

## The future of development banks: the case of Brazil's BNDES

Rogério Studart and Luma Ramos<sup>1</sup>

### 1. Introduction

Infrastructure and logistics (I&L) in Brazil fall short of the demand for basic needs, are a drag on national productivity and competitiveness, and may be inappropriate to address the challenges imposed by climate change. In a country facing one of the most significant recession of its history, this paper claims that increasing investments in *sustainable I&L* may, in turn, offer a golden opportunity to raise growth and to achieve sustained, inclusive and environmentally development. It is Brazil's necessary step out of its current middle-income trap.

The challenge of boosting I&L investment seems enormous at a moment when i) national and subnational governments face severe fiscal constraints; ii) private sources of long-term funding continue to be scarce and the cost of capital too high; and iii) project development capabilities, particularly for more complex and innovative projects, are limited. Recent studies, including by this author (e.g. Gallagher and Studart, 2016), indicate that national development banks may be critical to promote projects, and leverage and crowd-in private capital to transformational investments – such as *sustainable I&L* ones. Brazil's national development bank, we argue, should be no exception.

Founded in 1952, the Brazilian Economic and Social Development Bank (BNDES) has had a catalytic role in promoting *transformational investments* in different phases of Brazil's socioeconomic development. From 2002 to 2015, the bank increased its support for badly needed I&L projects, and its lending level increased hiked exponentially. BNDES became a financial giant, but in this process, it paid a high price: the political and economic turmoil that engulfed the nation, put it under strong scrutiny from a public opinion. An abrupt change of economic orientation of the federal government since 2015, and particularly in 2016, led to a “change of heart” about its role play in Brazil's future development path.

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<sup>1</sup> Rogério Studart is distinguished fellow at the Global Federation of Competitiveness Councils and non-resident senior fellow, Brookings Institution, and Luma Ramos is a PhD candidate at Federal University of Rio de Janeiro. The opinions expressed are not necessarily those of their respective institutions.

This paper analyzes the potential role of BNDES in promoting *transformational changes* needed for Brazil now – which in our view, must come from, but not solely, a wave of *sustainable infrastructure and logistics (I&L) investments*. The paper argues that BNDES could, and should, play a critical role in developing a needed I&L **investment financing architecture** - through its potential in fostering project development capacities, and financing, leveraging and crowding-in private resource for the sector

It is organized as follows. Section 2 assesses the I&L gaps and their consequences for Brazil’s growth, and discusses why raising *sustainable* I&L presents an opportunity to help overcome the current crisis, setting a new and promising path of socioeconomic development. Section 3 reviews the history, financial performance and funding of BNDES. Section 4 presents a preliminary analysis of more recent changes of its orientation and operational policies, and their likely effects on I&L financing. Section 5 summarizes our findings and offers our main conclusions.

## 2. An Economic Giant Trapped by I&L Gaps

Brazil’s growth in the past three decades has been characterized as a typical case of “middle-income trap”.<sup>2</sup> Indeed, Brazil’s per capita GDP trajectory, which had been quite robust in the 1970s, was almost nil during the whole 1980, and extremely low in the 1990s. Only in the 2000s this performance improved. More recently, though, the country has entered in economic recession which is producing a reversal of such achievements. In our view, much of Brazil’s “middle-income trap” results from the significant decline in public and private investments during the so-called lost decade, 1980s. This deterioration may have affected at least three pillars of economic development: education and knowledge, innovation and infrastructure and logistics (I&L). The lag in I&L investments, in particular, has created enduring challenges for Brazil’s capacity to remain on a sustainable and inclusive path, what was chosen for itself after its return to democracy in the 1990s.

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<sup>2</sup> Kharas and Hohli (2011) defines “middle-income trap” as follows “In a steadily growing economy, per capita Gross Domestic Product (GDP) rises continuously over time (growth) toward higher income levels. That has been the experience of the Republic of Korea. But many middle-income countries do not follow this pattern. Instead, they have bursts of growth followed by periods of stagnation or even decline, or are stuck at low growth rates. Instead of steadily moving up over time, their GDP per capita simply gyrates up and down. They are caught in the Middle-Income Trap—unable to compete with low-income, low-wage economies in manufactured exports and unable to compete with advanced economies in high-skill innovations. South Africa and, until recently, Brazil are examples of this phenomenon”.

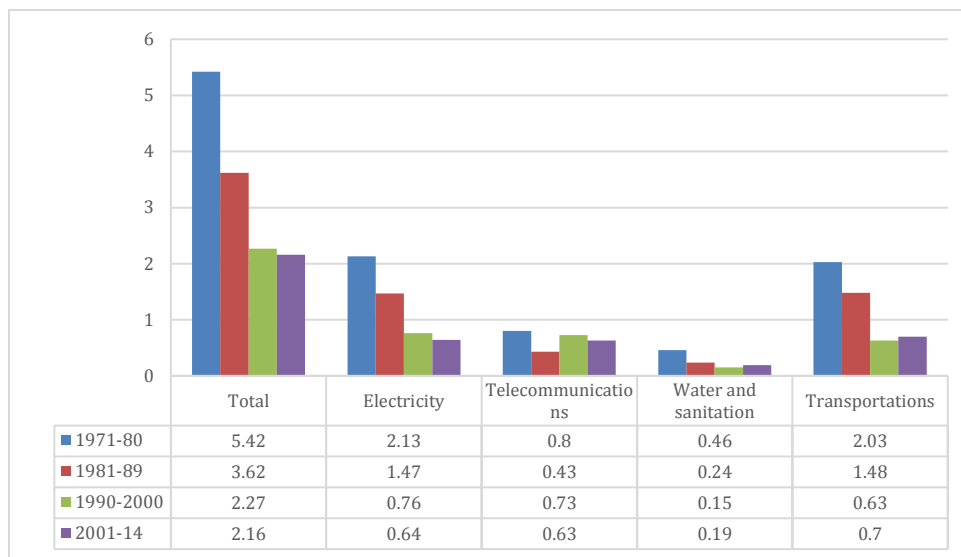
## *2.1. THE DOUBLE LEGACY OF A “LOST DECADE”*

Brazilian early industrialization was a result of the closure of international trade during the first world war, which allowed to pursue import substitution (ISI) started in the beginning of the 20<sup>th</sup> century initially (Furtado, 1959). The postwar period was characterized by a government-sponsored import substitution strategy, accompanied by a rapid urbanization and emergence of an incipient middle-class, particularly in industrial cities, such as Sao Paulo. These changes class had social, political and economic consequences, as the pace of demand growth generated constant mismatches of aggregate supply and demand of goods and services. Not surprisingly, the experience of post-war growth was followed by macroeconomic imbalances, inflation or balance of payments difficulties, and increased social and political tensions.

A dramatic political turmoil of the early 1960s ended up with a military coup in 1964 and twenty-five years of dictatorship. Following several years of stagnation, paradoxically with policies focused on macroeconomic adjustment and reforms, the military regime resumed import substitution industrialization, anchored in the development of intermediary goods – including the chemical complexes. Brazil reached the end of the 1970s with a diversified internationally competitive manufacturing sector, but also with one of the highest poverty and inequality levels in the planet. An additional vulnerability inherited by Brazil’s high growth period in the 1970s was linked to its balance of payments. Indeed, the international interest shock of the 1979 transformed a relatively small external debt situation into a full-fledged debt crisis.

This was the beginning of the “lost decade” characterized by structural adjustment, economic stagnation and rampant price hikes that led to hyper-inflation. But also distinguished by processes that had direct impact on the infrastructure challenges faced by Brazil until now: the rapid decline of private and public investments, particularly in I&L, and deterioration of the State capacity to develop, implement and monitor large investment undertakings. Finally, it was a period of rising inequality and poverty, which together with the infrastructure gaps became the two main heritages for the governments after 1990, when Brazil entered in a period of democratic and inclusive course.

**Figure 1 - Brazil: investments in infrastructure (% GDP)**



Source: CNI (2016).

This heritage only began to change with the successful stabilization program in 1994, and the establishment after 1999 of a macroeconomic model anchored on a “tripod”- based on its fiscal responsibility law, central bank autonomy and flexible (dirty floating) exchange-rate regime. Even though inequality fell as a one-off consequence of price stabilization in 1994, the achievement of macroeconomic stability opened the possibility of addressing the social debt through, for instance, the enhancement of social programs and real-wage growth policy. Poverty and inequality fell significantly, and whereas GDP per capita had the highest advances since the 1990s. In this process, a new middle class emerged and access to credit expanded significantly, which led to a boom in consumption of goods and services.

Albeit the socioeconomic advances, I&L investments needed to increase the provision of public goods and services did not follow. Widening I&L gaps contributed for the increasing pressure put on infrastructure in general, but particularly in the urban areas where 85% of Brazil’s population live. This is what we shall see next.

## *2.2. I&L GAPS AS CONSTRAINTS TO SUSTAINED INCLUSIVE DEVELOPMENT*

It seems to be a consensus among analysts and policy makers that I&L gaps have become a true constraint on Brazil's growth and particularly for a future of sustainable development (e.g. Castelar Pinheiro and Frischtak, 2014). Whatever measure applied, they are extremely large and their negative externalities in Brazil's recent socioeconomic history cannot be understated. For instance, the 2010 World Bank Enterprise Survey pointed out that 28 percent of firms considered transportation to be a major constraint, against 23 percent in LAC (Garcia-Escribing, Goes, and Karpowicz, 2015).

Another evidence that I&L gaps represent a drag on the national business environment and competitiveness is that Brazil ranks 120, out of 144 countries surveyed, in the 2014 World Economic Forum overall infrastructure quality. Only in electricity and telecommunication, Brazil is in a better ranking than some competitors, areas in which it has invested comparably more in recent years - with greater interest and participation of the private sector.

Poor I&L also creates significant bottlenecks in Brazil's social development, and arguably political "ceilings" for a process of inclusive growth. In this vein, despite recent hikes in social infrastructure investments, access to improved sanitation was still denied to 12.0% of the urban population, and almost 50% of the rural population.

Other indicators also paint a grim picture of the obstacles created by I&L gaps for the new needs generated by inclusive growth and rapid urbanization. For instance, even though the national fleet of cars and trucks almost doubled, less than 15 percent of Brazil's roads are paved (including municipal roads) and multi-lane roads are still relatively rare, although they have doubled over the past half-decade. This makes traffic jams a major concern in any of its largest urban centers.

Finally, when it comes to environmental sustainability most I&L are not climate-smart, both when it comes to mitigation and adaptation, even though the effects of climate change are already being felt. Building an I&L that simultaneously helps the country be on a path of low carbon, climate-resilient, and inclusive growth may be the challenge in the next decades for Brazil.

Overcoming the existing I&L financing gaps will not be easy, as it requires investments estimated to be as high as R\$1.1 trillion, the equivalent of one-fourth of Brazil's 2012 GDP (Wagner et al, 2015). This will demand a simultaneous increase of public and private investment, at a moment when the national and subnational government face tremendous budgetary challenges, and long-term private financing – traditionally very limited – is scarcer than ever. BNDES could play an important role in achieving these goals. This is our next topic.

### **3. BNDES: history, business model and funding challenges**

BNDES's history is profoundly connected with Brazil's post-war development. In the early years, its main role was to finance economic infrastructure projects and develop the steel industry that were critical for industrialization based consumer durables. (Studart, 1995). Already in the 1960s, it helped finance the development of the consumer goods industry. BNDES played a fundamental role in 1970s import substitution programs that strengthen several industrial input-producing sectors (e.g. petrochemical industry) and capital goods, and even created completely new ones (e.g. information technology and microelectronics). Indeed, BNDES helped shape what is now the most diversified industrial sector in Latin America (Castro and Souza, 1985).

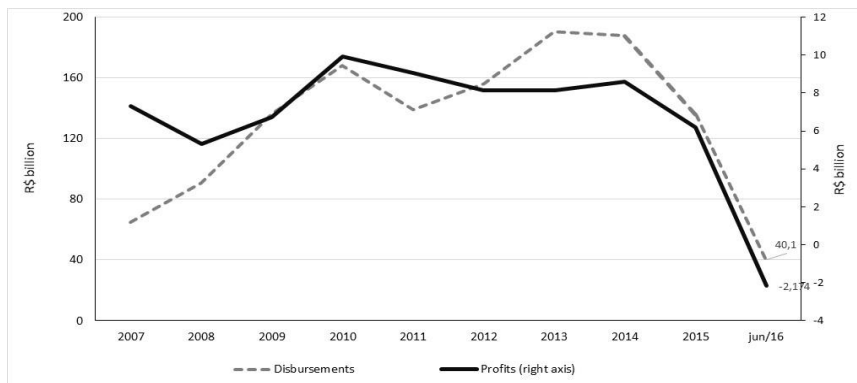
During the 1980s, in addition to its other mandates, BNDES promoted the expansion of the energy exports, agriculture and promoted social integration. In the 1990s, it was a critical part of the federal privatization program, by assisting in the sale of large State-owned Brazilian companies. From 2002 to 2015, besides all other activities, BNDES increased its support for large I&L projects and for their global presence. In the last decade, its lending level increased exponentially, until it fell dramatically in the past year (more on this later); and despite its attempts to leverage and crowd-in private capital, so did its dependency on transfers made from the National Treasury for its funding. BNDES became a financial giant, and a centerpiece of Brazil's social and economic development.

Since the early 2000s, BNDES has become an even more critical player in major government infrastructure investment programs. Its business model and funding strategy were adapted to facilitate PPI and other government programs, but they also became a source of political vulnerability. Partly, this vulnerability explains some of the more recent changes in its orientation and operational policies.

### 3.1. BUSINESS MODEL, PERFORMANCE AND FUNDING

The overall financial performance of BNDES has been impressive in the past decade. Disbursements have been multiplied by more than four times (in average US dollars), whereas profits almost quadrupled. This performance is partly due to its role in supporting the two large government-sponsored investment programs, the growth acceleration program (**PAC** in its Portuguese acronym) and the logistics investments program (PIL), and the countercyclical role it played in the aftermath of the 2009 crisis.

**Figure 2 - BNDES – Disbursements (left axis) and profits (R\$ bi)**



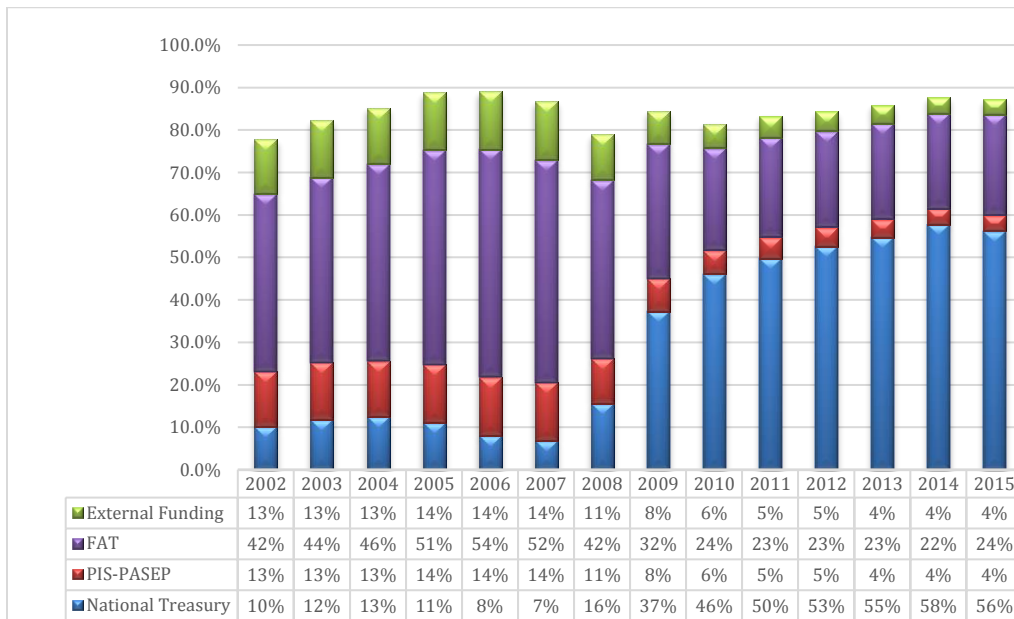
Source: BNDES.

PAC was launched in early 2007, still under the Lula da Silva Administration. It consisted of a set of economic policies and investment projects with the objective of eliminating the I&L bottlenecks and easing growth in Brazil. The program had a budget of R\$503.9 bi between 2007 and 2010, and soon after the 2009 global financial crisis became one of Brazil’s main countercyclical efforts. The Rousseff administration (2010-15) continued the program under the name **PAC-2**. The Logistics Investment Program (**PIL**) was launched in 2012 to promote concessions of 7,500 kilometers of highways and 10,000 kilometers of railroads. The total planned investment over 25 years was to reach R\$133 billion (R\$42 billion for highways and R\$91 billion on railroads), with R\$79.5 billion to be invested in the first five years.



BNDES became one of the largest financial institutions in Brazil – in addition to becoming one of the five largest development banks (be it national, regional or multilateral) in the world. This market position did not come without challenges. And one of them became increasingly controversial in Brazil: its funding strategy. Indeed, until very recently the main sources of funding to BNDES were provided by investments of “quasi-public” funds (PIS-PASEP and FAT) associated with social insurance and workers’ safety nets, returns of its outstanding loans and equity investments, bond issuance, and/or borrowing from multilateral institutions. This has changed since 2009, when BNDES stepped in to fill the post-crisis 2008 crisis created by the retrenchment of private financing. Incapable of tapping the market at a pace compatible with the expansion of its loan portfolio, BNDES’ funding became highly dependent on transfers from the National Treasury and the volume of resources coming from it increased substantially, becoming higher than 50% of the total.

**Figure 3 - BNDES's funding structure (% of total liabilities)**



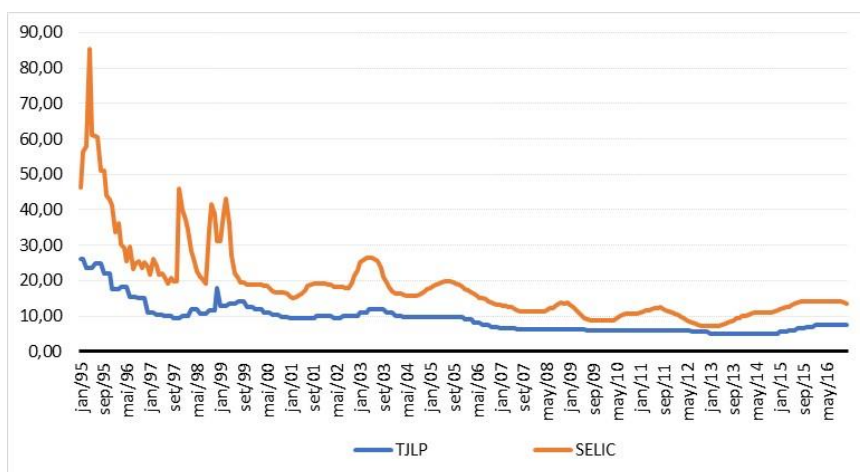
Source: BNDES.

This extraordinary growth of transfers from the national treasury revived an old controversy on the societal costs of promoting industrial policies, and therefore on the validity of BNDES funding strategy.



The problem lies in the fact that Brazil does not have a developed term-structure interest rates curve (or yield curve), because most private debt instruments have short maturities. For that reason, BNDES uses the so-called TJLP, the acronym for the long-term interest rate, which is the benchmark rate created by BNDES, around which it sets the interest rates charged on its loans. Since its creation, TJLP has been set systematically below the Treasury interest rates, even the rate on their most liquid bonds (SELIC) – as can be seen below.

**Figure 4 - TJLP and SELIC (%)**



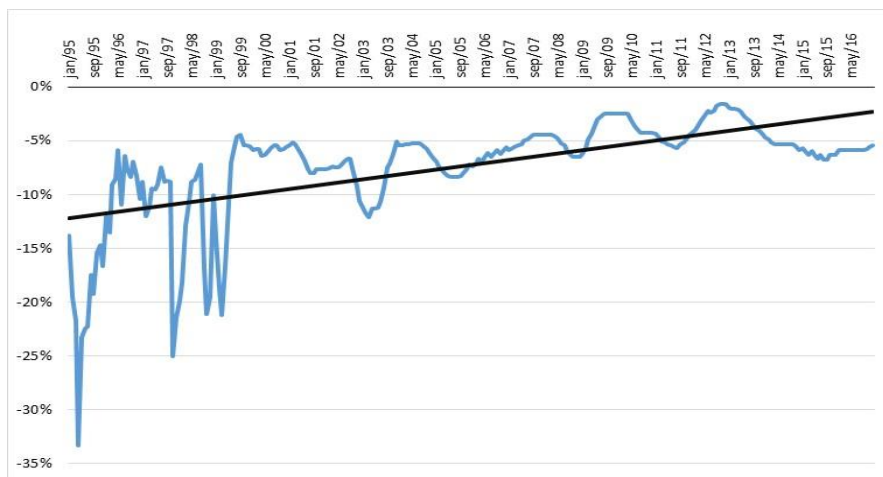
Source: Central Bank of Brazil database.

As the participation of Treasury loans to BNDES reached historical levels, critics raised concern about the fiscal impact of such transactions. For many of them, the difference between the roll-over cost of the national public debt and the long-term interest rate charged by BNDES represents a fiscal burden, “handouts” that are higher than the societal benefit coming from the projects financed. In addition, some claim that BNDES strategy to lend to large companies and/or exporters should not have been part of its mandate as instrument of public policy, as it supposedly created unnecessary distortions in the macroeconomic supply of credit (e.g. Lazzarini et al, 2011).

Others, like these authors (e.g. Ramos and Studart, 2016) argue that the lack of private long-term financing and high short interest rates makes it necessary for BNDES to set an interest rate that is less volatile than Treasury rates, and compatible with the maturity structure of the projects and investments

it supports. In addition, attention is brought by the same approach to the important role that BNDES loans play in directing investment as part of broader industrial policy, and their externalities and multiplier effects (on production, employment and competitiveness). It is important to notice that there has been a convergence of TJLP towards Treasury interest rates, including SELIC, over the years, particularly in the years when they declined and/or became less volatile.

**Figure 5 - TJLP-SELIC differentials (% and trend line)**



Source: Author's calculations based on data from Central Bank of Brazil.

This debate is not easily settled and would deserve a document of its own. For our purposes, here, however, we emphasize that the increasing dependency on semi-fiscal sources of funding creates challenges for the bank model. Not surprisingly, much before 2015, there had been raised pressure on BNDES to adjust its pricing (and reduce the differential with Treasury bond rates), to widen the co-financing of larger projects, and to simply downsize.

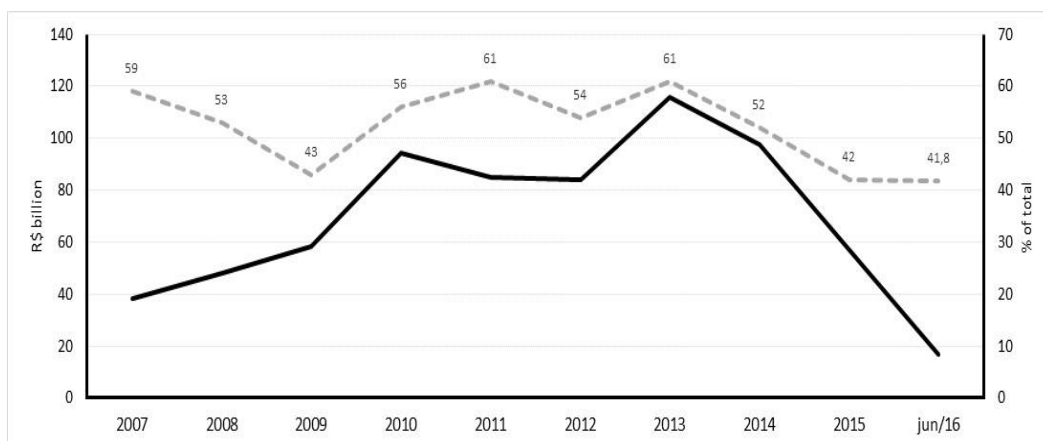
Therefore, for financial and political reasons, this model needs to evolve if BNDES wants to expand its relevance in addressing the significant challenges faced by Brazil – particularly those related to the improvement of existing infrastructure and logistics. This evolution could, and perhaps should, build on the long-standing experience of BNDES in leveraging and crowding-in private financing resources. This is our next topic.

### *3.2. LEVERAGING AND CROWDING-IN PRIVATE CAPITAL FOR INFRASTRUCTURE*

BNDES has a history of policies and instruments to leverage its own resources. This includes **lowering final loan cost** through co-financing projects; **risk mitigation** through their tier-2 (indirect) lending operations; and **risk sharing** through its project finance platform and guarantee funds. It has also started a program to **crowd-in** private capital, by fostering the issuance of infrastructure bonds that goes beyond the traditional risk-sharing initiatives. The latter efforts started in 2012, and were particularly intensified in 2015.

Co-financing and indirect lending have been part of BNDES's model for a long while. Indeed, indirect operations through a network of public and private banking agents constitute approximately half of its credit operations. The partner banks conduct project analyses and take on the credit risk behind loans. The returns of financial intermediaries come directly from project financing, but also from having access to BNDES resources with longer maturities, which allows them to increase the customer base, with which they can intensify their business relationship - including management of cash flow, structuring of new operations, absorption of employees' salary accounts and sales of direct services. In a way, BNDES indirect operations do more than just reducing loan costs: once private banks become more acquainted with certain types of clients, sectors and investments, they can better analyze the credit risk and directly finance the best clients. On some occasions, this has led private banks to take the lead in consortia to finance long-term undertakings. This partnership also gives capillarity to BNDES financial products, once the network reaches commercial banks in at least most of the 5,570 Brazilian municipalities.

**Figure 6 - BNDES: evolution of indirect lending (R\$ billions and % of total)**



Source: BNDES.

Yet another example of **risk sharing** is the evolution of a very “peculiar” type of **project finance** operations carried out by BNDES since 2003. Knowingly, project finance is backed by the projected cash flows of the **project** rather than the balance sheets of its sponsors. But in the case of those sponsored by BNDES, corporate or banking guarantees are required from the companies participating in a concession consortium. Despite the limitations of this “sponsored” project finance, by introducing this innovation, BNDES does share risks by inducing private players, both developers and their private bankers, to increase their participation in infrastructure financing. Indeed, in the past, private financial institutions increased their participation in such projects — with equity, providing advisory service, offering collaterals, guarantees and insurance; and by leading loan consortia.

**Risk sharing** through guarantees became part of BNDES’s attempt to leverage private financing. The increased funding constraints on BNDES led to the creation of guarantee funds to reduce the uncertainty of certain projects and to leverage private sector financing in sectors previously only funded by public institutions. Two were built to support small and microenterprises in securing credit with financial intermediaries: Investment Guarantor Fund (IGF) and Guarantee Fund of Free Investment Credit (FGI - free credit).

BNDES’s role as a financier of I&L was enhanced further as it became a critical financial player in the government commitment to address I&L gaps through extremely large programs – the Program for

Growth Acceleration (PAC and PAC2) and the Logistics Investment Program (PIL). PAC was a strategic investment program that combined management initiatives and public works. In its first phase, launched in 2007, the program called for investments of US\$ 349 billion (R\$ 638 billion).

Similarly, PAC 2 focused on investments in the areas of logistics, energy and social development, organized under six major initiatives: urban infrastructure, and particularly mobility; safety and social inclusion; popular housing; sanitation and access to electricity; renewable energy, oil and gas; and transportation (highways, railways, airports). PIL, in turn, was aimed at increasing investments in infrastructure, enhancing the competitiveness of the economy and improving transportation conditions.

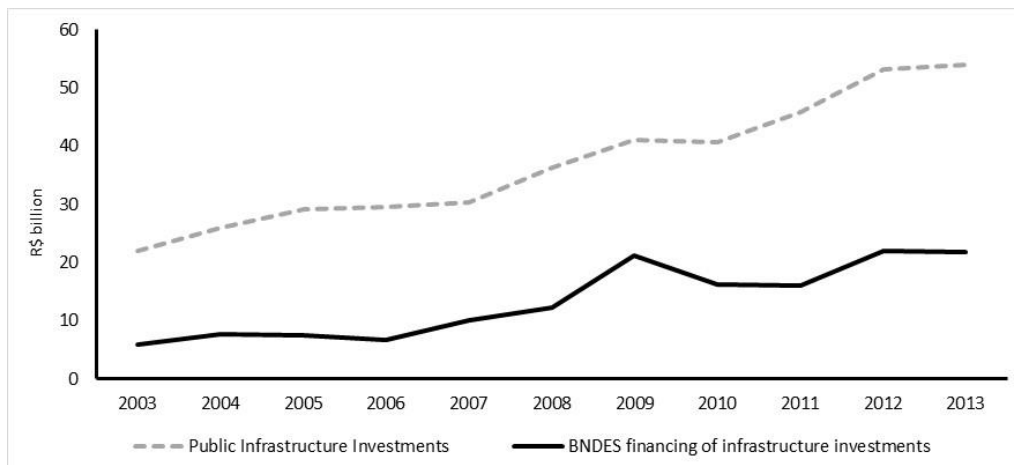
**Table 1 - I&L investments as share of GDP**

Segment	PAC				PAC2			
	2007	2008	2009	2010	2011	2012	2013	2014
Electric Energy	0.56	0.61	0.63	0.69	0.72	0.7	0.7	0.66
Telecommunications	0.46	0.8	0.56	0.41	0.49	0.5	0.42	0.52
Sewage	0.14	0.22	0.24	0.21	0.17	0.19	0.2	0.19
Transportation	0.62	0.74	0.90	0.96	0.84	0.84	0.96	0.92
Roads	0.35	0.4	0.55	0.57	0.48	0.39	0.47	0.44
Railroads	0.11	0.16	0.11	0.14	0.14	0.13	0.14	0.16
Urban mobility	0.05	0.1	0.17	0.1	0.08	0.1	0.15	0.16
Airports	0.03	0.02	0.01	0.02	0.03	0.06	0.11	0.09
Ports	0.07	0.04	0.03	0.1	0.09	0.15	0.08	0.06
Hydroways	0.01	0.02	0.03	0.03	0.02	0.01	0.01	0.01
<b>Total</b>	<b>1.78</b>	<b>2.37</b>	<b>2.33</b>	<b>2.27</b>	<b>2.22</b>	<b>2.23</b>	<b>2.28</b>	<b>2.29</b>

Source: CNI (2016).

In both programs, BNDES had a critical role in helping build a financing structure for the concessionaires that won the auctions for specific projects. That is why there is a significant correlation between overall infrastructure investments and BNDES disbursements to the sector. PAC and PIL aimed to expand access and improve infrastructure services for the emerging middle class. Therefore, in addition to guaranteeing the feasibility of higher risk and more complex projects, the explicit goal of BNDES intervention was to allow lower tariffs to be charged once the project became operational.

**Figure 7 - Infrastructure investments and BNDES Disbursements**



Source: Coutinho (2015).

BNDES’s financing model traditionally included fixed and variable-income products with very favorable financing conditions – both in term of maturities and cost. BNDES, through its subsidiary BNDESPAR, has also bought stakes in companies that could prospect for new business in the sector. For that reason, BNDES ended up assisting the federal and state governments structure concessions for the private sector and public-private partnerships (PPP).

In the 2000s, BNDES’s “coverage” of I&L sectors widened in scope and in commitments as large volumes of its investments went to energy production, transmission, distribution, and efficiency. BNDES also financed large logistics projects, such as highways, railways, airports, navigation, and ports. Urban mobility projects grew in number and volume, amounting to R\$ 92 billion in 2014. Investments in high and medium-capacity transport systems financed by BNDES became part of a larger block of investment headed by the federal government PAC programs dedicated to mobility in the states.

The financial arrangements around the concessions issued by the federal government always involved BNDES directly as financier. This involvement had positive and negative consequences. First, BNDES support increased the share of I&L investment in Brazil’s GDP, and private participation in the concessions of the I&L investment programs (PAC and PIL). In fact, according to the World Bank in

2014, Brazil was a leader among developing countries in private participation in I&L project, with 44% participation (MFB, 2015) – a situation that only reverted in 2015 as the federal government promoted a fiscal retrenchment, mainly through cuts in government expenditures in I&L projects.

Secondly, though, this arrangement created significant fragility for BNDES, as its loans were used as “adjustment variables” to make infrastructure projects viable. Indeed, the federal government was determined to maintain at low levels the tariffs charged by I&L projects concessionary, even though private cost of capital remained extraordinarily high. To lower the overall cost of capital for those projects, BNDES had to offer lending rates below its own funding and operating costs. Not surprisingly, it had to receive significant support from the National Treasury to expand its operations. This funding strategy significantly increased BNDES dependency on Treasury transfers, and was already becoming a source of concern for the government, and BNDES management. That is why they introduced initiatives meant to attract and crowd-in private sources to finance I&L, as was the case for its program to sponsor the infrastructure bonds markets.

### *3.3. FOSTERING THE MARKET FOR INFRASTRUCTURE BONDS*

In 2011, the federal government launched an effort to build the market of infrastructure bonds, and BNDES became an important part of this initiative. For that, the government created several tax benefits for investments in market instruments to channel funds to finance I&L investment. These incentives included a tax exemption on incomes generated by bonds acquired by domestic and foreign investors. BNDES in turn expanded guarantees-sharing clauses in its financing contracts, equalizing the level of seniority of bondholder to loans co-financed by BNDES. Lastly, in some projects, BNDES relaxed financial requirements in its credit operations in case there was issuance of bonds.<sup>3</sup>

These efforts were only intensified in 2015, for two reasons: (i) under a severe fiscal adjustment agenda, the government could no longer commit to the increased volume of public investment - as it had done in the last twelve years; and (ii), by setting the reduction of gross debt as a policy goal, the government

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<sup>3</sup> The first was to reduce coverage ratio of debt services, increasing the maximum leverage of the projects, which improved profitability and reduced the capital requirement of the project. The second was to change the amortization schedule for the issuance of bond infrastructure to allow to redistribute the cost of capital for later phases in the investment cycles.



decided not to increase the funding for BNDES with Treasury resources.<sup>4</sup> BNDES responded to this new challenge by enhancing its infrastructure bond issuance program including additional de-risking engineering, and pricing incentives.

The efforts paid off. From 2012 to 2016, total issuances have reached R\$11 billion in 55 issuances. This may seem to be a significant amount. However, it is significantly smaller than the total investment needed. Only in 2013, according to the Brazilian Association of Infrastructure and Basic Industry (ABDIB), the annual infrastructure investments, excluding the oil and gas sector, amounted to R\$ 125 billion.

Such modest results should not be taken as a failure of the government's attempt to foster the market for infrastructure bond, for at least two reasons. First, as pointed out by Wajnberg (2014), there is a learning curve needed for both potential issuers and potential bondholders to start operating with such instruments. Second, there are high costs involved in this learning process - such as hiring banks, lawyers, rating agencies, auditors and costs related to documentation and offer record-keeping. So, only issuances that exceed a certain critical value manage to reach the market. Third, and perhaps most importantly, the macroeconomic environment was not friendly as the launch of the bond instrument coincided with the years of greatest economic turmoil and a steep rise in Treasury interest rates. Finally, the level of corporate debt has increased substantially since 2012.

Despite the results, BNDES followed the correct guideline to help build a market for infrastructure bonds, fostering their issuance and stimulating their secondary market (see box below). It is quite possible that in a more stable political and economic environment, with declining interest rates, these efforts would bear fruit. That is, they may contribute to the development of a market for securities, particularly those backed by infrastructure.

However, no matter what incentives are created to promote the issuance of infrastructure-backed assets, developing an infrastructure bond market will depend on the capacity and interest of institutional investors to acquire them. In other words, it will require "building bridges" between potential demanders

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<sup>4</sup> As mentioned above, from 2009 to 2014, total Treasury funds to BNDES amounted to about US\$ 430 billion. The way to reconcile the growth of investments in infrastructure, which is one of the guidelines to move the Brazilian economy towards a new growth cycle, is to promote private participation, not only as an investor in concession projects, but in long-term financing as well.

of long-term funds for I&L projects and those institutions that have a need to acquire such types of assets. In Brazil, the potential was there.

The pension fund segment in Brazil, for instance, is relatively large, and has been growing strongly. The total amount of its investments in September 2016 was R\$750 billion. There is plenty of room for infrastructure bonds in their portfolio – indeed, little more than two percent of Brazilian pension funds’ assets are currently invested in infrastructure. However, there remain difficulties in placing infrastructure bonds with pension funds.

The first one is more intrinsic to infrastructure projects: uncertainty about the funded project’s ability to generate sufficient resources for the payment of interest, especially in the first years of operation. Second, infrastructure projects have a high degree of indivisibility—that is, most of the investment is done prior to cash generation. Thus, it is not possible to adapt it to the growing demand, and if the desired degree of use is not achieved during the planned period, cash flows will be insufficient for the payment of financial obligations. Third, pension funds in Brazil are used to allocate their resources to fixed rates investments in government bonds and public companies that have low risk profiles and relatively high returns. They lack the incentives and capabilities to diversify their portfolio towards long-term riskier assets, particularly companies that are not listed.

Finally, the development of an I&L bond markets depends on the existence of a pipeline of projects that in turn requires public and private project development capabilities. This is a critical issue that deserves a section of its own.

#### *3.4. PROJECT DEVELOPMENT CAPACITY*

One of the greatest challenges to boost sustainable infrastructure is to create a pipeline of projects that are simultaneously technically solid, environmentally smart and financially sustainable. Infrastructure projects are not exactly “plain vanilla” investments, and their “risk” depend on how well they are developed. As pointed out in a 2013 report:

The long-term character of such projects requires a strategy that appropriately reflects the uncertainty and huge variety of risks they are exposed to over their life cycles. Infrastructure projects also involve many different stakeholders entering the project life cycle at different stages

with different roles, responsibilities, risk-management capabilities and risk-bearing capacities, and often conflicting interests. While the complexity of these projects requires division of roles and responsibilities among highly specialized players (such as contractors and operators), this leads to significant interface risks among the various stakeholders that materialize throughout the life cycle of the project, and these must be anticipated and managed from the outset.

Despite the sophistication of domestic players, the country faces project development constraints, for reasons already mentioned. Indeed, since the 1980s until the 2000s, there had been **a deterioration of the State capacity to plan, develop, implement and monitor large investment undertakings**. There were at least three consequences of this process.

The first one is straightforward: the government's capacity to plan and develop large scale infrastructure projects shrank, which naturally later created problems in project development and implementation - particularly at subnational levels. The problem became more evident in the 2000s, due to the push given by PAC and PIL programs, including PPPs and concessions as part of Brazil's federal government to boost infrastructure investments, which demanded resources far beyond the existing budgetary and other public financial resources. Not surprisingly, a strong effort was made in the 2000s to promote the recovery of such capabilities, some of which directly involved BNDES, such as the creation of the Brazilian Project Development Company - Estruturadora Brasileira de Projetos S.A. (EBP) – in 2008.

Second, project development was transferred to private actors, but the financing of such projects often involved governments' budgets and/or financing from public institutions. This transfer made it very difficult for governments to evaluate and monitor projects independently, and may partly explain excessive delays in their constructions and governance problems that became obvious in the recent corruption investigations.

A third characteristic is indirectly related to the bankability of projects. Indeed, it is quite possible that a significant number of the infrastructure concessions could be developed with the view of using private sources from their outset. That is, if the projects were structured from the outset with the view of mitigating the risks throughout their life cycle, many of them could have had access to private financing, at least from international capital markets. However, if the public entities possess limited project development capabilities, their capacity to propose alternative financial modeling for the projects

brought to them is constrained. This creates a “catch-22” situation, where the dependency on public financing is perpetuated.

Despite this effort in capacity building, most project development capabilities remain in the hands of very large private developers and consulting firms. Smaller companies have been thriving in new types of infrastructure projects – such as those in sustainable infrastructure – but are even less prepared to produce projects that are simultaneously technically sound, environmentally smart, and bankable from the outset. This may create important challenges for attracting the interest of private investors, even in a friendlier macroeconomic environment of steady growth and low and stable interest rates.

BNDES may play a role in capability building, sponsoring the development of an investment financing architecture. This has been the case of its support for sustainable infrastructure projects and particularly for renewable energy ones. It is worth then describing briefly this interesting experience. This is our next topic.

### *3.5. BNDES AND SUSTAINABLE INFRASTRUCTURE: A CHAPTER ON ITS OWN*

BNDES is an important player in the current financing architecture sponsoring sustainable infrastructure projects in Brazil. This is associated with a history of promoting internal project development capability and expertise in sustainable energy since the early 2000s. Like other national development banks in the world, (Gallagher and Studart, 2016) BNDES has not only implemented government directives towards “greening the economy”, but has had a role in drafting and improving them. Indeed, when assessing direct and indirect non-automatic operations, it not only checks if they comply with its own environmental standards, but also assesses the environmental risks, and promotes environmentally related improvements in investment and company management.

Additionally, BNDES has for a while offered products and instruments to other sectors, with special financial conditions that depend on sustainability standards. It also manages three dedicated “green funds”: Amazon Fund, BNDES’ Atlantic Forest Initiative, and the Climate Fund. Indeed, BNDES disbursements increased almost six times from 2004 levels (R\$ 4.7 bi) to 2014 (R\$ 27.8 bi). Despite this increase, the proportion of green investments never exceeded 15% of total lending, still a small portion of loans outstanding.

The potential role of BNDES as a promoter of sustainable I&L, although already substantial, is still far from being fully tapped. First, a significant part of BNDES “green” pipeline still consists of hydroelectric power plants, but the case for diversification for other sources of renewable energy is there. For instance, in the past ten years, the Brazilian energy matrix has not been able to cope with the fast increase of demand, which forced the more intensive use of costlier and environmentally damaging coal-generated energy. These mismatches of supply and demand are due to rise demand and to the increased intensity of droughts, a probable consequence of climate change, and can only be mitigated through expansion towards renewable energy. Because of the privileged climate conditions in Brazil, there is significant scope for other alternative, cleaner sources of energy – such as solar energy and wave power - and, definitively, for more energy efficiency.

Further, freight and transportation systems in Brazil are still highly geared towards automobiles and trucks – and this explains why almost 40% of its energy is produced by oil and derivatives. The actual roads are in poor state and unfit to address the current demand, which is the main source of traffic congestion in urban areas and inefficient freight transportation system. Developing alternative, “green” transportation systems would not only reduce transportation costs for consumers and producers, but also improve urban mobility.

Finally, BNDES can be a key player in financing, leveraging and crowding-in private capital to I&L – *sine quo non* condition for a sounder and more stable financing of the sector in the future. The Climate Bond Initiative (2016) indicated that despite the macroeconomic and political uncertainties, the outstanding volume of bonds in Brazil 2016 was US\$ 2.4 bi. Of those, 54% were transportation projects and 23% were associated with clean energy. The potential expansion of this market is significantly, particularly if it develops an appropriate *architecture* (of regulation, the institutions, risk management tools and instruments), that can build the bridge between final demanders and suppliers of such bonds.

BNDES efforts in boosting such investments show its comparative advantages as a central point in establishing this *architecture* – a role, as we insisted elsewhere, that has been successfully been played by other national development banks. They were undermined by many external factors – particularly the limited pipeline of technically sound and “financeable” projects and because of the constraining macroeconomic environment.

With the change of government in July 2015, a new leadership has been put in place with the clear mandate to change the focus and business model of the institution – including a greater focus on sustainability and on crowding-in private capital for green investments. An analysis of these changes can only be preliminary. But given the importance of the institution to Brazil’s development, it cannot be avoided. In the next section, we present some of the main features of these changes and speculate about their possible consequences.

#### **4. BNDES: New Directions**

After the impeachment of former president Dilma Rousseff in July 2016, a coalition government led by former vice-president Michel Temer came to power. With it, a new economic team was appointed and there was a replacement of leadership in BNDES, and significant changes of orientation happened.

The first one was associated with the pressure put on BNDES to make an anticipated repayment of its debts with the National Treasury, starting with an R\$ 100 billion (US\$ 30 bi) in December 2016. This transfer, comprised of R\$ 40 billion in securities and R\$ 60 billion in cash, was justified by the need to reduce overall federal debt (corresponding to 70% GDP). The early payment is the equivalent of nearly 19% of the total debt that BNDES holds with the Treasury, and over 120% of the disbursements in 2016, but it would only lead to a fall of 1.6% of the debt-over-GDP ratio.

Another important change was very recently announced by BNDES senior management concerning the pricing system method and the creation of the TLP (long-term interest rate). Even though the acronym of the new rate seems like the earlier one (TJLP), this change has important governance and operational consequences.

Concerning the governance of this policy instrument, the TJLP was set quarterly by the National Monetary Council, which includes representative the ministries of finance and planning, as well as of the central bank. This composition allowed the final decision to be determined by the overall development strategy set by the executive branch, but also influenced by the monetary policy objectives. The new TLP will be determined solely by the central bank, which is guided by targeting price stability (Table 2).

The announcement of the changes emphasized an even greater focus towards environmental sustainability. Indeed, BNDES stopped financing coal-fired power plants, and, as pointed out by its new president, will now focus even more on green technologies. Given the current levels of subsidization of other sectors, it is significant that BNDES is prepared to contribute up to 80% of the financing needs of “green projects” supported.

Also, even though BNDES already has its own M&E procedures, the current leadership created a department that will be responsible for implementing the new policies and for producing a “results matrix”, in which goals will be defined per each project. This is very similar to what is already in place in multilateral development banks, such as the World Bank – which is reported to have been a source of advice in creating the new system for the Bank. And, following through with the criticisms that have targeted BNDES in the past two years, the actual board has placed emphasis on efficiency, and processes are being reviewed, with more use of technology to speed up loan applications and improve operations.

**Table 2 - TJLP and TLP – A Summary**

Source: Santander (2017).

	TJLP	TJP
<b>Frequency</b>	Set on a quarterly basis by the National Monetary Council (CMN, comprising the Central Bank Governor and the ministers of Finance and Planning)	Announced monthly by the Central Bank, based on a pre-defined formula
<b>Formula</b>	TJLP = international interest rate in real terms + country risk + inflation, all evaluated from a long-term perspective	TLP = 5-year sovereign inflation linker (NTN-B) yield x smoothing factor + 12-month IPCA
<b>Nature of BNDES loans</b>	Fully floating rate – loans benchmarked on TJLP will have their cost oscillating according to changes in TJLP over the duration of the loan	Hybrid rate – loans benchmarked on TLP will have their cost defined by two components: a real rate component (fixed for the duration of the loan at the level prevailing when the loan was granted), brought to nominal terms according to accumulated inflation over the lifetime of the loan
<b>Validity</b>	All life of loans granted by BNDES up to December 31, 2017	All loans granted by BNDES from Jan 1, 2018 onwards.



Finally, BNDES is moving towards a “transversal” approach in its interventions. The bank seemingly will cease to promote “sectors” and large firms and/or exports of services. It is introducing the use of external auditing firms for large-scale infrastructure projects with a financing of more than R\$1bn and for financing of more than R\$500mn in other sectors. BNDES participation will be limited to 80% of the cost of projects. As is currently proposed, they will focus on six categories of investment with differentiated financial conditions: education, health, innovation, export promotion, MSMEs and infrastructure projects are priorities.

It is still very early to draw conclusions about these changes. But it is worth discussing some possible consequences.

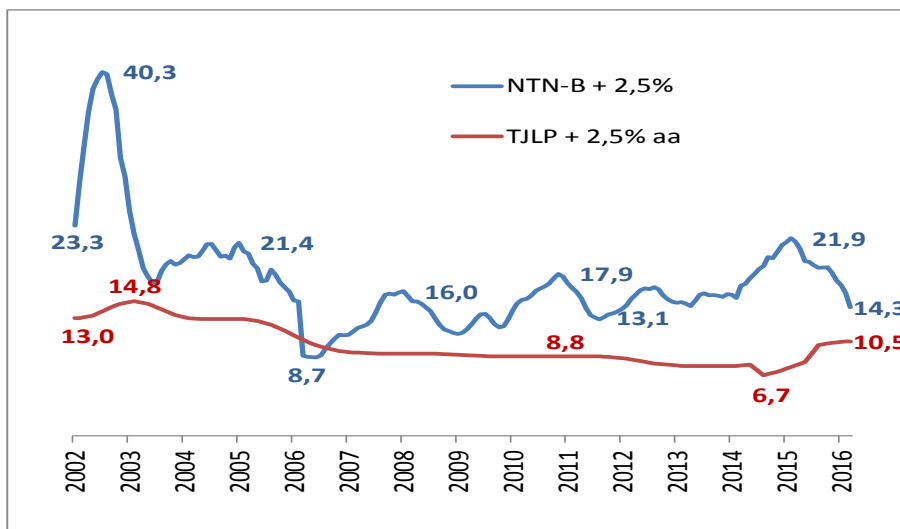
First, focus on sustainability seems to be a correct strategic decision. Sponsoring sustainable I&L may have significant positive externalities on overcoming the current crisis and promoting long-term inclusive sustainable growth. In addition, BNDES already has significant experience in supporting green and climate-smart projects and, building on this experience, can promote project development, leverage and crowding-in private capital to a critical area. Finally, BNDES can also benefit from the potentialities of the green bond market, both in Brazil and abroad, to significantly open its funding basis.

The second one is related to the transfer of resources back to the National Treasury. Given the significant fall in the demand for its resources in the past two years, BNDES is experiencing a moment of high liquidity. According to its capital position, it is unlikely that BNDES will have any difficulties in maintaining its current lending – which is, as mentioned earlier, the lowest level since 2008. However, when investment demand increases, the institution is likely to be under pressure to expand its lending, and will have little capacity to do so.

The third question refers to its new pricing policy. It remains to see how this directive is implemented, but some observations should be made. First, TJLP is already set using several variables in consideration, including Treasury bonds. Changes in the rate were implemented with a certain delay and a significant amount of discretion. The lag was necessary to avoid volatility in TJLP, which would make it inconsistent as a rate guiding long-term undertakings, such as infrastructure projects. And the discretionary approach was meant to avoid TJLP ending up being pro-cyclical – a role of development banks since the 2009 crisis, which has been supported by G-20, multilateral institutions and think tanks.

In addition, the new TLP will be set monthly and will peg a rate that for the past decade has not only been very volatile, and significantly higher than TJLP. Indeed, according to several recent reports, including Santander (2017) and Torres (2017), if the TLP had been used as a reference rate on BNDES loans, except for 2006, it would be systematically higher than TJLP – which in turn has already been one of the highest interest rates in the world for the past decade. When adopted, the TLP may end up being too high to be relevant in financing long-term investment, and BNDES may cease to be a potential instrument for countercyclical policies, when needed. Indeed, it may even turn to be pro-cyclical, given that in the past Treasury rates have behaved that way.

**Figure 8 - Final cost of BNDES loans using NTN-B and TJLP**



Source: Torres (2017).

Finally, there remain some question marks around the change of orientation of BNDES operational policies towards a horizontal support for investments. Until now, it is unclear how this new guidance will be able to handle the fact that BNDES has traditionally been an industrial policy instrument, providing support to specific government programs and initiatives that usually target sectors – and not crossing issues. How this problem will be dealt with will evidently be fundamental to define the future

of this institution, but also the role that BNDES may have in structural changes that Brazil required. With that, we can move to the conclusions of the paper.

## 5. Summing-up and Concluding Remarks

Low public and private investment levels have generated a sizable overall infrastructure gap in most nations, but particularly in developing ones, that creates strict “ceilings” on potential socially inclusive and environmentally sustainable paths. Brazil would appear to be an extraordinary case of such phenomenon, where these gaps have been structural impediments in its overcoming a “middle-income” trap. Indeed, despite the recent socioeconomic achievements, this nation now faces new daunting challenges related to its outdated, and to a certain degree dysfunctional and “climate-dumb” infrastructure. If Brazil aims to achieve sustained inclusive growth in the future, it must find ways to fill its significant sustainable I&L gaps.

This will not be an easy task, for many reasons. An important one is related to the capacity of governments, in different spheres (federal, state and municipal), to expand their required investments in a very delicate (to say the least) fiscal situation. Another constraint is the peculiar Brazilian financial landscape. Indeed, for the past two decades, Brazil’s financial system has undergone significant transformations that increased its sophistication and linkage with international markets. However, one feature has not changed: private capital continues to be allocated to short-term assets and its securities markets are relatively shallow. This has led to a “catch-22” situation, whereby the financing of long-term and/or riskier undertakings was left mainly to public financial institutions.

The main conclusions that we have reached in this paper are:

1. Promoting transformational investments are a “sine qua non” condition for Brazil to overcome the trap of low productivity and competitiveness, required for guaranteeing an inclusive and environmentally sustainable path. Part of such efforts should come from addressing its significant social and economic infrastructure gaps by promoting sustainable I&L.
2. A hike of such investments will require an effort to raise public investments, to expand the pipeline of technically solid and financially smart projects, and to leverage public finance and crowd-in private capital to finance them. In our view, policy is required to achieve these goals -

particularly in the case of I&L projects, in which investing in greenfield projects or during the construction phase means financing assets with long time maturities and with highly uncertain returns.

3. Such architecture needs an appropriate macro and microeconomic environment, incentives (embedded, for instance, in a carbon pricing system) and policies. However, the right policy to address this challenge is to sponsor the development of an I&L financing architecture – with specific incentives, appropriate regulatory framework, new players, innovative instruments, and markets. It is also to expand the pipeline of projects, improve the efficiency of public money dedicated to them, and bridge the gaps between ultimate borrowers and large institutional investors. It will require “institutional leadership” to speed up a process that in many economies took decades to be built. This is where a national development bank, such as BNDES, is fundamental.
4. With the experience achieved throughout its history, BNDES is perhaps one of the few institutions in Brazil that can play that leadership role, by (i) investing more in project development, particularly in support of developers in building a pipeline of technically sound and bankable projects - either by increasing in-house capabilities and expertise in project development or by developing a “origination” fund that can be used to outsource it; and by (ii) fostering the development of new instruments that can leverage additional resources from private banks and can create a bridge between infrastructure developers and institutional investors.

Finally, this paper has discussed the potential impacts of the new operational policies of BNDES launching in January 2017. Obviously, any analysis of these changes now can only be preliminary. Here are some of them.

5. Focus on sustainability seems to be a “spot-on” strategic decision. Sponsor sustainable I&L is not only a moral imperative to warrant a better future for all, but it contributes to overcoming the current crisis and to promoting long-term inclusive growth.
6. In view of the shortages and the important role we ascribe to BNDES in supporting I&L investment, we have raised concerns about whether the recent return of National Treasury resources could impact in BNDES's balance sheet and long-term lending capacity. In addition, the change of pricing methodology by the new TLP seems to rest on an optimistic view about

the perspective for the rapid development of a private long-term corporate debt market. If such expectations are not met, access to long-term financing will be even more limited than it already is.

7. Finally, we are puzzled by the changes from vertical to horizontal orientation of its operational policies. At a moment when Brazil needs significant transformation investments, particularly those related to sustainable I&L, this shift may be incompatible with BNDES acting as a government policy instrument in this task.

The future of BNDES will evidently depend on these policies, and they are very uncertain now.

However, it is certain that BNDES is one of the few institutions that can help promote transformational changes that will allow Brazil to aspire to a future of inclusive and sustainable growth – a future its citizens set for themselves almost three decades ago, when, after years of dictatorship, they were finally given a chance to decide it.

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