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What Do Development Banks Do? Evidence from Brazil, 2002-2009

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Abstract

While some authors view development banks as an important tool to alleviate capital constraints in scarce credit markets and unlock productive investments, others see those banks as conduits of cheap loans to politically-connected firms that could obtain capital elsewhere. We test these contrasting views using data on loans and equity allocations in the period 2002-2009 by the Brazilian National Development Bank (BNDES), one of the largest development banks in the world. In our fixed effect regressions, we find that BNDES' allocations do not seem to affect firm-level operational performance and investment decisions, although they do reduce firm-level cost of capital due to the governmental subsidies accompanying loans. Next, examining the selection process through which BNDES' capital is allocated to firms, we find that BNDES apparently selects firms with good operational performance but also provides more capital to firms with political connections (measured as campaign donations to politicians who won an election). Yet, we do not find evidence that BNDES is systematically bailing out firms. In general, BNDES appears to be generally selecting firms with capacity to repay their loans, as regular commercial banks would do.

Keywords: Development banks, industrial policy, national champions, political economy

JEL codes: O16, O25, H1, L3

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Introduction

Defendants of state banking see development banks as an important tool to solve market failure leading to suboptimal productive investment. Thus, development banks can solve market imperfections that would leave either profitable projects or projects that generate positive externalities without financing (Bruck, 1998; Yeyati, Micco, and Panizza, 2004). Moreover, in economies with significant capital constraints, those banks can alleviate capital scarcity and promote entrepreneurial action to boost new or existing industries (Armendáriz de Aghion, 1999; Cameron, 1961; Gerschenkron, 1962). According to such *industrial policy* view, development banks do more than just lending to build large infrastructure projects. They also lend to companies that would not undertake projects if it was not for the availability of long-term, subsidized funding of a development bank (Rodrik, 2004; Yeyati *et al.*, 2004). Furthermore, development banks may provide firms with capital conditional on operational improvements and performance targets (Amsden, 2001). In such circumstances, we would expect to see the firms who borrow from development banks increasing capital investments and overall profitability after they get a loan.

According to the *political* view, on the other hand, lending by development banks leads to misallocation of credit for two reasons. First, development banks tend to bailout companies that would otherwise fail (this is the soft-budget constraint hypothesis, e.g. Kornai, 1979). Second, the *rent-seeking* hypothesis argues that politicians create and maintain state-owned banks not to channel funds to socially efficient uses, but rather to maximize their personal objectives or engage in patronage deals with politically-connected industrialists (Ades and Di Tella, 1997; Faccio, 2006; Hainz and Hakenes, 2008; La Porta, Lopez de Silanes, and Shleifer, 2002). Thus, rent-

seeking capitalists may request subsidized credit or cheap equity even in cases where projects would be normally funded and launched using private sources of capital.

The debate around the mission and effects of development bank actions is nuanced even more when we add the desire of governments to create “national champions.” That is, politicians and officials explicitly target specific firms to receive funds, either debt or equity, as a way to propel them to consolidate their sectors and grow. Some argue, however, that the criteria governments use to select those firms are not clear and have sometimes been linked to political objectives (Ades and Di Tella, 1997). A recent literature has found empirical evidence consistent with the hypothesis that financing can be influenced by political factors such as election cycles and campaign donations (e.g. Claessens, Feijen, and Laeven, 2008; Dinç, 2005; Sapienza, 2004). Therefore, it is important to assess not only the impact of development banks on firm-level investment and performance, but also the selection mechanism through which certain firms, but not others, get funds from such banks.

In this paper we use evidence from Brazil to examine how, and what happens when, development banks target publicly traded companies. Brazil offers a good laboratory to examine how development banks work and the effects that their loans have on companies because the National Bank for Economic and Social Development, known as BNDES for its Portuguese acronym, is one of the largest development banks in the world (Torres Filho, 2009). In 2010, for example, the value of loans disbursed by BNDES was more than three times the total amount provided by the World Bank; BNDES’ equity was around twice the total equity of other large development banks such as KDB (Korea) and KfW (Germany). Founded in 1952 to provide long-term credit for infrastructure projects, BNDES soon became a central venue for the capitalization of domestic and foreign groups investing in Brazil (Leff, 1968). Despite

the privatization wave that took place in Brazil in the 1990s, BNDES remained an important source of capital in the economy. By 2010, BNDES' loans corresponded to 21% of the total credit to the private sector and the bulk of long-term credit—a position that was reinforced after the global financial crisis of 2008 (Figure 1).

Although BNDES does not disclose detailed firm-level data on loans, we managed to collect detailed data on BNDES allocations from the annual reports of 286 firms publicly traded in BM&F Bovespa, the Sao Paulo Stock Exchange, between 2002 and 2009. Firms are required to report their loans according to their origin (BNDES or elsewhere) and/or with detailed information of the interest rate associated with each credit line. Because BNDES lends at a subsidized rate known as TJLP (Federal Long-Term Interest Rate), which has been around 7.5 percentage points below the market rate. We could identify cases of loans originated from BNDES' credit programs whenever firms declared that the associated interest rates followed TJLP.

In addition to loans, some development banks also manage some of the minority equity positions of their governments. That is, development banks can act as private equity firms, creating another channel through which local firms can capitalize. Therefore, some of the positive effects one would expect to find when firms get development bank loans should also be expected when development banks invest in the equity of those firms. We thus use detailed data on minority positions held by BNDES—through its equity investment arm, BNDESPAR—in all publicly traded companies in Brazil to see the effects of such investments on firm-level performance and investment. In other words, we empirically assess the dual role of development banks as both lenders and (minority) private equity providers.

Empirical research on development banks is scant. Most of what we know about these banks is based on descriptive or theoretical work, rather than on empirical studies

of the effects of their actions (Amsden, 1989; Armendáriz de Aghion, 1999; Aronovich and Fernandes, 2006; Bruck, 1998). Quantitative studies on state-owned banks also do not examine development banks in detail (La Porta *et al.*, 2002; Yeyati *et al.*, 2004). A handful of studies have examined the effect of BNDES loans in Brazil, with mixed results. In a large sample of Brazilian firms, not only publicly traded ones, Ottaviano and Sousa (2007) find that some BNDES credit lines positively affect productivity, although others have a negative effect; in a later study, Sousa (2010) reports an overall null effect of those loans. Coelho and De Negri (2010) find that loans have a larger effect on more productive firms. Specifically analyzing the impact of BNDES equity allocations, Inoue, Lazzarini and Musacchio (2011) find some positive effect of equity participations in the period 1995-2002, but not in the subsequent period 2003-2009. In their view, BNDES equity investments had a positive effect on investment and performance in firms before 2003 because they were more capital-constrained. Yet, the rapid development of capital markets in Brazil after 2003, they argue, seems to have alleviated those capital constraints. None of these studies, however, jointly examine the role of BNDES loans and equity investments.

Our basic cross-sectional analysis shows that BNDES appears to be lending to large, profitable firms. Of course, not controlling for unobservables obscures whether those firms that get BNDES perform better because they get loans or equity, or simply because they were already the best firms when they received the funding. Thus, we run additional regressions using company fixed effects to see the effect of BNDES allocations on firm-level performance and investment, controlling for constant firm-level, industry-level, and time-varying industry-level unobservables. We do not find any significant increase in profitability, market valuation (Tobin's q), or investment in the firms receiving funds from BNDES, either debt or equity. However, BNDES loans

reduce these firms' financial expenses in a significant way. This finding supports the idea that BNDES, rather than providing funding for companies that were capital constrained and in need of resources to pursue large capital investments, actually appears to be supporting firms that would most likely be able to borrow elsewhere. The effect of the subsidized loan appears to be, therefore, a simple transfer from the government to the shareholders of the firms borrowing from BNDES. In sum, our basic econometric analysis does not support the industrial policy view of development banks.

We then examine the selection process through which firms receive debt or equity as a way to test the political view. Under the political view we test two hypotheses. First, we test the soft-budget constraint hypothesis by examining if BNDES systematically chooses underperforming firms. Second, we test the rent-seeking hypothesis, in which we would expect to find that political connections between the firm and the government would be correlated with BNDES lending, controlling for other firm characteristics.

Our fixed-effect regressions using firm-level data on loans and equity allocations received from BNDES as dependent variables show that loans tend to be allocated to firms with good past operational performance. Thus, it is not the case that BNDES is systematically bailing out bad firms (i.e., we reject the soft-budget constraint hypothesis). Yet, consistent with the rent-seeking hypothesis, our results also show that the political market matters. Following previous research (Bandeira-de-Mello and Marcon, 2005; Boas, Hidalgo, and Richardson, 2011; Claessens *et al.*, 2008), we measure political connections using data on firm-level campaign donations. We find that firms that donate to candidates who won an election are more likely to receive funding in the form of loans from BNDES, while firms donating to the losing candidates are less likely to get such loans. From this analysis we also conclude that

because both profitable and unprofitable firms appear to be donating to winning political candidates, donations do not cause bad firms to be systematically selected. BNDES is, apparently, lending to firms that want to reduce their financial expenses, without necessarily changing their operational performance or investment decisions as a result of the lower cost of capital.

Despite these results, it is hard to pass judgment on the performance of BNDES. On the one hand, it outperforms other development banks (see Table 1). On the other hand, BNDES underperforms large banks in Brazil, because it keeps its net interest margins low. BNDES tends to lend charging the Federal Long-Term Interest Rate (known as TJLP) and finances its operations with an extremely low cost of capital. This is because a good portion of its funding comes in the form of transfers from the Treasury (e.g., government bonds) or in the form of transfers from worker forced savings accounts. We argue that a more realistic way of studying the intermediation costs of BNDES from the social welfare perspective is to look at the interest income BNDES makes on loans compared to the opportunity cost of the funds it gets from the government and from savers (e.g., the benchmark interest rate in Brazil known as SELIC). Those net interest margins (the interest income on loans vs. the cost of funding) are negative, ranging from -10% to -5%. That is, society pays, in subsidies, 5 and 10 cents for every dollar that BNDES lends. That would be tolerable, even acceptable, for the industrial policy view if it each dollar lent was necessary to create new, productive investments. Since this is not confirmed by our data, we consider that the net welfare effect is zero or even negative.

Our paper is structured as follows. In the next section, we provide a brief overview of development banks in the world. We then describe our data on BNDES' allocations and outline our hypotheses building on the industrial policy and political

views of development banks, discussed before. We next present our econometric results. As a final analysis, we assess BNDES as a bank, in order to assess its overall performance and its cost of capital. Concluding remarks follow.

Development Banks throughout the World

According to Armendáriz de Aghion (1999, p. 83), “development banks are government-sponsored financial institutions concerned primarily with the provision of long-term capital to industry.” This definition highlights two key aspects of development banks: their state-owned status, and their emphasis on solving failures in credit markets, especially in the case of projects with long-term maturity. Indeed, various authors highlight the importance of development banks in promoting industrial “catch-up” (e.g. Amsden, 2001; Aronovich and Fernandes, 2006; Cameron, 1961; Rodrik, 2004). In his study of state intervention in the banking system, Gerschenkron (1962) argues that, without public participation, lack of trust among creditor and debtors would inhibit deepening credit markets. Within this perspective, private banks will be reluctant to give credit to risky investments, thereby leaving value-enhancing projects unfunded. Thus, following this logic, development banks will be “lenders of last resort,” in the sense that they will solve failures in credit markets inhibiting industrial growth (Bruck, 1998).

Existing historical accounts show that development banks exist at least since the 19th century with the creation of Société Général pour Favoriser l’Industrie National in the Netherlands (1822) and, later on, a group of institutions in France including Crédit Foncier, Comptoir d’ Escompte, and Crédit Mobilier (1848-1852)—the latter having important influence on European infrastructure investments such as railways (Armendáriz de Aghion, 1999). The escalating state-led intervention and the decline in private markets that followed the two Great Wars—a trend which Rajan and Zingales

(2004) termed “the great reversal”—further reinforced the expansion and importance of development banks. The creation of Germany’s KfW (Kreditanstalt für Wiederaufbau) and the Japan Development Bank (JDB) illustrate this trend. Musacchio (2009) also argues that BNDES was created to provide long-term credit after the retraction of bond and equity markets in the 1920s and 1930s in Brazil. At the same time, new development theories started emphasizing structural problems inhibiting the industrialization of underdeveloped countries dependent on the production and exports of basic commodities (Furtado, 1959; Hirschman, 1958; Prebisch, 1950). In their view, state-induced savings and credit would be crucial to spur value-added, productive investments (Bruck, 1998). Along these lines, Amsden (1989) also stresses the importance of development banks in late-industrializing economies. Financial institutions such as the Korea Development Bank, Amsden (1989) argues, were instrumental not only as a means to infuse long-term capital in the industry, but also as a mechanism to screen good private projects, establish well-defined performance targets, and monitor the execution of investments.

Development banks have persisted over time, in developed and emerging economies alike. Although the liberalization and privatization reforms of the 1990s reduced the scope of development banks in some countries, in several cases banks were preserved and even reinforced. Bruck (1998)’s survey of development banks counted around 520 banks in 185 countries, 29.5% of which in Latin America and the Caribbean, 28.5% in Africa, 23.4% in the Asia-Pacific region, 9.5% in Europe, and 9.1% in the Middle East. With the global financial crisis of 2008, development banks gained new momentum. In 2009, the Argentine government announced an intention to create a national development bank mimicking Brazil’s BNDES. Even in the United States there have been calls to revamp development banks. The federal budget of 2011

included a US\$ 4 billion package to build a development bank supporting large infrastructure projects.

Our study provides a detailed analysis of Brazil's BNDES, one of the largest development banks in the world (Table 1). BNDES was created in 1952 after joint commission involving the governments of Brazil and the United States decided to expand Brazil's infrastructure projects and create a mechanism to provide long-term credit for energy and transportation investments. The Brazilian National Bank of Economic Development (BNDE in Portuguese, later changed to BNDES when "social development" was added to its mission) then expanded its scope by providing loans to a host of "basic industries" that the government wanted to develop (such as metals, oil, chemicals, and cement) (Leff, 1968). In the 1970s, BNDES also started investing more directly in the *equity* of Brazilian companies. In 1982, its investment arm BNDESPAR was created to manage those holdings.

BNDES survived and remained important even after the liberalization and privatization wave of the 1990s starting with Fernando Collor de Mello (1990-1992) and continuing under the term of Fernando Henrique Cardoso (1995-2002). The bank was actually an active participant in those reforms, in three ways: planning and executing privatizations, providing acquirers with loans, and purchasing minority stakes in several former state-owned enterprises. In the two administrations of President Luiz Inácio Lula da Silva (2003-2010), BNDES was also involved in several large-scale operations and helped orchestrate mergers and acquisitions to build "national champions" in several industries (Almeida, 2009). Our database, discussed next, covers the period 2002-2009 and sheds more light on the process through which BNDES selects firms and affects (or not) their performance.

Data and Hypotheses

Data

We collect panel data from 286 publicly listed companies in the São Paulo Stock Exchange (BM&F Bovespa) between 2002 and 2009. We used multiple sources to build our main variables. Basic financial information came from *Econômática*, a financial database, while ownership data were obtained from diverse sources such as the Brazilian Securities and Exchange Commission (CVM) and *Valor Grandes Grupos* (a yearly survey of Brazilian groups). We cleaned the database by eliminating inconsistent information (e.g. cases where total assets were different from total liabilities) and winsorized at the 1%/99% percentiles some key performance variables that were shown to vary substantially (return on assets, Tobin's q , etc.). Missing information for some variables and years causes the total number of firms in the panel to vary according to the model specification. We also dropped from our database financial firms and publicly listed holding corporations (i.e. we only kept their affiliates).

We collected data on BNDES loans and equity in two different ways. In the case of loans, we analyzed companies' balance sheets in detail, trying to find explanatory notes indicating the origin and yearly composition of outstanding loans. More recently BNDES started disclosing data on approved funded projects; however, for confidentiality reasons the bank does not provide historical data on firm-level loans. Still, because most publicly listed companies report the name of the lender and/or the interest rate associated with the loan, we were able to collect data for a larger number of firms and years. As noted in the introduction, loans originated from BNDES—supplied directly by the bank or indirectly through another financial intermediary—will be associated with a subsidized interest rate called TJLP (Federal Long-Term Interest Rate). Thus, yearly information on BNDES loans was collected based on cases where the company reported either that the loan came from BNDES or that the associated

interest rate was based on TJLP. If the firm did not specify the origin of its loans or their interest rates, we considered that information on BNDES loans for that particular company was missing.

As for BNDES' equity, we observed the ownership composition of each firm to identify cases where BNDES—through its investment arm, BNDESPAR—appeared as an owner. We then collected the percentage of equity ownership by BNDES. We focused on direct ownership relations only, that is, cases where BNDES was a direct owner of the firm instead of an indirect owner through a pyramidal ownership structure (e.g. BNDES owns an intermediary firm, which then owns the observed company). Our focus on direct ownership relation is for two reasons. First, we were interested in computing the size of equity participations; retrieving information on the size of ownership is much more difficult when opaque pyramids are involved. Second, Inoue, Lazzarini and Musacchio (2011), comparing direct and indirect stakes, report that the most consistent performance effects of BNDES equity comes from direct ownership. Thus, our focus on direct equity is apparently appropriate to capture the effect of BNDES ownership as well as its magnitude..

Table 2 shows descriptive data on the number of firms in the database observed with BNDES loans and equity. The number of firms with BNDES loans is much larger than the number of firms with BNDES equity, although the participation of the bank as an owner has increased over the years. The modal firm in our database with BNDES loans has around 31% of its debt coming from the bank; in the case of equity, the modal firm has around 14% of BNDES direct ownership. Although 84.5% of firms with BNDES equity also have BNDES loans, the majority of firms with BNDES credit (87.9%) are not owned by the bank. Thus, the correlation between the size of observed

BNDES loans and equity is small, 0.149. This allows us to simultaneously examine the effect of both loans and equity positions on firm-level performance variables.

Variables

We employ four sets of variables (see Table 3). The first set corresponds to variables related to firm-level performance and investment activity. Thus, the profitability of firms is measured by ROA (net return on assets) and EBITDA/assets (operational return on assets). The later is particularly important because the subsidy associated with BNDES loans may distort an analysis of profitability through ROA. We also measure the performance of firms as assessed by the stock market, through a simplified proxy of Tobin's q (market value of stocks plus debt divided by total assets). Because, as noted before, BNDES loans may help reduce the cost of capital, we also add the variable $Finex/assets$ measuring the ratio of firm-level financial expenses (loan payments) to debt. The last two variables are related to investments: $Capex/assets$ and $Investment/assets$ measure respectively yearly capital expenditures and total investments (e.g. permanent capital) relative to the stock of existing assets.

The second set of variables corresponds to BNDES loans and equity. We measure these variables in both absolute and relative (percentage) terms. Thus, $\ln(BNDES \text{ loans})$ and $\ln(BNDES \text{ equity})$ measure the total (logarithmic) value of loans and equity positions (in the case of equity, we considered the book value of equity times the percentage participation of BNDES). $\%BNDES \text{ loans}$ and $\%BNDES \text{ equity}$, in turn, gauge the extent of BNDES capital relative to total debt and total equity respectively.

The third set of variables is related to the political environment. Numerous studies have found that, in Brazil, political campaign financing is a crucial mechanism through which firms establish political connections. Large election districts and an

open list competition create incentives for politicians to trade “pork” for private money to support costly campaigns (Samuels, 2002). Different from the United States, corporations can make cash donations directly to candidates, and there is no restriction on donations from foreign firms (provided they have a local subsidiary). The official limit for domestic firms is two percent of their gross revenues, but “under the table” donations are pervasive (Araújo, 2004). Furthermore, collective lobbying efforts are not widespread. The lack of encompassing peak associations, capable of controlling free-riding, pushes firms to establish their own connections (Schneider, 2004). Consistent with this logic, several empirical studies have found a significant association between campaign donations for Brazilian politicians and firm-level profitability (Bandeira-de-Mello and Marcon, 2005), preferential finance (Claessens *et al.*, 2008), and access to government contracts (Boas *et al.*, 2011).

In Brazil, candidates are required to disclose all donors to the Superior Electoral Tribunal (TSE). The electoral authorities then release data on election finances for each candidate. We used this data to match individual firm contributions to politicians with election results. Thus, for each firm we have the total number of candidates (running for President, Senator, State or Federal Deputy) to whose campaign the firm officially contributed in the previous election. Given that our panel runs from 2002 to 2009, we consider campaigns that occurred in 2002 and 2006. Thus, data from the 2002 campaign are used to assess outcomes occurred in 2003-2006, while data from the 2006 campaign are used for the years 2007-2009. Because donation data may be plagued with self-selection issues—e.g. the best firms may be approached by a larger number of candidates—we also separate between donations to candidates who won from donations to those who lost the election, considering that election results have an exogenous component due to random events affecting political competition (Claessens *et al.*,

2008). In addition, we compute the variable “donations for winners – losers,” corresponding to the difference between the number of candidates who received donations and won the election minus the number of candidates who received donations and lost the election. In line with previous studies, we consider campaign donations as a sign of a firm’s political activity, even if “under the table” donations are common in Brazil.

Finally, we employ a set of control variables. Because scholars have argued that membership to business groups (multi-unit corporations) affect firm-level performance in emerging markets (Khanna and Yafeh, 2007), we add a dummy variable coding whether the firm belongs to a group or not. Variations in the size of the firm are captured by the variable $\text{Ln}(\text{assets})$, which is the logarithmic value of total assets. Leverage (debt to assets) and Fixed (fixed assets to total assets) capture respectively variations in terms of debt activity and propensity to engage in fixed allocations. The last control, Foreign, is a dummy variable indicating whether the firm is foreign-controlled or not.¹

Hypotheses

Based on our earlier discussion on the *industrial policy* and *political* views on the role of development banks, Table 4 summarizes our main hypothesized effects. To tease out alternative explanations, we examine not only whether BNDES affects performance and investments, but also factors that may affect BNDES allocations, i.e., the extent of loans or equity that the firm will receive from BNDES.

The industrial policy view rests on the assumption that development banks will operate in environments with capital scarcity, and that their allocations will facilitate the

¹ We also have a control related to whether the firm is state-owned or private; however, because in our sample there was no instance of privatization, this aspect is automatically controlled for in our fixed-effect regressions.

execution of valuable investments and projects that would otherwise not happen (e.g. Armendáriz de Aghion, 1999; Bruck, 1998; Yeyati *et al.*, 2004). Development banks may also set high standards for firms and subject them to performance targets conditional on their allocated capital (Amsden, 2001). Thus, according to this view, BNDES loans and equity should have a positive effect on profitability (ROA, EBTIDA/assets), as well as on the market valuation of the firm (Tobin's q). Of course, an increase in profitability may be due to subsidized funding (i.e., a reduction in Finex/debt). However, if development banks allocations prompt investment in valuable projects, then the effect on performance should occur beyond a simple reduction in interest payments. Following the same logic, BNDES allocations should also positively affect investments and capital expenditures, whose longer-term horizon may require extended loans or equity allocations not easily found in scarce capital markets. Furthermore, such effect may be more pronounced in the case of equity than debt (Inoue *et al.*, 2011). While debt requires a pre-specified return over the duration of the contract, shareholders have more discretion to meet and discuss strategies to reorganize the company and provide a longer-term time frame for the necessary changes—which is particularly helpful when the firm has to invest in fixed, nonredeployable investments with long maturity (Williamson, 1988).

As for the determinants of allocations, the industrial policy view offers no clear prediction. On the one hand, development banks may pick firms with good performance to either boost “champions” or guarantee repayment (Amsden, 2001). On the other hand, development banks may influence firms with “latent advantages,” i.e., valuable projects and activities that were not sufficiently developed due to lacking capital and complementary investments (e.g. Lin and Chang, 2009; Rodrik, 1995). If

those advantages are “latent,” development banks may not necessarily target firms with superior (actual or past) performance.

The political view, in contrast, places higher emphasis on the process of selection. Through their development banks, governments can bail out failing corporations (the soft-budget constraint hypothesis) or benefit politically-connected capitalists (the rent-seeking hypothesis). One way political connections translate themselves into preferential access to finance is through state banks. In this case, the government uses the control of scarce country financial resources as an instrument with which to bargain for political support and private interests. Thus, Dinç (2005) finds that, during election years, the lending activity of government-owned banks in emerging markets is greater than that of private banks. Sapienza (2004) shows that in Italy the performance of the ruling party in elections affects the lending behavior of state-owned banks. As discussed earlier, in Brazil campaign donations have been shown to have implications for preferential finance (Claessens *et al.*, 2008), and a possible channel for this effect may be through state-owned banks.

Therefore, well-connected industrialists may have superior ability to attract loans or equity from development banks, even in cases where they would be able to get capital elsewhere (Ades and Di Tella, 1997; Haber, 2002; Krueger, 1990). Because, according to this view, allocations may be driven for reasons other than efficiency, the effect of allocations on firm-level performance or investment should be null. The only “positive” effect from allocations (in particular, loans) should be associated with a reduction in interest payments due to subsidized credit. However, in this case the loan will simply represent a transfer from the bank to capitalists, without necessarily having any effect on actual business-level activity.

In the next section we test these hypotheses through two sets of regressions. The first set examines the impact of BNDES allocations on firm-level performance and investment, while the second set assesses the determinants of allocations (i.e., using BNDES loans and equity as dependent variables and, as independent variables, performance and political factors). In both cases, to control for unobservables, we employ fixed-effects specifications including time-invariant firm-level fixed effects as well as time-varying year and industry-year effects.² Thus, we fundamentally measure how variations in BNDES' allocations affect variations in firm-level performance, and vice-versa.

Results and Discussion

Cross-sectional analysis

The first important pattern that comes out of our data is that the cross-sectional variation does show that firms that receive BNDES loans are larger and exhibit superior performance in terms of higher ROA, higher EBITDA/assets, and lower Finex/debt (see Table 5). Although the latter may have to do with loan subsidies, from a cross-sectional standpoint it seems that BNDES loans are associated with firms with superior operational performance (net of financial expenses). They also appear to invest more and engage in more capital expenditures, although the difference is barely significant. Firms with BNDES loans and equity, however, exhibit lower Tobin q's—which may either indicate that the target firms are not heavily valued by market investors or that BNDES is targeting firms and sectors with less intangibles such as brand names or patents. Indeed, the latter explanation is consistent with Almeida's (2009) observation that during our period of analysis BNDES has focused on basic commodity sectors such

² We code industries at the 2-digit SIC level because we would otherwise have few representative firms per industry. Note that our firm level fixed effects already control for (invariant) industry membership effects.

as mining, oil and agrifood. One of the justifications presented by BNDES executives is that those are sectors in which Brazilian companies have a comparative advantage, thereby creating a natural opportunity to develop “national champions” (Dieguez, 2010).

When we look at firms in which BNDES buys equity we don’t find such clear cross-sectional variation (see Table 5). Firms with BNDES equity allocations have lower EBITDA/assets and (as discussed earlier) also have lower Tobin’s q, although they apparently invest more relative to assets. They also tend to be larger and incur lower financial expenses. We note, however, that the number of firms with BNDES equity in our sample is much smaller than the number of firms with BNDES loans, which limits the generalization of our results.

Impact of BNDES allocations on performance and investment

Table 6 presents regression results on how BNDES affects firm-level performance (ROA, EBITDA/assets and Tobin’s q). We include loan- and equity-based variables measured in two ways (absolute logarithmic value and percentage), as well as, in some specifications, lagged values to accommodate possible phased effects of the allocations. No significant effect is found for the BNDES variables, in virtually all model specifications and for all performance variables. Thus, although BNDES appears to be lending to the best firms in a cross-sectional examination, the effect disappears once we control for firm- and industry-level factors. Furthermore, although we observe cross-sectionally that firms with BNDES loans or equity have lower Tobin’s q, as discussed before this result may likely be due to industry-based selection (e.g. BNDES focusing on industries with less intangibles). Once we control for industry- and firm-level traits, any change in BNDES loans or equity has no significant effect on the market valuation of the firm. Our data is inconsistent with the industrial policy view,

which argues that loans from development banks improve firm performance by allowing firms to invest in valuable projects that would otherwise be left unfunded. Once we control for particular industry- and firm-level traits we find that BNDES loan allocations have no particular effect on profitability or market valuation.

As expected, the first four columns in Table 7 show that BNDES loans have a negative effect on financial expenses. The subsidy included in BNDES loans reduces firms' cost of capital. Consider the results of the second column: because the marginal impact of BNDES loans is simply the estimated coefficient of $\text{Ln}(\text{BNDESloans})$ divided by the size of BNDES loans, and the dependent variable measures financial expenses relative to assets, the marginal reduction of financial expenses for each additional dollar from BNDES can be computed as the estimated regression coefficient divided by the participation of BNDES loans on total debt—which is 0.303, on average, for the firms with observed loans from BNDES. Thus, each additional dollar from BNDES reduces financial expenses (relative to debt) by 0.04 ($0.013/0.303$), or 4%. Considering, alternatively, the results of the fourth column, an increase in one percentage point in BNDES loans relative to debt (lagged) reduces the ratio of financial expenses to debt by 0.12 percentage point ($p < 0.01$). Thus, our estimates indicate that BNDES loans reduce the cost of capital by a percentage differential somewhere between 4 and 12%, which is more or less consistent with the subsidy included in BNDES' interest rates (to be discussed later, in the section “BNDES as a Bank”).

The results of the fourth column also show that an increase in one percentage point in BNDES equity participation (lagged) reduces by 2.1 percentage points the firm's financial expenses to assets ($p < 0.001$). A possible explanation is that creditors see extra equity from BNDES as an implicit guarantee of repayment. These results are consistent with both the industrial policy and the political views, given that

governmental allocations may affect the cost of capital directly through subsidies or indirectly through implicit guarantees.

Table 7 also shows that there is a significant effect of BNDES loans on the ratio of capital expenditures to assets. However, results are not very consistent across specifications. While there is a positive effect once we consider the logarithmic value of loans (sixth column, $p < 0.05$), the effect becomes negative, although with moderate significance ($p < 0.10$), if we take the ratio of BNDES loans to the firm's total debt (seventh column). As for the effect of BNDES loans and equity on the ratio of investments to assets, no significant effect is found. These results thus provide at best only weak support for the industrial policy view. In our sample, BNDES allocations are not consistently changing firms' investment decisions, once we control for a host of firm-level factors. Also, because only loans significantly affect capital expenditures, our results do not provide support for the prediction that equity will more effectively influence fixed investments than debt.

Selection process: impact of firm-level variables on BNDES allocations

We now examine the selection process by considering BNDES loan and equity allocations as dependent variables. Tables 8 and 9 present regression results for BNDES loans and equity respectively.

Let us first analyze how firm-level performance variables (ROA, EBITDA/assets and Tobin's q) affect BNDES allocations. To capture temporal effects, we add lagged values of the performance variables (e.g. BNDES takes into consideration firms' past performance). Estimates from the second column show that EBITDA/assets has a significant positive effect on BNDES loans, measured in logarithmic form ($p < 0.05$). To assess the magnitude of this result, note that the effect of an additional change in a performance variable is simply the estimated coefficient of

the variable on $\ln(\text{BNDESloans})$ times the size of BNDES loans. Thus, considering an average size of loans of around US\$ 166 million (for firms that received some BNDES loan), the estimate in the second column of Table 8 indicate that an increase in one percentage point in EBITDA/assets increases the amount of received loans by around US\$ 4.5 million. The effect of ROA, although positive, is moderately significant ($p < 0.10$). Because no significant effect is found when we consider Tobin's q as a performance variable affecting loans, it seems that accounting (operational) variables are more important determinants of BNDES allocations than the market valuation of the firm. The choice of BNDES equity, in turn, is not affected by performance variables in any meaningful way (Table 7).

Therefore, consistent with the industrial policy view, BNDES may be selecting good candidates for “national champions” or trying to guarantee repayment by lending to well-performing firms. On the other hand, our data show that the correlation between BNDES loans and performance is from the latter to the former; the bank may be picking “champions” but its allocations are not changing firm-level performance or investment decisions. In other words, allocations are apparently driven for reasons other than an attempt at reducing market failure. However, our data do not show that, as predicted by soft-budget hypothesis (of the political view), BNDES is systematically bailing out poor-performing firms. Thus, if anything, loans are not generally targeting bad projects.

Strong effects are found for the political variables as determinants of loans (Table 8), although no similar effect is found in terms of equity (Table 9). While donations in general do not affect loans, clear effects appear when we separate between donations to candidates who won and who lost the last election—either when we consider these variables separately or when we use the difference between number of winners and number of losers ($p < 0.01$). Because, as noted before, the effect of

donations on BNDES loans is simply the estimated coefficient of donations on $\ln(\text{BNDESloans})$ times the size of BNDES loans (US\$ 166 million on average), estimates in the fifth column of Table 8 indicate that an additional winner who received donations increases loans by around US\$ 28.2 million, whereas an additional loser reduces loans by US\$ 24.4 million. Considering our previous results that BNDES loans reduce financial expenses somewhere between 4 and 12%, then the private gain from each additional donation to a winner would bring net benefits ranging around US\$ 1.1 and 3.4 million. The magnitude of these effects is not trivial; for instance, the *largest* donation for a presidential candidate in 2006 was around US\$ 1.8 million (R\$ 4 million). In addition, by establishing political ties, firms may receive benefits beyond loans. A caveat here is that we only have data on declared donations; according to Araujo (2004), total donations in Brazil, including “under the table” deals, can be twice or ten times official figures.³

Our separate findings for winners and losers are of particular importance because it suggests that our results are not merely driven by self-selection. For instance, one might argue that donors receive more loans because BNDES selects profitable firms and those profitable firms have more money to be distributed to politicians. There is, however, no significant correlation between donations for winners and firm-level performance variables. And while there is significant correlation between donations for losers and performance variables ROA and EBITDA/assets, the correlation coefficient is small and *positive* (0.06, $p < 0.05$). In other words, well-performing firms are more associated with giving donations for *losers*, rather than for winners. Furthermore, there is no significant correlation between these performance indicators and the difference

³ The effect of donations also appears cross-sectionally. Thus, if we split our sample considering the difference between donations for winners and for losers, the subgroup involving more donations for winners than losers has on average 28.7% of BNDES loans relative to debt, while the other group has on average 24.4% ($p < 0.05$).

variable computing donations for winners minus losers, which is also highly significant in our regressions. An explanation is that the result of an election has an exogenous component due to random factors influencing political competition (Claessens *et al.*, 2008). The effect of donations also remains significant when we add in the *same* regression financial performance variables such as ROA and EBITDA (not reported here, but available upon request).

This finding should not be necessarily interpreted as an outright “give-and-take” relation between BNDES bureaucrats and capitalists. BNDES is well known for having a technical, competent staff that scrutinizes the repayment capability of borrowers (Evans, 1995; Schneider, 1991). A likely explanation is that firms donating to winners are more likely to be engaged in governmental contracts (Boas *et al.*, 2011); and large, public projects in Brazil have usually been accompanied by substantial BNDES funding (Lazzarini, 2011). Alternatively, certain donors are more likely selected by the government as “national champions,” and their sectors are more likely subject to industrial policy targeting.

Collectively, our results thus provide stronger support for the rent-seeking hypothesis (of the political view) than for the industrial policy view. Now, the evidence supporting the rent-seeking hypothesis shows that campaign donations appear to influence BNDES allocations, although apparently this effect does not cause bad firms to be systematically selected. Thus, it is not the case that BNDES is generally picking bad projects, with negative implications for its own financial health (i.e., there is no evidence to support the soft-budget constraint hypothesis). A likely reason is that politically connected firms in our database do not appear to be underperformers, on average. These firms want cheaper credit but they are not bankrupt firms in need of a financial lifeline. Even good firms will have incentives to be politically connected as a

way to guarantee subsidized loans. Furthermore, good firms may use connections as a “hedge” against adverse political decisions.

This should not imply, however, that bailouts never occur. For instance, a group of firms including Electricité de France (EDF) and AES Corporation acquired, in 1998, the control of Eletropaulo, a former state-owned company in the electricity sector. BNDES provided the acquirers with US\$ 1.2 billion in loans. However, by 2003, the acquirers were on the brink of default, and BNDES decided to reconvert part of the loans into shared and convertible bonds. A similar movement occurred in 2011 with Brazilian meat packer JBS-Friboi, which aggressively expanded internationally by acquiring Swift and Pilgrim’s Pride, among other firms. The expansion came at a cost of a substantial debt, and thus in 2011 JBS and BNDES agreed to reconvert part of BNDES loans into shares.⁴ However, although these cases are important, our findings indicate that they are not the norm, at least in the period covered by our database.

BNDES as a Bank

We now evaluate the overall performance of BNDES as a bank. We saw before that BNDES is apparently selecting firms with good performance on average, although the impact of its allocations on their operational results is insignificant. How does this affect the overall performance of BNDES as a bank? In Figure 2 we can see that in terms of return on assets (ROA) and return on equity (ROE), BNDES is the least profitable among some of the largest banks in Brazil. Yet, BNDES is profitable and show rates that are relatively high when compared to other development banks internationally (see Table 1).

⁴ The fact that BNDES sometimes prefers to finance firms through convertible bonds indicates that their way of providing funding follows the kind of incentives that Rodrik (2004) wants in industrial policy. The company has an objective and promises an amortization rate for the debt, if it does not meet those targets, BNDES “punishes” the owners by diluting their shareholdings and voting power when it converts its bonds into equity.

Banks are in the business of financial intermediation and commercial banks in Brazil have some of the largest net interest margins (NIMs) in the world (the average difference between the interest charged on loans and the interest paid for deposits and financing). In Figure 3 we compare the net interest margins of BNDES with those of some of the largest banks in Brazil. We can see that BNDES does not behave like a commercial bank in the sense that they charge the lowest NIMs among the banks in our sample, disregarding what methodology we use to estimate NIMs.

In fact, our results show that most of BNDES's intermediation margin is made of earnings from investments and not from loans, which we would expect in good commercial banks. In Figure 2 we show two estimates of NIMs. First, we show a measure that uses all interests and fees generated from all income earning assets over earning assets, which shows an intermediation margin of 2.4%. Second, we use a measure of NIMs just for the loan business of BNDES, taking only interest and fee income from loans minus the interest costs over total loans. The results using the latter are smaller (with a margin of 1.4%). That is, BNDES makes very small margins on its loan business. These results and Figure 4, therefore, show that BNDES makes most of its income from investments (in government paper) and from equity investments and not from the lending business.

Yet, we do not think that development banks can be judged like normal banks not only because they do not charge market rates for their loans, but also because they do not pay market rates for the totality of their funds. In fact, they usually have a low cost of capital because they obtain funds from the government and from compulsory savings accounts. Thus, their cost of capital does not reflect the opportunity cost of the resources they get.

In Brazil, BNDES has funded its operations by using retained earnings, bond issues, debt from multilateral organizations, transfers from the treasury, from transfers from worker's forced savings, and through unconventional deposits of the government (e.g., from privatizations).⁵ BNDES is obliged by law to pay returns to those worker funds, usually the so-called Federal Long-Term Interest Rate (TJLP). Yet, if some of those funds are lent in foreign currency there are also foreign exchange gains or losses. The government also funds a kind of a mutual fund called National Development Fund (NDF), which is managed by BNDES, partly-owned by state-owned enterprises (that swap their own equity for shares in the fund), and private creditors who buy NDF bonds, and which is targeted at lending to companies in the raw materials and consumer goods industries. BNDES pays NDF a return composed of the TJLP rate plus the dividends made on the equity investments. Finally, workers savings transferred to BNDES receive in return the TJLP⁶ for the tranche of loans made in local currency and the equivalent of the London interbank rate (Libor) and any foreign exchange loss/gain for loans made in foreign currency (Prochnik and Machado, 2008).

Thus, we can summarize the differences between BNDES and a normal commercial bank in two ways. First, it has a lower cost of capital than a regular bank. Second, that low cost of capital allows it to charge low interest rates on loans and still have a positive NIM. We can look at the weighted average cost of capital (WACC) of

⁵ The main funds that the government uses to transfer funds to the BNDES are: direct transfers from the Treasury; the Navy Fund (*Fundo da Marinha Mercante*); the National Development Fund; and funds that come from workers' forced savings. There are two of these workers funds, the unemployment insurance fund, know as *Fundo de Amparo ao Trabalhador* (FAT), and the Constitutional FAT, which takes 40% of individual worker accounts known as PIS and PASEP. FAT funds are transferred to BNDES in perpetuity and are, thus, considered subordinated debt in the BNDES balance sheet. For more information see Prochnik and Machado (2008) and the Ministry of Labor site <http://www.mte.gov.br/fat/historico.asp> <accessed at November 26, 2011>>.

⁶ It is important to note that for workers accounts deposited at BNDES (ironically called FAT in Portuguese) BNDES pays the TJLP, up to a maximum of 6% per year. If TJLP is larger than 6% the additional interest payments get accrued to the FAT account, which in practice is a perpetual debt BNDES has with the Ministry of Labor's workers accounts. The only circumstance in which BNDES would amortize part of the FAT debt is if the unemployment insurance funds held at the Ministry of Labor were not enough to cover payments (e.g., during a deep recession). See Prochnik and Machado (2008), especially p. 15.

BNDES and compare it with the benchmark interest rate in Brazil, as a way to get an idea of the cost of capital it would have to pay to fund its operations at market rates. We calculate WACC using the following formula:

$$WACC = \alpha * \frac{\text{debt} + \text{worker funds} + \text{deposits}}{\text{total assets}} + i * \frac{\text{equity} + \text{Treasury's transfers}}{\text{total assets}},$$

where α is the cost of funds calculated using the total cost of debt of all the government funds (worker funds) and the amounts paid for the deposits; and i is an interest rate that reflects the cost of the capital of the funds the government invests in BNDES directly (i.e., the Treasury's transfers) or that it owns as a shareholder (i.e., the actual equity of the bank). We compute WACC using the average actual cost of funds for α and using the Central Bank's Overnight Lending Rate, known as SELIC, as i .

In Figure 5 we plot our estimates of WACC, from 2002 to 2009, against the benchmark interest rate in Brazil. We can see that BNDES has a significantly lower WACC than the benchmark rate by approximately 5% to 10%, on average. BNDES then uses those funds to lend some at a slightly higher rate (with a NIM of 1.4-2.5%) or to invest in bonds or equity.

This lower cost of capital is what allows BNDES to lend at low rates and still make a margin. Yet, one of the most common criticisms of development banks is that their operations may distort financial markets because they do not cover the opportunity cost of their capital. That is, the resources flowing into development banks might otherwise be used to reduce the government debt or for other purposes, perhaps with a higher social rate of return or generating superior social welfare. We cannot perform a complete welfare analysis of the effects of using some of the government and worker's funds in a development bank, because we would have to calculate the returns those funds would have in other uses. What we can assume is that at least those resources should generate something close to the cost of capital for the government (SELIC).

Thus, we can perform a simple counterfactual. How would the net interest margins of BNDES look like if it had to pay the SELIC rate to fund its loan operations? In Figure 6, we can see that if BNDES had to fund its operations using a rate closer to the benchmark rates, the net interest margins would be negative in most years. The difference between the interest rate BNDES charges and SELIC is very close to the difference between TJLP and SELIC. The main difference would be the amounts BNDES charges for loans in foreign currency. In sum, the implicit subsidy in each dollar lent leads BNDES to lose between 5 to 10 cents per dollar in loans.

Therefore, the bank is profitable and manages to get positive net interest margins, mostly because it has an extremely low cost of capital (compared to market rates) and because most of the profits come from its investments. The strategy of allowing negative to low margins in the loan business and covering it with returns on the investment arm makes sense for a development bank if the loans are used to fund projects that would go unfunded (with a high social rate of return). Yet, our evidence points to the fact that BNDES does not seem to be generating such projects and is, thus, having a small impact on the Brazilian economy (at least in terms of capital formation and efficiency). BNDES seems to be subsidizing interest rates for the owners of the beneficiary firms at rate that costs society approximately 5 to 10 cents for every dollar lent.

Concluding Remarks

Our study contributes to the evolving debate on the role of development banks and state-led intervention in credit markets. Our in-depth analysis of Brazil's BNDES, one of the largest development banks in the world, reveals a more nuanced picture of development banks. On the one hand, BNDES does not appear to be systematically picking or bailing out failing firms, and its operations are, to some extent, profitable.

On the other hand, its loans and equity allocations do not affect the performance and investment decisions of our firms in a consistent way—except for a reduction in financial expenses due to the effect of governmental subsidies. We also see that politically-connected firms are also more able to obtain BNDES loans, although this mechanism does not seem to self-select poor performers only: all firms, with good or bad projects, have incentives to attract BNDES funding so as to reduce their financial costs, even in case where their projects would be normally launched using other sources of capital. Therefore, although our results are inconsistent with the industrial policy literature seeing development banks as mechanisms to unlock productive investments through state-led credit, they do not completely support the opposing perspective of development banks as tools to support and rescue failed industrialists.

To be sure, our focus on a single bank calls for more studies on a broader range of countries with distinct institutional characteristics and stages of development. Furthermore, our data on publicly traded companies tap into the largest firms in the country. For instance, small enterprises may be subject of more binding credit constraints and be more positively affected by allocations by development banks. In Chile, for instance, a semi-public organization called Fundación Chile acts as a venture capitalist for innovative start-ups, with well-defined exit strategies after the new firm is launched. Such entrepreneurial role for development financial institutions is not well addressed by the extant literature, and certainly calls for future empirical studies scrutinizing the pros and cons of governmental interventions to fund productive investments.

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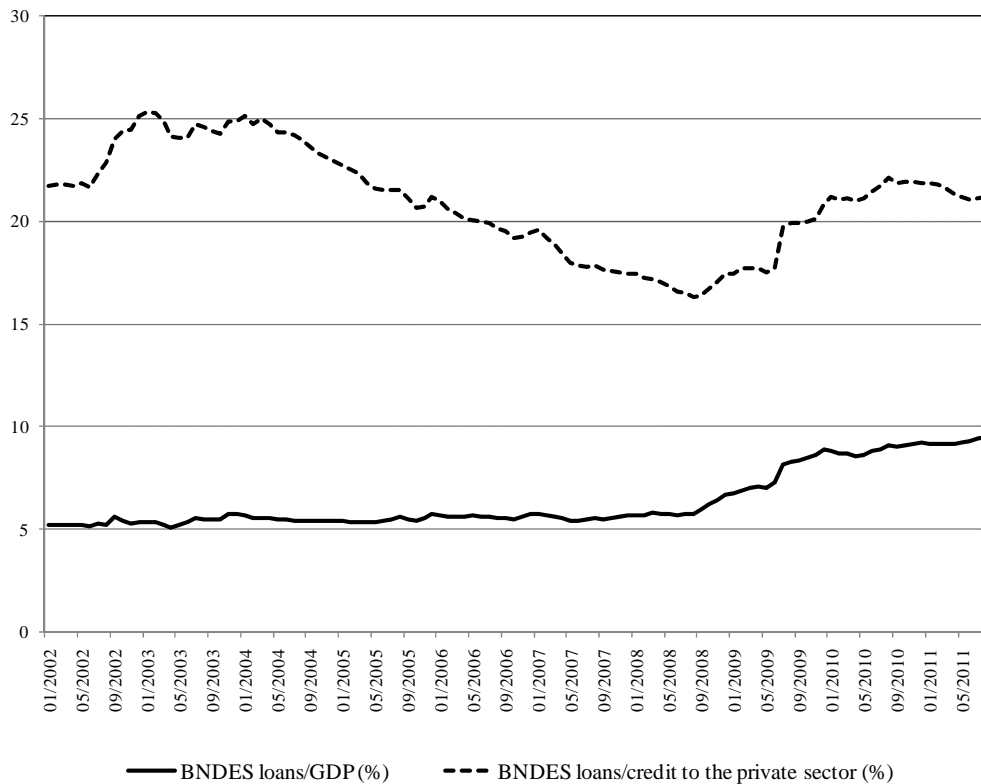


Figure 1
 BNDES: evolution of loans
 Source: Central Bank of Brazil

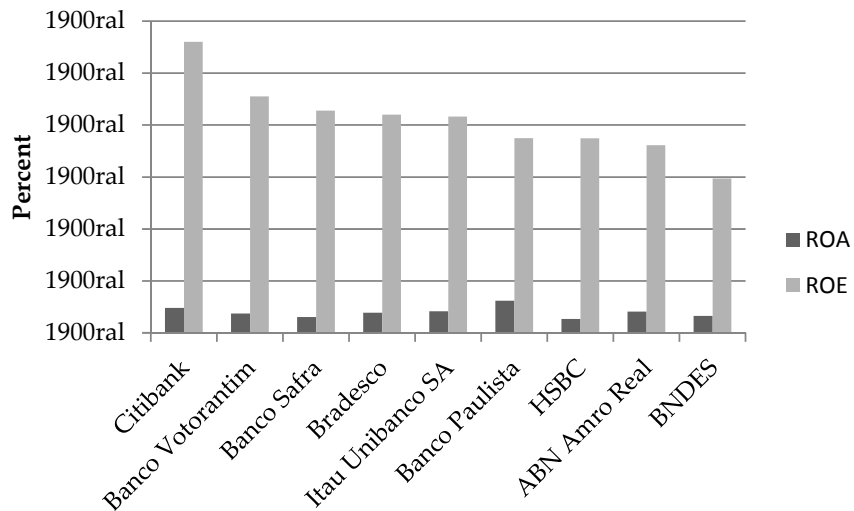


Figure 2
 Return on assets and on equity of some of Brazil's largest banks (average, 1996-2009)
 Source: Bankscope.

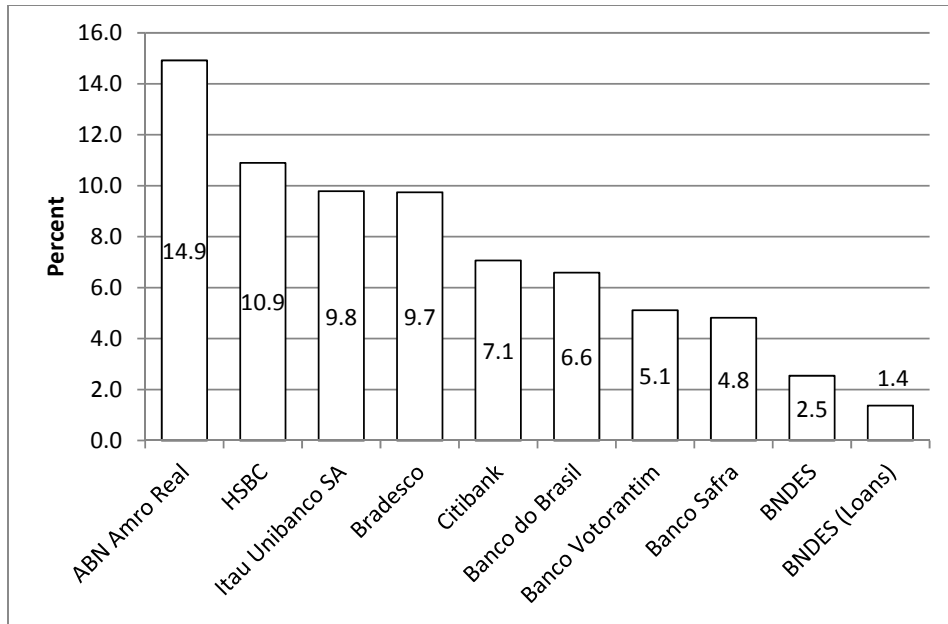


Figure 3

Net interest margins in large banks in Brazil (average, 1996-2009)

Source: All data from Bankscope and BNDES, *Annual Reports*, 1997–2010. Net interest margins calculated with Bankscope’s data as net interest income over earning assets, except for BNDES (loans), which we estimated using data from the detailed P&L’s and balance sheet. The latter NIMs are estimated as interest earnings on loans over total loans minus interest payments and fees over funding (deposits, debt and Treasury transfers).

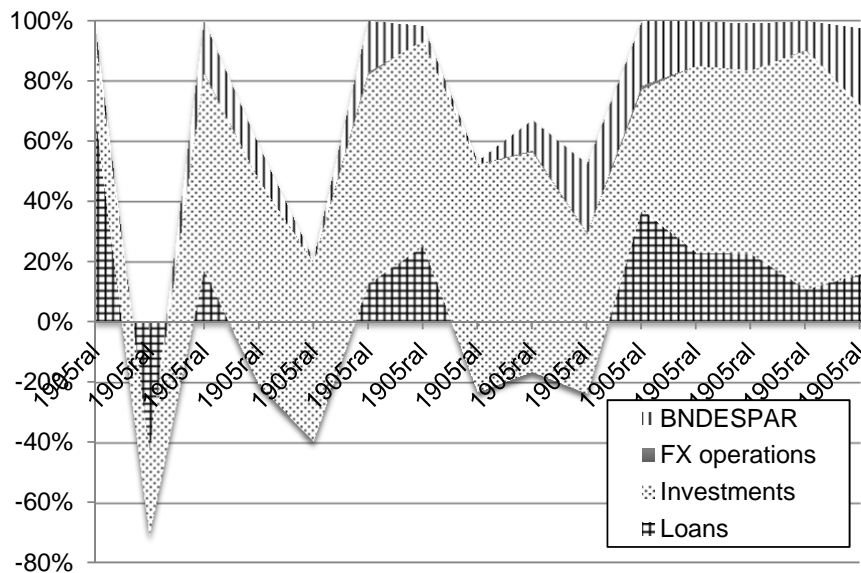


Figure 4

BNDES’s revenues by asset type (in % of total revenues), 1995–2009

Source: BNDES, *Annual Reports*, 1997–2010

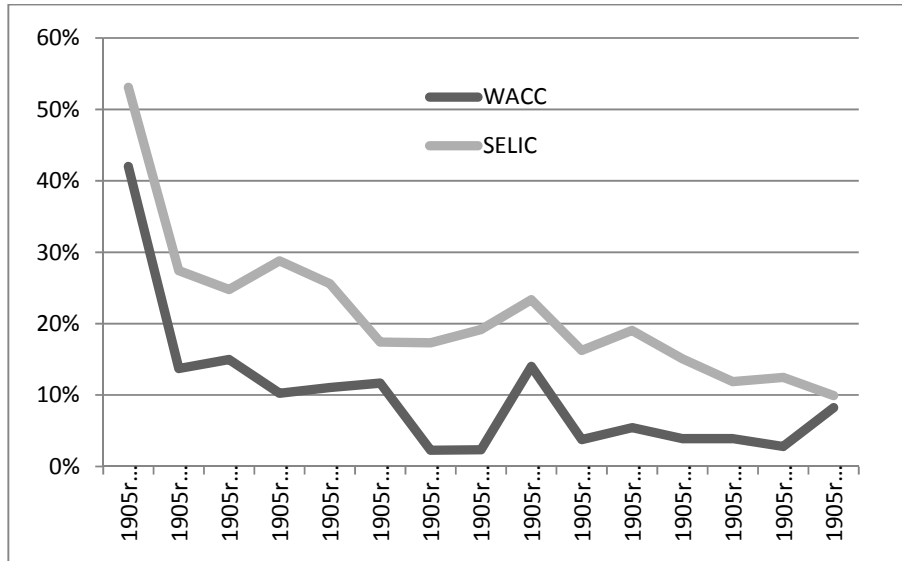


Figure 5

BNDES's cost of capital (WACC) vs. Brazil's benchmark interest rates, 1995–2009
 Source: For the sources and methodology used to estimate the weighted average cost of capital (WACC) for BNDES, see the text. The Central Bank's Overnight Rate (SELIC) comes from the Central Bank's webpage, <http://www.bcb.gov.br/?INTEREST>.

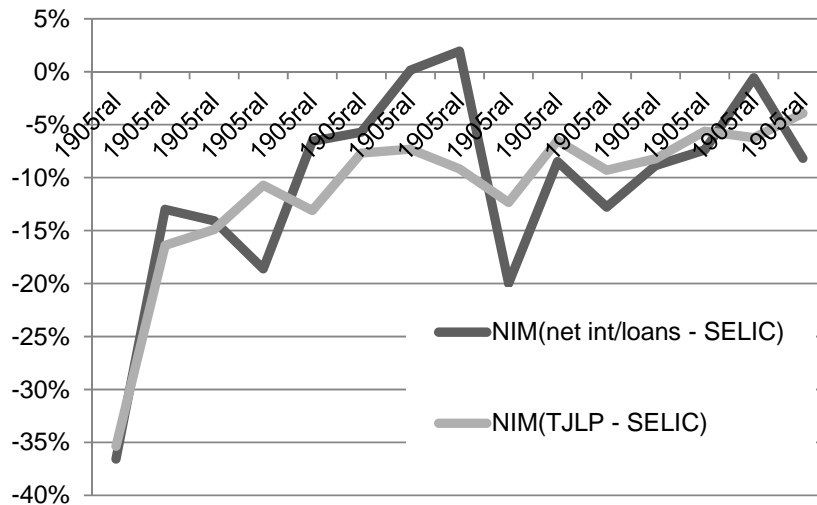


Figure 6

Counterfactual estimate of net interest margins assuming BNDES finances its loan operations at the benchmark rate (SELIC), 1995–2009
 Source: Counterfactual estimates using the average rate on loans (interest income from loans over total loans) minus the SELIC rate. We also show the simple difference of the rate at which BNDES lends (TJLP) minus SELIC as another approximation of actual NIMs. The differences are accounted for gains/losses in exchange rate transactions and fees. Data from BNDES, *Annual Reports*, 1997–2010 and the Central Bank's webpage, <http://www.bcb.gov.br/?INTEREST>.

Table 1
Comparison of selected development banks (2010)

	BNDES (Brazil)	IDB	World Bank	KDB (Korea)	KfW (Germany)
Total assets (US\$ bi)	330.4	87.2	428.3	123.3	591.4
Equity (US\$ bi)	39.7	21	165.8	17.3	21.2
Profit (US\$ bi)	6	0.3	1.7	1.4	3.5
Total loans (US\$ bi)	101.4	10.3	26.3	n.a.	n.a.
Size of staff	2,982	~2,000	~10,000	2,266	4,531
Return on equity (%)	15.1	1.4	1.0	8.1	16.5
Return on assets (%)	1.8	0.3	0.4	1.1	0.6
Profits per employee	2	~0.2	~0.2	0.6	0.8
Assets/equity	8.3	4.2	2.6	7.1	28
Assets (US\$ mi) per employee	110.8	43.6	42.8	54.4	130.5

Source: based on Torres Filho (2009), with updated information from the banks' annual reports.

Table 2
BNDES' participation in the firms included in the database

Year	Firms with BNDES loans		Firms with BNDES equity	
	Number of firms	BNDES as a % of debt	Number of firms	BNDES as a % of equity
2002	115	25.2%	13	17.0%
2003	109	30.1%	12	17.6%
2004	102	31.7%	12	14.4%
2005	96	31.1%	17	15.4%
2006	95	31.4%	20	13.0%
2007	114	31.8%	25	12.3%
2008	128	28.7%	28	13.3%
2009	128	32.9%	31	13.2%
Mode	112	31.2%	19	13.9%

Table 3
Summary statistics and description of variables

Variable	Description	Mean [std. dev.]	Min	Max
<i>Performance, investment</i>				
ROA	Net profit divided by total assets	0.025 [0.118]	-0.464	0.308
EBITDA/assets	Operational profit (net of taxes, depreciation and interests) to total assets	0.106 [0.138]	-0.377	0.403
Tobin's q	Market value of stocks plus debt divided by total assets	1.546 [1.647]	0.062	4.831
Finex/debt	Financial expenses (loan payments) divided by total debt	0.303 [0.204]	0.000	0.994
Capex/assets	Capital expenditures divided by total assets	0.073 [0.092]	0.000	0.998
Investments/assets	Investments as reported in the balance sheet divided by total assets	0.257 [0.303]	0.000	1.000
<i>BNDES financing</i>				
Ln(BNDES loans)	Logarithmic value of BNDES loans reported in the balance sheet (1,000 US\$)	7.479 [4.731]	0.000	16.781
Ln(BNDES equity)	Logarithmic value of BNDES equity (% participation times book value of equity, 1000 US\$)	2.988 [0.000]	0.000	16.205
%BNDES loans	BNDES loans divided by total loans	0.244 [0.271]	0.000	1.000
%BNDES equity	BNDES equity divided by total equity	0.011 [0.049]	0.000	0.450
<i>Political variables</i>				
Donations	Number of candidates receiving donations by the firm in the last election	5.814 [17.972]	0	171
Donations for winners	Number of candidates who received donations and won the last election	3.320 [10.130]	0	89
Donations for losers	Number of candidates who received donations and lost the last election	2.488 [8.119]	0	82
Donations for winners – losers	Donations for winners minus donations for losers	0.832 [3.748]	-8	38
<i>Controls</i>				
Belongs to a group	Dummy variable coded 1 if the firm belongs to a business group	0.473 [0.499]	0	1
Ln(assets)	Logarithmic value of total assets (1,000 US\$)	12.636 [1.686]	1.386	19.015
Leverage	Total debt divided by total assets	0.186 [0.174]	0.000	0.957
Fixed	Fixed assets divided by total assets	0.293 [0.248]	0.000	0.995
Foreign	Dummy variable coded 1 if the firm is foreign-controlled	0.200 [0.400]	0	1

Table 4
Summary of hypothesized effects

	Industrial policy view	Political view
Effect of BNDES on firm-level performance (ROA, EBITDA/assets, Tobin's q, Finex/debt)	Positive (including, but not only, through a reduction in financial expenses).	If any, only through a reduction in financial expenses due to subsidies.
Effect of BNDES on investments (Capex/assets, Investment/assets)	Positive, perhaps with larger effect due to BNDES equity.	Null.
Determinants of selection: factors affecting BNDES allocations (loans, equity)	No particular effect; BNDES may revamp firms with good performance ("national champions") or select good firms to guarantee repayment. Alternatively, BNDES may not take into consideration past performance if the bank wants to stimulate firms with latent advantages.	Effect of firm-level performance on selection: negative (bailing out failing firms). Effect of political connections: positive.

Table 5
Mean comparison tests

Variable	Firm was observed with BNDES loans?		Firm was observed with BNDES equity?	
	No	Yes	No	Yes
ROA	0.039 [0.008] <i>N</i> = 290	0.056* [0.003] <i>N</i> = 887	0.050 [0.003] <i>N</i> = 1407	0.041 [0.009] <i>N</i> = 158
EBITDA/assets	0.088 [0.009] <i>N</i> = 290	0.131*** [0.004] <i>N</i> = 887	0.124 [0.004] <i>N</i> = 1407	0.093*** [0.010] <i>N</i> = 158
Tobin's q	1.838 [0.100] <i>N</i> = 290	1.675† [0.051] <i>N</i> = 887	1.796 [0.043] <i>N</i> = 1407	1.252*** [0.076] <i>N</i> = 158
Finex/assets	0.328 [0.020] <i>N</i> = 129	0.265*** [0.007] <i>N</i> = 689	0.289 [0.006] <i>N</i> = 993	0.255* [0.017] <i>N</i> = 112
Capex/assets	0.069 [0.008] <i>N</i> = 273	0.078† [0.003] <i>N</i> = 852	0.073 [0.003] <i>N</i> = 1333	0.076 [0.008] <i>N</i> = 153
Investments/assets	0.292 [0.020] <i>N</i> = 290	0.263† [0.010] <i>N</i> = 887	0.262 [0.008] <i>N</i> = 1407	0.363*** [0.025] <i>N</i> = 158
Ln(assets)	12.287 [0.107] <i>N</i> = 290	13.119*** [0.053] <i>N</i> = 887	12.621 [0.044] <i>N</i> = 1407	14.093*** [0.167] <i>N</i> = 158

† $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ (one-tailed mean comparison tests). Standard errors in brackets.

Table 6
Effect of BNDES loans and equity on firm-level performance variables: fixed effect regressions

	ROA		EBITDA/assets		Tobin's q		
Ln(BNDES loans) _t	0.000 [0.002]	-0.002 [0.002]	0.002 [0.002]	-0.003 [0.003]	-0.021 [0.016]	0.014 [0.021]	
Ln(BNDES loans) _{t-1}		0.001 [0.003]		0.002 [0.003]		-0.040 [0.029]	
Ln(BNDES loans) _{t-2}		-0.001 [0.003]		-0.004 [0.003]		0.008 [0.031]	
Ln(BNDES equity) _t	0.001 [0.002]	-0.002 [0.002]	-0.001 [0.003]	-0.004 [0.003]	-0.014 [0.019]	-0.006 [0.020]	
Ln(BNDES equity) _{t-1}		-0.001 [0.004]		0.001 [0.004]		-0.044 [0.031]	
Ln(BNDES equity) _{t-2}		0.004 [0.005]		0.003 [0.005]		0.029 [0.026]	
%BNDES loans _t		0.020 [0.022]	0.018 [0.026]	0.025 [0.022]	0.025 [0.031]	-0.133 [0.249]	0.114 [0.321]
%BNDES loans _{t-1}			0.038 [0.029]		0.029 [0.036]		-0.169 [0.232]
%BNDES loans _{t-2}			-0.011 [0.027]		-0.013 [0.029]		0.013 [0.191]
%BNDES equity _t		0.030 [0.181]	-0.092 [0.151]	0.033 [0.201]	-0.158 [0.187]	-0.343 [0.795]	1.372 [1.183]
%BNDES equity _{t-1}			-0.07 [0.272]		0.069 [0.259]		-1.763 [1.467]
%BNDES equity _{t-2}			0.315 [0.367]		0.187 [0.385]		0.912 [2.379]

Belongs to a group	0.018	-0.145***	0.016	-0.137***	-0.004	-0.161***	0.003	-0.148***	-0.017	0.011	-0.009	0.048
	[0.057]	[0.033]	[0.058]	[0.035]	[0.053]	[0.031]	[0.054]	[0.039]	[0.525]	[0.152]	[0.517]	[0.135]
Ln(Assets)	0.072**	0.103*	0.079**	0.113*	0.063**	0.090*	0.063*	0.091*	-0.086	0.080	-0.229	-0.104
	[0.022]	[0.042]	[0.029]	[0.044]	[0.023]	[0.039]	[0.031]	[0.040]	[0.249]	[0.364]	[0.310]	[0.349]
Leverage	-0.223***	-0.236***	-0.212***	-0.228***	-0.160**	-0.144**	-0.140*	-0.150**	0.451	0.159	0.378	0.132
	[0.047]	[0.055]	[0.050]	[0.055]	[0.053]	[0.051]	[0.056]	[0.050]	[0.684]	[0.628]	[0.716]	[0.605]
Fixed	-0.043	-0.051	-0.043	0.002	-0.001	0.022	-0.019	0.081	0.868	0.242	1.277	0.273
	[0.056]	[0.080]	[0.060]	[0.088]	[0.070]	[0.085]	[0.070]	[0.085]	[0.839]	[0.907]	[0.867]	[1.049]
Foreign	0.052	0.033	0.050	0.035	0.046	0.042	0.046	0.047	0.006	-0.467*	0.065	-0.373†
	[0.046]	[0.026]	[0.046]	[0.032]	[0.047]	[0.039]	[0.047]	[0.049]	[0.547]	[0.192]	[0.551]	[0.192]
Fixed effects												
Firm	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry-year	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>N</i> (total)	1,177	600	1,102	553	1,177	600	1,102	553	1,177	600	1,102	553
<i>N</i> (firms)	266	172	252	161	266	172	252	161	266	172	252	161
<i>R</i> ² (within)	0.451	0.563	0.468	0.588	0.410	0.577	0.434	0.621	0.347	0.389	0.354	0.371
<i>p</i> (<i>F</i> test)	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

† $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$. Robust standard errors in brackets, clustered on each firm.

Table 7

Effect of BNDES loans and equity on firm-level financial expenses, capital expenditures and investments: fixed effect regressions

	Finex/debt		Capex/assets			Investments/assets	
Ln(BNDES loans) _t	-0.006*	-0.013*	0.002	0.004*	0.003	-0.004	
	[0.003]	[0.005]	[0.001]	[0.002]	[0.003]	[0.005]	
Ln(BNDES loans) _{t-1}		0.005		-0.001		0.004	
		[0.006]		[0.002]		[0.006]	
Ln(BNDES loans) _{t-2}		-0.001		-0.004		-0.001	
		[0.006]		[0.002]		[0.004]	
Ln(BNDES equity) _t	-0.001	0.001	-0.002	-0.003	-0.003	0.005	
	[0.004]	[0.006]	[0.002]	[0.003]	[0.004]	[0.004]	
Ln(BNDES equity) _{t-1}		-0.014		0.001		0.001	
		[0.009]		[0.002]		[0.002]	
Ln(BNDES equity) _{t-2}		0.003		-0.001		-0.006	
		[0.007]		[0.002]		[0.004]	
%BNDES loans _t		0.005	0.101	-0.032†	0.000	0.001	-0.044
		[0.050]	[0.065]	[0.017]	[0.021]	[0.032]	[0.043]
%BNDES loans _{t-1}			-0.124**		-0.007		-0.025
			[0.047]		[0.024]		[0.027]
%BNDES loans _{t-2}			0.093		-0.063		-0.017
			[0.069]		[0.061]		[0.031]
%BNDES equity _t		-0.099	0.277	-0.045	-0.135	-0.164	-0.071
		[0.306]	[0.352]	[0.147]	[0.284]	[0.226]	[0.249]
%BNDES equity _{t-1}			-2.100***		-0.003		0.164
			[0.496]		[0.120]		[0.109]
%BNDES equity _{t-2}			-0.171		-0.135		-0.531

				[1.704]				[0.204]				[0.329]
Belongs to a group	-0.080	0.031	-0.078	0.063	0.045*	-0.007	0.053*	-0.010	-0.036	0.002	-0.034	0.001
	[0.054]	[0.059]	[0.059]	[0.069]	[0.020]	[0.027]	[0.022]	[0.028]	[0.045]	[0.052]	[0.048]	[0.046]
Ln(Assets)	0.067†	0.113*	0.061	0.114*	0.006	0.027	0.000	0.028	-0.058	-0.045	-0.099†	-0.046
	[0.039]	[0.054]	[0.041]	[0.050]	[0.023]	[0.031]	[0.025]	[0.036]	[0.046]	[0.095]	[0.059]	[0.094]
Leverage	-0.483***	-0.596***	-0.500***	-0.613***	0.001	-0.015	0.005	-0.016	-0.015	0.147	0.020	0.095
	[0.091]	[0.155]	[0.089]	[0.143]	[0.043]	[0.056]	[0.040]	[0.058]	[0.083]	[0.100]	[0.084]	[0.108]
Fixed	-0.074	-0.334†	-0.044	-0.186	0.04	-0.059	0.037	-0.069	-0.768***	-0.832***	-0.794***	-0.960***
	[0.091]	[0.171]	[0.086]	[0.148]	[0.050]	[0.123]	[0.049]	[0.148]	[0.165]	[0.203]	[0.173]	[0.202]
Foreign	0.002	-0.041	0.009	-0.035	-0.002	-0.021	-0.003	-0.022	0.009	-0.025	0.008	-0.026
	[0.044]	[0.034]	[0.052]	[0.052]	[0.011]	[0.019]	[0.016]	[0.024]	[0.030]	[0.027]	[0.030]	[0.021]
Fixed effects												
Firm	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry-year	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>N</i> (total)	818	422	807	416	1,125	582	1,057	539	1,177	600	1,102	553
<i>N</i> (firms)	211	130	207	129	257	168	244	158	266	172	252	161
<i>R</i> ² (within)	0.530	0.613	0.515	0.580	0.314	0.397	0.314	0.413	0.451	0.520	0.472	0.556
<i>p</i> (<i>F</i> test)	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

† $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$. Robust standard errors in brackets, clustered on each firm.

Table 8
Determinants of BNDES' loans: fixed effect regressions

	Ln(BNDES loans)		%BNDES loans	
ROA _t	0.924		0.195†	
	[1.459]		[0.114]	
ROA _{t-1}	2.868†		0.141	
	[1.663]		[0.118]	
ROA _{t-2}	0.676		0.178†	
	[1.535]		[0.107]	
EBITDA/assets _t	1.566		0.139	
	[1.087]		[0.106]	
EBITDA/assets _{t-1}	2.734*		0.051	
	[1.369]		[0.104]	
EBITDA/assets _{t-2}	0.947		0.089	
	[1.523]		[0.094]	
Tobin's q _t		-0.064		0.001
		[0.081]		[0.006]
Tobin's q _{t-1}		-0.01		-0.003
		[0.068]		[0.008]
Tobin's q _{t-2}		0.048		0.000
		[0.073]		[0.008]
Donations		0.000		0.000
		[0.008]		[0.001]
Donations for winners		0.170**		0.015**
		[0.062]		[0.005]
Donations for losers		-0.147**		-0.013**
		[0.049]		[0.004]

Donations for winners - losers						0.146**						0.013**
						[0.051]						[0.004]
Belongs to a group	-0.582	-0.638	-0.460	-0.188	-0.198	-0.199	0.047	0.048	0.053	0.045	0.042	0.042
	[1.611]	[1.590]	[1.764]	[1.369]	[1.359]	[1.360]	[0.080]	[0.085]	[0.091]	[0.094]	[0.093]	[0.093]
Ln(assets)	0.194	0.299	0.552	0.278	0.347	0.334	-0.038	-0.011	0.007	0.004	0.009	0.007
	[0.767]	[0.696]	[0.626]	[0.600]	[0.591]	[0.589]	[0.063]	[0.061]	[0.059]	[0.046]	[0.045]	[0.045]
Leverage	5.793***	5.497***	5.107***	4.512***	4.339***	4.381***	-0.139	-0.190	-0.217†	-0.234†	-0.251*	-0.247†
	[1.681]	[1.535]	[1.470]	[1.220]	[1.195]	[1.191]	[0.132]	[0.127]	[0.129]	[0.128]	[0.126]	[0.126]
Fixed	-1.375	-1.32	-1.472	-3.778	-4.121	-4.060	0.036	0.027	0.022	0.025	-0.008	-0.002
	[3.431]	[3.402]	[3.351]	[2.962]	[2.912]	[2.915]	[0.182]	[0.181]	[0.187]	[0.147]	[0.139]	[0.141]
Foreign	-1.861	-1.866	-1.666	-1.445	-1.491	-1.484	0.013	0.023	0.032	0.007	0.003	0.004
	[1.996]	[1.983]	[2.032]	[1.922]	[1.918]	[1.918]	[0.112]	[0.115]	[0.115]	[0.119]	[0.120]	[0.120]
Fixed effects												
Firm	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry-year	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>N</i> (total)	918	918	918	978	978	978	855	855	855	921	921	921
<i>N</i> (firms)	216	216	216	235	235	235	205	205	205	225	225	225
<i>R</i> ² (within)	0.332	0.337	0.325	0.291	0.301	0.300	0.369	0.363	0.358	0.306	0.319	0.318
<i>p</i> (<i>F</i> test)	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

† $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$. Robust standard errors in brackets, clustered on each firm.

Table 9
Determinants of BNDES' equity: fixed effect regressions

	Ln(BNDES equity)		%BNDES equity	
ROA _t	-0.497		0.005	
	[0.788]		[0.011]	
ROA _{t-1}	-0.615		0.004	
	[1.006]		[0.015]	
ROA _{t-2}	0.089		-0.010	
	[1.287]		[0.013]	
EBITDA/assets _t	0.190		0.007	
	[0.680]		[0.009]	
EBITDA/assets _{t-1}	-0.723		-0.001	
	[0.954]		[0.014]	
EBITDA/assets _{t-2}	0.238		-0.011	
	[1.046]		[0.012]	
Tobin's q _t		-0.028		0.000
		[0.027]		[0.000]
Tobin's q _{t-1}		-0.039		0.000
		[0.037]		[0.001]
Tobin's q _{t-2}		-0.002		0.000
		[0.035]		[0.001]
Donations		-0.021		-0.001
		[0.036]		[0.000]
Donations for winners		0.042		0.000
		[0.075]		[0.001]
Donations for losers		-0.079		-0.001
		[0.070]		[0.001]

Donations for winners - losers						0.069 [0.069]						0.001 [0.001]
Belongs to a group	-0.2 [0.366]	-0.26 [0.331]	-0.274 [0.350]	-0.198 [0.333]	-0.234 [0.322]	-0.243 [0.315]	-0.007 [0.007]	-0.006 [0.007]	-0.005 [0.007]	-0.006 [0.006]	-0.006 [0.005]	-0.006 [0.005]
Ln(assets)	0.263 [0.328]	0.227 [0.329]	0.232 [0.288]	0.586 [0.472]	0.571 [0.460]	0.536 [0.451]	0.005 [0.006]	0.005 [0.005]	0.005 [0.005]	0.013† [0.007]	0.013† [0.007]	0.012 [0.007]
Leverage	0.244 [0.858]	0.363 [0.866]	0.367 [0.881]	-1.048 [1.492]	-1.032 [1.499]	-1.065 [1.502]	0.005 [0.016]	0.004 [0.017]	0.004 [0.018]	-0.022 [0.023]	-0.022 [0.023]	-0.023 [0.023]
Fixed	0.433 [1.192]	0.447 [1.218]	0.537 [1.204]	0.083 [1.363]	-0.068 [1.305]	-0.167 [1.310]	0.028 [0.022]	0.029 [0.022]	0.029 [0.022]	0.008 [0.021]	0.006 [0.021]	0.003 [0.021]
Foreign	1.228 [1.134]	1.209 [1.117]	1.159 [1.156]	1.126 [1.117]	1.16 [1.103]	1.151 [1.073]	0.028 [0.024]	0.028 [0.023]	0.027 [0.024]	0.023 [0.022]	0.024 [0.022]	0.023 [0.021]
Fixed effects												
Firm	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry-year	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>N</i> (total)	1,213	1,213	1,213	1,243	1,243	1,243	1,213	1,213	1,213	1,243	1,243	1,243
<i>N</i> (firms)	267	267	267	286	286	286	267	267	267	286	286	286
<i>R</i> ² (within)	0.338	0.338	0.337	0.286	0.289	0.286	0.168	0.169	0.167	0.16	0.163	0.137
<i>p</i> (<i>F</i> test)	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

† $p < 0.10$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$. Robust standard errors in brackets, clustered on each firm.