The Boston Consulting Group

Infrastructure Investment and Its Impact on Job Creation in Brazil

Jean Le Corre, Eduard Pujol, Thiago Cardoso and Ricardo Andrade

September 2017

AT A GLANCE

Investments in Brazil's infrastructure have been historically low. The current economic crisis has caused them to fall even further, reaching 1.7% of GDP in 2016—below that of Sub-Saharan Africa (1.9%) and of Latin America and the Caribbean (2.8%).

Poor infrastructure brings diverse effects

The effects of poor infrastructure for the country are many: Higher costs for asset "users" and logistics bottlenecks limiting economic development, to name a few. In this scenario, a relevant indirect effect of infrastructure investing goes even more unnoticed by the public: Job creation.

A Holistic Infrastructure Project Selection Approach

Historically, there is no robust methodology and criteria for prioritizing and selecting projects in the country. In order to provide transparency and avoid political bias, two key dimensions must be taken into account: impact for society and project feasibility.

Job Creation Potential and economic development

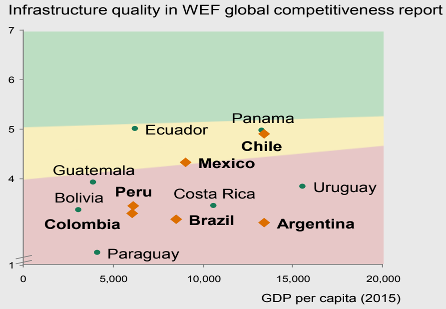
Infrastructure investment can not only be a key enabler of long-term economic recovery in Brazil, but also contribute to job creation in the short term. Considering the projects currently considered in Brazil's federal government concession portfolio, highways and railways are the ones with the highest potential for job creation, accounting for at least 37 thousand potential direct jobs and 110 thousand total jobs

MUCH HAS BEEN DEBATED about Brazil's poor infrastructure quality: Bumpy roads, clogged ports, a limited and low-performing railway network, just to name a few. Investments in Brazil's infrastructure have been historically low: 2.1% of GDP between 2001 and 2014, according to CNI (Confederação Nacional da Indústria). The current economic crisis has caused them to fall even further, reaching 1.7% of GDP in 2016—below that of Sub-Saharan Africa (1.9%), Latin America, and the Caribbean (2.8%), and distant from that of East Asia and the Pacific (7.7%). In fact, infrastructure investments have mirrored the trend in Brazil's gross fixed capital formation, which plummeted from 20.9% of GDP in 2013 to 16.4% in 2016, a 22% drop.

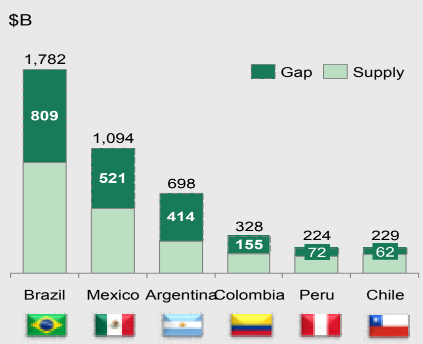
The investment issue is much larger than the drop indicates. Brazil's infrastructure quality index, measured by the World Economic Forum, is much lower than that of countries with similar levels of wealth, such as Mexico. Besides, we estimate the country has a huge infrastructure investment gap: US$ 800 billion over the next 10 years, again much higher than other Latin American countries (Exhibit 1).

EXHIBIT 1 | Infrastructure Quality and Investment Gap for LatAm Countries

Infrastructure quality levels are worse in Argentina and Brazil



Projected infrastructure gap until 2025 is higher for Brazil, Mexico and Argentina



Source: Infrastructure quality as weighted average of 50% roads +10% rail + 10%port+ 10% airports + 20% energy supply
Source: WEF 2016-2017; BCG Analysis

Besides the limited impact on Brazil’s infrastructure quality, thin investments also fail to drive economic development. According to a 2014 estimate by the International Monetary Fund, if advanced economies invested an extra 1% of GDP in infrastructure construction, they would achieve a 1.5% increase in GDP after four years.

The lack of infrastructure investment in Brazil has many plausible explanations, ranging from the shortage of domestic savings to the lack of long-term funding to political and institutional challenges. However, another factor may also help to account for these figures: Brazilians do not perceive infrastructure to be a high-priority topic. In research done by CNI in February, 2014, roads appeared within the top three most pressing issues for only 6% of Brazil’s population. Sanitation figured as a “Top-3” issue for only 3%, even though 50% of Brazil’s households do not have sewage collection, and polluted rivers (such as the Pinheiros and Tietê, which both cross the city of São Paulo) and polluted coastlines (such as Guanabara Bay in the heart of Rio de Janeiro) are highly visible.

The effects of poor infrastructure for the country are many: Higher costs for asset “users” and logistics bottlenecks limiting economic development, to name a few. In this scenario, a relevant indirect effect of infrastructure investing goes even more unnoticed by the public: Job creation. In fact, infrastructure has a strong impact on employment generation. According to FIESP (Federação das Indústrias do Estado de São Paulo), construction and infrastructure respond to around 10% of employment in Brazil. In particular, the contribution of infrastructure to job creation becomes even more relevant in light of Brazil’s current unemployment rate, which stands at around 13% (versus 8% in 2015, and less than 5% in 2013). A recent survey from CNI showed that the lack of jobs is an increasing concern for the population: It rose from 7th place in 2014, when it was mentioned by 18% of interviewees, to 2nd place in 2016, mentioned by 32% of the sample.

Historically, the government has played a significant role in infrastructure investment, not only as planner, coordinator or advocate, but also as a direct investor. However, despite overarching agreement that infrastructure investments are needed, budgets for infrastructure in the public sector are still very limited (around 1% of the federal government budget in 2017, or about R$ 36 billion) and are likely to drop even further due to a new constitutional amendment that limits government spending.

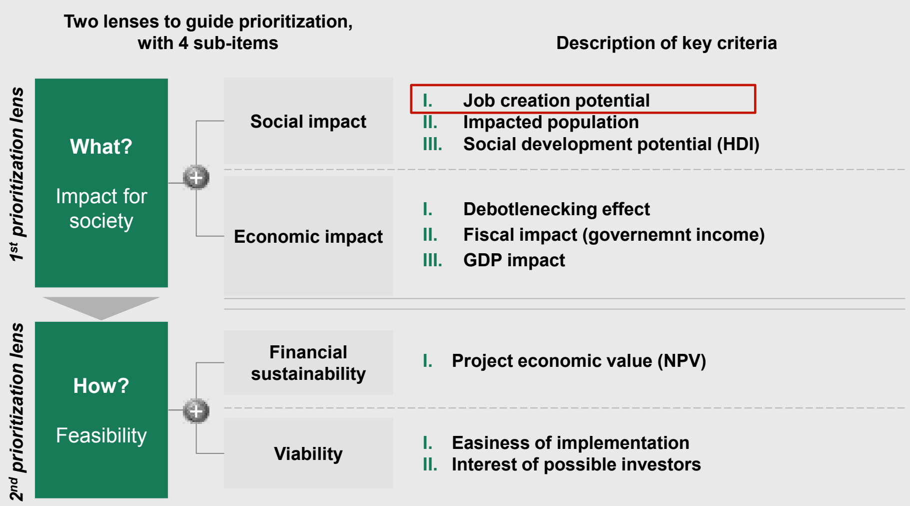
The lack of investment hinders Brazil’s economic recovery and long-term development. Considering the effects on economic development and job creation, Brazil would benefit from stimulating investments in infrastructure as a whole. The selection of specific projects to be prioritized should rely on a holistic and systematic approach, even though job creation potential is a critical factor as it may help alleviate some of the country’s infrastructure bottlenecks, driving costs down, and helping overcome the current economic downturn.

A holistic approach to selecting infrastructure projects

Historically, project prioritization and selection criteria has been a black box, often influenced by political interests. We believe infrastructure projects should be selected through a systematic approach, providing transparency and avoiding political bias. BCG proposes an approach considering two lenses (as detailed in Exhibit 2):

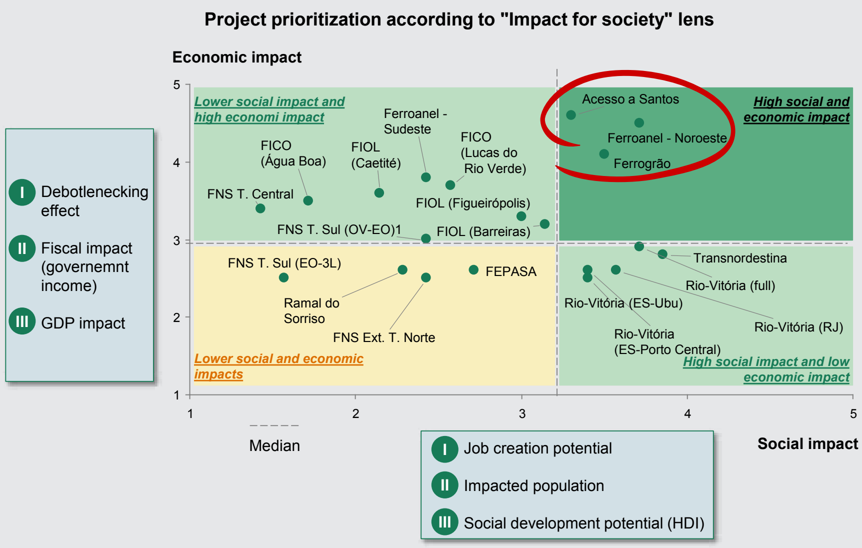
- Impact for Society, which assesses the value for the government and society as a whole, and is influenced by:
  - Social impact, considering job creation potential, the population impacted, and social development potential
  - Economic impact, which identifies the de-bottlenecking effect of the project, the potential cost reduction to the asset "users", the potential contribution to government revenues , as well as GDP impact
- Project Feasibility, which basically measures the likelihood that a project will drive interest and be successful, and is influenced by:
  - Financial Sustainability, which is essentially the project's net present value
  - Implementation viability, influenced by the ease of implementation, and the interest of potential investors

EXHIBIT 2 | Prioritization Framework for Infrastructure Projects



The job creation potential is one of the key criteria, among others in the framework. Other criteria that should be considered are the project's stage of completion and specific political interests, for example. Thus, the framework is extremely useful to prioritize projects. An application of the "Impact for Society" lens to railway projects in Brazil led to the results in Exhibit 3. According to the framework, the construction of the access to Santos Port (increasing productivity of one of the key logistics assets in the country), the completion of the Ferroanel Railway project in São Paulo (de-bottlenecking rail traffic around the city), as well as of the Ferrogrão Railway (optimizing the logistical flow of agricultural production in the Center-West region) should be prioritized as a result of their social and economic impacts. These projects alone could generate an estimated 20 thousand jobs.

EXHIBIT 3 | Application of "Impact on Society" Lens to Railway Projects in Brazil



Source: OV – Ouro Verde de Goiás/GO; EO Estrela d'Oeste/SP; 3L – Três Lagoas/MS

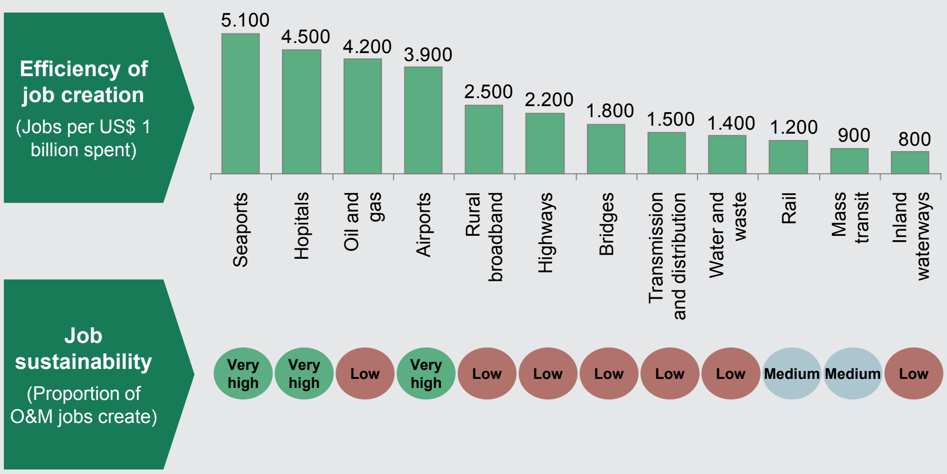
These projects also need to be assessed according to the "feasibility" lens. For example, the completion of the Ferrovia Norte-Sul Railway (FNS) to Estrela d'Oeste can seem much more appealing than other projects since most of the relevant investments have already been made, thus increasing its present value and shortening the time to implementation. Moreover, it also offers synergies to a few operators, boosting the appetite of private investors, and therefore, its overall feasibility.

Generally, the weight of each criterion will vary according to each country's context. For instance, in Brazil's current economic situation, there is a case for attributing a higher weight to job creation potential.

Job Creation Potential of Brazilian Projects across Infrastructure Sectors

It is also important to consider the different profiles of jobs generated within each infrastructure sector, weighing favorably those that generate a higher number of jobs per billion invested, as well as those where jobs tend to be more lasting. In a paper published in April 2017, BCG and CG/LA analyzed this topic. As Exhibit 4 demonstrates, seaports, hospitals, and airports not only generate many jobs per billion invested, but also "higher-quality", longer-lasting jobs such as Operation & Maintenance (O&M) of the asset during its lifetime. On the other hand, Oil&Gas also has relatively high job-generation potential, but with a much lower quality or of a more temporary nature.

EXHIBIT 4 | Job Creation and Quality per Infrastructure Sector



Source: "A jobs-centric approach to infrastructure investment", April 2017, BCG and CG/LA

Considering the projects currently considered in Brazil's federal government concession portfolio , highways and railways are the ones with the highest potential for job creation, accounting for 37 thousand potential direct jobs and 110 thousand total jobs, and R$70 billion in investments (Exhibit 5). Job creation in these two sectors, however, tends to have a low to medium level of sustainability, since most of the workforce is dismissed after the completion of the construction project, requiring fewer people for O&M.

Exhibit 5 | Job Creation Potential and Investment in Brazil's Current Concession Portfolio

Industry	Number of Projects	Job Creation – Direct jobs	Job Creation – Total jobs	Investments (R$M)
Ports	12	2,400	7,200	1,400
Oil & Gas	Many	2,500	7,600	1,800
Highways	6	20,000	60,000	27,100
Railways	4	17,000	50,000	41,500
Total	**Various**	**41.900**	**124.800**	**71.800**

On the other hand, some projects already announced in São Paulo state tend to have higher job quality since they include sectors such as Hospitals and Mass Transit, which require a relatively higher number of people for O&M (Exhibit 6).

Exhibit 6 | Job Creation Potential in some projects announced in São Paulo state

Industry	Number of Projects	Job Creation – Direct jobs	Job Creation – Total jobs	Investments (R$M)
Ports	1	3,400	10,200	2,000
Hospitals	2	3,700	11,100	2,500
Highways	5	8,800	26,500	12,000
Railways	1	1,400	4,100	3,400
Mass Transit	5	3,600	10,800	12,000
Total	**14**	**20.900**	**62.700**	**31.900**

Implications for Public and Private Sectors

We believe infrastructure investment can not only be a key enabler of long-term economic recovery in Brazil, but also contribute to job creation in the short term. Therefore, by acknowledging the deleterious effects of current unemployment rates on the economy, and the severe deterioration of fiscal accounts across the entire public sector (federal, state, and municipal), Brazil's politicians and officials need to facilitate and incentivize private investments as much as possible. In addition, while we do not advocate for the job creation potential as the sole criterion for project prioritization, in the current downturn, it should be an overweighted factor in a systematic approach to prioritize the investment of scarce resources in the most impactful projects. Moreover, sectors that have the potential to create jobs of "higher quality" (i.e., of longer duration) should be particularly prioritized.

It is also vital to monitor job creation as a key performance indicator of projects. This will help fine-tune the process for prioritizing projects in the future, and better guide policymakers on which sectors or asset types to focus (e.g., via tax alleviation programs).

Going forward, the private sector should play a key role in developing infrastructure in Brazil. The public sector, a historical driver of infrastructure investments, no longer has the financial capacity to do so. Of course, infrastructure should keep its uncontestable social role. Thus, private investors should be aware of the drivers and interests for the government and society as a whole, being transparent about the results, impacts, and benefits of their projects, as well as continually advocating for more opportunities in the infrastructure space.

Notes

1. Marianne Fay, Luis Alberto Andres, Charles Fox, Ulf Narloch, Stephane Straub, and Michael Slawson, "Rethinking Infrastructure in Latin America and the Caribbean: Spending Better to Achieve More," The World Bank, 2017, p. 7.
2. International Monetary Fund, "World Economic Outlook 2014," October 2014.
3. Confederação Nacional da Indústria, "Retratos da sociedade brasileira: problemas e prioridades do Brasil para 2014," February 2014.
4. Considering workers in construction and transportation; Numbers for São Paulo state, according to FIESP.
5. Confederação Nacional da Indústria, "Retratos da Sociedade Brasileira - Problemas e Prioridades", February 2017.
6. BCG and CG/LA, "A Jobs-Centric Approach to Infrastructure Investment," April 2017, available at http://on.bcg.com/2lVHAjE.
7. Projeto Crescer, http://www.projetocrescer.gov.br/, accessed July 2017; Includes only projects with estimated investments available at the time; Includes concession renewals in the pipeline

About the Authors

Jean Le Corre is a senior partner and managing director in the São Paulo office of The Boston Consulting Group. You may contact him by email at LeCorre.Jean@bcg.com.

Eduard Pujol is a partner and managing director in the São Paulo office of The Boston Consulting Group. You may contact him by email at Pujol.Eduard@bcg.com.

Thiago Cardoso is a principal in the Rio de Janeiro office of The Boston Consulting Group. You may contact him by email at Cardoso.Thiago@bcg.com.

Ricardo Andrade is a consultant in the São Paulo office of The Boston Consulting Group.

For Further Contact

If you would like to discuss this report, please contact one of the authors.

The Boston Consulting Group (BCG) is a global management consulting firm and the world's leading advisor on business strategy. We partner with clients from the private, public, and not-for-profit sectors in all regions to identify their highest-value opportunities, address their most critical challenges, and transform their enterprises. Our customized approach combines deep insight into the dynamics of companies and markets with close collaboration at all levels of the client organization. This ensures that our clients achieve sustainable competitive advantage, build more capable organizations, and secure lasting results. Founded in 1963, BCG is a private company with 90 offices in 50 countries. For more information, please visit www.bcg.com.

To find the latest BCG content and register to receive e-alerts on this topic or others, please visit bcgperspectives.com.

Follow bcg.perspectives on Facebook and Twitter.

10/17