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Do Public Development Banks Hurt Growth? Evidence from Brazil

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Brazil has been grappling with a severe political and economic crisis. Following several years of moderate to modest growth, the country is now deep in recession, with little or no respite in sight. Although Brazil's difficulties stem from a number of entrenched structural problems and policy missteps in recent years, they also have been exacerbated by the growing use of public financial institutions both to promote special interests and to serve as a countercyclical policy instrument amid a slowing economy. Over the last few years, Brazil's three major public banks—Caixa Econômica Federal, Banco do Brasil, and Banco Nacional de Desenvolvimento Econômico e Social (BNDES, Brazilian Development Bank)—have been heavily engaged in credit expansion. This effort has been aimed at both promoting industrial policy through the advent of "national champions" and avoiding a stronger recessionary impact from the global financial crisis. Even though the national champions policy was officially halted in 2013 amid growing imbalances, public credit expansion has continued long after the subsiding of the financial crisis.

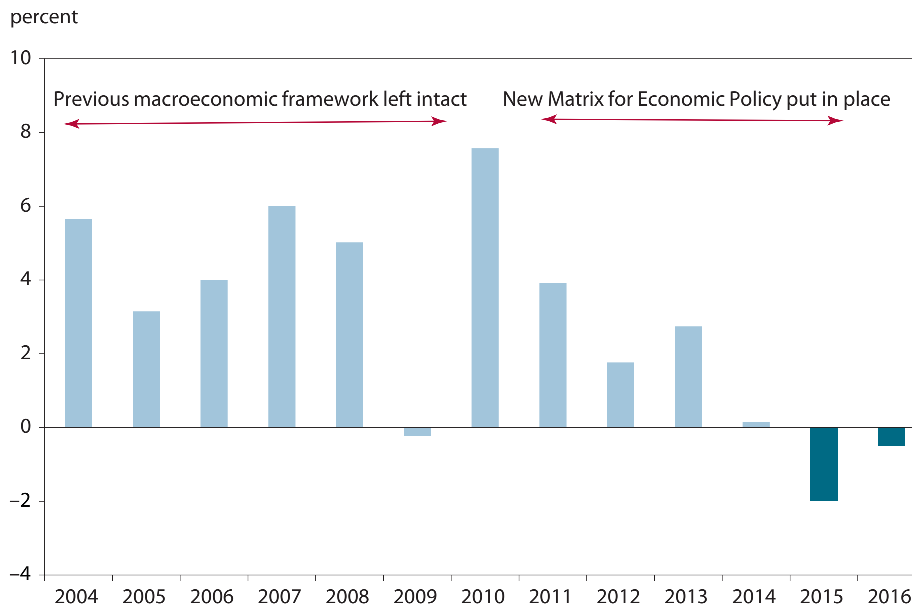
The potentially harmful distortions caused by public lending, particularly by BNDES, Brazil's public development bank, are a commonly cited criticism of the bank but an insufficiently explored topic in the literature. This *Policy Brief* aims to bridge this gap by examining how public lending by BNDES may have done more harm than good in Brazil, adversely affecting real interest rates and productivity growth. It contends that Brazil's interest rate puzzle—the high levels of interest rates that prevail in the country and that remain unexplained by factors common to its emerging-market peers with lower interest rates—stem directly from BNDES's role in the economy. Specifically, BNDES's large amounts of subsidized lending are responsible for substantial credit market segmentation, choking off monetary policy transmission. As a result, to maintain price stability the Banco Central do Brasil (Central Bank of Brazil) is forced to raise interest rates more than it might do otherwise in the absence of BNDES lending. Moreover, BNDES funds itself through vast amounts of Treasury borrowing, also at subsidized rates, placing undue pressures on public debt and budget execution. Finally,

...public lending by BNDES may have done more harm than good in Brazil, adversely affecting real interest rates and productivity growth.

BNDES may also be responsible for adverse selection problems in credit markets by capturing the best borrowers through its subsidized lending activities.

This *Policy Brief* argues that BNDES lending not only places undue pressures on interest rates but also damages economic efficiency and productivity. Thus the benefits of having a development bank that can be used both as a policy instrument during times of economic distress and as a mechanism to correct existing market failures—that is, the absence of long-term credit markets in Brazil—are outweighed by macroeconomic and microeconomic distortions. This *Policy Brief* presents evidence in support of the macroeconomic and monetary policy distortions just outlined and suggests that restoring Brazil's capacity to grow in the medium term requires a thorough rethinking of the role of BNDES. In particular, subsidized lending should be gradually extinguished by aligning the institution's lending rates with market prices, term and risk premia, while taking into account that, with an adequate transparency framework, public development banks may be able to increase private sector participation instead of creating problems that persistently crowd out these institutions.

Figure 1 GDP growth in Brazil, 2004–16



Note: Changes in GDP in 2015 and 2016 are based on author's projections.
Source: National Statistics Office, Brazilian Institute of Geography and Statistics (IBGE).

BACKGROUND

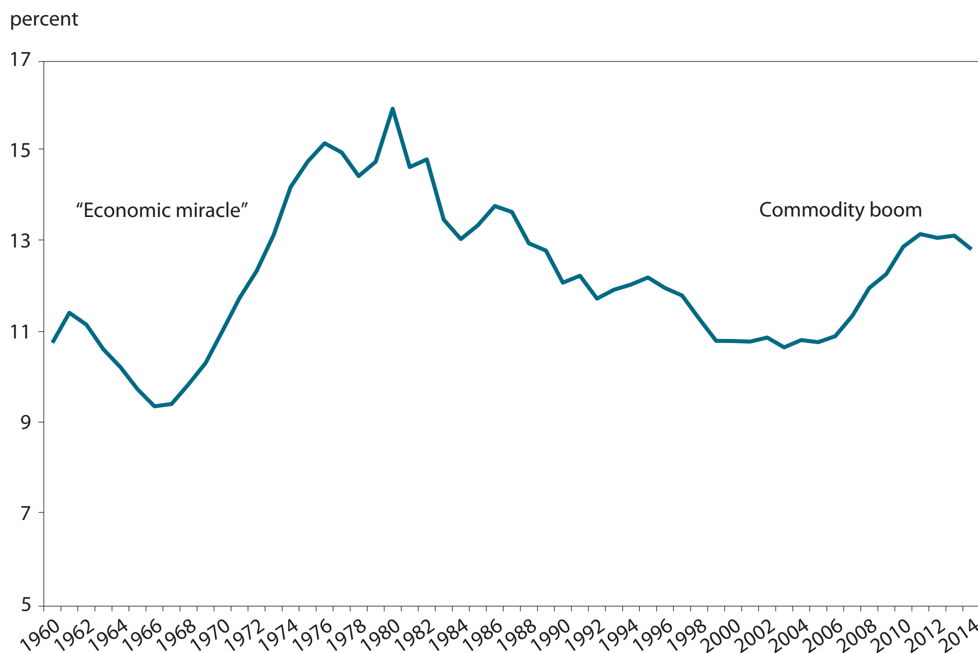
Brazil's current woes are a chronicle of a crisis foretold. After the reversal in commodity prices that began in 2011, as well as several years of macroeconomic mismanagement, ranging from a failed attempt to adopt a new policy framework under the guise of what became known as the New Matrix for Economic Policy (Nova Matriz Econômica) to outright interventions in private markets and price-setting mechanisms,[1] the country faces the prospect of a long-running economic slump. The current recession is expected to last well into 2016, marking the first time that Brazil will experience two consecutive years of GDP contraction since the Great Depression (figure 1).

Brazil's New Matrix was adopted by Finance Minister Guido Mantega in 2011 under President Dilma Rousseff's first administration (2011–14). It was presented as an alternative to the macroeconomic framework that had been in place since the early 1990s: inflation targeting, adherence to fiscal responsibility, and a floating exchange rate regime. Under the revised framework, inflation targeting was diluted when pursuing demand-led growth became a priority; fiscal profligacy became the norm following the recommended countercyclical response to the global financial crisis; and a heavily interventionist stance in foreign exchange markets was adopted as a response to appreciation pressures resulting partly from the monetary stimulus in developed economies. In the wake of the global financial turmoil, public banks were increasingly used as countercyclical policy instruments to stave off further recessionary effects. In Brazil, growth fell from an average of 4.8 percent between 2004 and 2008 to 2.1 percent during President Rousseff's first mandate (2011–14), when the drop in commodity prices damaged economic prospects and the new macroeconomic framework went into effect.

As Pritchett (2000) extensively documents, developing countries commonly go through phases of exceptional growth, often followed by long periods of stagnation or even contractions. In Brazil, perhaps most striking is that over the longer run the country has exhibited an unequivocal inability to grow without external stimuli or a substantial relaxation of external financing constraints. Figure 2 shows Brazilian per capita GDP in constant 2005 US dollars in purchasing power parity (PPP) terms relative to US per capita GDP—a measure of economic catch-up. Between 1960 and 2014, only two growth spurts can be identified: The "Economic Miracle Years" of 1968–75 and the recent commodity boom of 2006–11. Brazil's apparent inability to sustain a lasting catch-up phase with industrialized economies in the absence of a significant external impulse stems from both policy missteps and a number of structural bottlenecks, all fairly well documented in the literature. Poor infrastructure, an overly complex tax system, rigid labor market legislation, and a poor business environment have all been commonly cited as impediments to Brazil's growth.

1. See Monica de Bolle, "Brazil's Adjustment: It's (Not) Mostly Fiscal," PIIE RealTime Economic Issues Watch blog, April 23, 2015, http://blogs.piie.com/realtime/?p=4971.

Figure 2 Brazilian per capita GDP relative to US per capita GDP, 1960–2014



Note: Per capita GDP is in constant 2005 US dollars in PPP (purchasing power parity) terms.
Source: World Bank, *World Development Indicators* database.

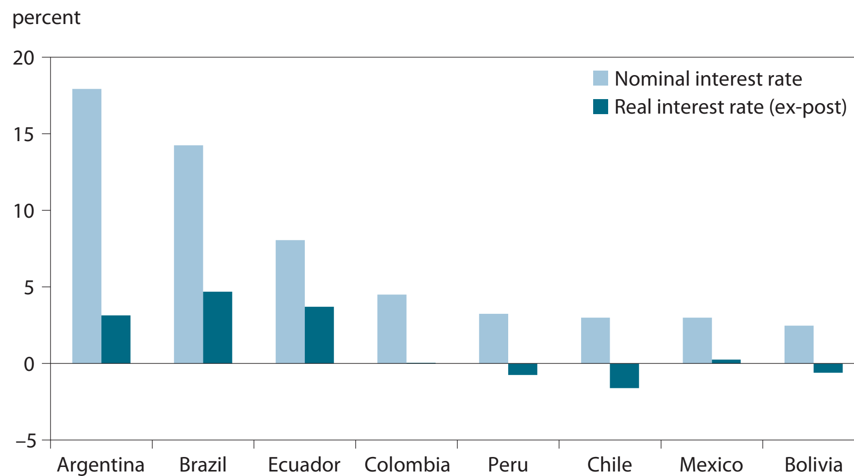
This *Policy Brief* will not discuss Brazil's overarching structural problems, but rather focus on the role that public banks, especially BNDES, play in possible resource misallocation and productivity losses. Policy mistakes made over the last several years have been the central subject of criticism and analysis, whereas less attention has been paid to the pervasive distortions caused by the excessive presence of public banks, particularly of BNDES, one of the largest state-owned development institutions in the world. Although BNDES has brought benefits to Brazil, both by circumventing market failures that impeded access to long-term financing for infrastructure and by serving as a countercyclical policy instrument in times of economic distress, the bank's role in the economy needs to be reconsidered. It thus argues that BNDES's excessive growth is at the heart of the fiscal and monetary policy dissonance in Brazil—a factor that has long prevented interest rates from converging to levels seen in other emerging markets with similar policy, structural, and institutional weaknesses (figure 3).[2]

BNDES also brings a host of other distortions to bear on the economy as a result of its subsidized lending activities. Notably, during the first few months of her second term in office President Rousseff briefly considered a sharper retrenchment of public lending in response to the growing criticism of BNDES's operations. However, she decided to revert to the government's previously failed attempts to spur growth by expanding public credit. In mid-August 2015, the government announced that the public mortgage lender Caixa Econômica Federal, one of the country's largest banks, will supply cheap loans to ailing sectors, adding to the problems identified here, including increasing the public sector's contingent liabilities and future public debt burdens.[3]

2. Brazil's high interest rate puzzle is not new. The country has the second highest level of nominal interest rates in Latin America, after Argentina, and the highest level of real interest rates in the region. Both Argentina and Ecuador also have their own home-grown institutional weaknesses: Argentina continues to grapple with very high inflation (official estimates suggest it is close to 15 percent annually), while Ecuador's dollarized economy suffers from institutional problems such as weak creditor rights and bankruptcy procedures that do not facilitate asset recovery, keeping interest rates at excessively high levels compared with other dollarized countries such as Panama.

3. In mid-August 2015, the government announced that Caixa Econômica Federal will deploy subsidized credit lines to help sectors most affected by the ongoing recession. Loans at below-market rates will be provided to companies in the automotive, construction, chemical, and heavy machinery sectors with the understanding that they will, to the extent possible, refrain from firing workers. The public bank is, of course, unable to monitor the results of such a policy, nor does it have the credit expertise to lend to sectors other than real estate. Because of similar policies adopted in the past, Caixa Econômica has had to undergo recapitalization several times, adding to the actual and contingent debt burdens.

Figure 3 Real and nominal interest rates in selected countries in Latin America, July 2015



Source: Central banks of the selected countries.

A substantial reduction in subsidized public lending, especially from BNDES, is key to restoring consistency between Brazil's fiscal and monetary policies, improving monetary policy transmission channels, eliminating microeconomic distortions that keep deposit and lending spreads excessively high, and addressing Brazil's long-standing difficulties in bringing down its nominal and real interest rates. The subsidized component of BNDES's lending could be gradually eliminated over time by increasingly linking the bank's lending rates to the market-determined rates.[4]

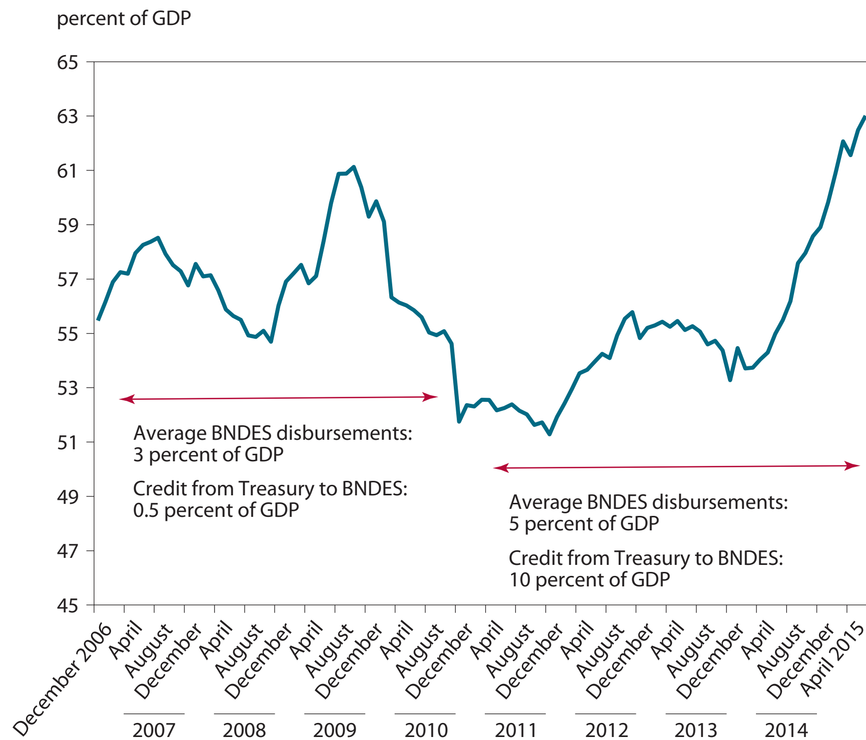
BNDES'S POTENTIAL DISTORTIONS: A SUMMARY

In recent years, public sector credit has locked Brazil into a pernicious trap. The perennial justification for public sector intervention is to correct for preexisting market failures. In this vein, the rationale for public lending is that public sector institutions provide long-term credit for investments that would otherwise not take place because of the absence of long-term credit markets. However, by attempting to address this problem via the use of cheap credit lines with substantial implicit subsidies that place an undue burden on the budget, an undesirable upward pressure on interest rates may be exerted, preventing the emergence of private long-term credit markets. BNDES, as Brazil's massive development bank, is particularly well suited to illustrate these difficulties. Since 2010, BNDES has received over R$400 billion (or almost 10 percent of Brazil's GDP) from Brazil's Treasury to finance various projects, thereby adding to the gross public sector debt figures (figure 4). Moreover, Treasury lending to BNDES carries a heavy subsidy, as discussed shortly. Thus BNDES may not only create financial market distortions but also represent a major drain on the budget and an important obstacle to stabilizing debt-to-GDP ratios.

Brazil's policy of continuing to expand public sector credit—most recently illustrated by the undue use of Brazil's mortgage lender, Caixa Econômica Federal—has raised the public banks' share of total bank lending to 55 percent from only 30 percent in the early 2000s. This increase has served to exacerbate some preexisting financial market distortions such as the gradual narrowing of monetary policy transmission channels and the loss of monetary policy efficacy. Because subsidized public lending does not react to the central bank's monetary policy rate, inflation becomes more easily entrenched and harder to reduce. As a result, the central bank has had to increase interest rates by more than it would otherwise have to do to maintain price stability—inflation in Brazil has been consistently above the midpoint of the target range since 2010. Furthermore, public credit expansion and monetary tightening are in direct opposition to one another, exposing the government's policy inconsistencies. Lack of policy consistency hurts credibility and investment and throws inflation expectations off balance. Although difficult to quantify, it appears that the

4. For example, the bank's lending rate, currently set at 6.5 percent, could begin to vary in line with the Treasury's funding rate, bringing it closer to the market-determined rates. Establishing the best formula for BNDES's lending rates, however, is beyond the scope of this *Policy Brief.*

Figure 4 General gross public sector debt in Brazil, 2006–15



Source: Central Bank of Brazil.

lack of confidence and low policy credibility associated with the heavy presence of public lending in large part explain Brazil's inability to stimulate investment.[5]

In addition, the use of subsidized Treasury financing to fund BNDES creates significant budget pressures. Treasury borrows at market rates (14.25 percent annually) and lends to BNDES at the *taxa de juros de longo prazo* (TJLP), Brazil's long-term interest rate (6.5 percent).[6] The result is creation of an implicit subsidy that weighs on budget execution, especially when such financing rises to the very high levels seen in recent years (close to 10 percent of GDP). Because BNDES and Treasury do not provide the full details of their operations, it is difficult to estimate the full drain on the budget. A rough calculation based on a 2014 online commentary by Marco Mendes[7] puts the onus of Treasury financing of BNDES at about R$200 billion, or 3.5 percent of GDP, over the last five years.[8] As figure 5 shows, the government can ill-afford further budget pressures in view of the deteriorating fiscal outturns and the increasing likelihood that the primary surplus target of only 0.15 percent of GDP will be missed this year.[9] Furthermore, by issuing additional market debt to fund BNDES, Treasury drives up interest rates, raising its own borrowing costs and increasing the overall cost of credit in the system.

5. The International Monetary Fund's most recent staff report on Brazil mostly attributes the dramatic plunge in investment rates to dwindling confidence associated with mismanagement of the economy. Such mismanagement appears to be a direct implication of BNDES's growing role.

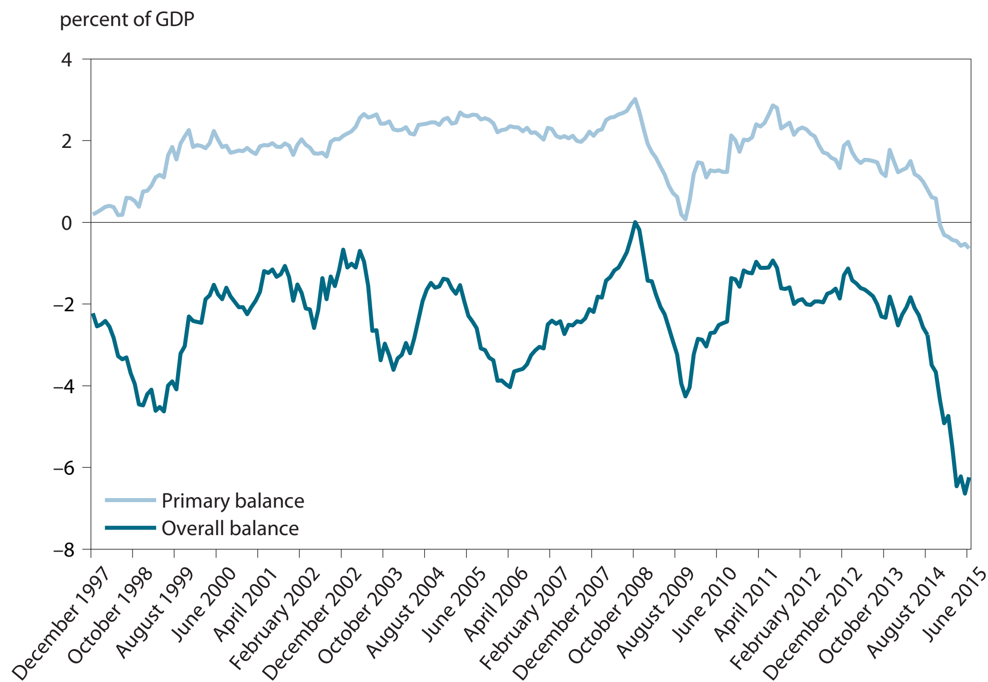
6. Because it is set quarterly by the National Monetary Council, the TJLP is not a market-determined rate.

7. See Marco Mendes, "Quanto custam para o Tesouro os empréstimos concedidos ao BNDES?" Economia e Governo, September 23, 2014, www.brasil-economia-governo.org.br/2014/09/23/quanto-custam-para-o-tesouro-os-emprestimos-concedidos-ao-bndes/.

8. BNDES argues that these calculations are flawed because they do not take into account profits from the bank's lending activities and additional tax revenues, both of which may be directly associated with the extra lending made possible by Treasury funding of BNDES.

9. The government has just sent a budget proposal to Congress for 2016 that envisages a primary deficit of 0.5 percent of GDP, or 1.2 percentage points of GDP lower than the target set for 2017 (a surplus of 0.7 percent).

Figure 5 Central government primary and overall balances in Brazil, 1997–2015



Sources: National Treasury; Central Bank of Brazil.

BNDES AND MONETARY POLICY

It is often argued that subsidized BNDES financing hinders monetary policy. This *Policy Brief* brings together all the available evidence to show how the public bank works against the central bank's efforts. If a large and increasing segment of the credit market is unresponsive to domestic policy rates, the credit channel for monetary policy will become narrower, requiring higher interest rates to stave off inflationary pressures. In a recent policy note, BNDES argues that this rationale is flawed (BNDES 2014). It contends that because BNDES financing is directed to nonresidential investment, which accounts for 63 percent of total investment, and total investment corresponds to only 18 percent of GDP, the additional credit provided by BNDES would directly affect only some 11 percent of the overall domestic aggregate demand. According to BNDES, then, the impact of subsidized lending on policy transmission is commonly overstated. However, one could consider this in a different way: Monetary policy operates mainly on private investment.[10] BNDES and other subsidized and government-directed investment flows from other public banks (Caixa Econômica Federal and Banco do Brasil) render some 70 percent of investment insensitive to monetary policy. Therefore, monetary policy has to work all the harder to influence the remainder of investment.[11]

PUBLIC DEVELOPMENT BANKS AND BNDES

Public development banks are a hallmark of many financial systems around the globe, whether in developed or emerging economies. According to data compiled by Ferraz, Além, and Madeira (2013), in 2012 Germany's development bank (KfW), Brazil's BNDES, and the China Development Bank (CDB) had outstanding loans of over 10 percent of GDP, placing them among the largest financial institutions in their respective countries (these banks lend both domestically and abroad). The sheer size of their operations implies that public

10. Monetary policy also influences durables consumption, as noted by Cline (2005). This said, in Brazil this effect is less pronounced since the interest rates that households pay to purchase durable goods are extremely high due to past inflationary history and the absence of historical credit risk registries.

11. If a large part of investment is financed by retained earnings, especially of small firms, then it is probably not sensitive to monetary policy. Furthermore, it might be interesting to compare the behavior of investment net of depreciation and the net increase of credit to private business relative to the net increase of BNDES loans to ascertain whether BNDES credit had a discernible impact on investment. Using micro-level data to explore these issues will be the topic of a future research project. The author is grateful to Joseph Gagnon for underscoring these points.

development banks not only occupy a large share of domestic credit markets in some cases, but also are often used as anticyclical policy instruments, explaining their excessive presence. Although the use of public development banks as an anticyclical policy instrument may be beneficial, prolonging the expansion of public credit on that basis when it is no longer needed may crowd out the private sector and create distortions that ultimately hamper long-term growth. This *Policy Brief* focuses on this aspect of recent BNDES lending to illustrate how public development banks may at times be simultaneously a boon and a curse for the domestic economy.

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Although there is a vast literature examining the benefits and costs of state-owned commercial banks, the same cannot be said of public development banks. A commonly cited difficulty and possible cause of the scarcity of analyses is how to define and differentiate public development banks from public commercial banks. Here development banks are defined as those that specialize in long-term financing to promote industrial policy and development, and this is how Brazil's BNDES defines its mandate. By contrast, state-owned commercial banks and private banks provide similar types of lending for residential and nonresidential projects. In some cases, most if not all long-term lending activity by public development banks has a substantial subsidy component.[12] As already noted, BNDES's financing costs are linked to its TJLP, the benchmark long-term interest rate set quarterly by the National Monetary Council. If BNDES lending reflected market-determined rather than preset subsidized rates, lending costs would likely increase from 6.5 percent to something akin to 14.25 percent plus risk and term premia, as defined by the operation.[13] The present arrangement takes into account the fact that public development banks are generally better able than private institutions to absorb risk, as long as public sector balance sheets are sound (see Armendáriz de Aghion 1999).

BNDES has a long history in Brazil. It was established in 1952 (then named BNDE) in response to a recommendation by the Brazil-US Development Commission that a development bank be created to improve and renew Brazil's energy and transportation sectors. The bank's early mandate was later expanded to include financial support for a host of industries such as metals, chemicals, and cement. During the military government (1964–85), BNDES changed its operations from lending to public projects to financing private companies under the scope of import substitution efforts. In 1982 the bank added the "S" to its acronym by taking on social goals. The 1990s saw the bank become actively involved in the privatization process by providing loans and acquiring minority stakes in several companies. Its equity operations under its subsidiary BNDESPAR became the bank's most profitable business. Beginning in 2003, BNDES pursued involvement in several large-scale operations to promote "national champions" in a number of sectors and industries. Today, about 60 percent of the bank's loans target large firms with annual revenues of more than US$130 million.[14]

The national champions policy adopted in 2003 and enhanced in 2006–07 was the key tenet of Brazil's industrial policy under Presidents Luiz Inácio Lula da Silva and then Dilma Rousseff. At the time, it was argued that Brazil would follow the example of South Korea by pursuing targeted interventions to create large conglomerates able to compete in the global marketplace, thereby enhancing the country's growth prospects. That policy, however, failed to meet at least two of the three criteria identified by Noland (2004) in the Korean case: (1) the firms contemplated for large amounts of subsidized lending did not necessarily possess strong interindustry linkages to the rest of the economy, and (2) most were not in sectors in which any growth stimulus would be passed forward.[15] In fact, the national champions policy, finally abandoned in 2013, arguably managed to reduce competitiveness in specific sectors, thereby hampering efficiency and growth. It was responsible for controversial mergers in the telecommunications, food and food processing, and pulp and paper sectors that recently have come under congressional scrutiny.

BNDES: FACTS AND A BRIEF LITERATURE OVERVIEW

In 2014 BNDES's loan portfolio was US$330 billion, which was about the same as the World Bank's (US$358 billion) and three times that of the Inter-American Development Bank

12. A comparative examination of various public development banks around the world, including how much subsidized lending they undertake, is the subject of a future research project.

13. The absence of markets for long-term lending in Brazil precludes providing a better benchmark for BNDES lending without the subsidy component.

14. BNDES can provide loans to companies directly or indirectly through financial intermediaries. In either case, loans are associated with TJLP plus a spread that is paid to BNDES or to the financial intermediary if the transaction is indirect.

15. See Lazzarini et al. (2015) for firm-level evidence that the second criterion was not met.

(US$106 billion).[16] BNDES is partly supported by the federal unemployment fund (Fundo de Amparo ao Trabalhador, FAT), which in turn is funded by a special payroll tax. Over the last few years, FAT has suffered from substantial shortfalls associated with a number of factors: rising unemployment claims; Treasury's recurrent use of its revenues to meet end-year fiscal targets; and BNDES's increasing efforts to tap into the fund to finance its growing operations. (Moreover, BNDES is obliged to pay only TJLP-linked interest on amounts borrowed from FAT, implying losses for workers who contribute to the fund.) As a result, a large part of BNDES funding in recent years has come straight from Treasury, creating additional pressures on the budget.[17] To fund BNDES, Treasury borrows from the market at the going rate and on-lends to the bank at TJLP, thereby embedding a substantial subsidy—market rates reflect Selic, the policy rate (currently 14.25 percent), while the TJLP is fixed at 6.5 percent. Therefore, Treasury's substantial borrowing on behalf of BNDES not only adds to budget pressures but also drives up domestic interest rates.

There is a fairly large literature exploring the benefits of BNDES. Older studies emphasized BNDES's role in Brazil's industrialization process during the 1960s and 1970s. Recent work examines the impact of BNDES's lending activities (BNDES 2002, 2015; Torres Filho and Puga 2006), the anticyclical implications of BNDES's credit expansion in the aftermath of the global financial crisis (Ferraz, Além, and Madeira 2013), and the potential productivity-enhancing operations of its FINAME subsidiary, which is responsible for financing the acquisition of heavy machinery and equipment (Ottaviano and de Sousa 2007). It appears that only a handful of studies adopt a more critical view of BNDES's evolving role.[18] Notably, Inoue, Lazzarini, and Musacchio (2013) analyze BNDES's equity investments under its BNDESPAR arm to conclude that, although firms that benefited from these operations in the 1990s showed higher profitability and improved performance in the long run, the positive effects all but disappeared after 2002. The study, based on micro-level data, suggests that from 2002 onward Brazilian firms were receiving substantial amounts of resources that did not lead to any significant increase in investment. Lazzarini et al. (2015) expand on this analysis to examine firm-level data on loans and equity investments of BNDES. They find no evidence of a consistent impact on firm performance or on greater incentives to invest, contrary to how BNDES systematically portrays itself.[19] Their results also indicate that even though BNDES is not lending to underperforming firms—a common criticism of BNDES is that it is a "hospital for ailing companies"—the bank directs most of its financing to large corporations that could potentially fund their projects with other sources of capital.

Although the literature has established that large firms in developing economies are not necessarily financially unconstrained (see Didier, Levine, and Schmukler 2014; Kumar and Francisco 2005), implying that lending by development banks to these types of corporations may fill an important gap, this finding does not necessarily apply to BNDES's portfolio. Figure 6 shows that a substantial share of BNDES loans is directed to large firms, which include companies such as Petrobras and Vale do Rio Doce—firms that have benefited from ample access to domestic and foreign capital markets. Moreover, there is evidence that some companies in BNDES's portfolio receive loans on the basis of political considerations, such as providing campaign donations.[20] This finding, too, implies a potentially harmful misallocation of resources.

16. BNDES not only lends to Brazilian companies but also finances a number of foreign projects—over 4,000 operations between 2007 and 2014, according to the bank's recently disclosed information. The bank recently came under the scrutiny of Brazil's Congress as well as the Federal Accounts Court (TCU) for operations in Cuba, Angola, Venezuela, the Dominican Republic, and Argentina that had not been fully disclosed. In response, the bank has launched initiatives to promote greater transparency, although most of the newly available information continues to be very difficult to navigate. As of June 2015, BNDES had announced on its website that the total loans to these countries between 2007 and 2014 amounted to some US$12 billion, most at below-market rates. Major construction companies allegedly involved in the Petrobras bribery scandal (Odebrecht, OAS, Andrade Gutierrez) were the largest recipients of BNDES funds earmarked for investment abroad. Over the years, BNDES has also lent to projects in Guatemala, Costa Rica, Ecuador, Ghana, and Mozambique.

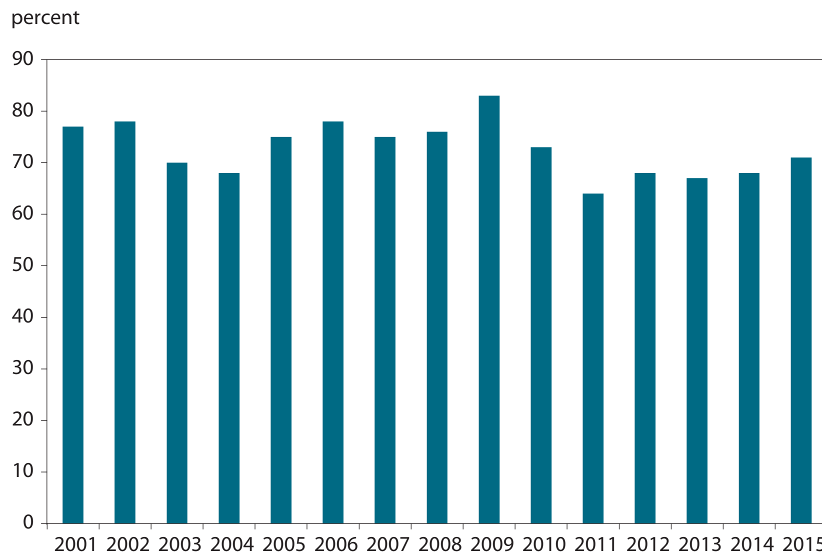
17. The net outstanding amounts owed to Treasury, including interest, stand at R$520 billion (or about US$150 billion).

18. That said, various press articles have criticized BNDES's role, particularly in view of Brazil's unfolding political crisis. And, as noted earlier, in response to the corruption scandal at the oil company Petrobras, one of the bank's most important clients, Congress convened an inquiry commission to investigate the bank's activities. However, an in-depth discussion of these issues is beyond the scope of this *Policy Brief.*

19. Responding to recent criticism posted on the beyond-brics blog of the *Financial Times*, BNDES argued that the institution "has evolved in line with Brazilian development: Disbursements and investments follow almost the same trajectory" (http://blogs.ft.com/beyond-brics/2014/06/02/guest-post-bndes-and-brazilian-development/).

20. Lazzarini et al. (2015) find evidence that firms that donate to winning candidates are more likely to receive funding in the form of loans from BNDES.

Figure 6 BNDES lending to large firms as share of total disbursements, 2001–15



Note: Large firms are considered those with gross annual revenues in the R$90 million to R$300 million range (US$30 million to US$100 million). The data for 2015 cover January–May.

Source: BNDES.

BNDES, ACCORDING TO ITSELF

In early 2015, BNDES launched an "Effectiveness Report," the first flagship publication in its long history that aims to improve transparency amid growing criticism of its obscure operations. According to this report, "the role of development banks is to provide long term financing when long term lending in local currency is absent" and to "serve as a countercyclical instrument during times of financial distress, preserving financial stability."

However, BNDES lending currently works against its two chief stated objectives. On the one hand, by lending to firms that are not necessarily cash- or credit-constrained without the appropriate checks and balances, BNDES may inadvertently create adverse selection by leaving it up to private lenders to serve higher-risk firms. This type of adverse selection may create prohibitive upward pressures on private lending rates, making the emergence of private long-term credit markets a virtual impossibility. It is therefore unsurprising that given the recent growth in BNDES lending, Brazil continues to struggle with shallow and illiquid long-term markets and credit instruments. On the other hand, the rise in subsidized BNDES credit following the global financial crisis—it alone accounts for over 20 percent of the total credit market (figures 7 and 8) in Brazil—has damaged monetary policy transmission channels, helping to explain one of Brazil's long-standing puzzles—why real interest rates have remained so high following economic stabilization (figure 9).[21]

21. Brazil's inordinately high real interest rates have been a long-standing puzzle in both the policy debate and the academic literature. For a comprehensive overview, see Segura-Ubiergo (2012).

BNDES, REAL INTEREST RATES, AND PRODUCTIVITY GROWTH

This section turns to a quantitative exercise to gauge the impact of BNDES lending on the cost of capital, or the real interest rate. For the purposes of this analysis, ex ante real interest rates are used as calculated by interest rates on Brazil's 360-day interbank swap deposit certificates minus inflation expectations over the next 12 months.

Brazil's real interest rate[22] using quarterly data from 2004 to 2014 can be estimated as

$$\Delta rir_t = C + \beta_1 \Delta rir_{t-1} + \beta_2 \Delta cc_{t-1} + \beta_3 \Delta bndes_{t-1} + \beta_4 \Delta gap_{t-1} + \beta_5 infvol + \beta_6 dummycrisis + \varepsilon_t$$

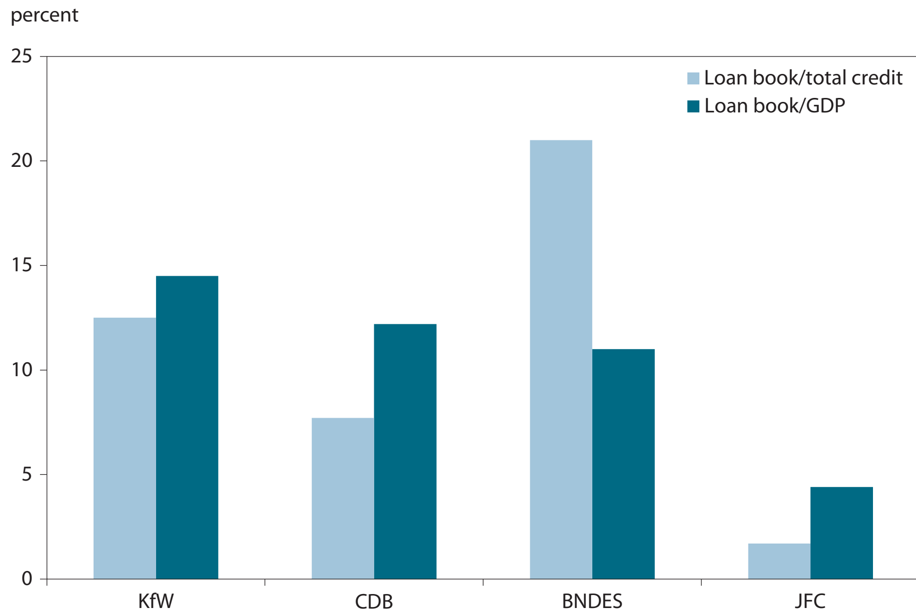
where *rir* is the real interest rate as just described; *cc* is the current account to GDP ratio;[23] *bndes* is total BNDES disbursements as a share of GDP; *gap* is a measure of the output gap;[24] *infvol* is a measure of inflation volatility; and *dummycrisis* is a dummy

22. All variables were tested for unit roots, found to be present in levels but not in first differences. Tests are available upon request.

23. Inclusion of the current account variable is related to the rationale that if a country needs to borrow more from international markets to finance a current account deficit, it may drive up domestic interest rates to attract foreign capital. This has long been a feature of Brazil and other emerging markets, although it has become less pronounced as these countries have improved their policy frameworks and built large reserve cushions.

24. *Gap* is defined as the difference between a measure of potential output growth and actual output growth.

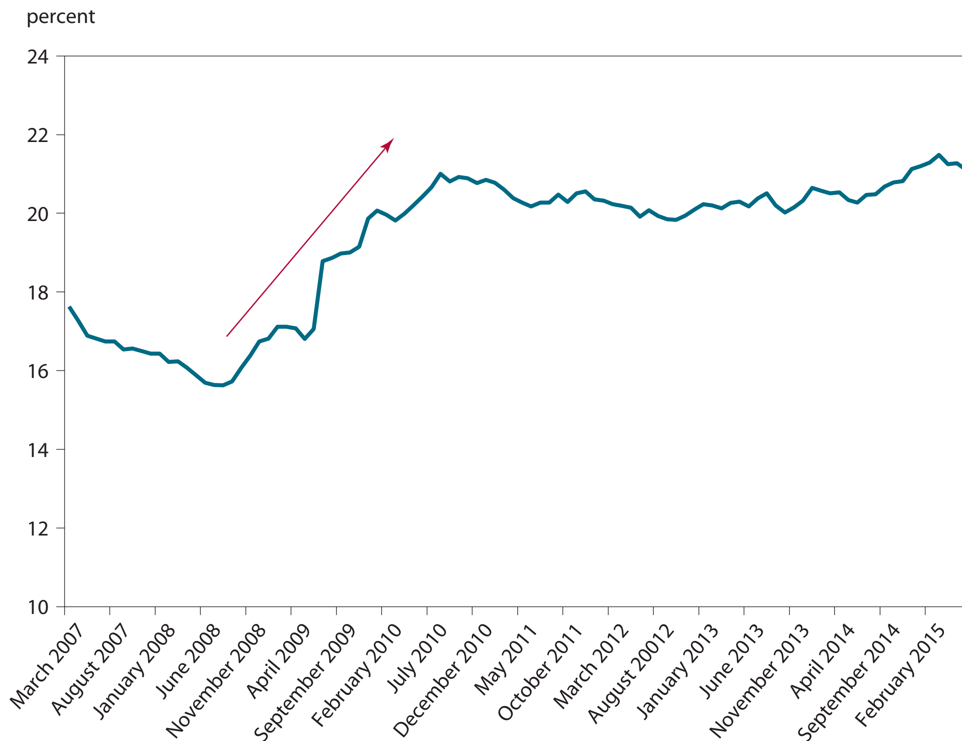
Figure 7 Comparison of BNDES and other countries' public development banks using two ratios: loan portfolio to total credit and loan portfolio to GDP



KfW = German Development Bank; CDB = China Development Bank; BNDES = Brazilian Development Bank; JFC = Japan Finance Corporation

Sources: Ferraz, Além, and Madeira (2013); BNDES (2015).

Figure 8 BNDES as an anticyclical policy tool based on BNDES stock of credit as share of total bank credit, 2007–15



Source: Central Bank of Brazil.

Figure 9 Real interest rates in Brazil, 2004–15

Note: Real interest rates were calculated using the 360-day interbank rates on deposit certificates minus inflation expectations over the next 12 months (ex ante rates) or minus current inflation numbers (ex post rates).
Source: Central Bank of Brazil.

variable that assumes a value of 1 for 2009Q1 to 2010Q4 and 0 otherwise. Table 1 presents the estimation results.

As can be seen, the specification that best fits the data includes BNDES lending as a share of GDP, which carries a significant coefficient, both with and without the output gap measure.[25] Thus positive variations in BNDES lending tend to raise the rate of increase observed in real interest rates.[26] An approximate calculation of the impact of BNDES on the real interest rate shows that an increase of 1 percentage point in the share of BNDES lending in GDP raises the real interest rate by 0.4 to 0.5 percentage points in the following quarter. Thus, assuming linearity, if the flow of BNDES lending as a share of GDP were to be reduced by half—reverting to levels last seen in early 2004 real interest rates could fall by as much as 1.3 percentage points—that is, from 4.7 to 3.4 percent. This would place Brazil's real interest rates at levels similar to Argentina's, although lower than those currently prevailing in Ecuador.

To further gauge the effects of BNDES on Brazil's real interest rates, Granger-causality tests were run, and they found that at one lag there is Granger-causality running from BNDES to real interest rates, but not the opposite. At higher lags, there is no evidence of Granger-causality either way. This suggests that jumps in BNDES lending similar to those that took place in 2008–10 translate fully into an upswing in real interest rates within a very short period of time—one quarter. This is consistent with the observation that credit markets in Brazil operate with a very short time horizon.[27]

Because the real interest rate reflects the cost of capital, and because the higher the cost of capital the lower will be the incentive to invest and to create new opportunities for productivity growth, a test was run to determine whether BNDES lending has had a statistically significant effect on overall productivity in Brazil. The first step was the growth accounting exercise summarized in table 2.

25. Presumably, the output gap measure takes away some of the significance of the coefficient on *bndes* because as *bndes* rises, demand is stimulated and the gap falls, thereby putting upward pressure on the real interest rate.

26. Although countercyclicality in BNDES lending should generate a positive coefficient without this necessarily amounting to a harmful welfare effect, there is no episode of BNDES reducing lending during a cyclical expansion. BNDES lending increased following the global financial crisis, and continued to rise thereafter, when the economy was arguably overheated with inflation above target.

27. Similar regressions for longer-term interest rates could not be run because of the lack of liquidity in long-term credit markets.

Table 1 Estimation results, dependent variable Δ*rir(t)*

Constant	0.000 (0.001)	0.000 (0.001)	0.002 (0.002)	0.002 (0.003)	0.002 (0.002)	0.002 (0.002)
Δ*rir*(*t* – 1)	0.661*** (0.099)	0.655*** (0.099)	0.591*** (0.116)	0.574*** (0.106)	0.523*** (0.107)	0.489*** (0.119)
Δ*cc*(*t* – 1)				–0.523 (0.504)	–0.444 (0.463)	–0.216 (0.392)
Δ*gap*(*t* – 1)						–0.217** (0.98)
Δ*bndes*(*t* – 1)					0.536** (0.207)	0.395* (0.206)
infvol			–0.017 (0.015)	–0.019 (0.013)	–0.018 (0.013)	–0.17 (0.013)
dummycrisis		–0.002 (0.003)	–0.003 (0.003)	–0.003 (0.003)	–0.004 (0.003)	–0.005 (0.003)
Adjusted R-squared	0.43	0.42	0.42	0.43	0.52	0.56

*p < .05 **p < .01 ***p < .001; n = 132

Note: Newey-West standard errors in parentheses. They correct for autocorrelation and heteroskedasticity often present in error terms.

Source: Author's calculations.

Table 2 Contributions to growth in Brazil, 2003–14 (percent)

Year	Use of disposable capital	Education	Demographic factors	Labor market dynamics	Productivity (TFP)	GDP growth
2003	0.85	0.76	1.31	1.90	–3.59	1.22
2004	1.30	0.60	1.26	0.76	1.75	5.66
2005	0.89	0.58	1.22	0.58	–0.13	3.15
2006	0.53	0.90	1.19	0.23	1.14	4.00
2007	1.49	0.85	1.15	0.57	1.95	6.01
2008	1.32	0.80	1.12	1.22	0.57	5.02
2009	–1.59	0.77	1.07	–0.51	0.02	–0.24
2010	2.46	0.62	1.03	1.54	1.93	7.57
2011	0.49	0.42	0.98	0.56	1.46	3.92
2012	0.55	0.80	0.94	0.67	–1.20	1.76
2013	0.78	0.73	0.90	–0.23	0.56	2.74
2014	0.33	0.70	0.86	–0.92	–0.83	0.14

TFP = total factor productivity

Sources: IPEADATA; Brazilian Institute of Geography and Statistics (IBGE); author's calculations.

Data from 2004 to 2014 were then used to test the possible direct and indirect effects of BNDES lending on quarterly productivity growth.[28] The direct effects were captured by introducing the *bndes* variable in the regression, whereas indirect effects that would come from higher real interest rates linked to higher levels of BNDES lending would show in the coefficient for the lagged difference in real interest rates (table 3). The regression now appears as

$$tfp_t = C + \alpha_1 tfp_{t-1} + \alpha_2 \Delta rir_{t-1} + \alpha_3 \Delta bndes_{t-2} + \alpha_4 tfp_{t-2} + \varepsilon_t.$$

As the results show, both real interest rates and BNDES lending have a nonnegligible negative effect on productivity growth, suggesting that the distortions created by this type of financing may outweigh its benefits. The evidence is particularly strong in

28. The hypothesis of a unit root on the growth of TFP was rejected. Test results are available upon request.

Table 3 Potential effects of BNDES lending on productivity

Constant	0.003 (0.002)	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)
Δ*rir*(*t* – 1)			–0.499*** (0.127)	–0.246* (0.127)	–0.463*** (0.135)
tfp(*t* – 1)	0.750*** (0.128)	1.251*** (0.201)	0.682*** (0.470)	1.133*** (0.214)	0.698*** (0.111)
tfp(*t* – 2)		–0.549*** (0.094)		–0.475*** (0.115)	
Δ*bndes*(*t* – 2)	–0.522** (0.252)	–0.279* (0.160)			–0.150 (0.268)
Adjusted R-squared	0.59	0.73	0.67	0.74	0.66

*p < .05 **p < .01 ***p < .001; n = 132

Note: Newey-West standard errors in parentheses. They correct for autocorrelation and heteroskedasticity often present in error terms.

Source: Author's calculations.

light of the procyclicality of Brazilian total factor productivity (TFP), as documented by Bacha and Bonelli (2015). Because the TFP is highly sensitive to the economic cycle in Brazil, periods of expansion tend to induce an increase in productivity. Because BNDES lending has a positive effect on the cycle, one might expect higher TFP growth as a result of its activities. A negative effect of BNDES lending on the TFP is therefore strong evidence supporting the hypothesis that BNDES lending has recently done more harm than good to productivity growth.[29]

This finding is consistent with the firm-level of studies by Sousa (2010) and De Negri et al. (2011), which found no effect of BNDES loans on firm productivity, although there may be a positive impact on employment and exports, according to their results. Moreover, BNDES lending does not appear to have a direct negative effect on productivity in addition to the indirect negative impact via real interest rates. This is consistent with the literature's findings that the bank is not involved in systematically supporting or bailing out inefficient firms (Lazzarini et al. 2015).

CONCLUSION

Brazil is trapped in a complex web of fiscal and quasi-fiscal entanglements. Following several years in which these problems were either hidden from view by the afterglow of the commodity boom that ended in 2011 or justified on the basis of anticyclical policy needs, they now have come to a head. As a country faced with severe growth constraints associated with a political crisis, structural bottlenecks, and macroeconomic imbalances, it is unclear how it will exit from what some have dubbed the perfect storm.

According to the vast literature on Brazil's interest rate puzzle,[30] the country exhibits substantially higher real interest rates than its emerging market peers after controlling for factors such as savings rates, fiscal stance, current account balance, inflation volatility, and differences in the level of economic development.[31] This leaves the possibility that the inordinate use of public lending in Brazil and the extent to which this is intertwined with fiscal and monetary policies may be largely to blame.

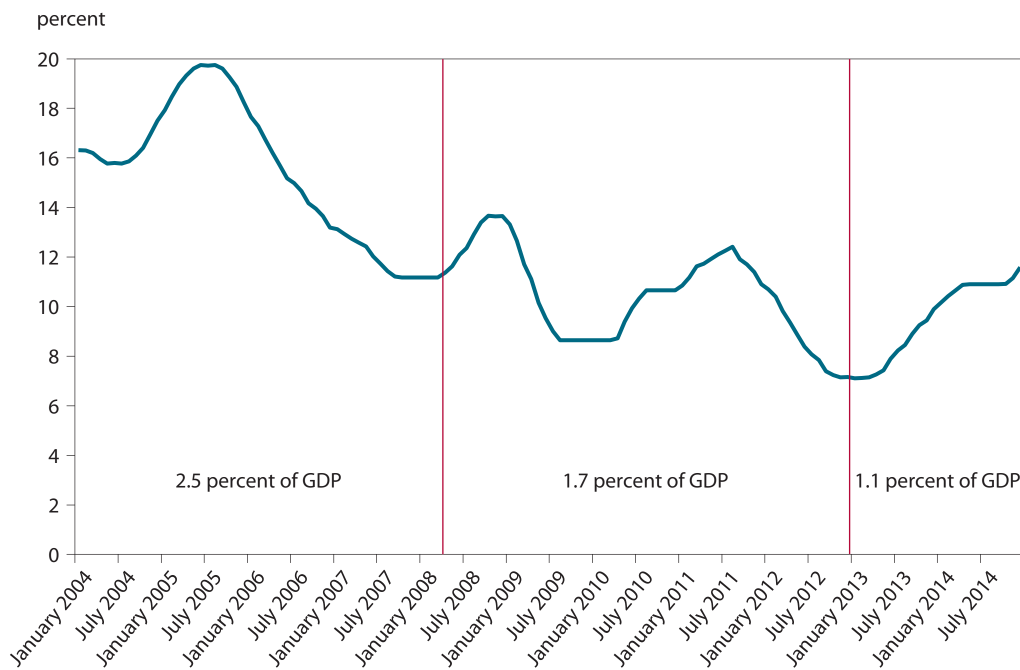
Indeed, a vicious cycle is set in motion. When BNDES borrows at subsidized rates from Treasury, it induces Treasury to place new debt at market rates, raising both the level and cost of public debt. This in turn complicates budget execution and fiscal policy, particularly because Treasury grants BNDES a sizable implicit subsidy. When BNDES increases credit after receiving a loan from Treasury, it acts in dissonance with the Central Bank of Brazil, which is attempting to maintain aggregate demand at a level consistent with price stability. In addition, because the loans provided by BNDES are not responsive to monetary policy rates, credit segmentation induces the central bank to raise interest rates further to offset inflationary pressures. Higher than warranted interest rates in turn raise the cost of public debt, damaging budget execution. Breaking this cycle—and the adverse selection side effects it causes for private financial institutions—would require rethinking the role of BNDES, possibly scaling down and redirecting its operations. Eliminating the subsidized component of the bank's lending operations by gradually increasing its links to market-determined rates would also be crucial in ending the perverse crowding-out effects of private institutions that hamper the development of capital markets. Future work will explore lessons to be drawn

29. The author thanks Edmar Bacha for pointing out this implication. Of course, if TFP is procyclical high TFP growth is unlikely to sustain itself without control of the cycle (the author thanks Bill Cline for this point).

30. For a good overview of the literature, see Segura-Ubiergo (2012).

31. Countries that are at lower stages of development should see a higher marginal productivity of capital, as reflected in possibly higher real interest rates.

Figure 10 Nominal interest rates and fiscal policy: Brazil, 2004–14



Note: Numbers in percent of GDP correspond to the average primary surplus for the period defined by the vertical lines. Between 2003 and mid-2006, public credit fell from 50 percent of total credit to just over 35 percent. Between mid-2006 and 2014, public credit rose from about 35 to 55 percent.

Sources: National Treasury; Central Bank of Brazil.

from other public development banks for BNDES, with a view toward formulating proposals for refocusing the bank.

Refocusing public lending alongside a comprehensive public fiscal consolidation program could have positive long-term effects, as evidenced by the experience of 2003–06. At the time, a serious adjustment effort was undertaken to enhance policy credibility, which in turn led to a significant reduction in both the real and nominal interest rates (figure 10). The gradual and unwavering weakening of the fiscal framework after 2010, coupled with the sharp expansion in public credit, led to a reversion of Brazil's falling interest rate trajectory.

Unfortunately, rethinking the role of public banks in Brazil and promoting robust fiscal consolidation are not something the Brazilian government is currently prepared or even able to do. As demonstrated by its most recent actions, public credit expansion with little regard for future fiscal implications is still considered the primary means of averting a rapidly mounting political and economic crisis. Current political constraints further damage actions that would prevent repeating the costly mistakes of the past. Brazil thus seems to be headed toward a full-blown crisis before it is prepared to seriously address the pressing issues discussed in this *Policy Brief*.

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