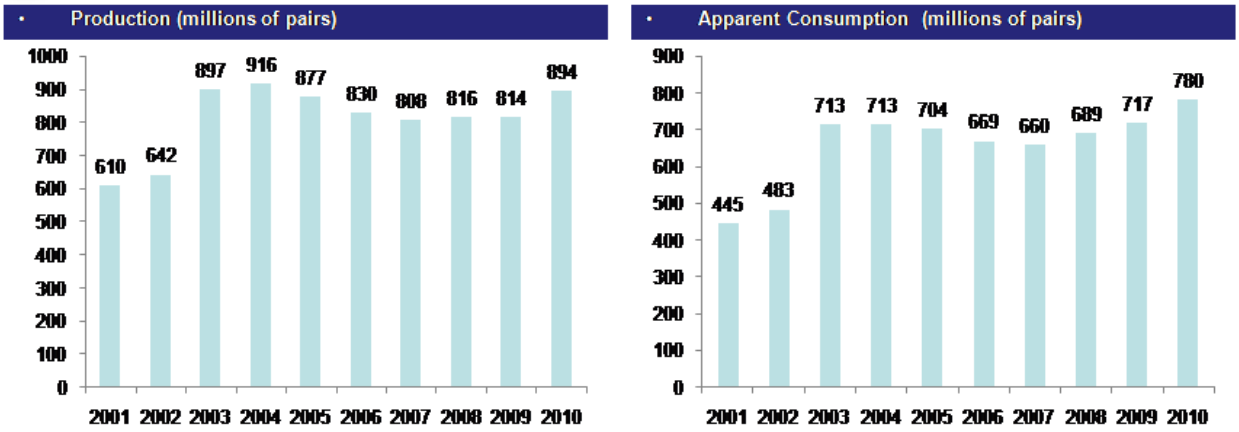


Figure 15: Footwear production and apparent consumption in Brazil. Source: Abicalçados (2011).

The importance of poverty reduction and its potential impact on footwear demand can also be illustrated by the results of research from several companies, presented by the major Brazilian footwear companies (Arezzo 2011 and Grendene 2011). According to them, the Footwear and Apparel is the sector that shows the largest potential increase among all the consumer goods sectors due to poverty reduction. According to estimates, consumption more than doubles with every change in income class, increasing 125% when an individual moves to Class C, 141% when climbing to class B and another 132% when reaching Class A income levels. This becomes even more significant to the cluster due to the fact that they are specialized on high-end women's footwear. According to Arezzo (2011), the 61% of the demand for women footwear in Brazil comes from the top 2 income levels, Classes A and B.

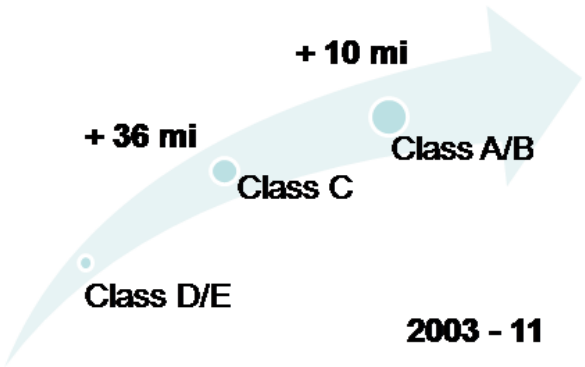


Figure 16: Impact of population income growth in the demand for footwear and apparel. Source: Arezzo (2011).

Context for Firm Strategy and Rivalry

In order to better understand the context in which firms in the cluster operate, it is important to situate how sophisticated the cluster's exports are as compared to other top world exporters of footwear. The comparison of the average price of exports provided in Figure 17 is an attempt to capture this effect. Note that while the average price commanded by Brazilian shoes in the external market is US$10, the average price of Rio Grande do Sul's exports is US$ 22. That is equivalent to say that while the average Brazilian firm competes with India and Indonesia in the international market for low-cost shoes, the average firm in the Rio Grande do Sul cluster competes with their counterparts in Germany and Spain, judging solely on the average price of their exports. Furthermore, this large variation of average export prices suggests that there is segmentation among the different footwear clusters in Brazil, according to the sophistication of their exports. This effect is better understood when we refer to Figure 18.

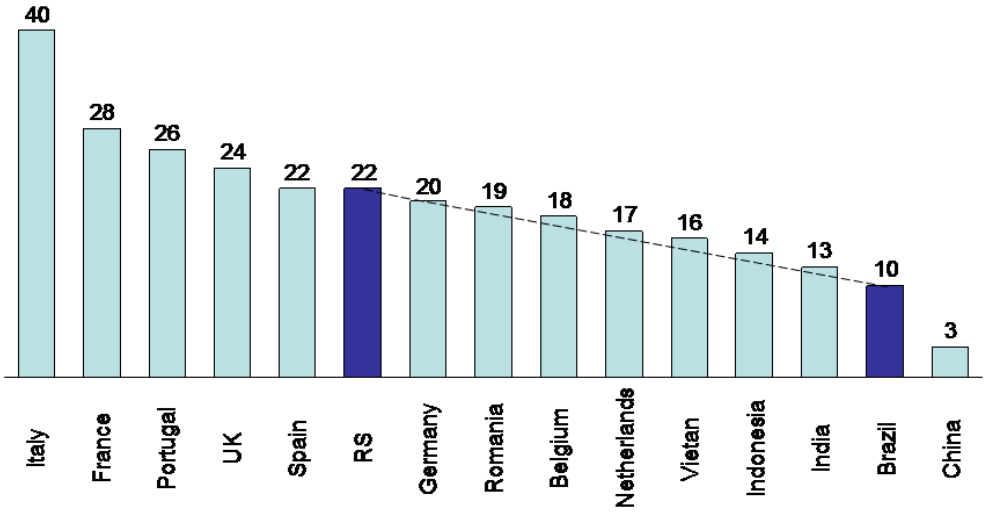


Figure 17: Average export price (US$) among top world exporters (2010). Source: World Footwear Yearbook (2011).

In Figure 14, we can locate the different footwear clusters in operation in Brazil, according to their location. The first interesting thing to observe is that the average price of the Brazilian exports presented little variation between the years 2000 and 2009, $9.50 and $10.15, respectively. Although there was little difference, on average, this fact hides the effect of geographical specialization in distinct segments among two clear groups of clusters.

The first group, composed of clusters located in the states of Ceara, Paraíba and Bahia (in the country's northeast region), was producing shoes whose average export price was in the range of $4 to $6 in 2000. However, by 2009, one could already observe a process of differentiation taking place inside this group of clusters. While the cluster of Paraíba specialized in low priced products, Bahia was moving towards the middle-market, close to the $10 national average. Although Ceará practically did not increase its average export price during the period, it has reached a volume of production that surpassed that of Rio Grande do Sul, making Ceará the largest exporter cluster, in volume terms.

The second group of clusters, comprising the states of Rio Grande do Sul, São Paulo and Minas Gerais, has clearly moved up-market, with prices in 2009 that were 100% superior to their average export prices in 2000. Although the cluster in Minas Gerais has not been an exception to this rule, it remained very close to the national average, in 2009, and the volume of its exports was the smallest among the main market players. Although Rio Grande do Sul has lost its position as the largest exporter, in volume terms, to Ceará, it still ranks first in monetary terms. This fact can be explained by the remarkable increase in the average price of its exports, which reached US$22 by 2009 from less than US$11 a pair a decade earlier.

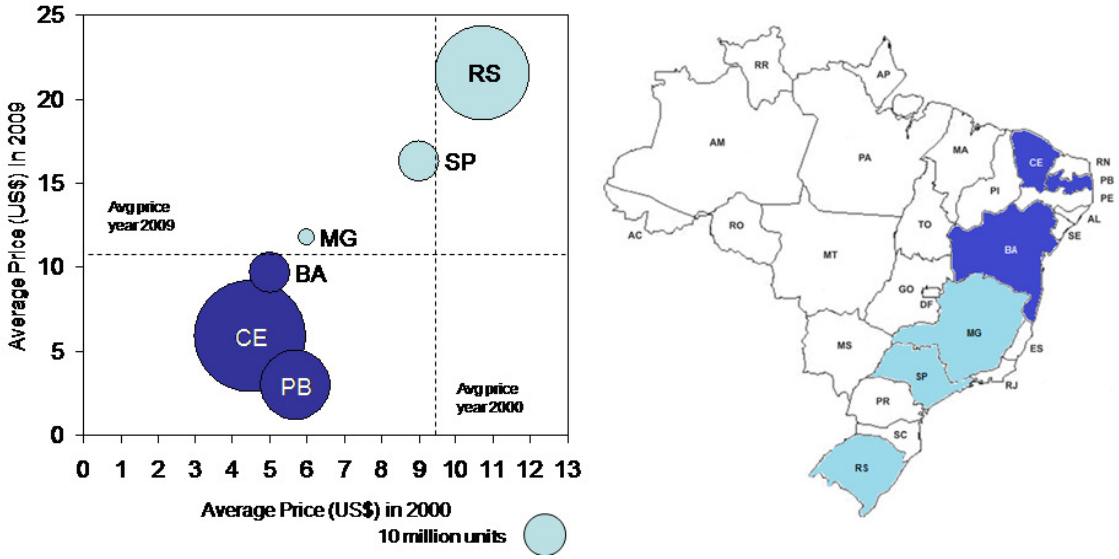


Figure 18: Specialization among different footwear clusters according to the average price of their exports in 2000 and 2009. Source: BNDES; Abicalçados. Note: Dotted lines indicate aggregate average price on that year. Legend: RS (Rio Grande do Sul), CE (Ceará), SP (São Paulo), BA (Bahia), MG (Minas Gerais), PB (Paraíba).

Now that we have seen how the emergence of the clusters in the northeast was associated with an up-market movement by the clusters in the south and southeast, it is interesting to observe how this dynamic is reflected in the structure of production. In order to do that, let us observe the information provided in Figure 19. We can clearly distinguish the two groups of clusters by looking at the scale at which their firms operate. While the average firms in São Paulo, Minas Gerais and Rio Grande do Sul operate with less than 50 employees, firms in the northeast operate in a much larger scale, in the range from 110 to 330 employees. This is explained, in part, by the different methods of production adopted in the two cases. While in the emergent clusters production is organized according to the paradigm of mass-production, in incumbent clusters production is arranged in a hybrid cellular arrangement. This is consistent with the type of product and, ultimately, with the strategic positioning adopted by these firms. For example, firms in the Rio Grande do Sul cluster are focusing on fashion-driven designs, whose product life cycles are short and therefore production arrangements that allow for shorter runs and smaller lead times are more adequate to serve the demand. In Ceará, where firms are focusing on lower-priced products that sell to price conscious segments of the market, the ability to achieve a low cost of production requires the use of mass-production arrangements that allow these firms to capture gains from economies of scale.

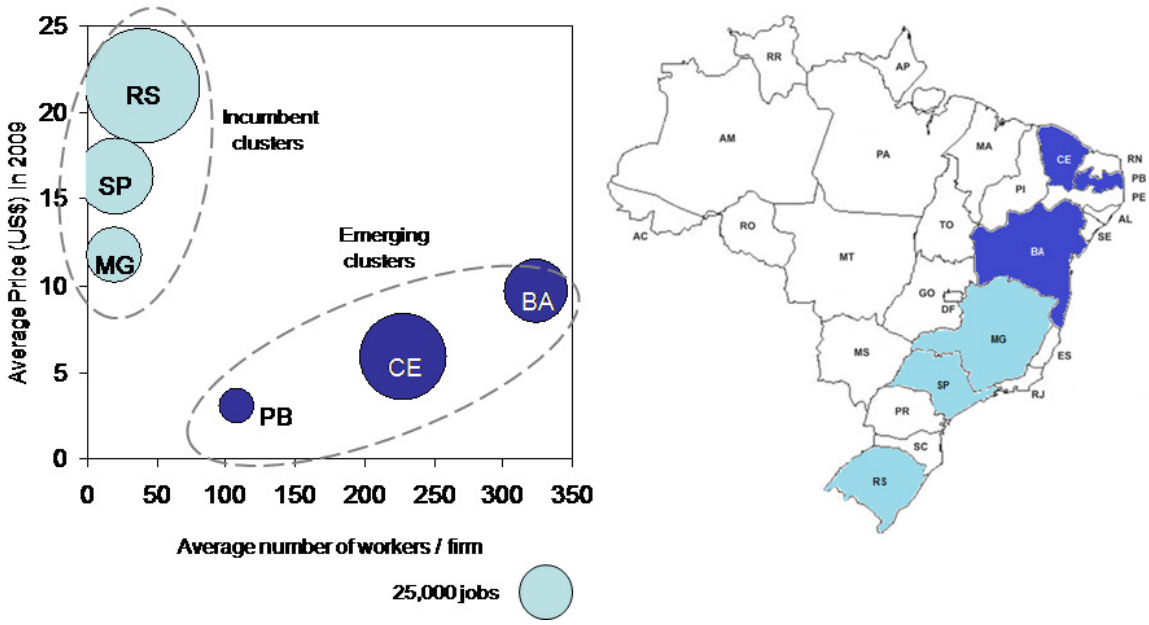


Figure 19: Specialization among different footwear clusters according to the average price of their exports in 2000 and 2009. Source: BNDES; Abicalçados. Note: Dotted lines indicate

aggregate average price on that year. Legend: RS (Rio Grande do Sul), CE (Ceará), SP (São Paulo), BA (Bahia), MG (Minas Gerais), PB (Paraíba).

Another factor that influences the relatively higher size of the firms located in the northeast is the inexistence of a well developed network of component suppliers, which forces the firms to integrate backwards, incorporating stages of the value chain in their operations that are usually sourced from component suppliers in the Rio Grande do Sul cluster, for example.

The Rio Grande do Sul cluster is based on a large number of small firms, which creates an intense rivalry. From 2002 until 2010, the number of firms increased 18%, and among the almost 3,000 firms, the number of those considered medium and large was reduced.

Even among the largest companies in the Brazilian footwear market there is no dominant player in the national market and in the regional cluster. The 6 largest companies (table below) have operations in the Rio Grande do Sul state and the 3 largest ones have production operations in all regions of Brazil. They also have different market focus and different strategies towards external markets. Grendene and Alpargatas have Rubber and Plastic production as it main market, but while Grendene exports 20% of its production, Alpargatas relies on production abroad to gain external markets and achieve a similar percentage of revenues from abroad. Vulcabras, on the other hand, has an important operation on sports shoes and also relies on production abroad. The next 3 largest footwear producers are mainly focused in domestic markets and specialized in women's leather shoes.

Recommendations

Reduction of the Tax Burden – The **National** government should propose a tax reform with a focus on the simplification and reduction of taxes. Similarly, the**State** should reduce their state taxes to match conditions offered by other States and reduce the advantage for industries that move their production to another location.

Reduction of the cost of Labor– The **National** government should pursueSocial Security reform and reduction of government expenditures in order to allow a reduction of social contributions and other costs on labor. Government has launched the "Plano BrasilMaior" which allows certain industries to move from contributions based on wages to contributions based on revenues. Footwear is one of the industries included in the program. The National government

should also evaluate changes in the labor code in order to reduce the labor market rigidities, reducing the cost of hiring/firing of employees.

Improve quality of education–**National** Government should pursue improvements in thequality of education from K-12, invest in teachers training and reform of curricula particularly in math and science. It should also expand technical training in industry related fields. The **State** of Rio Grande do Sul should expand training opportunities in design and fashion.

Innovation and product differentiation – The **National** government should create a structure to promote and incentive R&D and innovation. The **State** and regional IFCs should offer consulting services related to marketing, branding and product design. The **cluster industries** should continue to invest in brand recognition in order to be able to access higher- end markets and increase the value of its products. The industry should focus on productivity.

Institutes for Collaboration – The **National** government should promote the creation of IFCs at emerging clusters and create quality certification agencies. The **State**of Rio Grande do Sulshould create an export promotion agency to pursue markets opportunities for SMEs.

References

ABICALÇADOS, "Industria de Calcados do Brasil", 2011.

AREZZO, Apresentacao Institucional, 2011. *In:* <http://www.arezzoco.com.br/PT/Download/164_Apresentacao_Institucional_Marco_2012.pdf>

EXAME, "Melhores e Maiores", 2011.

FEE – Fundacao de Economia e Estatistica, "Resumo Estatistico", 2011.

GRENDENE, Relatorio da Administracao, 2011. In: <http://ri.grendene.com.br/port/download/relatorio/Relatorio_Administracao_2011.pdf>

NADVI, K., "Industrial Clusters and Networks", UNIDO, 1995.

PNUD (2003), "Atlas do Desenvolvimento Humano no Brasil", 2003. In: <http://www.pnud.org.br/atlas/>

PORTER, M. "Clusters and the New Economics of Competition", Harvard Business Review, November-December 1998.

SCHEMES, C. "Pedro Adams Filho: empreendedorismo, indústria calçadista e emancipação de Novo Hamburgo". Doctoral Thesis. Porto Alegre, 2006.

SCHMITZ, H., "Small Shoemakers and Fordist Tale of a Supercluster", *World Development*, Vol. 23, No. 1, pp. 9-28, 1995.

World Footwear Yearbook, 2011.