



BRAZILIAN
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BRAZILIAN INFRASTRUCTURE: A NEW HOPE FOR SUSTAINABLE GROWTH

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INTRODUCTION

Brazil's infrastructural issues is one of the country's most critical economic bottlenecks and have been a public policy priority in the past recent years. In its 2013-14 Global Competitiveness Report, the World Economic Forum ranked Brazil's infrastructure quality at overall 114th place. By categories, Brazil's roads quality was ranked at 120th place, railroads at 103rd place, ports at 131st, airports at 123rd and electricity supply at 76th place (See Figure 1). The efforts currently underway are motivated by the belief that solving these issues is crucial to boost economic growth.

Figure 1: Brazilian Infrastructural Quality by Categories

2nd pillar: Infrastructure		
2.01	Quality of overall infrastructure	3.4 114
2.02	Quality of roads.....	2.8 120
2.03	Quality of railroad infrastructure.....	1.8 103
2.04	Quality of port infrastructure.....	2.7 131
2.05	Quality of air transport infrastructure.....	3.3 123
2.06	Available airline seat km/week, millions*	3,780.6 9
2.07	Quality of electricity supply.....	4.8 76
2.08	Mobile telephone subscriptions/100 pop.*	125.2 45
2.09	Fixed telephone lines/100 pop.*	22.3 52

Highlighting Brazil's infrastructure problems are its dependence on its highway network, which is responsible for moving 54% of the country's freight. Making matters worse, according to a 2012 World Bank study, only 18% of Brazil's highways are paved. Additionally, the conditions are forecasted to worsen over time, given the inadequate funds available to maintain the existing roads. The World Bank predicts that investments equivalent to, approximately, 6% of the GDP are required if Brazil is to catch up with developed countries, yet only the equivalent of 1% is spent at the present. An important aspect of Brazil's highway composition is the inequalities found in each region. While the South and the South East are relatively well served, the North, North East and the Centre West are far behind. All these factors combined, contribute to a high transportation cost, representing about 15.4% of Brazil's GDP, while in developed countries this number is ranging from 8% to 10%.

Besides the highways, Brazil also has problems with its railway infrastructure. The extent of the country's railway sector is about five times smaller than its paved roads. By summing the paved and unpaved highways network, Brazilian railways network becomes fifty times smaller. For purposes of comparison, Brazil has only 3.4km of rail per 1000 square km, while the US has 14.7km per 1000 square km. Another challenge for Brazil's rail transportation is the fact that its rail network possesses different gauge sizes spreaded throughout the territory, which challenges its inter-operability. Additionally, the

average speed of the national rail system is 15,4 km/h, while in the U.S., trains ride at 45 km/h, making cargo transportation slower and costlier. Making matters worse, only one third of the railways are in operating conditions.

In terms of ports infrastructure, Brazil suffers with quality and capacity limitations, which is surprising, given the economy's dependence on natural resources exports. Those elements contribute to increase the country's cost of transportation, in addition to the fact that tariffs are substantially higher in Brazil and ships must wait for a long time to access the harbor to be unloaded and loaded again. Despite its importance, infrastructural improvements on Brazilian ports have been stagnated since the last century, when the average cost of handling a 10-foot container in Buenos Aires was \$ 180 in 1998, and \$ 350 in Santos. Today, while Brazilian ports can handle 34 containers per hour per ship, ports like the one in Hamburg can handle 66 containers and Singapore 100 containers. This is a huge problem, given the fact that Brazilian ports are responsible for handling 95% of the country's trade volume and 85% of the trade value.

Brazil also faces a huge deficit in storage infrastructure. In the grains sector, this deficit is close to 80 million tonnes, resulting in R\$ 2 billion of losses. This situation induces the producer to commercialize the production during periods of low prices and higher transportation costs. This situation contributes to accentuate the bottlenecks in Brazilian ports, since farms contribute with only 16% of the total storage capacity.

Increasing Transportation Costs Damages the Country's Competitiveness

As the largest exporter of soybeans in the world, reducing transportation costs is a priority if Brazil wants to improve its competitiveness. However, the poor quality of its infrastructure network has been the major challenge faced by the country. Combined to that, the comparative high reliance of the country in its highway sector increases the exposure to fluctuations in oil prices, which contributes to higher freight costs in times like today. According to a February 2018 study made by the USDA, the cost of shipping 1mt of soybeans 100 miles by truck in Brazil increased by 30%, from 2016 to 2017. Additionally, transporting soybeans from Brazil to Shanghai, in China, got 30% to 50% more expensive in 2017, compared to 2016 fares (See Figure 2). In Sorriso-MT, the largest soybean-producing State, transportation costs represented 29% of the total costs of shipping soybeans to Shanghai through the port of Santos in 2017.

Figure 2: Costs of Transporting Soybeans from Brazil to Shanghai

	2013	2014	2015	2016	2017	% Change 16-17	2013	2014	2015	2016	2017	% Change 16-17
	North MT¹ - Santos² —US\$/mt—						Northwest RS¹ - Rio Grande² —US\$/mt—					
Truck	116.40	103.90	86.04	75.49	92.95	23.1	23.26	24.56	26.37	18.38	30.72	67.1
Ocean	40.96	36.85	23.81	16.63	26.88	61.7	41.52	37.02	25.31	20.50	27.30	33.2
Total transportation	157.36	140.75	109.86	92.12	119.82	30.1	64.79	61.58	51.68	38.88	58.02	49.2
Farm price ³	415.28	388.33	295.17	331.91	293.60	-11.5	459.33	442.52	331.55	352.69	322.30	-8.6
Landed cost	572.64	529.08	405.02	424.03	413.43	-2.5	524.11	504.10	383.23	391.57	380.32	-2.9
Transport % of landed cost	28.4	27.8	27.1	21.9	29.0	32.5	12.3	12.2	13.5	9.9	15.3	54.1
	North Central PR¹ - Paranagua² —US\$/mt—						South GO¹ - Santos² —US\$/mt—					
Truck	32.26	30.98	24.07	21.31	29.29	37.4	58.90	62.57	39.82	34.66	44.22	27.6
Ocean	43.88	39.21	24.92	18.13	28.38	56.6	40.96	36.85	23.81	16.63	26.88	61.7
Total transportation	76.15	70.19	48.99	39.44	57.66	46.2	99.86	99.42	63.63	51.28	71.09	38.6
Farm price ³	470.66	433.91	323.15	340.74	321.54	-5.6	428.06	401.49	304.36	329.15	301.99	-8.3
Landed cost	546.80	504.10	372.14	380.18	379.20	-0.3	527.93	500.91	368.00	380.43	373.08	-1.9
Transport % of landed cost	13.9	13.9	13.1	10.4	15.2	46.1	18.9	19.8	17.2	13.6	19.1	40.6

The Importance of the Private Sector in Resuming Investments in Brazil's Infrastructure

The efforts made to solve Brazil's infrastructural problems became front and center during President Lula's second tenure (2007-2011). The belief that the infrastructural issues were holding back the country's economic growth united business groups, unions, the civil society and the government to solve the bottlenecks of the economy by promoting state-directed investment programs. The result of this initiative was the creation of PAC (Programa de Aceleração do Crescimento).

The PAC was initiated in 2007, at the beginning of Lula's second mandate. The initial idea was to divide the program into two phases, the first one (PAC 1) being from 2007 to 2010 and the second one (PAC 2) from 2010 to 2014, under Dilma Rousseff's first administration. The goal was to increase capital

expenditures in critical and growth-sensitive areas, like housing, sanitation, electricity, urban infrastructure, transportation and energy (See Table 1).

Table 1:

Brazil: PAC investments, percent by sector.

Sectors	2007–10	After 2010	Total
Logistics	14.9	7.2	11.5
Energy	45.7	92.4	66.1
Social and urban	39.5	0.4	22.2
Total	100.0	100.0	100.0

Source: PAC, Morgan Stanley LatAm economics.

PAC 2, in general terms, was a more ambitious program. While PAC 1 envisaged spending R\$ 503.9 billion in a four-year period, PAC 2 proposition was to spend R\$ 958.9 billion, around 2,7% of Brazil's annual GDP in 2010, with R\$ 631.6 billion more planned beyond 2014. The program had an important differentiation from previous ones, notably the Second National Development Plan of the 70's. Instead, PAC also envisioned to address infrastructural quality and durability issues, by increasing the portion of public resources that would be allocated at operation and maintenance of the existing infrastructure. However, as shown by Table 1, during the first phase of the PAC, the logistics sector received approximately R\$ 75 billion (14.9% of the program's total budget) in investments, while on the second phase, the same sector received, roughly, \$ 69 billion (7.2% of the program's total budget) in investments, only half of the percentage invested during the first phase.

Despite the resources of the central government in both phases of the program in helping to select projects and create incentive mechanisms to encourage private and public investments, the program was not able to meet its targets. This failure clarified two things: 1) the state didn't have the managerial or technical skills to run these projects by itself; 2) the state didn't have the financial strength to complete the projects.

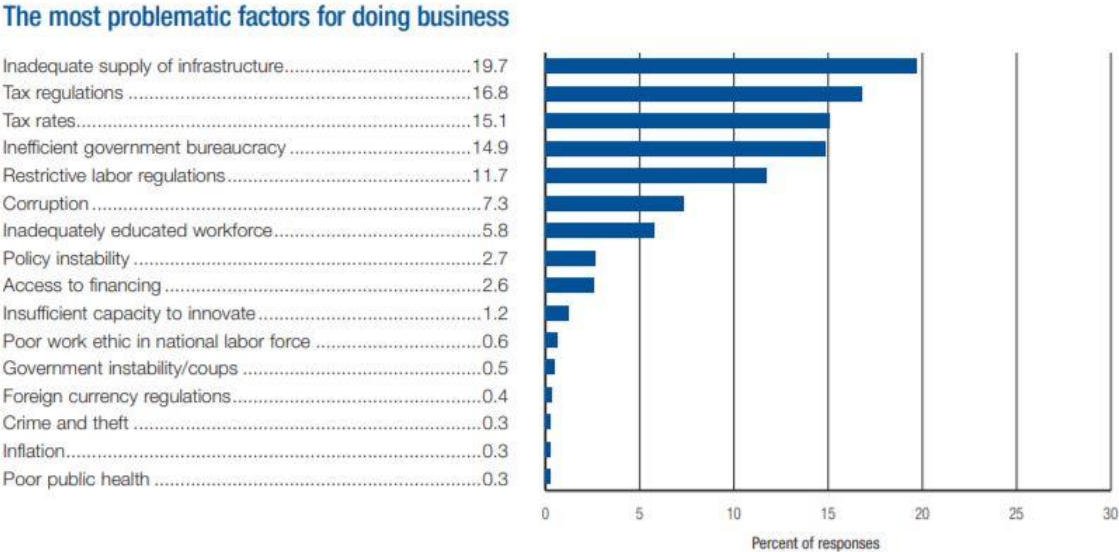
Given the failures of the PAC, the government changed the emphasis of the program, shifting towards two models, the Public Private Partnership (PPP) and the concession contracts. These changes in the project format allowed an increased involvement from the private sector in the construction and maintenance of highways and railroads, modernization of ports and airports and electricity generation. The increased participation from the private sector on infrastructure projects was a reflection of the government's fiscal limitations, exacerbated by economic recession. Additionally, it was believed that the private sector could perform the services in a more efficient way than the public sector.

Under a scenario of fiscal tightening after the approval of a law to freeze federal spending, the administration of Michel Temer announced, in mid-2016 the intent of increasing its reliance on the PPP model and the private sector, instead of state-owned institutions such as the BNDES. The renewed PPP, under the name of Programa de Parcerias e Investimentos (PPI), recognized the need for less state participation. The new program forecasted R\$ 500 billion in investments over the 2016-18 period.

Brazil emerged from one of its biggest historical recessions in 2017, with an economic growth of 1.1%, 11.8% unemployment and 2.95% inflation. For the year of 2018 the expected growth is still very low, below the 2% rate, with expectations of a 2.9% growth rate only in 2019. If the economy resumes growth at a satisfactory rate, financing for important infrastructure plans can be catalyzed, which can help the PPI program to grow its importance. Some important projects of the program’s portfolio are already in motion, one of them being the 90 km of pavement along BR-163, connecting Sorriso-MT to Miritituba-PA, which is expected to be concluded by the end of 2018, and reduce transportation costs in the region by about \$ 10/mt.

Despite the implementation of some of these projects, establishing an efficient private sector-directed investment model requires availability of long-term financing in local currency. For this to happen, domestic capital markets must become deeper and more liquid. Figure 3 shows the innumerable factors slowing down investments from private companies, such as: the relative high cost of capital, despite the recent decreases in the country’s base interest rate; policy instability; inadequate education of the workforce; corruption; restrictive labor regulations; inefficient government bureaucracy; tax rates and regulations; and the inadequate infrastructure network, as mentioned before.

Figure 3: Most Problematic Factors for Doing Business in Brazil



Regulatory Risks

Another issue that infrastructure projects face in Brazil is the slowness in which they have been rolled out, a result of very complex bureaucratic procedures. The structure of the regulatory governance in Brazil and the lack of autonomy by regulatory agencies increase regulatory risks and contribute to hold back investments from the private sector. Figure 4 shows some of the major concerns related to institutions and poor governance that drag away investments from the private sector.

Figure 4: Major Concerns Related to Brazilian Institutions and Governance

1st pillar: Institutions		
1.01	Property rights	4.6 51
1.02	Intellectual property protection	3.5 80
1.03	Diversion of public funds	2.3 133
1.04	Public trust in politicians.....	1.9 136
1.05	Irregular payments and bribes.....	3.9 72
1.06	Judicial independence.....	3.9 65
1.07	Favoritism in decisions of government officials	2.9 89
1.08	Wastefulness of government spending.....	2.2 132
1.09	Burden of government regulation	2.0 147
1.10	Efficiency of legal framework in settling disputes	3.3 101
1.11	Efficiency of legal framework in challenging regs.	3.5 68
1.12	Transparency of government policymaking.....	3.7 112
1.13	Business costs of terrorism.....	6.3 22
1.14	Business costs of crime and violence.....	3.4 124
1.15	Organized crime.....	4.0 126
1.16	Reliability of police services	4.3 64
1.17	Ethical behavior of firms	3.7 87
1.18	Strength of auditing and reporting standards	5.3 31
1.19	Efficacy of corporate boards	4.8 44
1.20	Protection of minority shareholders' interests	4.9 26
1.21	Strength of investor protection, 0-10 (best)*	5.3 69

Additionally, Brazil's regulatory governance has been facing more criticisms after the Car Wash scandal, which involved some of the biggest Brazilian infrastructure builders and capital goods firms. The episode increased the importance of the PPI to Brazil, since it aims to establish partnerships among the private sector and recover the inflow of investments directed to infrastructure projects. Before the PPI, some government initiatives were created to address the inefficiency problems of the regulatory agencies and attract investments. One of them was the PRO-ERG program, created in 2007, which aimed to reduce the gap between Brazilian and foreign regulatory agencies, by providing exchange opportunities and diffusion of international best practices.

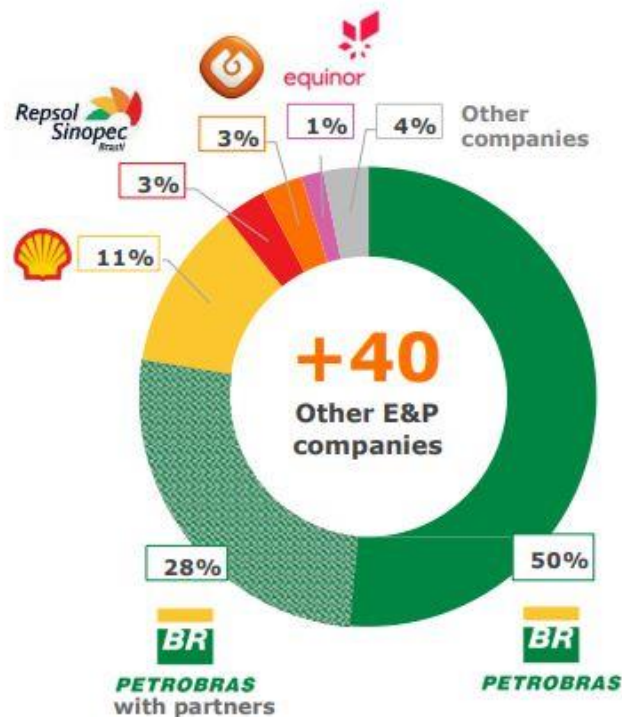
So far, the efforts to improve the regulatory environment in Brazil have been producing interesting outcomes. The PPI itself has helped to transform the country's infrastructure and regulatory framework

since its introduction in May 2016. The new model guarantees clearer rules, society's participation and the Union Court of Auditors' (TCU) involvement, which increases predictability and results in more attractive projects, with diminished risks.

Within the PPI, one of the sectors that has experienced the biggest transformations is the oil and gas industry. One of the key steps towards these transformations was the extinguishment of Petrobras' oil exploration monopoly, which paved the way to create a more diverse and competitive oil sector (See Figure 5). This also allowed Petrobras to have a healthier financial situation, without having the burden of making massive investments that the company didn't have the resources to make. Additionally, clear rules and a sound understanding of the market by the Brazilian National Petroleum, Natural Gas and Biofuels Agency (ANP) under the guidance of the Director-General, according to Décio Oddone, are clear evidence that the private sector will respond to investment opportunities in Brazil.

Figure 5:

Production National O&G production by company 2018



Because of the attractiveness of the oil and gas sector, Brazil was able to hold several bid rounds and attract companies from different countries. With the five bids held during 2017, Brazil expects to attract up to \$ 80 billion of new investments by 2027, \$ 334 billion of tax revenues and produce 2 million barrels per day. Additionally, as José Firmo, President of the Brazilian Petroleum, Gas and Biofuels Institute (IBP) puts it, the boom in U.S.'s shale oil production put more pressure on Brazil to increase the efficiency of its deep-water exploration. Therefore, attracting international big oil companies is crucial to access advanced technologies and capital.

Unfortunately, Brazil still has a long way to go to attract additional investments. Still needed are stable, rational regulatory rules, better concession contracts that properly manage risks and rewards, autonomous, non-political technically qualified regulatory agencies, capable of making timely decisions, swifter environmental licensing and more effective foreign exchange hedging are some of the areas that could be improved upon.

CONCLUSION

Brazil's infrastructural issues need to be resolved if the country wants to engage in a sustainable development process and maintain its competitiveness in the exports market of agricultural goods. A study made by the World Economic Forum ranked the country's overall infrastructure network quality on the 114th place. In addition to the poor quality of its infrastructure, Brazil is too reliant on highways, which are responsible for moving 54% of the country's merchandise. This setting leaves the country exposed to events like the recent truck drivers' strike, resulting in scarcity of goods and food for the population and accelerated inflation. The precarious conditions of highways aligned with the lack of other transportation alternatives contribute to higher freight costs and lower competitiveness.

Despite the previous attempts made by the federal government to create infrastructural development programs with state-directed investments, the lack of managerial and technical skills of the public sector, combined with its lack of financial strength to complete the projects led these programs to failure. The failure of the previous programs and the necessity of pushing the country's infrastructural development forward led to a revision of the model. In mid-2016, the Temer administration created the PPI program, which increased the role of the private sector in infrastructure projects in detriment of the participation of public institutions, like the BNDES, alleviating public accounts and increasing projects' efficiency. The program also contributed to diminish Brazil's regulatory risks, by defining clearer rules, allowing public participation and involving the Union Court of Auditors (TCU), which enhanced predictability and reduced risks. A comparison made by the World Economic Forum in its 2013-2014 Global Competitiveness Report between Brazil and countries in the same stage of development suggests that, among other factors, Brazil's institutions are more unreliable, and its infrastructure quality is worse than its peers (See Figure 6).

Figure 6: Comparisons Between Brazil and Other Economies in the Same Stage of Development



Although this new private sector-led investment model may solve some of the issues presented by the previous one, some other challenges may arise. One of the most essential elements for the success of these projects is the availability of easy long-term financing to the private sector and increased liquidity of the domestic capital markets. These macroeconomic measures combined with lower interest rates should decrease borrowing costs and create a comfortable environment to increase private sector's capital expenditures.

Despite the challenges, some sectors of the economy, like the oil and gas industry, already started to show signs of recovery. The main reasons why private sector capital is pouring in the sector again has to do with the efforts made by the PPI and ANP to simplify the bureaucratic procedures and clarify the rules, in addition to extinguishing Petrobras' oil exploration monopoly, which contributed to create a more diverse and competitive environment.

For further information on the PPI and the efforts made by ANP to increase the competitiveness of the oil and gas sector in Brazil, please access the following links:

PPI:

<https://bit.ly/2Mbj0ww>

Oil & Gas Sector Initiatives:

<https://bit.ly/2OsaqGf>

<https://bit.ly/2AUlyKO>

<https://bit.ly/2OrHrSS>

SOURCES

Amann E., Baer W., Trebat T., Lora J.V., (2016). Infrastructure and its role in Brazil's development process. Quarterly Review of Economics and Finance, 62, pp. 66-73. Available at: <https://bit.ly/2ISHQ4M>

Datagro, (2018). Half of the Highways will be in Poor Conditions Until 2025, Study Warns. Datagro, June, 2018. Available at: <https://bit.ly/2u0meXD>

Firmo, J. (2018). Brazil: A new window of opportunity. Rio Oil & Gas, September 24-27. Available at: <https://bit.ly/2OsaqGf>

Graham, N., & Vayas, D. (2018). Energy Policy in Brazil: What's Next for Upstream, Refining and LNG?. The Dialogue, June 28. Available at: <https://bit.ly/2AUlyK0>

Oddone, D. (2018). Energy Policy in Brazil: What's next for upstream, refining and LNG?. The Dialogue, June 28. Available at: <https://bit.ly/2OrHrSS>

Programa de Parcerias de Investimentos (2018). Avançar Parcerias: check out the projects and 2018, June 08. Available at: <https://bit.ly/2Mbj0ww>

Road & Rail Industry Profile: Brazil. (2013). Road & Rail Industry Profile: Brazil, 1-30. Available at: <https://bit.ly/2IOwXtE>

Schwab, K. & World Economic Forum (2013). The Global Competitiveness Report 2013-2014. Available at: <https://bit.ly/1bCOHnl>

Steel Industry Profile: Brazil. (2017). Steel Industry Profile: Brazil, 1-34. Available at: <https://bit.ly/2KH5nDx>

Trucks Industry Profile: Brazil. (2014). Trucks Industry Profile: Brazil, 1-38. Available at: <https://bit.ly/2NllgOF>

USDA (2018). Brazil Soybean Transportation. United States Department of Agriculture, February 26th, 2018. Available at: <https://bit.ly/2LFLLMN>

Utilities Industry Profile: Brazil. (2017). Utilities Industry Profile: Brazil, 1-38. Available at: <https://bit.ly/2IS91MS>