
CHICKEN RUN IN GOIAS
THE POULTRY CLUSTER IN BRAZIL



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Frederic Bustelo • Barbara Dutzler • Julio Kogut

Paula Savanti • Roberto Severin

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1. Introduction

'A nation's competitiveness depends on the capacity of its industry to innovate and upgrade'. Michael Porter

Literature stresses the importance for countries to develop a 'capacity to innovate' in order to allow for the creation of new knowledge in sectors of competitive advantage and to catch up with the rest of the world in other sectors. The case of Brazil's poultry cluster reminds us that success hinges critically on the ability to move up the value chain from low-value to high-value output and to generate spill-overs, for instance into the biotech sector. Relying on the competitive advantage of the natural endowments such as cheap soy and extensive land will not suffice if Brazil wants to continue to remain the number one exporter of poultry in the world. Given Brazil's gap between its growth potential in terms of natural resources, innovative companies, competitive exports, and its apparent failure to sustain high growth rates, there is a need for the government to improve its performance in supporting the private sector and creating the right conditions for its development. In order to understand the strengths and weaknesses of Brazil's demand conditions, factor conditions, related and supporting industries, and the context for firm rivalry and competition, and how this relates to the success of the poultry cluster, we start with an analysis of the macro-environment.

2. Brazil in context

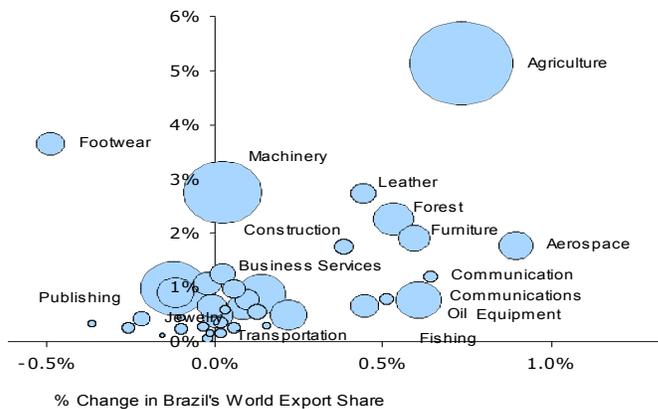
2.1. Macro-economic environment

Brazil occupies 5.7 percent of world's land (8.5 million km²). It shares common boundaries with all South-American countries except Chile and Ecuador. Its topography includes a long coastal strip along the Atlantic Ocean (7367 km), the Amazon river,

highlands, plateaus, forests and semiarid scrub land. Brazil hosts 40 % of the world's biodiversity, is rich in natural resources, and is blessed with fertile soil that allows for competitive production of a wide range of agricultural goods – in particular soy and corn, the essential ingredients for the poultry cluster.

Brazil is nevertheless quite an industrialized country, with a contribution of agriculture to GDP of only 10 %, while industry accounts for 32 % and services for 58 %. Yet, in terms of exports, the agriculture sector remains the most significant, with US\$19Bn representing 33 % of exports in 2004. Brazil is the world's largest exporter (in terms of volume) of coffee, sugar, orange juice, soybeans, meat/poultry; second largest of corn, cocoa, tobacco, and third on tropical fruits. But after having been one of the most active practitioners of import substitution in the past, Brazil's industrial sector today generates 50 % of exports and has a very high level of export diversification. The goods are highly value-added, similar to those exported by developed countries (aircraft, vehicles and parts, steel, chemicals, machinery, electronic equipment, paper and pulp, and footwear). Together with the agricultural products and the mining exports, this multiplicity of clusters makes Brazil different from most developing economies.

Figure 1: Export clusters in Brazil – world export market share 2000

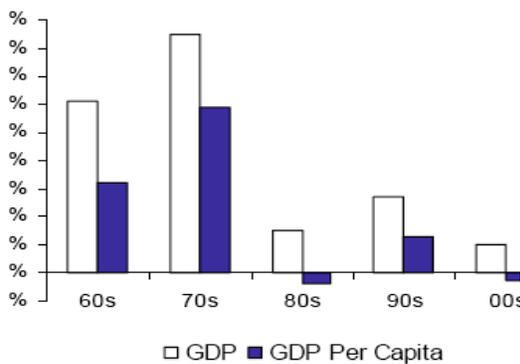


Source: International Cluster Competitiveness Project

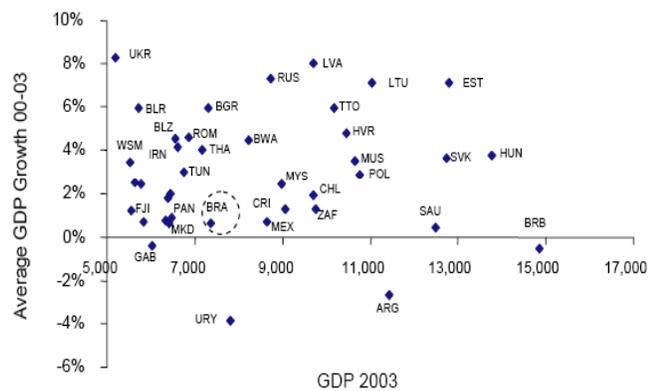
Brazil is the fifth most populated country in the world, with 181.4 million inhabitants in 2005, representing 2.9 percent of world population. Yet, Brazil produces only 1.9 percent of world GDP, ranking 9th in terms of absolute size of the economy. With a per capita GDP in purchasing power parity terms of US\$ 8,563 in 2005, Brazil is a middle income country. While this puts Brazil slightly below world average and slightly above LAC average, it is important to acknowledge that Brazil has remained nearly stagnant in per capita terms over a 25 year period. As the next charts show, the reason is the reversal in 1980 of the impressive growth achieved until the end of 1970s, and the recent lack of growth.

Figure 2: GDP growth in recent decades

Figure 3: GDP levels and growth in the world



Source: Calderon et al., using WDI online data



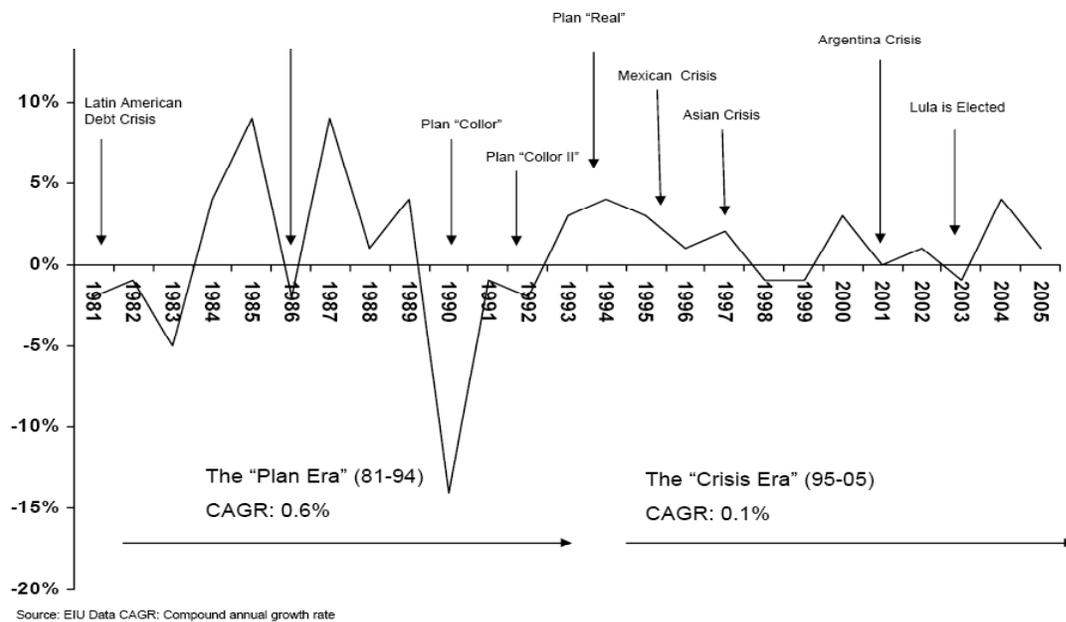
Source: WDI 2003

There is an apparent gap between Brazil's growth potential and the actual disappointing outcome, from an economic development point of view, which makes it necessary to look more closely into the reasons for the lack of growth from 1980 onwards. In particular, volatility is high in output, terms of trade, capital flows and inflation. Figure 4 is an attempt to explain volatility by tying the growth rates to external factors, such as currency crisis and shocks (e.g. debt crisis, oil crisis or Asian & Russian crisis), as well as to internal factors such as frequent regime changes (e.g. devaluation or shifting from fixed to

floating regimes) and heterodox economic plans. Figure 4 makes clear that the failure to catch up is not only a regional phenomenon, which could be concluded from the fact that the ratio of Brazilian GDP to LAC remained more or less constant and thus Brazil's rate of development was similar with that of its neighbors. Although the 1980s debt crisis affected the whole region, other countries such as Chile managed to continue to grow. Volatility implies policy uncertainty that is costly for growth, as illustrated by the 2005 WEF Competitiveness Report where businessmen ranked policy uncertainty as the top third concern in Brazil (see chapter 2.3. for details).

Figure 2: GDP growth and recent events

Figure: GDP Growth and recent events



In the last 10 years (up to 2003), the average growth for real GDP was 1.7 percent, with stagnant consumption and investment, thus, no longer is the economy characterized by fast capital accumulation and TFP growth, which had been the drivers behind the convergence with the developed world. As can be seen from figures 5 and 6, TFP growth decreased from an average growth of over 3 percent per year, to below zero, in spite of the increased

macroeconomic stability, liberalization and reform. Labor, as the remaining potential driver of economic growth, has recently shown an increasing participation rate (from 44% in 1995 to 51% in 2005), but hardly any improvement on the productivity side.

Figure 5: Factor Accumulation and TFP

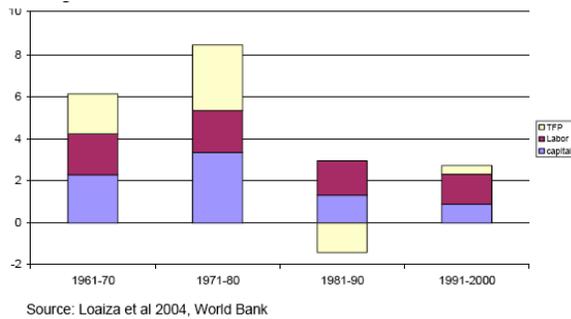
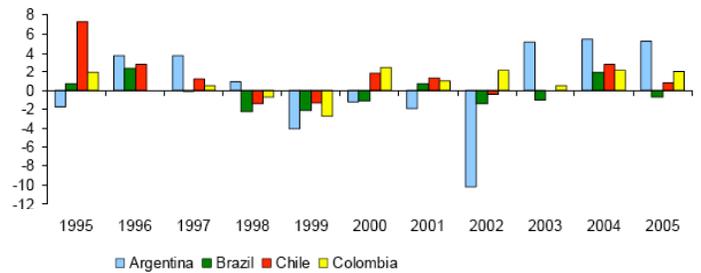


Figure 6: Growth in TFP



This suggests that exports have been the main contributors to Brazilian growth. In particular the recent recovery was due to an impressive growth of the ratio of exports/GDP from 11% in 2000 to 22% in 2004, boosted by the 1999 currency devaluation and higher international demand, but also by greater productivity that can be traced back to domestic liberal reforms in the early 90's that created an environment in which an innovative private sector could emerge. For instance, the number of firms involved in exports grew by 10%. The high growth rate of exports is, however, also a reflection of the low level they started from. Like most big countries Brazil has historically been relatively closed to trade. And government policies had traditionally been inward looking. This changed in 1995 with the creation of the Chamber of Foreign Trade (CAMEX), which is responsible for formulating, coordinating and implementing Brazil's trade policy by establishing guidelines for trade negotiations, whether multilateral, regional or bilateral; overseeing FDI policies and regulating the Export Financing Program (PROEX) and the Export Guarantee Fund

(FGE)¹. A branch of the executive, it acts like a board led by the Minister of Development, Industry and Foreign Trade, but brings private sector to the table to influence trade policy formulation

2.2. Socio-economics

Table 1 – Selected indicators

<i>Indicator</i>	<i>2005 estimates</i>
Life expectancy at birth (years)	71.7
GINI	0.59
Percentage of population below 2 USD/day	25 %
Estimated labor force (millions)	89
Unemployment	10 %
Population Diversity (% white, mulatto & black)	53.7, 38.5 & 6.2 %
Infant Death per 1000 live births	30
HIV/AIDS rate (% of population)	0.7 (2003 est.)
Average Years of Education	4.88
Percentage of population with completed tertiary education	3.77

Life expectancy in Brazil in 2004 was 68 years, which is low compared to similar income per capita countries. For instance, it is 10 years less than Costa Rica (78) the best performer in Latin America. Brazil is also a very unequal country, with the highest GINI of the region (0.59). This means that the richest 1 percent receives 10 percent of total income – the same share as for poorest 50 percent. Some 12 percent of income inequality in Brazil is accounted for by skin color differences (as opposed to only 2.4 percent in the US). Reasons for the persistence of high inequality in Brazil include less equitable distribution of education

¹ Main institutionalized tools for supporting exporters *via* subsidized interest rates.

(in terms of years of schooling, blacks are two-thirds behind whites), regressive public transfers (over 50 percent of social spending is heavily biased in favor of higher-income groups and the share of pensions of the richest 20 percent Brazilians is more than twice the corresponding share in the US) and large wage differentials (skilled versus unskilled labor). Education indeed seems to be a bottleneck. The average years of education attained for population over 25 years in 2000 was only 4.88 versus 8.83 in Argentina. And for higher and technical education, the country scores relatively well but, only a small proportion of the population reaches these education levels (3.7% of the population over 15 years of age has finished tertiary education). Unemployment oscillates around 10 percent, with rising unemployment growth rates for young (aged 14-24 years) males and females (15 and 20 percent in 2001, respectively).

Figure 7: Gini coefficient

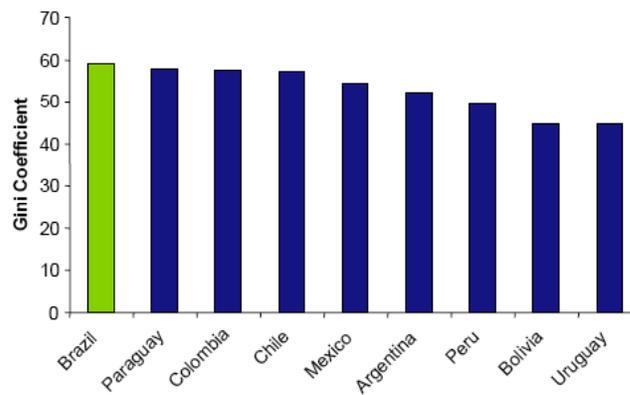
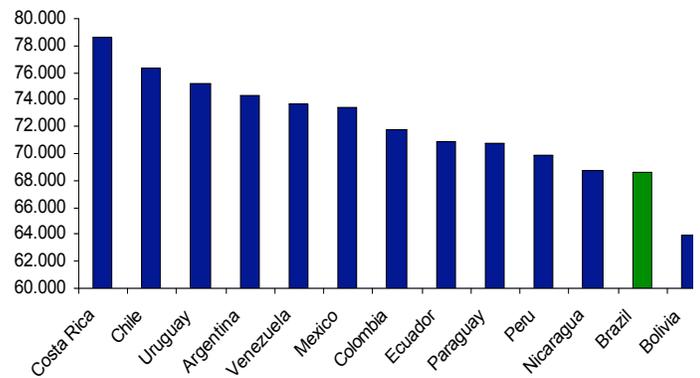


Figure 8: Life expectancy



Source: WDI, 2003

2.3. Brazil's Competitive Position

The world competitiveness index published annually by the World Economic Forum ranks 117 countries according to different criteria to evaluate overall country's competitiveness. In 2005, Brazil ranked 57 out of 117 countries showing that Brazil remains

behind comparative developing countries both in Latin America and Africa. Brazil ranks fourth among 21 LAC countries, behind countries such as Chile and Colombia.

Furthermore, Brazil's relative competitive position has been declining in recent years.

When looking closely at the components of the index, several issues stand out as particular obstacles to the business environment and overall country's competitiveness. The country ranks particularly bad in terms of macro-economy, Institutions, Infrastructure and Market Efficiency. Regarding macro-economy, the worst performing component is the "interest rate spread" where Brazil ranks 115 out of 117 countries. This represents a huge cost of borrowing for firms which therefore limits their capacity to invest. Regarding Institutions, the worst performing indicators are those that have to do with "wastefulness of government spending, burden of government regulation and business costs of crime and violence. Finally, in the Market Efficiency category Brazil is the worst performer in the world (117/117) with respect to the "extent and effect of taxation". It also performs badly regarding the number of procedures and the time required to start a business.

In essence, Brazil's main competitive disadvantages are thus all related to government intervention and regulations. The inefficiency of public institutions and excessive bureaucracy create an unfavorable climate for business investment. A state that taxes too much but is wasteful in its spending, (resulting in high interest rates) and imposes excessive regulation to start and operate businesses, is a state that is hindering, not helping, the private sector to compete.

On the other hand, when analyzing Brazil's competitive advantages, we see that the country scores high on issues of innovation and business sophistication, meaning that the private sector is able to be competitive despite the high costs of doing business imposed by government and that competitiveness at the firm's level is better than the overall country's

competitiveness. In particular, Brazil scores high in terms of local supplier quality and quantity, production process sophistication, company spending on research and development, quality of scientific research institutions and capacity for innovation.

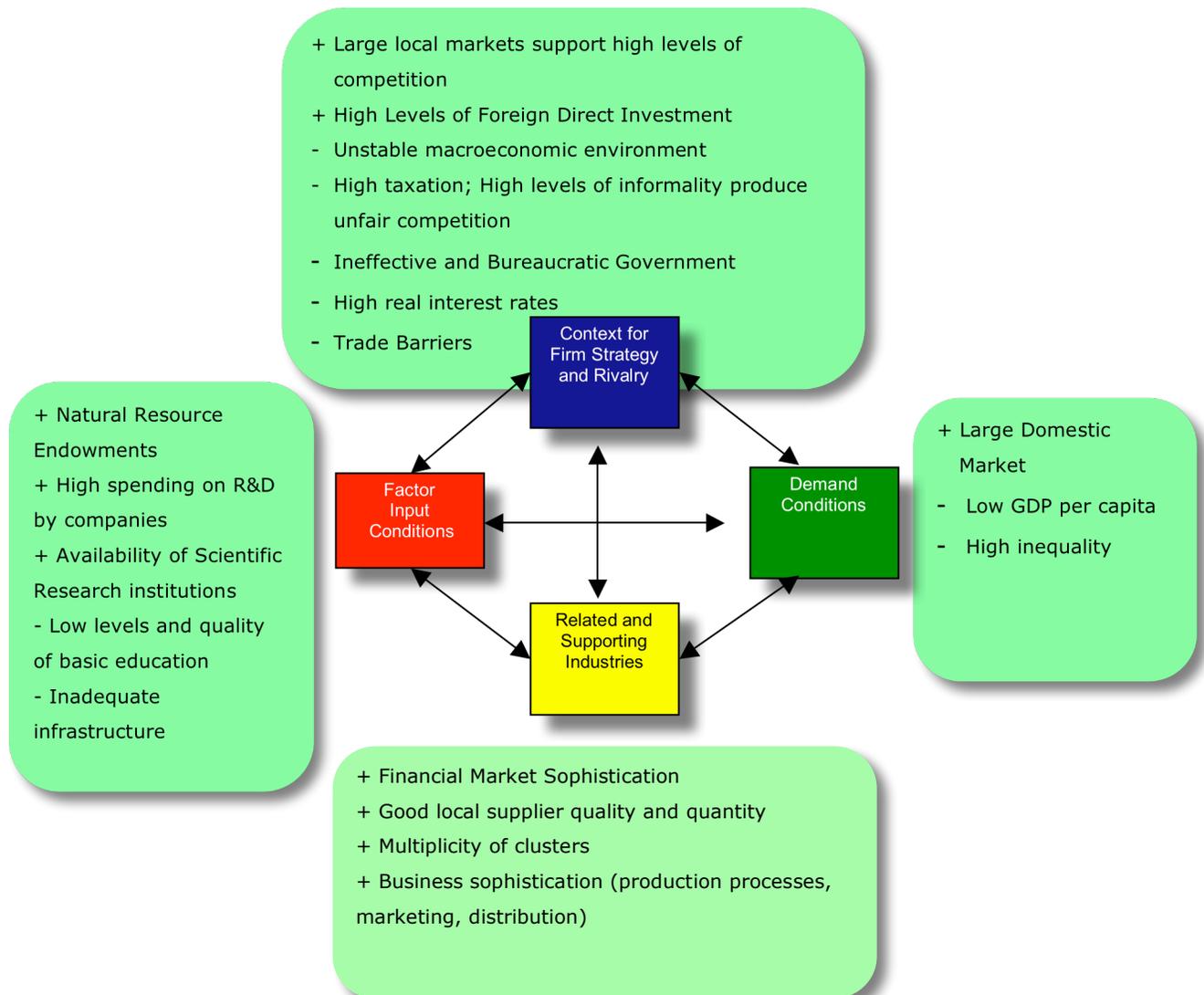
Table 2: Global Competitiveness Index (2005) - Brazil

Brazil overall Rank (out of 117)	57
Competitive Advantages	
Business Sophistication	33
Local Supplier Quantity	27
Local Supplier Quality	36
Production Process Sophistication	32
Innovation	39
Quality of Scientific Research Institutions	39
Company Spending on R&D	29
Capacity for Innovation	32
Technological Readiness	51
FDI and Technology Transfer	31
Higher Education and Training	50
Competitive Disadvantages	
Macroeconomy	91
Interest Rate Spread	115
Institutions	79
Wastefulness of Government Spending	111
Burden of Government Regulation	115
Business Costs of Crime and Violence	107
Market Efficiency	55
Extent and effect of Taxation	117
Number of procedures to start business	102
Time Required to start business	104
Infrastructure	70

Additional limiting factors to the private sector include poor quality of infrastructure and limited quality and coverage of basic education. As pointed out in section 2.2., the overwhelming majority of Brazilians have limited access to basic education and the low quality of elementary schools has been identified as a major cause behind Brazil's lower than desired level of competitiveness. This deficiency in education levels positions Brazil lower than countries such as China or India in terms of technological absorption and readiness.

In this sense, several priorities can be identified as necessary for the country to compete in the global market and sustain higher levels of economic growth: (i) improve macroeconomic environment, (ii) improve efficiency of public institutions and business environment, (iii) invest in infrastructure and (iv) support technological adoption through investments in education. Most of these advantages and limitations are captured in the National Diamond:

Figure 9: Brazil's National Diamond



3. Regional Analysis

3.1. The State of Goiás

The State of Goiás is located in the center-west region of the country. It is the seventh state by territorial extension but only has 3% of the population (3.5 million) and produces 2.1% of total GDP. At US\$ 6,825 the State's per capita GDP is slightly lower than the national average of US\$ 8,694. Social indicators, as measured by the Human Development Index, are also slightly lower than the national average, with an HDI of 0.78 for Goiás and 0.83 for the country overall.

The economy of Goiás is largely agricultural (cattle, hogs, soybeans, corn, sugarcane, cotton, rubber, tomatoes and watermelons) with an expanding agribusiness and industrial sectors. Goiás is the fourth largest producer of soybeans in Brazil, representing 55% of the State's total grain production. The poultry cluster, traditionally located in the South of Brazil (Rio Grande do Sul, Santa Catarina and Parana), has recently been migrating to the south of Goiás given the availability of cheaper soy and corn (main raw materials needed to feed chicken) in the region, which is a net exporter of both grains, and whose production and productivity levels have been increasing considerably in the past few years. In addition, the region has favorable climatic and soil conditions, and is centrally located, providing an advantage with respect to the southern region in the distribution to high consumption areas such as Sao Paulo, the Federal District, Triângulo Mineiro, Grande Belo Horizonte, as well as regions of growing consumption in the center-west, north and northeast of the country.

The main hindrances to developing a poultry cluster in the South of Goiás are related to the lack of skilled labor, and important infrastructure shortcomings, including electricity provision, roads, etc. The Regional Government has fostered the development of

the cluster mainly through the provision of credit lines with differential rates and conditions for rural producers through the Fundo Constitucional do Centro-Oeste (FCO). In addition, the local Secretariat for Planning, Development, Science and Technology carries out applied research of grain and poultry production in partnership with national and state research entities and universities. An example of this kind of collaboration are workshops organized with federal, state, local and private agents regarding the development of a technological platform in the Southwest of Goiás. Issues of grain quality, sanitary and health conditions of animals and environmental conservation are all part of the agenda. The Centro Tecnológico da Comigo was created as an institution of collaboration between producer cooperatives (*Comigo*), universities, local government, Embrapa and other private sector companies such as Monsanto, Aventis, Perdigão and Sadia.

The advantages and disadvantages of Goiás with respect to the southern region described above are summarized in the table below:

Table 3: Advantages and disadvantages of Goiás

	Goiás	South
Input Prices	✓	✗
Labor Costs	✓	✗
Land Costs and Geography	✓	✗
Location	✓	✗
Infrastructure	✗	✓
Access to Credit	✓	✗
Education & Skills	✗	✓
Other government policies (tax incentives, research)	✓	✓

3.2. Cluster History

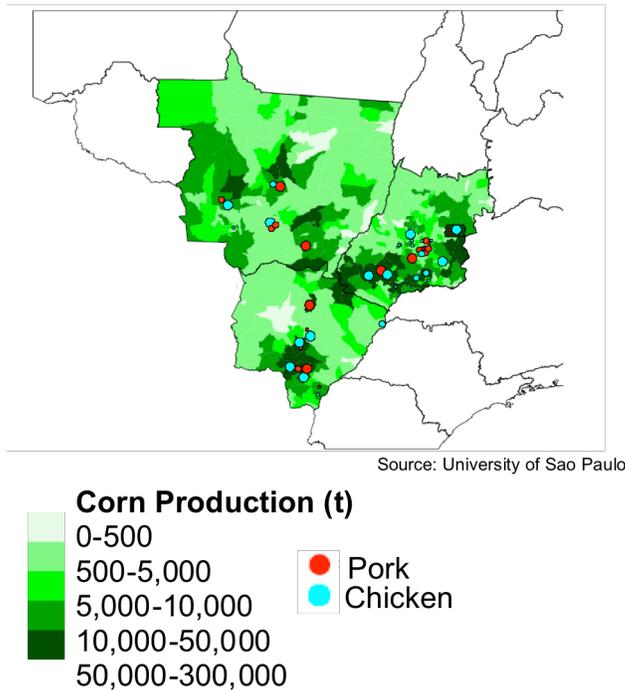
The State of Goiás had been considerably isolated from the rest of the country until the beginning of the 20th Century. Goiás' integration with the rest of the country speeded up in 1930, when the government constructed a railway linking São Paulo and Anapólis, a city

in the middle of the state. The next important step for the state integration with was the construction of Brasília in 1950. Brasília was planned to be built in the middle of the country and it ended up located in the Northeast of Goiás. As planned, Brasília accelerated the “interiorization” of Brazil and Goiás benefited from this movement.

In the 1970, the state started showing considerable agriculture development. This was a result of technology advancements aiming at planting soy in the “cerrado”. The “cerrado” is the nomenclature for the vegetation and soil in the state. The soil in the region was extremely acid for agriculture. Following several years of research, Embrapa (the Brazilian Public Research Institute for Agriculture), was able to create mechanisms to improve the soil conditions and also developed soy seeds adapted to the region. There was an enormous growth in the soy planted area starting in the middle of the 1970s. It grew from 81,719 ha in 1975 to 519,579 ha in 1980. The growth continued in the 1980s and 1990s. Soy continues to expand in the region and there are still 136,000 ha to be explored.

During the 1990s, corn was introduced as a rotating crop to protect soy. There was an oversupply of corn, with prices not high enough to justify transportation elsewhere. This was the magnet to attract poultry and pork companies to Goiás. The number of poultry and pork companies in the region multiplied rapidly and currently, there are at least 30 of them in the state. In the map below, it is interesting to note that most of the chicken and pork processing plants are located in regions with high corn production density.

Figure 10: Distribution of corn availability and processing plants



Source: Brum and Wedekim 2002

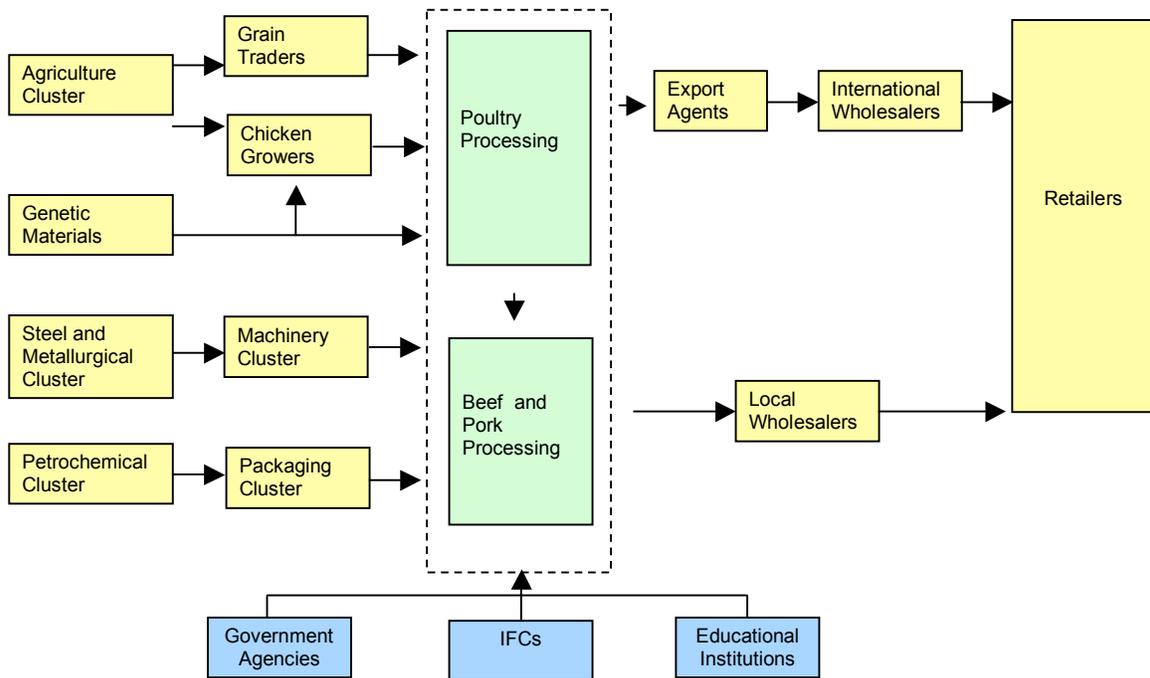
While the South of Brazil has historically concentrated the operations of this cluster, the advantages of the Goiás State have been attracting if not all, a very large percentage of the growth in the cluster in Brazil. The most recent Sadia and Perdigão's (two biggest companies) projects are located in the region and they are being followed by a large number of related companies.

3.3. Cluster Map

The cluster in Goiás has developed substantially in recent years. Several companies have moved to the region to be close to the poultry processing plants. In the packing cluster, Videplast and Orsa have now operations in Goiás. In the genetics materials cluster, corporations such as Agroceres PIC, Dalland and Cobb Vantress have located close to the poultry cluster. Also important, the region counts on a large number of knowledge

institutions closed linked to the agribusiness sector that provide important support to the development of the cluster. Among them are SENAR, EAFRV, CEFET-Jataí, Centro Tecnológico Comigo and Plataforma Tecnológica. We should note, however, that at least for the large companies, important operations such as marketing and general management operations are still headquartered in São Paulo. The latter is Brazil's most important economic pole and still attracts the majority of companies' main offices.

Figure 11 Cluster Map



Source: Brum and Wedekin 2002

Table 4: Cluster Main Participants

Soy/Corn	Genetics	Packaging	Universities	Research	IFCs	Animals
Cargill	Agroceres	Vide Plast	Fesurv	Centro Tec. Comigo	Clube amigos da Terra	SPOs
Bunge	Dalland	Orsa	Faculdade Objetivo	Granja Escola	APG	FGOs
Adm	Cobb Vantress		UFG - Jatai		ACI	SPLs
Caramuru						SVTs
Comigo						
Coinbra						

a. Factor Conditions

Good climate and soil conditions for Soy and Corn

The conditions of the land, soil and climate have contributed to the development of the cluster in Goiás. The temperature, which fluctuates from 21-22 C, the low humidity and the high mineralization rate of the soil throughout the whole year have enhanced the basic thermo conditions for the animals' growth. In addition, the flat topography of the region has enabled the installment of farms with higher production capacity and the use of bigger load factor vehicles for the distribution of the product.

Use of modern equipment and technologies have helped to achieve high yields

Given the topography of the region which has allowed the use of heavy equipment, the cluster has benefited from the use of modern equipment and machines throughout the different activities of the poultry value chain, helping the cluster to achieve high yields in the production of soy and corn. In addition another factor that has helped the promotion of technology in the sector is the increase concentration of producers that allows promoting internal rivalry, reduction machinery prices and high quality service.

Availability of capital resources throughout the "Fundo Constitutional of Centro-Oeste

The availability of capital resources through the Fundo Constitutional of Centro-Oeste has facilitated the development of the cluster. The capital resources directed to the cluster have grown 67% in an annual base from 1997 to 2000, increasing the number of poultry projects from 60 to 225 in the same period. This fund has been of significant importance because 52% of businesses that started operations in the region came from other regions of the country, 50% from the South and 50% from the Southeast. In addition, one

of the most important challenges for the cluster is the expansion of capacity, which involves a significant investment from producers.

Existence of precarious and unreliable roads, highways and railroads for ground transportation.

The cluster relies on ground, rail and water transportation for the distribution of the products. The precarious and unreliable conditions of the roads and the inexistence of highways connecting the cluster with the main city centers are a problem, which has increased the importance of water transportation. At times when water levels are low the transportation of products using this method can pose additional challenge for the cluster. In addition, the cluster relies on the limited rail transportation, but the government has contemplated a modernization and expansion project of railroads in the region.

Limited existence of qualified human capital in the different areas of the value chain could limit growth

The limited existence of qualified human capital in the different activities of the value chain has inhibited the future growth of the cluster. This problem is aggravated by the fact that only 34% of potential high school students are attending school. In terms of secondary and technical education, the region has only four technical institutes and one university, which can limit the development of skilled labor and best in class knowledge generation for the future.

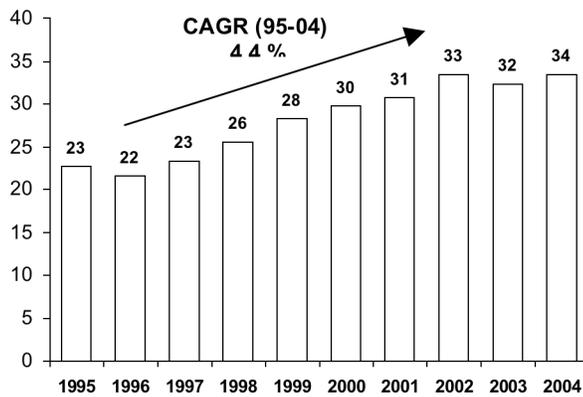
b. Demand Conditions

The cluster enjoys a significant domestic demand that is growing at a faster pace than developed markets.

As observed in figure 11, the Brazilian poultry consumption per capita has grown significantly in the last ten years, at an average yearly rate of 4.4%. When this growth is

compared to that of other major world markets such as the US at 0.8%, China at -1.4% and European Union at -0.6%, (that together account for more than 55% of the share of global markets) we can conclude that Brazil has a significant potential regarding its local demand.

Figure 11: Brazilian poultry consumption/ capita 1995 -



Source: USDA March 2005 Note: CAGR: Compound annual growth rate

Table 5: Global poultry consumption

Country	Share of	CAGR
USA	25 %	0.8 %
China	18 %	-1.4 %
European Union	14 %	-0.6 %
Brazil	11 %	6.2 %
Mexico	5 %	5.9 %
India	3 %	14.7 %

This impressive growth in Brazil over this period has occurred as a result of the changing habits of the consumers towards healthier foods, shifting from meat and pork to chicken, and a 14% reduction in the final prices to consumers.

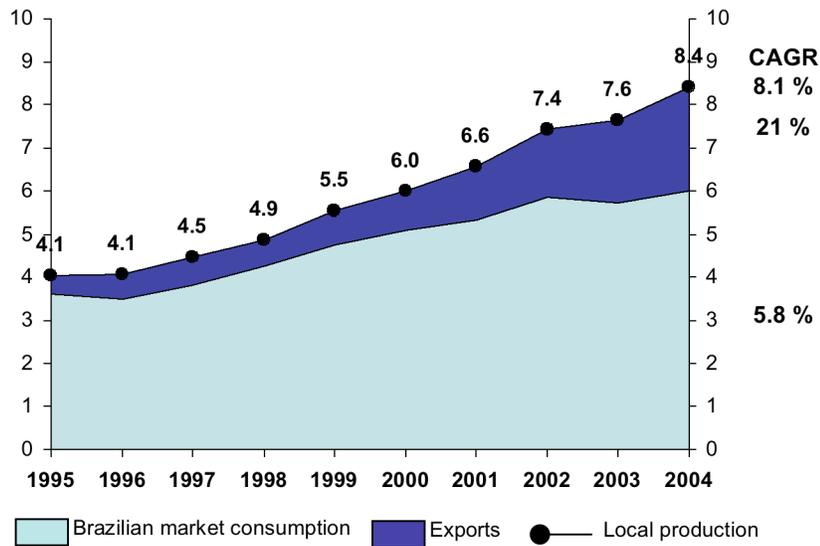
As a result of this local demand, local business leaders of the poultry sector in Brazil has categorized the proximity to market as key factor for investment and development of the cluster in Brazil.

Exports have increased significantly in the last 5 years successfully, entering very competitive international markets

As a result of the favorable competitive position of the poultry production in Brazil, the cluster's production and exports has grown, as observed in figure 12, at an average annual rate of 8.1% and 21% respectively over the last ten years. The major markets destinations of Brazilian poultry exports have been Saudi Arabia, Japan, Hong

Kong, South Africa and Russia over the last few years. Together, these markets have accounted for 45% of total exports in 2004.

Figure 12: Brazilian domestic market 1995 -2004



In addition, Brazilian poultry exports have gained significant market share against their other major producing countries such as China, USA, India, Thailand and the European Union, that together account for 63% of total global production.

Out of these producing countries only Brazilian and Thailand exports have grown at positive rate of 18.6% and 5.3% respectively. One of the major threats that Thailand and China have faced during the past few years is the avian flu, which has significantly reduced their poultry production by 16% and 0.1% respectively, and restricted their imports within the European Union market. Another important factor that has helped Brazilian competitiveness is the devaluation of the Brazilian Real over the past decade.

One of the most important considerations for the cluster’s future export strategy is that all of the Brazilian export markets have experienced insignificant or negative growth of their poultry domestic consumption over the past three years. As a result, one of the threats for the Brazilian poultry cluster is the disappearance of demand in the near term,

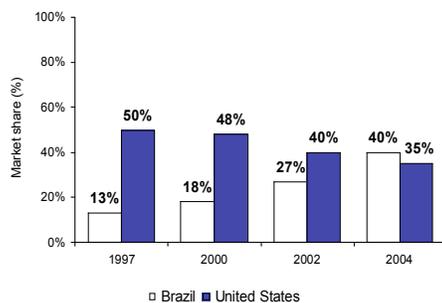
causing an oversupply of products, a reduction of the prices and reduction in the profitability for the companies in the cluster.

c. Context for Firm Strategy and Rivalry

Largest exporter in the world, competing against global major players

Brazil is the largest exporter of chicken in the world followed by the United States. The two countries have been fiercely fighting for the first position in the world market in the last decade. Brazil presented an enormous growth in exports since 1997, when the country was responsible for 13% of global exports, while the United States had a 50% share. In 2004, Brazil was already ahead with a share of 40% of world markets against a 35% share of the United States. As mentioned earlier, other largest exporters in 2004 include the European Union (13%), Thailand (4%) and China (4%).

Figure 13: Exports: Brazil versus the United States



Entrance of foreign players via FDI

The Brazilian poultry market has attracted the attention of several foreign players. Large American firms have demonstrated substantial interest in making acquisitions in Brazil, especially targeting the cluster anchors, Sadia and Perdigão, but no transactions have evolved with those two companies. In contrast, foreign companies were able to acquire

medium-sized players. In 1998, the French group Doux acquired Frangosul, currently the fourth largest player. In 1999, the Argentine group Macri acquired Chapecó, a company with 3.5% of the market in 2002 (sixth largest at that time). The situation of Chapecó deteriorated substantially since the acquisition and it lost market share rapidly. After several attempts to divesture the assets without success, the company went bankrupt in 2005.

Increasing concentration via mergers

Threats to competition have emerged in two areas in the Brazilian poultry cluster. First, the largest companies, Sadia and Perdigão have been acquiring small players. In 1999, Sadia acquired 90% of Granja Resende, an investment of US\$109 million. In 2004, Sadia acquired Só Frangos for US\$26.5 million. Perdigão has also been active in the acquisition side, but concentrated its efforts on a larger operations. In 2000 it acquired from Parmalat the meat operations of Batavia, with more than 1,300 employees and activities including the slaughtering of poultry, pork and turkey. These acquisitions have been analyzed by the Brazilian Antitrust Body, CADE, but none of them faced strong resistance.

The second area in which competition could be jeopardized relates to the potential merger of Sadia and Perdigão. Although there are no official accounts, newspapers and financial markets have raised rumors several times. It is not clear if CADE would approve the merger, since it would have a very negative impact on competition in the sector. However, a similar transaction occurred in 1999 when the two largest Brazilian brewers announced their merger and the antitrust institution did not present important obstacles.

Trade barriers in other markets

In the European Union, the greatest threat to the Brazilian cluster is related to the complete ban on the use of antibiotics to support the growth of animals for slaughtering.

Imports containing animals with such materials will not be permitted into the region. Although such move represents a challenge to the Brazilian industry it is also an opportunity. Looking at the demand side, the European consumers may represent the most advanced demand conditions. Serving the European Union may give the Brazilian cluster a competitive position as other markets converge to similar demand restrictions. On another issue, the European Union has made some attempts to increase tariffs for the Brazilian poultry through the modification of product nominations. Brazil, however, was able to block such moves through the World Trade Organization.

Brazil has also faced problems in relation to the United States. The latter stopped accepting Canadian poultry exports, because it feared that Brazil and Canada were using a triangular trade system to get to the United States. Additionally, the United States has accused Brazilian poultry to be infected with the “Newcastle” disease, difficulting exports.

Unfair competition from small players

Informality is a large problem in the Brazilian economy. In the labor market, 60% of the working population is not hired following the required regulations. Regarding sales and income taxes, informality is also very high. Usually, the smallest players are the ones that do not pay taxes. As firms grow it becomes more difficult to hide operations from the authorities. The Goiás poultry market has a large number of small players. The situation creates two problems. First, most small players compete in unfair terms with the larger players, as the formers usually do not comply with all tax and labor requirements. Second, the situation does not create incentives for small firms to grow. As entrepreneurs fear that may have to pay substantial taxes and become uncompetitive, they opt to remain small.

d. Related and Supporting Industries

Very efficient relationship with chicken growers

The arrangement of the Brazilian poultry industry has proved very successful. Most of the processing companies follow a semi-integrated approach. Sadia and Perdigão operations illustrate well the Brazilian system. These companies do not own egg or fattening farms, assets that are in the hands of small farmers. Sadia and Perdigão are directly responsible for the processing, marketing and sales activities. At the same time, they provide all the inputs necessary for the small farmers. They provide credit, technology, raw materials, consulting, veterinary services, training and rations. The large processing companies have control of the whole process, but do not need to operate directly the first phases of the chain. This system provides complete control of the process, and the possibility to focus operations on processing and marketing activities.

Strong Public Research

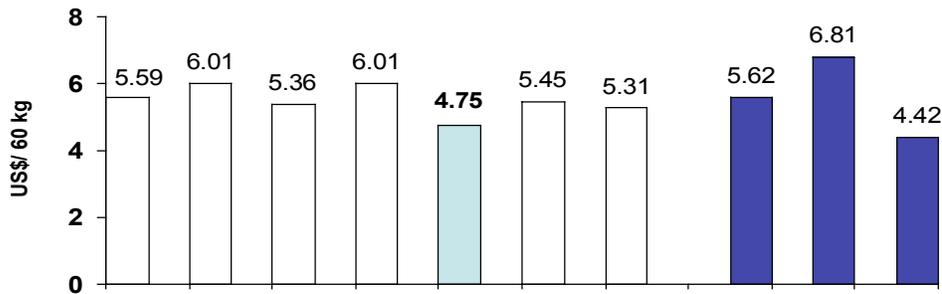
As discussed, Embrapa had a key role in creating the conditions for the cultivation of soy in the Brazilian “cerrado”. These developments were key to creation of a strong competitive advantage of the Goiás cluster in national and international terms. Apart from soy, Embrapa also has had an important role in the breeding and genetics area. The Embrapa 021 specimen, for example, presents substantial improvements in terms of weight gain for the Brazilian poultry (Embrapa website).

Competitive soybean and corn industries

The soybean and corn industries competitiveness in the State of Goiás presents the cornerstone of the cluster competitiveness. Corn and soy represent approximately 50% of

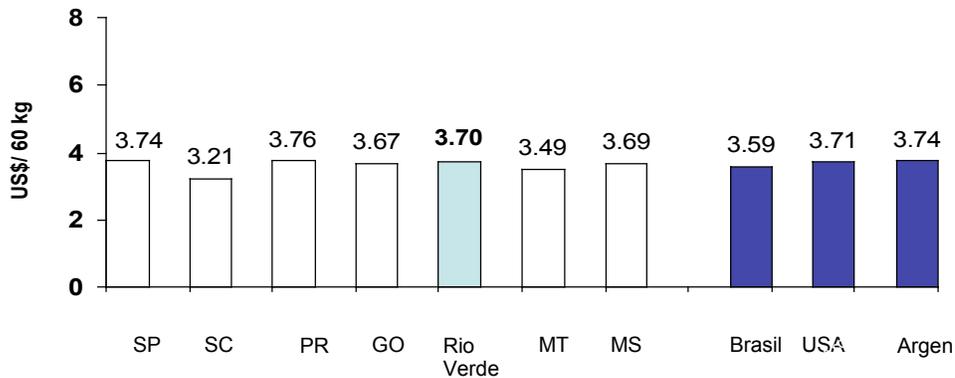
the cost of a slaughtered chicken. Therefore, advantages in this area create a strong edge for the companies in region.

Figure 14: Production cost of soybeans, 2001



Source: RC Consultores

Figure 15: Production cost of soybeans, 2001

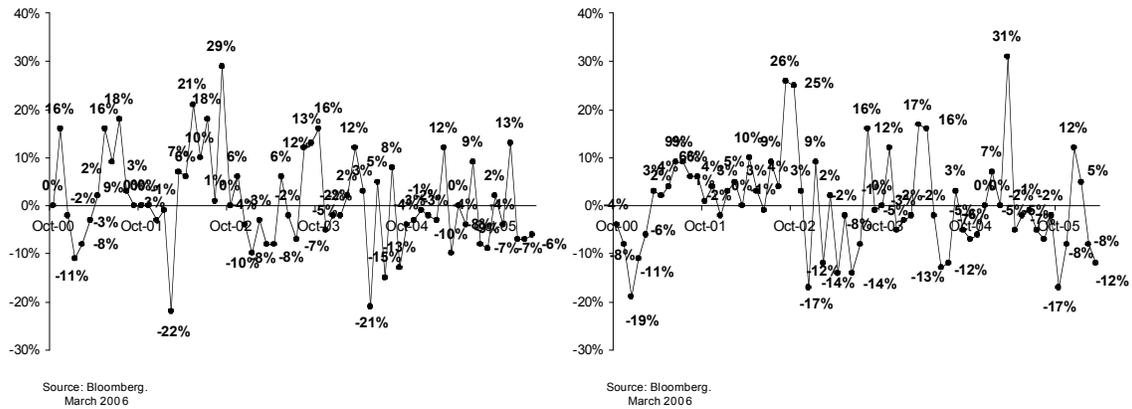


Source: RC Consultores

However, two concerns must be raised. First, the companies in the sector will not be able to sustain their competitiveness in the long term solely based on this cost advantage. The cluster must progress in other areas, such as genetics and equipment manufacturing, to sustain its competitive position. Second, soybean and corn price volatility is especially large in the Goiás region. In addition to the raw material price volatility, freight costs prices also

fluctuate significantly. This environment creates instability for companies operating in the region, and mechanisms to hedge such risks should be considered by the cluster.

Figure 16: Monthly variations in the price of Soybean Figure 17: Monthly variations in the price of Corn



Cluster Depth

The poultry cluster in Brazil has been able to show some important moves in segments that are key to its development. In the equipment front, the Brazilian industry has been able to increase substantially its participation on the cluster procurement. The last large project in the Goiás cluster was made by Perdigão. From the seven groups of equipment necessary for the project, four were acquired in Brazil: boiler, effluent treatment, subproducts plant and incubatory (Brum and Wedekin 2002). In the genetics area, the local cluster has also given important steps. As mentioned, Embrapa have developed important breeding materials. Additionally, private companies in Brazil, in partnerships with foreign players, have started to participate importantly in the market.

Competitive position in related products

The presence of very competitive beef and pork clusters in the region creates important synergies in terms of raw materials availability, distribution networks and marketing. Perdigão and Sadia, along with other companies in the cluster have been producing pork for a long time and have also been very competitive in this cluster. According to a USDA study, the cost of producing a kilo in Brazil is US\$0.60, while the cost worldwide varies from US\$0.70 to US\$1.00. Poultry companies have been more reluctant to enter the beef market. However, in recent years, Sadia and Perdigão have also targeted this market more aggressively.

5. Strategy

The strategy of the cluster going forward in order to remain competitive worldwide should be to produce value added products and developing the necessary machinery and biotechnology to support the cluster. The cluster has already evolved from a factor driven cluster, to an investment-driven one. Initially, it benefited from the existent low wages and the proximity to cost-critical input factors such as corn and soy necessary to feed the chicken. The final product at this stage was the frozen chicken that was sold in the region and Brazil. The technology used in the process used to be mostly foreign, but local suppliers now provide some of equipment (boilers, incubatory). Production of chicken has always been done by farmers that grow the animals; however, the growth of the cluster has been fostered by the growth of local firms Perdigão and Sadia that provide the chicks and the food to local farmers. In this initial stage, companies competed based only on cost advantages, and therefore profit margins were very sensitive to the very common commodity price volatility.

In a following stage, the cluster has started to improve quality by improving technology and processes. This has allowed improving yields in production. In this sense, technology has been obtained abroad through alliances and joint-ventures with international players. Firms in the cluster have realized they need to improve some critical inputs for production, such as infrastructure. For this, companies have partnered with the government to improve infrastructure and capital intensive projects. For example, firms have agreed to help the government improve the construction of three roads in the surroundings of their production factories.

The cluster has started to move to the next level where innovation plays a critical part. This has happened particularly regarding the commercialization of products, where in particular the larger firms have started selling higher-end products in Brazil and abroad. These products bear a brand, and of course are higher value-added products. In this sense, in order to add value to their products, the cluster needs to keep investing in developing their own brands, especially abroad where they are still concentrated in commodity poultry. In order to improve quality and efficiency in production, the cluster should also incur in the development of biotechnology and genetics investments. Food safety is critical in today's world, and this can be one way of obtaining healthier, better quality chickens. The European veto on antibiotics illustrates a challenge in this area.

6. Recommendations

As mentioned earlier, countries and clusters cannot maintain their competitive advantages based on cheap inputs forever. To maintain its competitive edge the cluster needs to move into an innovation-driven mode, improving the four sides of the diamond.

We have seen that this cluster is very strong in the demand side, where Brazil is a significant world player with one of the highest growth rates in consumption. The cluster also benefits from very cost competitive inputs, especially for corn and soy.

However, other aspects of the diamond do need to be improved.

- Regarding factor input conditions, workers qualifications, need to be improved in order to use more sophisticated technology in the growth and processing of poultry. Considering that there are many small chicken producers that produce independently of the larger players, they should consider working together in order to create outsourcing alliances to obtain price advantages in raw material acquisition.
- Regarding demand conditions, as we have said, the cluster benefits from a significant and sophisticated demand. However, the cluster could reap higher benefits out of production if they could profit even more from economies of scale in production and distribution of new food products. They could also increase the production of high-end products. Finally, they should tend to focus growth of foreign sales in high consumption and high growth countries such as India, as compared to Europe, which has showed stagnant growth.
- Regarding related and supporting industries, the cluster should develop local technology, regarding biotechnology and equipment. Although there have been some advances in this respect, there is an opportunity to develop machinery that can be tested and improved locally. When results are positive, machinery could easily be exported later to other poultry producers in the world. Developing more suppliers and supporting industries would be very beneficial, as it increases competition and innovation among suppliers. This gives more opportunities for firms to improve costs.

- Regarding the context for firm strategy and rivalry , it is necessary to improve competition locally and cooperation abroad. Because there are high fixed costs to enter new world markets, strategic alliances could be made among producers to enter foreign markets. They could be using the same sales force and distribution network. A merger of Sadia and Perdigao should not be authorized by regulatory authorities.
- Locally, the government should be leveling the field in order to create fair competition. The fact that only the formal players pay taxes generates unfair competition when compared to informal producers.
- To move up the value chain, the cluster needs to coordinate some actions between the larger and the smaller firms, and the different levels of government, and the existing institutions for collaboration should be strengthened. This organization should create a common plan for the future development of the cluster. It would allow improving the coordination between firms and government agencies.
- The government has an important role to play in improving the competitiveness of the cluster. Excessive taxation was mentioned as an important obstacle for operations. Government should focus on lowering tax rates while simultaneously expanding its tax base, thus simultaneously achieving the objectives of leveling the playing field (reducing informality) and lowering the tax burden for big firms. At the local level, government should complete some important infrastructure works necessary to lower transport and operational costs and improve the attractiveness of the region as a whole. At the same time, it should continue to foster access to finance, in particular to small firms. Finally, the Brazilian Government should force companies to comply with the most strict international quality standards. Even though in the short term this might increase costs for Brazilian firms, it can actually

constitute a future competitive advantage. In a world that is increasingly concerned with food safety and traceability of products, being at the frontier in this aspect will end up being critical competitive advantage for the cluster.

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