Brazil’s competitiveness in the soybean sector: Will Brazil lose its competitiveness due to its patchy infrastructure?

Picture: “The road to hell”, the economist 2013

Bachelor Project submitted for the Bachelor of Science HES in Business Administration with a major in International Management

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Geneva, May 28th 2014
Haute école de gestion de Genève (HEG-GE)
Business Administration (International Management)
Declaration

This Bachelor Project is submitted as part of the final examination requirements of the Geneva School of Business Administration, for obtaining the Bachelor of Science HES-SO in Business Administration, with major in International Management.

The student accepts the terms of the confidentiality agreement if one has been signed. The use of any conclusions or recommendations made in the Bachelor Project, with no prejudice to their value, engages neither the responsibility of the author, nor the adviser to the Bachelor Project, nor the jury members nor the HEG.

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Geneva, May 30st 2013

Eli Elisa BLAICH
Acknowledgements

I would like to express my special appreciation and thanks to my advisor Robert Piller, for the continuous support of my thesis, for his guidance and immense knowledge. He also made me enjoy his classes and confirmed my wish to work in commodities trading.

Also, a big thank you to the three Agronomists, Vanderlei Campos Jr., José Luis da Silva Nunes and Amelio Dall Agnol that answered my questionnaire and gave me very interesting insights into the Brazilian soybean market. I appreciate the time you took to answer all of my questions.

I would also like to thank my family, my mother, my father, my sister, my grandmother and my grandfather. Your motivation and support have made me grow to the person I am today. Without your continuous support and sacrifices this would never have been possible.

A special thanks also to all of my friends who supported me in writing and encouraged me to strive towards my goal. Also, I want to thank my classmates that made the three years at the HEG unforgettable and I hope to have many more years with them in the future.

At the end I would like to express my appreciation to my boyfriend who was always there for me and able to calm me during my stressful moments.
Executive Summary

This paper seeks to analyze the competitiveness of Brazil within the soybean sector based on certain criteria. In particular it will assess one of Brazil’s main bottlenecks, its infrastructure, as well as expose what Brazil’s key competitive advantages toward its main competitor, the United States, are.

Brazil has a long export history and its main exports have always been in the agricultural sector. Soybeans gained on importance in Brazil in the mid seventies and introduced a socioeconomic and technological revolution. Today Brazil is about to outpace the United States, the world’s largest soybean producer.

However, Brazil is dealing with a number of issues and one of the primary factors shrinking Brazil’s soybean export competitiveness is its insufficient infrastructure. Brazil has been decreasing the level of investment in transport infrastructure since the 70s. This caused inefficiency in the system throughout Brazil rising transportation costs, accidents and travel time that also resulted in a loss of reliability. This problem worsened with the boom of soybean production in the Center-West region of Brazil, which has significantly increased the distance to export ports. Today the transportation sector is highly dependent on the highway network (60% of total freight volume) which in turn is the most expensive mode of transport.

However, Brazil does have some important key advantages such as cheaper cost of production, higher yields and a huge potential to expand soybean crop land. The government has also recognized the need to improve the infrastructure and has put certain programs in place. Moreover, the United States and Brazil do not always compete directly in the export markets. Different harvest times give China, the biggest soybean importer, the possibility to have fresh harvested soybeans throughout the year.

The main findings suggest that the infrastructure's role is key for Brazil’s export competitiveness in soybeans and remains a concern in the future. However, the growing demand for soybeans, especially in China, together with a low Real will partially offset the lacking infrastructure. Therefore Brazil will not lose its competitiveness due to its patchy infrastructure in the midterm, but to continue to be a successful soybean exporter Brazil has to tackle many issues.
Methodology

The research of this paper included several phases.

**Phase 1 – Context (chapter 1):** Consists of understanding the global context of the subject: Brazil’s trade history and how it evolved. Results are based on secondary research.

**Phase 2 – Analysis (chapters 2-5):** Consists of the study of the infrastructure system in Brazil and other competitive variables. Results are based on secondary research.

**Phase 3 – Consequences and conclusion (chapter 6-7):** Based on the analysis and the questionnaires a conclusion was developed evaluating the competitiveness of Brazil in the soybean sector. Results are based on primary research.

**Primary research**

The primary research was done between March 20th and May 5th 2014 by conducting three questionnaires with three Brazilian Agronomists working in different fields. They were contacted through LinkedIn or through their respective employer’s homepage.
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1. Brazil: An exporting country

1.1. The evolution of Brazilian commodity exports

According to Brazilian economist Francisco Carlos Bragança de Souza (2009) Brazil moved through 7 principal cycles, each representing the export of one commodity:

16th century brazilwood cycle

Portuguese explorers discovered these trees in South America and named them pau-brasil. Pau is Portuguese for "stick/wood" and Brazil must have come from brasa, Portuguese for "ember ". These South American trees soon became an important source to produce red dye and made the Portuguese Kingdom very rich. Brazilwood trees were such a large part of the exports and economy of the land so the country received its name Brazil. Due to the excessive exploitation of Brazilwood it is today listed as an endangered species by the IUCN1, with international trade being tightly restricted. Prices are likely to be very high, and from dubious sources.

1532 sugar cycle

Portuguese failed to find gold and silver in Brazil so they decided to implement an economy based on the production of agricultural goods to export them to Europe. This cycle ended with the Caribbean sugar boom that made world sugar prices decline steadily. Brazil was unable to compete and therefore Brazilian sugar exports declined sharply after having peaked by the mid-seventeenth century.

Within the sugar cycle there was a cattle sub cycle. This sub cycle was a consequence of the sugar production expansion. Huge quantities of herds were brought to the plantations as means of transportation and alimentation of the slaves.

1709-1789 gold cycle

As a result of the substantial cattle production, significant areas in Brazil’s interior were settled. Portugal understood that Brazil could only be upheld if precious minerals were found and therefore increased its exploratory efforts in the late seventeenth century which led to a discovery of gold and other precious metals early in the eighteenth century. Between 1700 and 1770, gold production in Brazil reached approximately 50% of what the rest of the world extracted (Simonsen, 1937).

1 International Union for Conservation of Nature
1866-1913 Rubber cycle

When Charles Goodyear discovered the vulcanization process of latex, which made it possible to manufacture rubber tires (before that cars used wooden wheels) the demand of those tires grew rapidly in Europe and the United States generating a sharp increase in the international price of latex. The Amazon region took advantage of the increase becoming the largest center of extraction and export of latex in the world. In the short period of three decades, between 1830 and 1860, exports of Amazonian latex increased from 156 to 2673 tons. But the rubber boom eventually ended. The high price of rubber gave the incentive to search for alternatives. Moreover rubber tree seeds were smuggled out of Brazil to Southeast Asia where they have no natural enemies decreasing the production costs.

1800-1930 coffee cycle

Coffee was the product that pushed the Brazilian economy from the early nineteenth century until the 1930s. It was the main export of the country for nearly 100 years. In 1885 Brazil was producing more than one half of the world’s supply of coffee. Unlike brazilwood, sugar, and gold, this accelerated economic growth and contributed to industrialization (Par Marshall C. Eakin, 1998). It also contributed to the decline of slavery and the rise of free labor. This growth attracted millions of immigrants to the Southeast which changed the city of Sao Paulo from a small, frontier town into the largest industrial center in the developing world. The profits earned were reinvested in other sectors and stimulating the growth in banking, commerce, and industry. However this cycle ended with the international crisis in 1929, decreasing coffee consumption and reducing prices.

1970 until today Soy bean cycle

The new product that boosted the export economy was soybeans, introduced from seeds brought from Asia and the United States. The growth of the soybean crop has occurred at the “expansion of the agricultural frontier” towards the Amazon, which in turn has led to large-scale deforestation.

1996 Iron Ore cycle

Brazil has the fifth largest reserves of iron ore in the world with the highest iron content (60%). The company Vale do Rio Doce was privatized in May 1997, which is the largest producer and exporter of iron ore. Iron ore is of great importance for the Brazilian trade balance, since it is the largest item of exports from the country, after the steel products.
1.2. Brazil’s exports today and the importance of Soybeans

Brazil’s historical export cycles show the importance of agricultural activity to the Brazilian economy. Today Brazil is a major player in the commodities sector. During 2006–10, Brazil accounted for almost 9 percent of global agricultural exports, making it the world’s third-largest agricultural exporter, behind the EU-27 and the United States (USITC, 2012). Brazil is about to overtake the United States as the world's top producer in soybean production and supplies approximately 40 percent of world’s soybeans and one third of world's coffee (USDA 2011/13/14). In 2009, Brazilian exports of raw materials accounted for 4.66% of world exports, and in recent years this percentage has been growing.

Figure 1: Brazilian exports in 2011

As shown in figure 1 agricultural products, metals and crude oil are leading Brazilian exports and approximately 40 percent of all exports are concentrated across the following five commodities:

- Soybeans represent 6 percent
- Sugar is approximately 6 percent
- Coffee is 3 percent
- Iron ore and related products constitute 17 percent
- Crude oil represents an additional 9 percent
Brazil exports mainly to China, 17% of all exports followed by the United states (11%) and Argentina (9%).

Three of the five largest exports are from the agricultural sector with soybeans being the most important commodity. It introduced a socioeconomic and technological revolution in Brazil that can be compared to the coffee cycle mentioned earlier in this paper. In 2008, soybeans accounted for almost 15% of Brazil's foreign currency revenues (da Silva Nunes, 2014).

Opening borders and cropping cities, soybeans led to the implementation of a new civilization in Central Brazil, bringing progress and development to an unpopulated and undervalued area, sprouting metropoles in the empty Cerrado regions and transforming existing small urban clusters into cities.

The explosive growth of soybean production in Brazil, which increased almost 260 times in the course of just four decades, established a chain of changes in the history of the country and it accounts largely for the emergence of commercial agriculture in Brazil. Soybeans are responsible for the acceleration of mechanization of farming in Brazil, the modernization of the transport system, the expansion of the agricultural frontier, the professionalization and the increase of international trade, the modification and enrichment of the diet of Brazilians, the acceleration of the urbanization of the country, the internalization of the population, helped to cultivate other cultures, notably corn, boosted the national agro industry and supports the expansion of poultry as well as swine production in Brazil (da Silva Nunes, 2014).

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2 Observatory of economic complexity (2011)
2. Brazil’s infrastructure

Most of Brazil’s infrastructure is decrepit and transport infrastructure in Brazil is characterized by strong regional differences. Brazil has been decreasing the level of investment in transport infrastructure since the 70s. The World Economic Forum ranks it at 114th out of 148 countries. According to the economist, the queue of lorries waiting to enter Santos sometimes stretch up to 40km. This makes transportation very expensive in Brazil. Nearly 60% of freight transport is done by road which costs twice as much as by rail and four times as much as by water. Brazilian farmers pay 25% or more of the value of their soya to bring it to port compared to their competitors in Iowa that just pay 9% (the economist, 2013). It also puts off customers as a case in China shows: In March 2013 Sunrise Group, China’s biggest soya trader, cancelled an order for 2 million tons of Brazilian soya after repeated delays.

This lack of infrastructure is a result of a shift in production regions. Southern states of Brazil have traditionally accounted for the majority of Brazil’s agricultural production. These states have therefore an established road and rail network and are close to domestic markets and ports for export (USITC, 2012). However, agricultural production is now booming in the Center-West but due to the underdeveloped transport infrastructure this region still exports most of its agricultural goods via southern and southeastern ports. The lack of infrastructure linking the North with the Center-West makes it difficult to reach the ports. For example, even though soybean production in the southern states has been overtaken by the one in the Center-West, there are still more than 80 percent of soybean exports shipped through the south and southeastern ports (USDA, 2011). Those increasing distances to ports and the reliance on road transportation have led to bottlenecks and high transportation costs. The government has developed plans to improve roads, rail, and waterways to help shift export routes toward northern ports to reduce transportation costs and relieve congestion at southern ports. As a result, northern ports for exporting soybeans are becoming more common but even those ports may be restricted in the future by a lack of port capacity.
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1. Trucks

An estimated 58% of total freight movements occur on roads (OSEC, 2010). While only 12 percent of Brazilian roads are paved\(^3\) Brazil has the world's fourth-largest road network in the world (1.8 million km)\(^4\). Also, this road system is concentrated in the southeastern parts of Brazil with a dense population, very distant from the soybean production regions analyzed in this paper which often lie in the Center-West.

Other bottlenecks, especially for agricultural producers, are the unevenly distributed trucking services and fleets throughout Brazil, which is an issue especially at harvest time. During that time of the year trucking companies must send additional trucks to production sites which drive up transport costs (National Agency for Land Transportation, 2009).

Those bad road conditions together with road capacity overload during peak harvest periods can cause substantial losses of the commodity. According to Famato, a farm organization in Mato Grosso, approximately 0.3 percent (51,000 tons) of the state's soybean crop is lost because it dribbles out the back of trucks while it is being transported over bumpy roads to Brazilian ports\(^5\). Potholes also lead to everyday delays, excessive repair and high maintenance costs for trucks, and road accidents, which are reportedly common for trucks (USDA, 2005). A survey made in 2010 by the CNT\(^6\) found that the operating costs of trucks are 25 percent higher in paved roads with poor conditions versus trucks in use on paved roads in optimal condition (USDA, 2010).

\[\text{Table 1: Freight transport, modal split compared, 2009}\]

<table>
<thead>
<tr>
<th></th>
<th>Rail</th>
<th>Road</th>
<th>Other</th>
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<tbody>
<tr>
<td>Russia</td>
<td>81%</td>
<td>8%</td>
<td>11%</td>
</tr>
<tr>
<td>India</td>
<td>48%</td>
<td>50%</td>
<td>2%</td>
</tr>
<tr>
<td>Canada</td>
<td>46%</td>
<td>43%</td>
<td>11%</td>
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<tr>
<td>USA</td>
<td>43%</td>
<td>32%</td>
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<tr>
<td>Australia</td>
<td>43%</td>
<td>53%</td>
<td>4%</td>
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<tr>
<td>China</td>
<td>37%</td>
<td>50%</td>
<td>13%</td>
</tr>
<tr>
<td>Brazil</td>
<td>25%</td>
<td>58%</td>
<td>17%</td>
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</tbody>
</table>

Source: ANTT 2009 Freight transport, modal split compared

\(^3\)WEF, The Brazil Competitiveness Report 2009, 2009, 34
\(^4\)The United States has the largest road network (6.5 million km), followed by China (3.9 million km) and India (3.3 million km). CIA, World Factbook, December 1, 2011
\(^5\)Soybean and Corn Advisor, "Poor Roads Causing Transportation Losses in Brazil,"
\(^6\)Confederação Nacional do Transporte (National Transportation Confederation)
2.2. Rail
In 2009 rail transport accounted for one quarter of Brazil’s total freight volume. Covering about 30,000 kilometres, its rail network is the largest in South America but it is relatively small compared to the country’s size being the 5th biggest country in the world. In contrast, the United States has the largest rail network worldwide (225,000 km), followed by Russia (87,000 km), China (86,000 km), and India (64,000 km). Brazil’s rail network ranks only 10th in the world. Again, most of Brazil’s rail network is concentrated in the south and southeastern states (about 50%). These areas are rich in mineral deposits, including iron ore, which accounts for the majority of rail freight.

Privatisation of the Brazilian rail network has taken place in the mid-1990s after years of negligence to improve productivity in the sector. As a consequence today 95 percent of Brazil’s rail network is operated by five private groups and two state-owned companies under 12 different concessions which led to a concentration of rail operators and limited competition give an incentive to monopoly pricing. Therefore costs for rail transport are only slightly less than for truck transport.

2.3. Waterways
Inland waterways account for about 13 percent of cargo transported in Brazil with 45 million tons of cargo carried annually via eight waterways, including agricultural and mineral products, construction material, and fertilizers. Brazil has a river network longer than that in the United States, however, it underuses its inland waterways. Brazil has a total of 28,000 km of navigable inland waterways, with a potential to develop an additional 15,000 km, but only about 13,500 km are used commercially to transport cargo which is less than half of all navigable inland waterways.

2.4. Storage capacity
The increased agricultural production in Brazil outpaced the storage capacity for grains and thus the country has suffered a lack of warehousing capacity for agricultural goods, expected to be about 40 million tons per year (EIU, 2010).

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7 WEF, The Brazil Competitiveness Report 2009, 2009, 35
8 more than 70% of transport production (OSEC, 2010)
9 Brazil Ministry of Transport, 2010
10 USITC, 2011
11 Brazil Ministry of Transport, “Logistic Infrastructure Scenario in Brazil,” 2010
Moreover, regional storage capacity is imbalanced. Again, storage capacity is concentrated in the south of Brazil creating distribution problems during harvest seasons because most producing regions (about 70%) lie in the Center-West (EIU, 2010).

Finally, Brazil has insufficient intermodal transfer terminals, which connect storage and warehousing infrastructure to rail networks. According to Macroligistica, (Brazil 2008), by doubling intermodal transfer terminals, the total inventory and warehousing costs could be decreased by a total of $1 billion annually. At least one large agricultural trader, interviewed by USITC in 2011, stated that the most critical element of the supply chain in Brazil for future development is the improvement of efficient transport infrastructure connecting warehousing and storage facilities to ports.

2.5. Ports

Brazil has one of the longest coastlines in the world, and seaports respond to 90% of total exports. Consequently ports in Brazil play a critical role in the country’s ability to trade. Even though most ports are owned and controlled either by federal port companies or by states or local municipalities, the majority are operated by private terminals based on long-term lease agreements of 25 years or more. This is an effect of government regulatory reform and privatization efforts in the 1990s. Private terminals ship mostly solid bulk such as mineral ores and grains (particularly iron ore and soy) and liquid bulks (petroleum and derivatives, ethanol and biodiesel). Public terminals on the other hand carry mostly general and containerized cargo, which has higher value added (Brisola, 2008).

According to Antaq, private terminals ship about two third of total cargo flowing through the national port system (754 million tonnes in 2007). In addition, according to the Brazilian Association of Port Terminals (ABTP), cargo at the public ports is handled almost entirely by terminals rented by private companies which means, that private companies are responsible for shipping over 90% of the country’s total cargo.

Brazil’s port system is generally characterized as relatively small, inefficient, and expensive. In 2009, Brazil’s seven largest ports combined handled only 475 million mt of cargo compared to the three largest U.S. ports combined that handled 516 million mt of cargo. In addition the number and size of ships that can access the ports is limited due to a lack of harbor capacity and insufficient dredging depths (EIU, 2010). For instance, the majority of

12 Latin Port Business 2014
15 Brazil Ministry of External Relations, Brazilian Ports, 2008, 14.
Brazilian ports can only handle Panamax-sized ships. There are only seven ports that can handle Capesize ships, which achieve greater economies of scale because they run at lower per-ton freight costs.

Inland port access for trucks is often limited with narrow and congested roads, resulting in huge delays during peak harvest periods. According to a World Bank study, inefficient intermodal transport in Brazil adds more than $1.2 billion per year to the cost of trade in goods. Mainly due to the obsolete equipment and labour-intensive processes trucks can wait up to 20 days to unload and queues at key grain ports can reach up to 50 km (EIU, 2010). These delays account for high demurrage costs for ships waiting to be loaded. In 2010, long delays resulted in a huge line-up of vessels waiting to load sugar cargoes at Brazil’s ports contributed to push the price of sugar futures to seven-month highs (Brough & Saul, 2010). Another drawback at the ports are strong trade unions that organize strikes that, though less frequent than in the past, remain a concern.

To counter this inadequate port infrastructure, some large agricultural, oil as well as iron ore producers and traders have invested in larger and more efficient terminals. One terminal at Santos leased as a joint venture between two large agricultural traders is considered the most productive terminal at the port (USITC, 2010).

According to MercoPress, Eduardo Bartolomeo, Integrated Operations executive director of Vale, said in 2011 “We invested 9 billion USD over the last six years and, in 2011 alone, a further 5 billion will be invested in the integrated mine-railroad-port-shipping chain”.

Another example is Cosan, the world’s largest sugar exporter that built the first rain cover in Brazil in 2012 over a bulk sugar terminal in the port of Santos. According to Reuters, they lost on average 95 days every year due to rains in Santos.

In Brazil contracts to develop and operate terminals are auctioned off. Changing port law helps to increase Brazil’s port capacity and competitiveness: According to Port Finance International, instead of aiming the highest bidder, concessions will be given to companies which demonstrate that they can handle higher volumes of cargo at lower tariffs.

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16 World Bank, Brazil Multimodal Freight Transport, 1997
3. The role of the Brazilian government in agriculture

As an extremely regulated market, Brazil’s government controls the market activity with a range of tools. They implemented an array of taxes on imports, domestic manufactured goods, capital inflows and energy production throughout the economic cycle (Cedrick Reynolds, 2013). However, to give additional incentives for investors focused on infrastructure projects Brazil has significantly reduced taxes on capital inflows such as taxes on "hot money". Also, a large payroll tax was converted to a smaller domestic sales tax and it implemented a 20 percent tariff reduction on electricity prices.

3.1. The evolution of Brazilian agricultural policy

Brazilian agricultural policies have shifted from direct market-intervention measures such as government purchases, price controls, high import duties, and export controls to measures that seek to boost private sector involvement, such as preferential credit and project financing, as well as agricultural research and development (USITC, 2012).

Table 2: The evolution of agricultural policy in Brazil

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<td>- Uncontrolled inflation and low growth (stagflation)</td>
<td>- Control of inflation</td>
<td>- Low inflation</td>
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<td>- Controlled exchange rate</td>
<td>- Heterodox plans</td>
<td>- Volatile exchange rate</td>
<td>- Structural reforms and fiscal balance</td>
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<td>- Debt crisis</td>
<td>- High real interest rates</td>
<td>- Less volatile exchange rate</td>
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<td>- Increased government</td>
<td>- Land as real asset</td>
<td>- Modest growth rate</td>
<td>- Lower interest rates</td>
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<td>- Family farming and social Inclusion</td>
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<td>- Unilateral openness to trade</td>
<td>- Aggressive policy against agricultural trade barriers</td>
<td>- Aggressive trade policies: negotiations, litigations</td>
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<tr>
<td>- High tariffs</td>
<td>- International integration (Mercosur)</td>
<td>- WTO dispute panels</td>
<td>- Increased emphasis on NTBs: technical, sanitary, and social barriers</td>
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<td>commodities</td>
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17 Foreign capital chasing high, short-term interest rates (Cedrick Reynolds, 2010)
18 Source: Chaddad and Jank, “The Evolution of Agricultural Policies,” 2006 unless otherwise stated
19 Source: Chaddad and Jank, “The Evolution of Agricultural Policies”
1965 to 1985 the government intervened massively in agricultural commodity markets (Table 2). At that time, except for tropical products such as coffee and sugar, the agricultural sector in Brazil was generally not competitive. It was characterized by inefficient landholdings known as “latifundios” that were sometimes less focused on the business of farming. Because of the start of the urbanization of many rural poor migrated to large cities in the 1960s and 1970s, the agricultural policy’s main goal was to promote food security of an increasingly urban population. With the import substitution model the government wanted to compensate the agricultural sector for the anti-export bias. Due to the debt crisis of the late 1980s the Brazilian government was forced to reduce support to farmers and to reassess agricultural policy goals. Reforms established in the early 1990s further deregulated and liberalized commodity markets by eliminating export taxes and price controls, unilaterally reducing trade barriers and imposing private instruments for agricultural financing. Consequently, government support to producers represented 3% of farm receipts in Brazil, compared with 2% in New Zealand, 4% in Australia, 8% in China, 18% in the US, and 34% in the EU in 2004 (OECD, 2005).

In 1995 considerable changes in agricultural policy goals were established that switched priority to land reform and family farming with the objective to lessen rural poverty and tackle the issue of the historical unjust land distribution in the country. At that time, approximately 500,000 new family farms were settled in expropriated land.

In 2000, the Brazilian government formed the new Ministry of Agrarian Development (MDA) to operate programs targeted to family farms and land reform. According to Chaddad & Jank Brazil is probably the only country in the world with two ministries of agriculture.

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20 Economic policy adopted in most developing countries from the 1930s to the 1980s to promote industrialization by protecting (in the form of high tariffs or the restriction of imports through quota) domestic producers from the competition of imports (Britannica).
Due to this significant policy changes, the Brazilian agrifood system shifted from a traditional to an increasingly global and industrial model that attracted new multinational food processors and retailers and increased investments in the Brazilian market during the 1990s resulting in a market share of 30% of foreign companies in (FAO 2014). According to the FAO eight of the top ten food processors in the country are multinational firms with foreign headquarters.

3.2. National Plan for Transportation and Logistics (NPTL)

Given the critical situation in infrastructure, the Ministry of Transport launched the National Plan of Logistics and Transport. This plan aims at reducing costs involved in the entire chain of transport departing from origins to destinations, sustainability and environment, reducing regional inequalities and proper use of rail and waterway modes of freight transportation. According to the Ministry of transport, the participation of various actors in the development was of fundamental importance and included users, universities, transport operators, productive sectors (agriculture, industry, trade, etc.), state governments, federal government, associations and many more parties.

With a time horizon of 20 years and investments of about R$291 billion by 2023 the country seeks to increase the competitiveness of the logistics sector. Two of their priorities are to integrate the waterway network with highways and railways and to shift freight transport from highways to waterways and rail transport. The use of sustainable modes of transport will also help to achieve environmental objectives.

3.3. Growth and Acceleration Plan (PAC)

PAC 1

The Growth and Acceleration Plan, launched in January 2007, is a program of the Brazilian government that aims to accelerate Brazil's economic growth that predicted investments of R$503.9 billion by 2010. According to the Brazil Investment Guide, it was mostly funded by both state enterprises (including Petrobras participating with R$ 148.7 billion) and the private sector as well as a proportion from fiscal and social security receipts.

With this plan the government’s objective is to accelerate economic growth and increase employment and income as well as reducing social and regional inequalities and sustaining macroeconomic foundations (low inflation, balanced public accounts, strong external accounts) (Minister Paulo Bernardo, 2007).

However, at the target completion date in 2010, only 63 percent of the funding was spent. Therefore the program was criticized for its low implementation speed. Despite these issues,
the overall impact of the PAC 1 was perceived as a positive step for Brazil from all sections of society (Selvanayagam, 2010).

PAC 2
In March 2010, part two of the Growth Acceleration Program was launched with an investment plan of R$958.8 billion between 2011 and 2014, and an additional R$631.6 billion post-2014 period, totalling to R$1.59 trillion. Funded by means of private, state, federal and municipal investment, the focus is the same as at the first step: logistics, energy and social-urban issues.

3.4. Tax Policy
Brazil has a very complex tax system that results in high bureaucracy and economic costs on agricultural producers and exporters. Its corporate taxes are also higher than those of some major agricultural export competitors including the United States (USITC, 2012).

According to the World Bank’s 2003 Investment Climate Survey (ICS) Brazilian companies rate the high tax burden as the most important obstacle to their growth (World Bank, 2003). This is also the case for Brazilian agribusinesses that could obtain a cost advantage of up to 10–15 percent, if the tax system were simplified (USITC, 2011).

Taxes, in Brazil, are imposed at three levels namely the federal, state, and municipal level. In certain cases, industries or certain types of producers can claim tax exemptions put in place by the government to boost competitiveness. Also, apart from the federal income tax, revenues from exports are usually exempt from taxes. In addition, credits given on taxes on inputs used to manufacture exported products may be used to offset other federal tax liabilities. That gives an incentive to export rather than selling domestically when prices are similar.

3.5. Environmental Policies
Environmental restrictions and policies generally increase the cost of agricultural production, which decreases Brazilian exporters’ competitiveness in global markets (USITC, 2012). Environmental issues have a long history in Brazil that started with the extraction of brazilwood. Today there are growing concerns regarding the impact of expanding agricultural production on the environment, especially into the Amazon forest. There are two important programs that show the link between the agricultural production and the environment that the

21 Source: United States International Trade Commission unless otherwise stated
22 including taxes on income, assets, production, and wages as well state and local taxes
23 United States International Trade Commission unless otherwise stated
government put in place, namely the longstanding Proambiente program and the low-carbon agriculture program (ABC). Yet, its forest code is the most important environmental policy. Targeting the regulation and limitation of deforestation, it places restrictions on land use.

The Proambiente program supports rural households with the sustainable use of Amazon resources (Ministry of Agriculture, 2014). Rural households are compensated for providing “environmental services” such as reducing deforestation, conserving soil and water, using fewer chemicals, lessening fire risk, and adopting renewable energy. The ABC program on the other hand supports sustainable agricultural practices by providing investment credit at preferential rates to farmers. These programs are intended to minimize costs of agricultural production to promote long-term sustainable agriculture.
4. Soybeans

4.1. History & Origin

According to Embrapa (2005), soybean originated five thousand years ago in Manchuria, a region of China and was then first domesticated around the 11th century B.C. in the eastern half of North China. Along with rice, wheat, barley and millet, soybeans have been one of the main plant foods of China. The awareness of soybeans reached Europe in 1712 through the writing of a German botanist and researchers began studies of soy bean oil as a source of food and animal feed. 1740 some soybean seeds were planted in France that may have been sent from China by missionaries. Soybean was first introduced into the American Colonies in 1765 as "Chinese vetches" but the fist use of the word “soybean” in U.S. literature was in 1804.

1908 first shipments of soybeans were made to Europe, and the interest for soybeans arouse in industries worldwide. However, attempts to commercial introduction of cultivation in Russia, England and Germany failed, probably due to unfavourable climatic conditions (INSUMOS, 2007). At the end of World War I in 1919, soybeans gained a truly international prominence. However, for many years, soybean acreage increased very slowly and most of the crop was used for hay until World War II started. Since the U.S. imported more than 40% of its edible fats and oils, soybean acreage in the U.S increased rapidly due to disruption of trade routes during the war.

Before World War II soybean was produced in the southern U.S and moved into the Corn Belt after the war. During the 1950's, 60's, and 70's, the U.S. was the world top soybean supplier with a share of more than 75 percent of the world soybean crop. During this time the U.S. was the major supplier of animal feed protein in the world until the worldwide shortage in the early 1970's. To secure animal feed protein the US introduced a soybean export embargo in 1973, which artificially raised world prices until it became profitable for even the most inefficient producer to grow soybeans (Harrison 1976). This was the start of a large-scale soybean production in several South American countries, especially in Argentina and Brazil.

Soybeans appeared in Brazil in the early twentieth century with the first Japanese immigrants, but its biggest boost came in the mid-70s, because of the shortage and the inability of the United States to satisfy global demand. Key soy importers, namely Japan and Europe, began seeking alternative sources of animal feed protein because the embargo

Source: Gibson & Benson 2005 unless otherwise stated
Brazilian Agricultural Research Corporation
caused the worldwide impression that the U.S. was an unreliable supplier (McVey, 2000). At this time Brazil surpassed even China, which was the world’s second largest producer of soybeans just behind the United States (Missão 2006). Ever since, Brazil’s soybean production grew from 5-million metric tons in 1973 to 86.6-million metric tons forecast in 2014.

Another important reason for the rapid growth of Brazilian soybean production is the support of the government to the soybean farmers with subsidies and price supports because it needed to generate currency to pay for expensive imports (especially petroleum) (Soyinfo center, 2007). Also, Japanese investors bought land in Brazil for soybean production and offered technical assistance to increase soybean production on 320 million acres of marginal frontier land.

From 1980 to 2009, despite increased production, the U.S. share of the world’s soybean exports had shrunk from over 90 to 40 percent (Figure 3) while Argentina’s and Brazil’s have increased to currently more than 50 percent compared to less than 15 percent before 1980 (USDA 2012).

4.2. Competitive advantages & bottle necks

Soybeans have a great economic importance and cover the biggest cultivated area in Brazil, boosting export growth since the 1990s. Including the United States, Brazilian soybeans are currently cost-competitive anywhere in the world. Brazilian and U.S. soybeans are interchangeable commodities in most export markets but direct competition is often limited. The boost in demand has often outpaced production increases. The fast growth of Chinese soybean demand has allowed both countries to increase exports and according to the USDA global demand will continue grow, particularly in China (Figure 4). Also, the harvest seasons in Brazil and the United States play an important role. Different harvest times allow importers to buy newly harvested soybeans almost throughout the year. Besides, consumers may favour one country’s soybeans over another, which will be discussed later in this paper.

26 The Brazilian government’s national crop supply agency (CONAB)
27 Source: United States International Trade Commission unless otherwise stated
Brazil’s competitiveness in the soybean sector: Will Brazil lose its competitiveness due to its patchy infrastructure?

BLAICH, Eli

4.2.1. Location

Key Features of territorial competitiveness include temperature, rainfall, sunlight, growing season, day length, soil types, topography and altitude. American soils are more fertile than the ones of Brazil. The U.S. has temperate climates, while the Brazilian climate is tropical. In the Midwest, the Cerrado region which is a savannah-like flatland, the climate is humid and tropical, with low fertility because soils are high in aluminum, highly acidic, and lacking phosphorus and nitrogen. For this region, Embrapa has developed tropical Soybean varieties that have been bred to adapt to these soil conditions (Menezes Bezerra Sampaio, 2012). Another problem in the Cerrado are the fragile soils that create major soil erosion problems at high rainfall levels. However no-till production practices and terracing have been adopted to counter these erosion risks. Those soil management techniques have elevated the productivity of this region to a competitive level.

In the two main producing regions of Brazil (the South, state of Paraná, and in the Midwest), more fertilizer and chemicals are used than in the U.S. due to the acid and rusty soil that lacks nutrition, but they have other suitable characteristics for agricultural production: The soil is deep and permeable, with an excellent filtration.

Seasonality favours Brazil that produces in different seasons than the United States, creating a certain complementarity in the world market. Harvest in Brazil is between March and May, while in the U.S. it is done between late October and early December. Since the U.S. is a price maker for soybeans, international prices are generally at the lowest levels at the time of

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28 Source: USDA “Soybean Production Costs and Export Competitiveness in the United States, Brazil, and Argentina”
the American harvest. Moreover, Brazil has larger production stations with climates that allow normally two harvests (double-cropping) and in the case of the Brazilian Center-West even up to three harvests. Often corn is planted immediately after soybeans are harvested and some farmers even manage to get two soybean crops in using early varieties. Due to the shorter growing season in the U.S. soybean double-cropping with corn is not possible. But in certain states, double-cropping with winter wheat as the first crop and soybeans as the second crop is practiced. According to the USDA this number was limited to 6 percent of the U.S. soybean planted acreage in 2011.

However, the geographical location favours U.S. exports: it has shorter distances to the ports of Rotterdam and East Asia. According to the Mato Grosso Soybean and Corn Producers Association (Aprosoja), Brazilian soybeans travel on average 52 days to arrive in China against 16 days U.S. soybeans. The reason for that is not only the shorter distance from the U.S. to China, but the lack of efficient infrastructure in Brazil to move the soybeans in a timely manner.

Brazil produces fertilizer and is rich in some of the necessary mineral resources. However, the rapid growth of the Brazilian agricultural sector and its strong demand for fertilizer has outpaced its domestic supplies, increasing dependence on imports. Potassium, the third major plant and crop nutrient after nitrogen and phosphorus, is not mined in Brazil, while Brazil’s phosphorus is of poor quality. Brazil is the world’s second-largest importer of phosphate fertilizers after India while the U.S. is the world’s biggest phosphate exporter. Brazil is also the fourth-largest potassium importing country after the United States, China, and India (The Fertilizer Institute).

More than 70% of Brazil’s fertilizer supply comes from imports and it is crucial to improve soil fertility. Bad infrastructure adds to the cost of fertilizer due to the long distances, and put pressure on the country’s already overburdened transport system (EIU, 2010). On top of that prices for fertilizer are already high in Brazil, due to the limited number of large domestic producers and its weak currency.
4.2.2. Technology, farm size & economies of scale

Brazilian soybean production systems are modern and efficient like those of the United States. However, there is an important difference in the size of soybean farms between the U.S. and Brazil. About 70 percent of soybean operations in Center-West Brazil are over 2,500 ha (6200 acres) and numerous are more than 20,000 ha (49'000 acres). In contrast, the average size in 2008 of an Iowa farm was around 333 acres (Iowa farm bureau).

These huge Brazilian farms are the result of a vast amount of land becoming available in the Cerrado region owing to improved technology and mechanized harvests on flat parcels in tropical areas. However, southern Brazilian soybean farms, are usually less than 60 ha (148 acres). The advantage of big farms is the resulting economies of scale that allow them to spread certain fixed costs, such as equipment for harvesting and planting, over many units of output.

The degree of vertical integration also plays an important role in economies of scale. For this reason cooperatives were created in the southern states of Brazil that help to offset the reality that smaller farmers do not have economies of scale. They make inputs such as fertilizer and technical assistance available, and buy the soybeans from their members after harvest for storing and processing. The meal and oil is then sold by the cooperatives domestically, abroad or to large global trading companies. Big farms generally sell their harvested crop directly to trading companies such as the ABCD’s relying on the marketing and logistics infrastructure of these agribusinesses.

4.2.3. Cost of production

This part focuses mainly on the production in Iowa, North Dakota and Mato Grosso. The choice of these regions is valid for two main reasons. First, because they are the major producing states of soybean in their respective countries and second the distances to the closest export ports is relatively similar. Sorriso, a production region in the State of Mato Grosso, is about 1,900 km from the port of Santos and 2,000 km from the Port of Paranaguá away and the main producing regions in Iowa are situated approximately 2100 km from the Port of New Orleans (Yotit Ikeda, 2011).

Variable costs in Brazil are higher based on high fertilizer input costs (Table 3). On the other hand, fixed costs are almost six times smaller in Brazil. The determining factor for these differences is the price of land, it is cheap in Brazil due to the huge amount of unexplored

Source: United States International Trade Commission unless otherwise stated
1 hectare equal to 10,000 square meters
Source: Menezes Bezerra Sampaio (2012) unless otherwise stated
land, and very expensive in the U.S., that has to reduce areas with other agricultural usage to increase Soybean production.

The table of Flaskerud (2003) also highlights the fact that Mato Grosso has the lowest costs of production for 2003 harvest compared to North Dakota and Iowa even when freight costs to Rotterdam are added. This gives Brazil a strong starting position in the world market. As a result, soybean production in Mato Grosso was in 2003 significantly more profitable.

Table 3: Soybean Total Costs of Production for 2003 Harvest, US$

<table>
<thead>
<tr>
<th></th>
<th>North Dakota</th>
<th>Iowa</th>
<th>Mato Grosso</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct Costs of Production</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seed</td>
<td>29.16</td>
<td>31.25</td>
<td>8.45</td>
</tr>
<tr>
<td>Herbicides</td>
<td>9.75</td>
<td>18.68</td>
<td>25.33</td>
</tr>
<tr>
<td>Fungicides</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insecticides</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertilizer</td>
<td>1.25</td>
<td>23.15</td>
<td>49.13</td>
</tr>
<tr>
<td>Crop Insurance</td>
<td>3.20</td>
<td>3.15</td>
<td></td>
</tr>
<tr>
<td>Machinery Operation</td>
<td>27.98</td>
<td>34.16</td>
<td>24.41</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Interest</td>
<td>1.98</td>
<td>3.91</td>
<td>5.36</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>73.32</strong></td>
<td><strong>121.30</strong></td>
<td><strong>127.75</strong></td>
</tr>
<tr>
<td><strong>Indirect costs of production</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machinery</td>
<td>24.59</td>
<td>26.27</td>
<td>7.91</td>
</tr>
<tr>
<td>Land</td>
<td>44.89</td>
<td>135.00</td>
<td>20.24</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>4.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>73.59</strong></td>
<td><strong>161.27</strong></td>
<td><strong>28.16</strong></td>
</tr>
<tr>
<td>Total direct &amp; indirect costs</td>
<td><strong>146.91</strong></td>
<td><strong>282.57</strong></td>
<td><strong>155.91</strong></td>
</tr>
<tr>
<td>Yield</td>
<td>32</td>
<td>45</td>
<td>48</td>
</tr>
<tr>
<td>Total costs/bushel</td>
<td>4.59</td>
<td>6.28</td>
<td>3.24</td>
</tr>
<tr>
<td>Freight/bushel to Rotterdam$^{32}$</td>
<td>1.17</td>
<td>0.93</td>
<td>1.33</td>
</tr>
<tr>
<td><strong>Total cost/bushel to Rotterdam</strong></td>
<td><strong>5.76</strong></td>
<td><strong>7.21</strong></td>
<td><strong>4.57</strong></td>
</tr>
</tbody>
</table>

Source: Flaskerud, 2003

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$^{32}$ Freight costs to Rotterdam reflect differences between local prices and Rotterdam prices CIF
4.2.4. **Financing**

For investments in assets and to finance their daily operations, soybean producers need credits prior to harvest and sale. In Brazil financing can be done through the government, agricultural input suppliers, processors, exporters or commercial banks. However, credit accessibility is limited and interest rates are higher than in the United States (Figure 6).

**Figure 6: Brazilian & U.S. interest rates compared**

![Brazilian & U.S. interest rates compared](image)

Source: Tradingeconomics, May 2014

Total credit granted by the financial system to the private sector in 2009 was less than 30 percent of GDP, which is one of the lowest levels of credit availability anywhere in the world (Valdes, 2009). The commercial rate offered to farmers by Brazilian banks was 15-20 percent in 2011 typically without minimum fees of 1–2 percent of the loan value. Compared to the U.S., where farmers were generally offered loans at rates around 5 percent in 2011 (Henderson, 2011). Large Brazilian agribusinesses with a strong balance sheet may have access to inexpensive financing abroad. A one-year loan can be accessed with interest rates between 7–8 percent, while investment loans may run 10–12 percent for investing in land.

Because of these constraints, Brazilian farmers often secure financing through their business partners. Input supply companies and trading companies provide inputs to farmers, such as fertilizer, in exchange for soybeans when they are harvested because it provides guaranteed crop volumes for crushing or export. On the other hand, according to newyorktimes, Brazilian farmers are paying up to 25 percent more for supplies like fertilizers provided by traders and Cargill stopped financing several farmers in Mato Grosso in 2006 after they failed to pay their bills. But those farmers find new Chinese benefactors. According to the Brazil-China Chamber of Commerce Chinese buyers are looking to enter the Brazilian agri market. Brazilian farmers would welcome Chinese money, but they worry about events like the one in

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33 Source: United States International Trade Commission unless otherwise stated
2004, when China rejected shipments from an estimated 30 contracts of Brazilian soybeans after claiming they were contaminated, resulting in a loss of close to $700 million.

4.2.5. Education

Education is important because workers generally increase their productivity in two ways. One way is by increasing their knowledge or skills through additional education and experience. The second way is through technological advancements that allow a worker to produce more output with fewer inputs (Kliesen, 1995). One of the success factors of the U.S. might be its education system, because most of the indices show a better result for the U.S. compared to Brazil. For example, literacy rate in Brazil is only at 90%, while in the United States it is at 99% (The world fact book). Moreover in Brazil only 49.5% of the population have at least a secondary education compared to the U.S. with a rate of 94.5% in 2010 (Human development index, 2010). However, public expenditure on education as % of GDP is slightly higher in Brazil with 5.8% and 5.4% in the United States in 2010 (Worldbank).

4.2.6. Quality

According to “The Nature Conservancy” (2012) Brazilian soybeans yield about 4.5% more oil and contain 4.5% more protein than US soybeans. Moreover, Brazilian meal is guaranteed to contain 47-48% protein compared to US meal that is sold as 44%. However, although U.S. soybeans trade at a premium Chinese consumers happily go after U.S. products due to the cheaper freight and because they know it will be shipped out in time (Johnson, 2014).

Also, Brazilian exports are more attractive to European and Asian consumers due to the predominance of non-genetically modified soybeans (The Nature Conservancy, 2012). Brazil is able to grow non-GM soybeans for export and stay cost competitive mainly for geographical reasons (USITC, 2012). In the state of Mato Grosso the climate is so favorable that producers can achieve the same high yields with conventional soybeans as they do with GM seed. This is a great way for Brazil to differentiate themselves from the U.S.. However, in the southern Brazilian states this is not the case and almost all production in this area is GM.

To be able to sell soybeans as non-GM products, conventional soybeans must be separated along the entire supply chain to end users. This traceability in Brazil is usually well organized. In Mato Grosso, conventional soybean production is shipped to northern Amazon river ports where GM-free terminals exist to handle large volumes of those soybeans. The farms involved in this production are often very large and able to deliver enough soybeans to fill an entire vessel. This makes it simple to keep conventional product isolated (USITC, 2012). This is very lucrative for Brazilian farmers because they can sell conventional beans at a premium
over GM beans in certain regions that reach up to R$2–R$4 per 60-kilogram bag. Moreover, they can save up to R$23,000 on royalty fees for every 1,000 ha (2,470 acres) of conventional seed planted.

According to the USDA (2011) the U.S. has one of the highest rates of biotechnology adoption for soybeans in the world, and only 6 percent of their soybean production is conventional. They are not able to keep up with non GM soybeans for several reasons. U.S. soybean farmers usually sell their soybeans to a local elevator, where they are mixed with soybeans originating from other farms. Therefore it is very costly for them to ship and store GM beans separately. Besides, yields of conventional beans are likely to be lower than those of GM seeds (USITC, 2011).

Another important difference between the U.S. and Brazil is that unlike in the U.S. all soybeans exported from Brazil are cleaned before loading for export (U. S. Soybean Export Council, 2011). This is done because there is a higher chance the soybeans have been exposed to ground heat and water, as well as increased trash content due to poor infrastructure and longer trucking distances to ports and storage facilities. Also, most soybeans in Brazil are held in flat storage on the ground at origination centres instead of silos. Therefore cleaning and drying are essential in Brazil to keep soybeans stable in storage. Moreover Brazilians use only one grade standard. All soybeans entering an export facility by trucks and railcars are sampled and tested by Brazilian Ministry of Agriculture certified officials. If the minimum standard grade, which is less than 14% moisture and 1% foreign material is not met, the truck or rail car is not allowed to discharge soybeans for export.

4.2.7. Crop Land & Environmental Policies

One of Brazil’s key advantages is the territories available in the central and west of the country to expand soybean production. These areas have proven to provide high-yield soybean crops. If this area were fully used, it would provide more land area than what the United States currently has dedicated to soybeans (Ho, 2005). Because of increased ethanol production US cropland dedicated to soybeans has declined in favour of corn production (The Nature Conservancy, 2012). According to the USDA (2005), unlike the United States, Brazil has expanded crop area and output substantially in the past 5 to 10 years without any price subsidies.

However, Brazil faces competitive disadvantages on environmental restrictions on soybean growers compared to the US. The Forest code, for example, obliges landowners to conserve natural vegetation between 30-50 meters of riparian zone (The Nature Conservancy, 2012).
4.2.8. Exchange rate

The exchange rate USD/BRL (Brazilian Real) affects Brazil’s competitiveness because most export transactions are conducted in U.S. dollars. The rise of the local currency was a major obstacle to agricultural expansion from 2003 to 2011 when the BRL appreciated along with investor demand for Brazil (Figure 7).

The prices of Brazil’s commodity exports have changed significantly in the last five years and the appreciation of the Brazilian real against the U.S. dollar reduced Brazilian export competitiveness particularly since late 2008 (USITC, 2011).

Soybeans are traded globally and prices are tied to the prices on the Chicago Board of Trade (CBOT) which trades in USD. Consequently, when the real appreciates, revenues decline and offset cheaper input costs such as imported fertiliser, chemicals and machinery. This results in smaller profit margins for exporters. For example, between 2006 and 2010 the international soybean price in USD increased 67 percent. The real appreciated along with this trend which resulted in a lower price increase of soybeans in Reais of 36 percent (IMF, 2011).

The contrary was the case at the end of the 1990s when the real depreciated the area planted to soybeans expanded rapidly, peaking in 2004, when the expansion stopped because the Real started to strengthen in 2003. However, despite the strong real in 2007, acreage has increased again as a result of factors such as vibrant demand from China and low corn prices.

The government has permitted the real to weaken since 2011 to fight the loss of Brazil’s pricing advantages for global commodities. The president’s currency strategy is to protect the competitiveness of Brazilian exports and attract investment to modernize the country’s infrastructure (Mercopress, 2012). To sustain this competitive advantage a further gradual decline in the Brazilian real to U.S. dollar exchange rate over 2014 is expected (Rabobank, 2014).

Source: Economist Intelligence Unit, 2010 unless otherwise stated
4.2.9. **Matrix comparison**

The following matrix is a competitive comparison of the analyzed variables in this chapter. First I provided some figures to have an overview of the starting position. Second, I graded the key competitive factors on a scale of 1-5, with 5 being the strongest and weighted them on a scale from 1-3, with 3 being the most important.

**Table 4: Matrix comparison**

<table>
<thead>
<tr>
<th></th>
<th>Brazil</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>201,032,714</td>
<td>318,059,000</td>
</tr>
<tr>
<td>Gross Domestic Product</td>
<td>$2.170 trillion</td>
<td>$16.799 trillion</td>
</tr>
<tr>
<td>estimate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crop land (soybeans)</td>
<td>72.9 million acres⁵⁵</td>
<td>77.728 million acres⁵⁶</td>
</tr>
<tr>
<td>Total crop land</td>
<td>519 million acres</td>
<td>430 million acres</td>
</tr>
<tr>
<td>Yield 2013⁷⁷</td>
<td>3.01 tonnes per hectare</td>
<td>2.97 tonnes per hectare</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Grade</th>
<th>Weight</th>
<th>Grade</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Soil</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Distance to import markets</td>
<td>3</td>
<td>2</td>
<td>5</td>
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Based on this matrix analysis the U.S. is in a slightly better position than Brazil, also when we take into consideration the weighted average. However, this is a very fast paced environment and it is likely to change quickly.

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⁵⁵ According to “The progressive farmer” for the 2013-14 season
⁵⁶ According to Bloomberg for the 2013-14 season
⁷⁷ According to AGProfessional
4.3. Key Export Markets

Figure 8: Trade flows Brazil vs US in 2011

China has become by far the biggest soybean consumer, responsible for more than 60% of world imports (CNBC, 2014). This is the result of increased Chinese purchasing power, which has also led to a rise in domestic meat consumption.

In 2011, China imported approximately 53 million mt of soybeans, valued at $30 billion of which nearly $13 billion originated in the United States and almost $12 billion in Brazil (Figure 10). This represents more than 80 percent of China’s total soybean imports. Argentina is the third-largest exporter to China. To capture the value-added processing activity, Chinese policy has encouraged the importation of whole soybeans for crushing within its borders using import tariffs. According to commodityonline, China maintains a 3 percent import tariff on soybeans, a 5 percent import tariff on soy meal, and a 9 percent import tariff on soy oil. Consequently Chinese crushers benefit from this tax structure that facilitates imports of soybeans while discourage soy meal and soy oil imports. As a result, from 2006 to 2010, China consistently crushed between 67 and 75 percent of its total imports.

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38 Source: USITC, 2012 unless otherwise stated
satisfy the high levels of demand for cooking oil by domestic production and is therefore the second-largest market for soybean oil (USDA, 2011).

According to Reuters, in April this year, Chinese importers defaulted on at least 500,000 tons of soybean cargos worth around $300 million because some companies were unable to open letters of credit. This is the biggest default in soybeans since 2004.

Like copper, some importers use soybean imports as collateral to finance other projects with cheaper funds which is quiet problematic (CNBC, 2014). They use soybean imports to secure cheap financing via letters of credit at rates as low as 2 percent following with a sale at a loss to use the funds for more profitable businesses.

Consumption Patterns and Preferences

Domestic consumption of soybeans and soybean products rose significantly owing to the growth of China’s population and income as well as the change in people’s diets toward more proteins and edible oils and it is expected to keep growing (figure 9). Another important variable is the excess in crush capacity. China’s preference for importing soybeans rather than soybean products has boosted the processing sector. Because of the heavy investments of owned enterprise in new plants there is currently overcapacity in the processing sector, which creates potential demand for whole soybeans (USDA, 2011). The USDA estimates that China’s processing capacity exceeded 100 million mt in 2011, even though the Chinese government began actively restricting continued expansion in the sector in 2009.

Figure 9: Soybean import volume of the top global soybean
Competition with the United States

1997 China didn’t import any soybeans yet and grew steadily until today to the global import leader. The United States exports approximately 25% of its soybean production to China and is China’s largest supplier. However, from January to June Brazil tends to be the largest supplier to the Chinese market, whereas the United States raises its supplies after its soybean harvest in September. Chinese imports increased from all of its largest suppliers from 2006 to 2011, reflecting the strong growth in Chinese demand. China is the largest processor by volume of soybean oil and meal from domestic and imported raw soybeans (African center for economic transformation, 2013). Recently, China has been a slight net exporter of soybean meal. Its soybean oil imports are low compared to its domestic production and consumption. China imported soybean oil mostly from Argentina, Brazil, and the United States from 2006 to 2011, while Argentina was the largest supplier from 2006 to 2009. However, once Argentina implemented duties on certain Chinese imports, China immediately reduced imports in 2010. According to USDA, China officially lifted the ban in November 2010. Yet, Chinese imports of Argentine soybean oil have remained low and Brazil took over in 2011, as the largest supplier of soybean oil to China.

Figure 10: Chinese soybean imports
4.3.2. European Union

Market Characteristics

The EU-27 is the world’s second-largest soybean importer. In 2010, it imported approximately 14 percent of total global imports of soybeans. Brazil, Paraguay, and the United States were the three largest suppliers of soybeans to the EU-27 in 2011, while Brazil accounted for half of those exports. From 2006 to 2010 both, exports from the United States and from Brazil decreased but the United States and Paraguay have gained market share because Brazil’s exports to EU-27 have fallen at a faster rate. In 2011 Paraguay overtook the United States as the second largest supplier of soybeans to the EU. Paraguay’s soybean exports to the EU accounted for 80 percent of its total production in 2011 (USDA, 2012).

Argentina and Brazil are the main suppliers of soybean meal to the EU-27, which is in turn the largest global importer of soybean meal. This soybean meal is mainly used for animal feed for the EU-27 livestock sector. According to the USDA, imports of soybean meal slightly decreased from 2006 to 2010 due to the increased consumption of its domestically produced rapeseed meal in animal feed. This trend may continue in the long-term depending if other oilseeds will be available.

Figure 11: EU soybeans imports origins

Consumption Patterns and Preferences

Most soybean imports are crushed into soybean meal and oil. The EU crushes almost 90 percent of its total soybean supply annually (USDA, 2011). GM soybeans or oil produced from GM soybeans are usually not used for human food applications in the EU-27 due to the negative perceptions of many EU consumers have. Since the late 1990s, the EU-27 requires transparency on GM products and they must be labelled as such. However, Soybean oil derived from GM soybeans is used in biodiesel production.
Competition with the United States

The United States and Brazil compete directly in the EU-27 market, but Brazil has a competitive advantage in the segment of direct human consumption, where the EU prefers conventional soybeans and products. Brazil is able to provide conventional soybeans and traceability at a reasonable cost. Brazil's major soybean-producing areas remained relatively free of GM seeds until the early 1990s, thus enabling Brazil to strengthen its position in the EU-27 market.

The EU-27 has a zero tolerance policy for unauthorized biotech events. Consequently, soybean shipments from the United States in 2009 were blocked because they contained traces of GM corn not yet approved in the EU-27. And although the EU-27 approved several of the biotech events in question, the USDA points out that the policy has made importers generally hesitant to purchase soybeans from the United States.

Brazil competes also directly with the United States and Argentina for exports of soymeal to the EU-27. Argentina has a competitive advantage over both, the United States and Brazil, due to Argentina’s differential export tax on soybean products. This tax is higher on whole soybeans than it is on meal and oil, therefore making it more profitable to process soybeans in Argentina for export.

4.3.3. Japan

Market Characteristics

Japan is the third-largest soybean market by value, with the United States as number one and Brazil as number two supplier. In 2011, the United States supplied about two third of Japan’s soybean imports, while Brazil held a 17 percent market share (GTIS, 2012). But in 2012 U.S. supplies dropped 15% because the increase in U. S. soybean prices led some Japanese buyers to switch to Brazilian soybeans. Japan imports bulk soybeans and soy meal that goes into animal feed, but Japan also imports some high-quality beans to process into tofu and other traditional Japanese foods. Japan is not a large market for soybean oil.

Consumption Patterns and Preferences

Soybeans and soy-based products have a long history in Japan and are central to the Japanese diet. As the public becomes increasingly aware of the protein’s health benefits, Japanese consumption increases (USDA, 2011). Because of the small crush capacity, Japan imports oil and meal when needed rather than whole soybeans. But traditional snacks like, edamame, which are boiled whole soybeans, require the import of whole soybeans.
According to the USDA, 25 percent of Japanese soybean imports are used for foods such as tofu, miso, and soy sauce. Tofu accounts for 49 percent of total food soybean use and is made from either soybean meal or whole soybeans. 89 percent of soybean meal in Japan is used animal feed and only a minority is used in food consumption. Consumption of soybean oil decreased in recent years as the price of rapeseed oil became more favourable in the Japanese market (USDA, 2011). The main imported vegetable oil into Japan is palm oil and high tariffs on soybean oil limit imports from major global suppliers.

**Competition with the United States**

The United States shipped more than three times as many soybeans than Brazil to Japan in 2011 and is therefore the principal supplier to the Japanese market. The U.S. has several competitive advantages over Brazil, the number two supplier in the Japanese market. The U.S. and Japan have historically shared strong economic and diplomatic relationships. This gives the U.S. the place as principal supplier of soybeans to Japan since 1950s. Additionally, the quality of U.S. soybeans and flexibility in shipping arrangements favour the United States in the Japanese market over Brazil. Furthermore Japanese consumers prefer the golden colour of U.S. soybeans over the reddish colour of Brazilian soybeans for certain food-grade applications. In Japan all food-grade soybeans (such as those for tofu and edamame) must be non-GM and conventional soybean growers in various U.S. states, take advantage of this niche market. They ship small volumes in containers, when shipping rates are low on containers that otherwise would have made the return trip to Asia empty.
5. How commodity trading companies are involved

Today many commodity trading companies such as the “ABCD’s” are highly diversified and integrated both vertically and horizontally. Cargill, ADM, and Bunge account for more than 60 per cent of total financing of soy production in Brazil. They provide inputs such as seeds and fertilizer and later buy the soy and store it in their own facilities. To counter the insufficient infrastructure in Brazil, those companies invest in infrastructure themselves. The following is an incomplete list of assets of the ADM, Bunge, Cargill and Louis Dreyfuss in Brazil.

Cargill
Headquartered in São Paulo (SP), Cargill is present in about 140 municipalities spread over 14 states, with 18 factories, 155 warehouses and transshipment, 22 offices, one Innovation Center and five port terminals. Two of the port terminals are operated under a concession with own facilities and one port terminal is operated by Terminal Exporter of Guarujá (TEG), a joint venture of Cargill and Louis Dreyfus Commodities.

Louis Dreyfus Commodities
Present in 12 states in Brazil, Louis Dreyfus has operations in major production regions. Currently, over 70% of its assets in the world are in Brazil, where the company has more than 60 industrial and logistical assets and one head office in São Paulo. It markets private labels, Vila Velha and Valencia, of refined oil. LD further strengthened their position through the acquisition of warehouses for receiving and drying soy and corn in Jataí, with a capacity of 145 000 tons. Funds were also directed in 2012 for work on the port of Itaqui, in the northeast of Brazil. The operation will open a strategically important corridor for the transportation of grains in the Region.

Bunge
Bunge works with more than 20 000 farmers in Brazil spread across the country. To produce higher quantities and better products they maintain an authentic partnership. The company purchases annually over 20 million tons of grain, including soybeans, corn, wheat and cotton. Bunge is the largest exporter of Brazilian agricultural products and also stands as the largest purchaser and crusher of soybeans in Brazil. Bunge is responsible for approximately 900,000 truck trips, 170 000 rail wagons, 350 barge trips and 700 ships scales carrying grain, vegetable oils, among others every year.

39 Source: Respective company websites
40 The Brazilian-EU Soy Chain” Milieudefensie/Friends of the Earth The Netherlands 2006
Bunge started operations at an export terminal in Brazil near Belem, in Para state, and a related barge transshipment terminal in the interior of the country. According to Bunge these two facilities will create a new export corridor for soybeans from Mato Grosso state to ports and, by shortening internal travel distances and shifting transport from road to river, it will reduce the cost and environmental footprint of flows to China and other markets.

**ADM**

ADM began operations in Brazil in 1997 after purchasing several crushing plants, grain elevators and silos and has grown to become one of the largest processors of soybeans in the country and the fifth largest exporter in Brazil in 2010. ADM originates about eleven million tons of oilseeds, corn and wheat per year and its factories handle about 4 million tons of soybeans per year. In addition to the processing plants, refining and packaging of soybean oil in Rondonópolis (MT), Campo Grande (MS), Joaçaba (SC), and Uberlândia (MG), ADM operates several silos with a total storage capacity of 2.2 million tons. Brands of soy oil, Concordia and Corcovado, are marketed by ADM.

ADM also plans to double the size of its South American fleet of river barges to boost shipments of crops from a new port. According to Bloomberg (2013) the new barges will mostly carry soybeans and corn by river to ADM’s port at Belem in Para state in northern Brazil. ADM intends to raise annual volumes at Belem from 1 million tons in 2014 to about 6 million metric tons in five years. Also, ADM has just announced plans to spend $US250 million building a soybean protein production complex in Campo Grande in the central western Brazil that will manufacture protein concentrates and isolates.
6. Questionnaire

This questionnaire about the importance of soybeans and a possible outlook was answered by the following three agronomists:

**Vanderlei Campos Jr. Commercial Director at Embra-Agro:**
Graduated from the State University of Londrina in 2005 he started his career at Monsanto in Brazil, where he worked in the commercial maize, seed and glyphosate product development field. The company Embra-Agro was founded to support the distribution of agricultural inputs in the state of Mato Grosso, redistributing and representing products with excellent quality and innovative technologies. In the western region of Paraná he did the planning and technical consulting of soybeans, maize, beans, wheat, oats, ryegrass and canola. From the purchase of inputs, planting, vegetative growth, harvesting and marketing he tracked and managed these crops on the whole chain.

**José Luis da Silva Nunes Analyst at BADESUL for development projects:**
He has experience in Agronomy, acting among others in the following areas: integrated and conventional fruit production, soil management, plant management, pest and pathogens and classification. Also, he is a technical manager of the company Joval, acts as technical advisor for the Agrolink Portal and is a technical development agronomist at BADESUL supervising the Rural and Agribusiness Operations.

**Amelio Dall Agnol - Embrapa Soja**
He graduated from the School of Agronomy in Pelotas in 1968. He made both his MSc (1978) and PhD (1980) in the University of Florida. Amelio Dall Agnol is an Embrapa researcher since 1975 and works for Embrapa Soy since 1980. He was the coordinator of the National Soybean Research program as well as Deputy Head of Administration, Research and Business Communication at Embrapa Soy. Also, he has been the general head of R&D, International Cooperation’s and Economic and Business Development’s department at Embrapa, headquarters in the capital, Brasilia. He was Executive Secretary of the Procisur Institute in Montevideo, Uruguay and Deputy Head of Embrapa Forestry Administration, in Curitiba, PR. He is author of over 80 technical and scientific papers.

1. **How important is the soy trade to Brazil?**
   - **Vanderlei Campos Jr.:**
     The agricultural sector is responsible for 33 % of Brazilian GDP, being the most important sector for the country. Within this sector soybeans account for the highest production and exportation rate, and are therefore the basis of the Brazilian trade balance.
José Luis da Silva Nunes:
Soybean is the main agricultural commodity of Brazil and all soy products (beans, meal and oil) accounted for about $3.25 billion of exports (between January and February) in the trade balance.

Amelio Dall Agnol:
Agribusiness accounts for about 22% of Brazilian GDP. Last year total agricultural exports were $101.5 billion compared to agricultural imports of $18.5 billion, leaving a trade balance of $83 billion. Soybeans accounted for $31 billion of that total and were therefore the main product on the Brazilian export agenda.

2. Do you feel the competition from the U.S.?

Vanderlei Campos Jr.:
The U.S. are competing mostly in soybean and corn markets such as the Asian market. However, with the growing global demand for food this competition tends to decrease each day.

José Luis da Silva Nunes:
This new crop year (2014/2015) Brazil could become the world's largest soybean producer and the largest exporter of soybeans, surpassing the U.S. It is the U.S. that should fear our competition.

Amelio Dall Agnol:
The U.S. has always been the largest competitor of Brazil in soybean production. Its global market share has been falling, not because they are producing less, but because other countries, especially Brazil and Argentina, have greatly increased their production. In the 1970s, the U.S. accounted for over 70% of global soybean market. Today, despite a great increase of its production since then, its share has shrunk to only 28% (82.5 million tons from a worldwide total of about 292 million tons). At harvest, which we just did, Brazil surpassed the U.S. in production with 86 million tons. But the crop they are planting now and reap in October / November, will probably again overcome Brazil as they are promising to increase the planted area and achieve a production of over 95 million tons, of course if the weather helps.

3. Which is the main advantage and competitive disadvantage of Brazil?

Vanderlei Campos Jr.:
The biggest advantage is the favorable climate and soil for grain production, and the biggest drawback is the logistical system and the lack of government incentives to improve the productive chain.
José Luis da Silva Nunes:
Main production advantage is the increasing productivity associated with opening new areas for cultivation of oilseeds. The main disadvantage is our infrastructure for storage, transportation (highways, railways and waterways) and ports.

Amelio Dall Agnol:
The main advantage of the USA against Brazil is having flatter as well as more fertile land and better water transport (much cheaper than by truck, as we do). They also have more support from the government, more storage and ports are better structured. Our disadvantages are obvious, but we have the advantage of having the best producers in the world, because of their spirit and entrepreneurship.

4. How confident are you about the Brazilian infrastructure in the future?

Vanderlei Campos Jr.:
I don’t believe in major improvements in Brazilian infrastructure in the short term.

José Luis da Silva Nunes:
As I mentioned, we have much to learn, especially in the three questions that are most precarious. Improving the quality of storage in the country, improve roads, exploit better rail and water transportation and reduce bureaucracy of Brazilian ports.

Amelio Dall Agnol:
We have to confident, because as it is, it cannot continue. Agribusiness has been the principal, if not the only, sector with a surplus in trade balance for decades. Therefore, it is impossible to not pay attention to such an important sector. There are several highways, railways and waterways planned. When and if those will be built is another question. But I believe it will happen. More ports and better structures are urgent because we pay very expensive (30’000 to $ 50,000 per day) for vessels which are parked offshore because they cannot berth. The construction of silos and warehouses are already improving, but by the private sector. Today we only have 65% capacity on the production of grain. The ideal would be 1.2 times the production.

5. Who made most investments last year in infrastructure, the private sector or the government?

Vanderlei Campos Jr.:
Undoubtedly the biggest investment came from the private sector.
José Luis da Silva Nunes:
Actually it was a partnership: the public sector funded, primarily through BNDES, rural farmers. This helped significantly to advance in irrigation and storage. But the private sector could increase its share, especially in the matter of logistics and transportation.

Amelio Dall Agnol:
I don’t know exactly who contributed more, but I think the trend is going towards the private sector taking on this task because the government is slow and inefficient.

6. Brazil is importing a large amount of fertilizer, is there a possibility that Brazil could increase its production of fertilizers and become one day self-sufficient?

Vanderlei Campos Jr.:
This is very unlikely, especially in the case of Potassium which is a scarce nutrient in our country.

José Luis da Silva Nunes:
Our problem is the import of raw materials to supply fertilizer plants in the country. This is very expensive and is paid in dollars, which raises the final cost of fertilizer a lot. Moreover, high-tech fertilizers are still imported.

Amelio Dall Agnol:
Brazil imports more than 90% of potash fertilizers, over 70% of Nitrogen and over 50% of Phosphorus. This excessive dependence is a risk. Brazil has deposits of K and P, we only need to invest to exploit them to be self-sufficient. But the way things are going we are far from achieving this objective, because I do not see enough movements to reach it.

7. Which are the main difficulties for Brazilian farmers who want to export?

Vanderlei Campos Jr.:
Port and logistics difficulties.

José Luis da Silva Nunes:
Two words: Bureaucracy & Taxes

Amelio Dall Agnol:
Cost of transportation, lack of silos and warehouses (more than 20% of storage is taken by trucks on the road between the farm and the port or industry) and disability of ports.
8. How do government policies interfere in the production of soy?

- Vanderlei Campos Jr.:
The Brazilian government interferes in the entire chain, but the most relevant are through interests, agricultural insurances, construction as well as maintenance of road and rail, port improvements, openness to new technologies and so on.

- José Luis da Silva Nunes:
The main policy of the government is linked to the financing of production, especially in relation to the resources allocated to crop plans. Those are resources for the agricultural funding and investment of infrastructure in the primary sector.

- Amelio Dall Agnol:
They do not interfere, neither do they help.
7. Conclusion

Although Brazil faces significant inefficiencies in infrastructure, its soybean sector is globally competitive and has some competitive advantages over the U.S. namely its advantageous climate, low production costs, rising levels of investment by large global agribusinesses, supportive government policies and the tremendous potential to continue to expand production. However, much of the available farmland is in areas with insufficient access to transportation infrastructure. And despite government efforts, the rapid growth of the soybean sector in Brazil that boosted the demand for transportation, storage capacity and port infrastructure will continue to outpace supply. In addition environmental and social demands are becoming increasingly important that will entice government resources away from other investments. On the other hand, the government is making an effort to simplify tax structure, reduce interest rates and depreciate the Brazilian Real.

Multinational agribusinesses like the ABCD’s (Cargill, Bunge, Archer Daniels Midland, and Louis Dreyfus) account for a significant share of Brazilian soybean exports. They do generally not view global markets as competition between producing countries, but they see principal exporting countries, such as Brazil and the U.S. as an integrated system in which they manage a range of options in relation to time, location, quality, lot size, and logistics of sourcing or delivering their precious cargoes, named optionality. According to David Tilman (University of Minnesota, 2011) global food demand could double by 2050 as rising incomes in many emerging markets result in increasing consumption levels, in particular for animal protein. This in return boosts demand not only for beef, pork and poultry, but also for soybeans used for animal feed. Brazil benefited from this high global demand for commodities. And as long global demand for soybeans increase, the competition tends to decrease.

Figure 12: Modal split transportation infrastructure
Through the National Plan for Transportation and Logistics (NPTL) and the Growth and Acceleration Program (PAC) the government increases both public and private investment in infrastructure projects. This shows the recognition of the government for the need to expand and improve railways, waterways, ports and road networks. Figure 12 shows the target of the transportation split for 2025.

Brazil’s ability to maintain its rapid growth of the soybean sector depends mostly on the capability of the government to improve infrastructure as well as to attract private investment because Brazil's production cost advantage are generally offset by its transportation inefficiencies. The government is already tackling other competitive disadvantages like high interest rates, possible currency appreciation, and burdensome labour laws and tax structures. However, based on this current problematic environment, Brazilian exports are likely to grow more slowly in the future.

Government efforts to privatize the operation of public sector assets in the 1990s have helped to increase private sector investment, mostly in ports and railways. An important trend is the increasing vertical integration (upstream and downstream) of large trading companies. Those investments in port terminals are improving overall port capacity and efficiency. Concessions are great means to reduce transportation costs. Brazil is granting them to private companies to expand and integrate the rail network in order to better connect agricultural regions to ports. Moreover, to improve their supply chain many Brazilian agricultural producers invested in local road networks, storage and warehousing facilities, and port terminals. As discussed in chapter 5 all of the big four agricultural trading companies are increasing their infrastructure spending in Brazil and according to the answers of the Brazilian agronomists in chapter 6 those investments are more efficient and more reliable than government’s plans. Therefore Brazil will not lose its competitiveness due to its patchy infrastructure in the midterm, but to continue to be a successful soybean exporter Brazil has to:

- encourage vertical integration of agribusinesses
- increase investment in waterways and railways that are way cheaper than truck transportation
- increase investments in sourcing raw material for fertilizer production in Brazil to reduce those huge amounts of expensive imported fertilizer
- Consolidate small farms in the south to achieve economies of scale
- Increase double cropping to increase profitability of farms that might increase their investments in infrastructure
- Decrease bureaucracy and taxes to attract foreign direct investments
- Increase soybean processing in production regions and export value added products. In this way transportation costs decrease relative to the value of the product.
Brazil’s competitiveness in the soybean sector: Will Brazil lose its competitiveness due to its patch infrastructure?

Blaich, Eli

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Appendix 1: Main soybean importers and exporters 2011

Source: USDA, Earth Policy Institute
Appendix 2: Brazilian main producing regions (Cerrado)

Source: cornandsoybeandigest, Nov 5, 2012
Appendix 3: Brazilian Ports


Note: A survey port is a Brazilian port where cargo data are collected. These ports are responsible for more than 98 percent of Brazilian cargo movement.
Appendix 4: Original questionnaire in Portuguese

1. Qual é a importância do comércio de soja para o Brasil?

- Vanderlei Campos Jr.:
  O setor agropecuário e responsável por 33% do PIB brasileiro, sendo o setor de maior importância para o País, dentro deste setor a soja e a cultura de maior produção e exportação, sendo a base da balança comercial brasileira.

- José Luís da Silva Nunes:
  A soja é a principal commodity agrícola do Brasil, sendo que o complexo soja (grão, farelo e óleo) foram responsáveis por cerca de U$ 3,25 bilhões (entre janeiro e fevereiro) na balança comercial de exportações.

- Amelio Dall Agnol:
  O agronegócio responde por cerca de 22% do PIB brasileiro. No ano passado ele respondeu pela exportação de US$ 101,5 bilhões, importou apenas US$ 18,5 bilhões, deixando um saldo para a balança comercial brasileira de US$ 83 bilhões. A soja respondeu por US$ 31 bilhões desse total. Foi o principal item na pauta das exportações do Brasil.

2. Você sente a concorrência dos EUA?

- Vanderlei Campos Jr.:
  Os EUA são concorrentes nos mercados compradores de soja e milho principalmente, como o mercado Asiático, no entanto com a demanda mundial crescente por alimento está competição tende a diminuir a cada dia.

- José Luís da Silva Nunes:
  Este novo ano agrícola (2014/2015) o Brasil poderia se tornar o maior produtor mundial de soja e o maior exportador mundial de soja, superando os EUA. Os norte americanos é que devem temer nossa concorrência.

- Amelio Dall Agnol:
  Os EUA sempre foram os maiores concorrentes do Brasil na produção de soja. Sua participação no mercado mundial vem caindo, não porque eles estão produzindo menos, mas porque outros países, principalmente o Brasil e a Argentina, aumentaram muito a sua produção. Na década de 1970, os EUA respondiam por mais de 70% do mercado global de soja. Hoje, apesar de terem aumentado muito a sua produção desde então, sua participação não passa de 28% (82,5 milhões de toneladas, sobre um total mundial de 292 milhões de toneladas). Na safra que acabamos de colher, o Brasil superou os EUA em produção, com 86 milhões de toneladas, mas na safra que eles estão plantando agora e colherão em outubro/novembro, sua produção deve novamente superar o Brasil, pois estão prometendo aumentar a área plantada e alcançar uma produção de mais de 95 milhões de toneladas. Se o clima ajudar, naturalmente.
3. Qual é a principal vantagem e desvantagem competitiva do Brasil?

- Vanderlei Campos Jr.:
A maior vantagem e o clima e solo favoráveis a produção de grãos, e a maior desvantagem e o sistema de logística e falta de incentivo governamental para a cadeia produtiva.

- José Luís da Silva Nunes:
Principal vantagem produtiva é o incremento crescente da produtividade associado a abertura de novas áreas com plantio da oleaginosa. A principal desvantagem é a nossa infra-estrutura de armazenagem, transporte (estradas de rodagem, ferrovias e hidrovias) e portos.

- Amelio Dall Agnol:
A principal vantagem dos EUA frente ao Brasil é terem terras mais férteis, mais planas, transporte aquaviário (muito mais barato que por carnihães, como fazemos nós). Têm mais apoio do governo, têm mais silos para armazenamento e os portos são mais bem estruturados. As nossas desvantagens ficam evidentes, mas temos a vantagem de ter os melhores produtores do mundo, por causa do seu empreendedorismo e garra.

4. Como você está confiante sobre a infra-estrutura brasileira no futuro?

- Vanderlei Campos Jr.:
Desacredito em grandes melhorias na infra-estrutura brasileira a curto prazo.

- José Luís da Silva Nunes:
Como já referi, temos muito a avançar, principalmente nos três quesitos que somos mais precários. Melhorar a qualidade da armazenagem no país, melhorar as estradas, explorar melhor o transporte ferroviário e hidroviário e desburocratizar os portos brasileiros.

- Amelio Dall Agnol:
Resposta: Temos que acreditar, porque como está não pode continuar. O agronegócio é o principal responsável, para não dizer o único, pelos superavits da balança comercial brasileira há décadas. Portanto, não é possível que não se dê mais atenção a um setor tão importante. Há várias rodovias, ferrovias e hidrovias planejadas. Quando e se serão construídas é outra coisa. Acredito que acontecerá. Mais portos e com melhores estruturas são urgentes, pois pagamos muito caro (30 a 50.000 dólares por dia) pelos navios que ficam parados em alto mar porque não conseguem atracar. A construção de silos e armazéns já está andando, mas pelo setor privado. Hoje só temos 65% de capacidade sobre a produção de grãos. O ideal seria 1,2 vezes a produção.
5. Quem fez a maioria dos investimentos no ano passado em infra-estrutura, o setor privado ou o governo?

- Vanderlei Campos Jr.:
  Sem dúvida os maiores investimentos vieram do setor privado.

- José Luis da Silva Nunes:
  Na verdade foi uma parceria: o setor público financiando, principalmente via BNDES, os produtores rurais. Com isto houve um avanço significativo na questão da irrigação e armazenagem. Porém, a iniciativa privada poderia aumentar sua participação, principalmente na questão de logística e transporte.

- Amelio Dall Agnol:
  Não sei exatamente quem contribuiu mais, mas acredito que a tendência seja de o setor privado ir assumindo essa tarefa porque o governo é lento e ineficiente.

6. O Brasil está importando uma grande quantidade de fertilizantes, há uma possibilidade de que o Brasil poderia aumentar sua produção de fertilizantes e de ser auto-suficiente um dia?

- Vanderlei Campos Jr.:
  Isto e muito improvável, principalmente na questão do Potássio, fonte de nutriente escassa em nosso País.

- José Luis da Silva Nunes:
  Nosso problema é a importação de matéria-prima, para abastecer as fábricas de fertilizantes do país. Esta é muito cara e é paga em dólar, o que eleva muito o custo final do fertilizante. Além disto, fertilizantes de alta tecnologia ainda são importados.

- Amelio Dall Agnol:
  O Brasil importa mais de 90% dos fertilizantes potássicos, mais de 70% dos Nitrogenados e mais de 50% dos fosforados. É um risco essa excessiva dependência e o Brasil tem jazidas de K e P, só precisa investir para explorá-las e ser autosuficiente. Estamos longe de conseguir isto pelo andar da carruagem, pois não vejo movimentação suficiente para alcançar atal objetivo.

7. Quais são as principais dificuldades para os agricultores brasileiros que querem exportar?

- Vanderlei Campos Jr.:
  Dificuldades portuárias e de logística.

- José Luis da Silva Nunes:
  Duas palavras: Burocracia & Impostos

- Amelio Dall Agnol:
  Custo do transporte, falta de silos e armazéns (mais de 20% da armazenagem é feita pelos caminhões no caminho entre a fazenda e o porto ou indústria) e deficiência dos portos
8. Como é que as políticas do governo interferirem na produção de soja?

- Vanderlei Campos Jr.:  
  O governo brasileiro interfere em toda a cadeia, mas as interferências mais relevantes são com juros, seguros agrícolas, construção e manutenção e rodovias e ferrovias, melhoras portuárias, abertura para tecnologias novas e etc.

- José Luis da Silva Nunes:  
  A principal política dos governos (todos) é a ligada ao financiamento da produção, principalmente com relação aos recursos destinados aos planos safra. São recursos destinados ao custeio agropecuário e ao investimento de infra-estrutura no setor primário.

- Amelio Dall Agnol:  
  Elas não interferem, só não ajudam
### Appendix 5: Planning

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