Leviathan Evolving:
New Varieties of State Capitalism
in Brazil and Beyond

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1. Introduction

In May 2007, the relatively unknown Brazilian firm JBS acquired Colorado-based Swift & Co for $1.4 billion and suddenly became the largest beef processing company in the world. Two years later, in September 2009, JBS made another surprising move by acquiring Pilgrim’s Pride, an iconic American meat processing firm, for $2.8 billion. Where had a rather unknown Brazilian firm gotten the funds to finance such acquisitions? The answer was simple. The Brazilian National Development Bank (known in Portuguese as BNDES) had singled out JBS as a “national champion” and provided funding to make it a dominant player in the global beef and poultry market. Thanks to its $4 billion investments in JBS, BNDES eventually controlled 30.4 percent of the firm’s shares, becoming its largest minority shareholder and, in turn, a minority shareholder of both Swift and Pilgrim’s Pride.¹ These transactions, like many others conducted by governments and development banks around the world, raised interesting questions. When should BNDES support Brazilian firms? Should it support them by becoming a minority shareholder? What are the implications of such investments for these firms and for Brazil as a whole?

¹ For further details of JBS’s acquisitions, see Bell and Ross (2008). For a discussion of BNDES’s support for JBS, see Almeida (2009).
In July 2010, while the JBS story was unfolding in Brazil, a consortium of investment banks on the other side of the world launched the initial public offering (IPO) of Agricultural Bank of China (ABC) on the Shanghai and Hong Kong stock exchanges. ABC had traditionally been a “policy bank”; that is, a bank that lent according to the interests of leaders of the Chinese Communist Party. As a result, by 2008, over 25 percent of its loans were nonperforming. The government had bailed out the bank, cleaned up its balance sheet, and revamped its processes and governance before the IPO, but it was not clear if those measures would be enough to keep the government’s “grabbing hand” at bay.2

Nevertheless, investor interest was enormous. This was the largest IPO in the world at the time; it raised almost $22 billion for shares—15 percent of the firm’s capital—and share value rose to almost 30 percent above the issuing price in a couple of months. Yet it was not clear if the investors who bought the shares knew what they were getting into. Were they misguided? Could the Chinese government be trusted as a majority shareholder?

In both cases, investors were faced with something that was clearly state capitalism, but was clearly not the state capitalism they were used to. In this book, we study the rise of these new forms of state capitalism in which the state works hand in hand with private investors in novel governance arrangements. We define state

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2 The term “grabbing hand” comes from Shleifer and Vishny (1998) and represents the idea that governments or bureaucrats run state-owned enterprises for political objectives rather than to solve market failures or to make profits.
capitalism as the widespread influence of the government in the economy, either by owning majority or minority equity positions in companies or by providing subsidized credit and/or other privileges to private companies. The new varieties of state capitalism differ from the more traditional model in which governments own and manage state-owned enterprises (SOEs)\(^3\) which are extensions of the public bureaucracy. We refer to this traditional model as *Leviathan as an entrepreneur*.

We identify two new models of state capitalism that go beyond the Leviathan as an entrepreneur model.\(^4\) In the *Leviathan as a majority investor* model, as in the example of Agricultural Bank of China, the state is still the controlling shareholder but SOEs have distinct governance traits that allow for the participation of private investors. In the *Leviathan as a minority investor* model, state capitalism adopts a more hybrid form in which the state relinquishes control of its enterprises to private investors but remains present through minority equity investments by pension funds, sovereign wealth funds, and the government itself. In the latter model, we also include the provision of loans to

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\(^3\) We conceptualize SOEs as *enterprises*; that is, they produce and sell goods and services. Such companies should be distinguished from government entities in charge of providing public services (such as courts, the police, social security, and national health services), which often do not have a corporate form and depend directly on orders from government officials.

\(^4\) Our work thus contributes to the evolving literature on the varieties of capitalism (Hall & Soskice, 2001; Schneider & Soskice, 2009) by introducing a taxonomy of the ways in which states intervene in the management of firms. That is, we are concerned with variation in ownership and corporate governance at the firm level, while the literature on varieties of capitalism examines the coordination of economies as a whole—the connections between governments, firms, and labor. This literature has paid little attention to state ownership, despite the fact that some of the largest firms in OECD countries still have the government as a shareholder. One exception is Gourevitch and Shinn (2005), who explicitly link the active role of governments as investors in publicly traded firms to greater coordination among economic actors.
private firms by development banks and other state-owned financial institutions. In our view, then, the rise of national champions such as JBS, whose expansion was based on subsidized capital from its home government, is a manifestation of the Leviathan as a minority investor model.

The examples of Agricultural Bank of China and JBS are by no means curious exceptions. By some calculations, firms under government control account for one-fifth of the world’s total stock market capitalization. In Italy, for example, SOEs listed on the stock exchange (both majority- and minority-owned by the government) account for over 20 percent of stock market capitalization. In Greece, this figure is 30 percent, while in the Netherlands and Sweden it is closer to 5 percent (OECD, 2005; p. 35). In large markets, such as Russia and Brazil, companies controlled by the government or in which the government has a significant stake dominate trading and they account for between 30 and 40 percent of market capitalization. In China, companies controlled by the government account for over 60 percent of stock market capitalization. Furthermore, in our analysis of SOEs in myriad emerging countries (see Chapter 2), the Leviathan as a minority investor model is prevalent and covers about 20-30 percent of

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5 See, for instance, the discussion in The Economist’s special issue on state capitalism (Wooldridge, 2012).
7 We made these calculations using Capital IQ data on market capitalization and ownership and then tracing ultimate ownership. That is, for each firm, we trace who is the controlling shareholder and, if it is a company, we then track the ultimate ownership of that company. In China, SASAC and other state holding companies are the ultimate owners and controllers of much of the stock market; in India, the government and Life Insurance Corporation own equity in hundreds of firms; in Brazil, the government has direct stakes in some companies and uses its development bank, BNDES, to control others; in Russia, the government uses its flagship SOEs to own other firms. See Chapter 2 for some examples.
the companies in which the government has equity (the rest being majority-owned SOEs).

Thus, it is very likely, then, that global investors will have to at least consider SOEs as potential investment targets. In fact, nine of the 15 largest IPOs in the world between 2005 and 2012 were sales of minority equity positions by SOEs, most of them from developing countries.\(^8\) One of the reasons why investors do not mind buying these securities is that governments share rents with them, which has often led to high returns. For instance, according to a report from Morgan Stanley, the stock returns of publicly traded SOEs from Europe, the Middle East, Africa, and Latin America between 2001 and 2012 “generated superior returns vs. [the] benchmark [indices].”\(^9\)

Moreover, the firms that we study are by no means small. SOEs are typically among the largest publicly traded firms in the stock markets of developing countries. In fact, large SOEs have also become some of the most profitable firms in the world. The number of SOEs among the 100 largest companies in the *Fortune* Global 500 list, which ranks companies by revenues, went from 11 in 2005 to 25 in 2010. In 2005, there were no SOEs among the top 10, but by 2010, there were four—Japan Post Holdings, Sinopec

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\(^8\) Among the largest transactions were the IPOs of Agricultural Bank of China, which raised $22.1 billion, and Industrial and Commercial Bank of China, which raised $21.9 billion, and the secondary issue of shares of Petrobras, which on paper raised $70 billion. For the IPO list, see “State capitalism’s global reach: New masters of the universe. How state enterprise is spreading,” *The Economist*, January 21, 2012. For details of the Petrobras offer, see (Dwyer, 2011).

and China National Petroleum (two of China’s national oil companies), and State Grid (a Chinese utility).  

Still, many observers view the rise of new forms of state capitalism with apprehension. Bremmer (2010) raises concerns because state capitalism, in his view, is “a system in which the state functions as the leading economic actor and uses markets primarily for political gain” (Bremmer, 2010, p. 5). A Harvard Business School summit of founders and CEOs of some of the world’s top companies identified state capitalism and its support for national champions among the 10 most important threats to market capitalism (Bower, Leonard, & Paine, 2011). Managers of private firms often complain when they find their competitors heavily supported or subsidized by local governments.

Not all investors and policy makers feel such apprehension (Amatori, Millward, & Toninelli, 2011), but for many, the concerns stem from the large theoretical and empirical literature showing that, on average, SOEs are less efficient than their private counterparts (see, for a review, Megginson & Netter, 2001). In this literature there are three broad explanations for the inefficiency of state ownership. According to the agency view, SOEs are inefficient because their managers lack high-powered incentives and proper monitoring, either from boards of directors or from the market, or simply

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11 Under certain conditions, firms with state ownership or control perform as well as private firms or even better; for example, when firms face competitive environments (Bartel & Harrison, 2005). Also, SOEs seem to perform as well as private firms do when they follow the management and corporate governance practices of private firms (Kole & Mulherin, 1997).
because they were poorly selected in the first place (Boardman & Vining, 1989; La Porta & López-de-Silanes, 1999; Vickers & Yarrow, 1988). According to the social view, SOEs have social objectives that sometimes conflict with profitability. For example, they may be charged with maximizing employment or opening unprofitable plants in poor areas (Bai & Xu, 2005; Shirley & Nellis, 1991). According to the political view, the sources of inefficiency lie in the fact that politicians use SOEs for their personal benefit or to benefit politically connected capitalists. Additionally, managers of large SOEs commonly face low pressure to perform because they know the government will bail them out if they drive their firms to bankruptcy (Boycko, Shleifer, & Vishny, 1996; Kornai, 1979; Shleifer & Vishny, 1998; Vickers & Yarrow, 1988).

In contrast, defenders of the industrial policy view see state investment as a way to solve market failures. In this view, governments should help firms develop new capabilities, either by reducing capital constraints (Cameron, 1967; Gerschenkron, 1962; Yeyati, Micco, & Panizza, 2004), by reducing the costs of research and development, or by coordinating resources and firms to pursue new projects with high spillovers (Amsden, 2001; Evans, 1995; Rodrik, 2007).

Our book is not about whether one view is right and the others wrong; nor is it a test of whether private firms are more efficient than SOEs. This book is about understanding (a) how the world ended up with new forms of state capitalism and (b) the circumstances in which these new forms overcome some of the problems highlighted by the literature and solve a host of market failures that thwart
development. Although each chapter proposes and tests explicit hypotheses related to different views of the role of SOEs, the book as a whole is about the nuances of state intervention and the conditions that make such intervention either more or less effective.

Furthermore, we are not trying to argue that privatization is not a desirable policy. We think, nonetheless, that the push back against full-fledged privatization in large developed and developing markets makes the study of the new forms of state capitalism relevant. That is, even if the new forms of state ownership we study are a second best solution from the point of view of economic efficiency, they are a solution that is politically more acceptable. They are also relevant if we consider that in emerging markets governments have encountered strong political opposition to sweeping programs of privatization. Shirley (2005) shows that, in Latin America, the popular rejection of privatization increased between the 1990s and the early 2000s. In BRIC countries, privatization programs have almost stopped in Brazil and India and have been proceeding at a gradual pace in China and Russia, with those governments now preferring to privatize only a small share of equity in their large SOEs.

Finally, we also do not claim that the new varieties of state capitalism are universally better than the previous varieties. We explicitly warn that the new varieties also have limits when it comes to taming the government’s temptation to intervene politically in a firm. In the model in which Leviathan is a majority investor, for instance, the government is still a controlling shareholder and, absent checks and balances, it
may be drawn to intervene in strategic sectors such as energy, mining, and utilities. In
the model in which Leviathan is a minority shareholder, equity investments or loan
disbursements may actually benefit politically connected capitalists rather than
financially constrained firms.

The Reinvention of State Capitalism

For some observers, the rise of state capitalism to the forefront of global markets
is a consequence of the global financial crisis that started in 2008. Bremmer (2010), for
instance, sees that crisis as a shock that led to an alarming reemergence of state
capitalism. Part of the concern comes from the fact that, even in a liberal economy such
as the United States, the crisis led the government to bail out firms such as General
Motors and AIG, a large insurance group, becoming a minority shareholder of the
former and a majority shareholder of the latter. As the examples of Agricultural Bank of
China and JBS illustrate, however, state capitalism was alive and kicking—and even
expanding—before the crisis (Amatori et al., 2011; Bortolotti & Faccio, 2009). Firms
owned and operated by the government were privatized en masse in the 1980s, 1990s,
and early 2000s, but state ownership and influence in those firms continued.

State capitalism peaked in the middle of the 1970s when European governments
nationalized firms in large numbers. Around the same time, governments in developing
countries either nationalized firms or created (and then owned) tens or hundreds of
new ones. As a consequence, by the end of the 1970s, SOE output to GDP reached 10
percent in mixed economies and close to 16 percent in developing countries.
Then, between the 1970s and the turn of the twenty-first century, governments transformed the way in which they owned and managed firms. In the 1980s, governments and multilateral agencies experimented with reforms in SOEs to try to reduce the financial hardship both state-owned firms and governments themselves were facing. Officials tried corporate governance reforms, performance contracts for firms and managers, and training programs for SOE executives (Gómez-Ibañez, 2007; Shirley, 1999).

Yet, these attempts were futile and the political cost of privatization started to look small compared to the losses SOEs were facing. For instance, as a consequence of the oil shocks of the 1970s and the liquidity crunch of the early 1980s, SOEs from all around the world ran average losses equivalent to two percent of GDP, reaching four percent in developing countries (World Bank, 1996). SOE losses were then translated into national budget deficits and those deficits exploded once interest rates spiked in the United States 1979 and once debt markets were closed for developing countries after Mexico’s 1982 debt default (Frieden, 1991). Ultimately, as a consequence of those macroeconomic shocks and the fall of the Socialist bloc, governments ended up privatizing thousands of firms (Megginson, 2005), opening up their economies to foreign trade, and gradually dismantling capital controls.

Still, because sweeping privatization was politically costly, some SOEs were only partially privatized. Around the world, governments ended up becoming controlling shareholders and minority investors in a large number and wide variety of
corporations, as can be seen clearly in Bortolotti and Faccio’s (2009) survey of SOEs in OECD countries and in the evidence we present in Chapter 2 for a broader sample of countries. While countries such as Australia, Austria, Belgium, Chile, Denmark, New Zealand, Slovenia, and the United Kingdom had less than 50 majority-controlled SOEs circa 2005, others such as Canada, Finland, France, Greece, Italy, Israel, Norway, and Sweden had between 50 and 100. The Czech Republic, Germany, Korea, Mexico, Poland, and Spain had more than 100 such firms. Emerging markets such as Russia and China had thousands of SOEs and others such as Brazil, India, Poland, and South Africa had over 200 SOEs at the federal level and many more at the provincial level.

Thus, the organization of state capitalism and state ownership that we observed at the turn of the twenty-first century is the outcome of a long process of transformation, of gradually adopting what has been learned from (a) 30 years of research on corporate governance and agency theories (Hansmann & Kraakman, 2004; Jensen & Meckling, 1976; Khurana, 2002) and (b) decades of experimentation with SOE reforms and with full and partial privatizations.12

We are aware that, in the past, SOEs in the United States and Europe commonly had governments operating as minority shareholders (Amatori, 2012; Bodenhorn, 2003; Sylla, Legler, & Wallis, 1987). In the twenty-first century, however, ownership

12 In fact, the process of learning and experimentation with SOE reform does not seem that long when compared to the slow process of transformation of the corporate governance regime of the largest corporations in the United States. At the turn of the twenty-first century investors were still surprised by corporate scandals, by outrageous executive compensation packages, by boards of directors that were not monitoring managers effectively, etc. For a discussion of this process of transformation in private firms see Chapter 3 of Khurana (2002).
arrangements in the largest SOEs are accompanied by more stringent corporate
governance rules and more stringent requirements to list firms on stock exchanges.\textsuperscript{13}

**New Varieties of State Capitalism**

Our conceptualization of the new forms of state capitalism, then, is full of
nuances to avoid the dichotomous views that pervade some of the literature. Bremmer
(2010) treats state capitalism as a general model of capitalism, juxtaposed with an
idealized form of liberal market economy in which the government does not intervene
in the running of corporations or the allocation of credit. For us, there are more shades
of grey in between. We therefore expand the spectrum of state intervention to include
not only the model in which Leviathan is an entrepreneur—owning and managing
SOEs (Ahroni, 1986)—but also the models in which Leviathan is a majority investor or a
minority investor (see Figure 1-1).

In the Leviathan as a majority investor model, the government corporatizes or
lists firms on stock exchanges. There is significant variation in the corporate governance
configuration of these firms, but publicly traded SOEs tend to have relative financial
autonomy, professional management, boards of directors with some independent
members and with short tenures, and financials audited by professional accounting
firms. Governments exercise their control as majority investors using so-called state-

\textsuperscript{13} Some papers comparing the performance of SOEs and private firms acknowledge that there are
different forms of state ownership. They usually divide SOEs into (fully) state-owned, partially
privatized, and private firms and they usually find that partially privatized firms perform better than
state-owned firms, while private firms are consistently found to perform best of all (Boardman & Vining,
1989; Dewenter & Malatesta, 2001; Gupta, 2005). These works, however, do not look at the variation in the
corporate governance arrangements of privatized firms. They also ignore the implications of minority
ownership.
owned holding companies (SOHCs) — pyramidal structures of ownership in which the
government is a majority owner in a company that then holds majority or minority
equity positions in other companies.14

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14 For examples of state-controlled pyramids in Europe, see Bortolotti & Faccio (2009).
which private parties manage the companies that the government want to support financially. Thus, we view this model of state capitalism as suffering less from the agency and social problems commonly found in SOEs that are wholly owned and controlled by the government. Furthermore, political intervention should also be low or minimal (although not absent) in this form of state ownership.15

Minority state participation in corporations is increasing worldwide. We argue that there are several channels through which states exercise minority control, such as directly holding shares in partially privatized firms (PPFs) and using state-owned holding companies to hold minority stakes in a variety of firms. In this model, we also see governments using development banks, sovereign wealth funds (SWFs), and other state-controlled funds (such as pension funds and life insurance investments) to either lend to or invest in private companies. In India, for instance, the Life Insurance Corporation practically acts as a holding company for the government, with around $50 billion invested as of September 2011. In Brazil, as the JBS example shows, the national development bank (BNDES) has actively pursued investments in local corporations.

Thus, the main idea is that governments use these new hybrid forms of ownership to partner with the private sector in ways that should, in theory, reduce the agency problems and political intervention that characterized the more traditional model in which the government wholly owned and operated most of its SOEs. As a

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15 This hybrid model of state capitalism should also be distinguished from hybrid public-private partnerships crafted to execute specific infrastructure projects or to provide public services such as water, transport, and prisons (Bennett & Iossa, 2006; Cabral, Lazzarini, & Azevedo, 2010).
way to summarize the differences, Table 1-1 explains the main sources of inefficiency in
SOEs according to the agency, the social, and the political views and whether those
inefficiencies can be addressed by the Leviathan as a majority and minority investor
models of state capitalism.

We are nevertheless cautious because, even if these new models of state
capitalism have improved incentives and monitoring inside the firm and have, in some
cases, insulated SOEs from outright political interference, governments still can and
often do intervene. These new models have their limits and can break down when the
government’s temptation to intervene is at its highest; for example, during a major
economic crisis or in advance of a hotly contested election. As we discuss throughout
the book, reducing political intervention in the model in which the government is a
majority shareholder or reducing agency problems in the model in which the
government is a minority shareholder will depend not only the private enforcement of
investor rights, e.g., through the firm’s own statutes and through the ability of stock
markets and rating agencies to prevent the abuse of minority shareholders, but also on
legal protections and regulatory provisions that tie the hands of governments and avoid
discretionary interference.
<table>
<thead>
<tr>
<th>Theory of SOE inefficiency</th>
<th>Leviathan as an entrepreneur (i.e., owner and manager)</th>
<th>Leviathan as a majority investor</th>
<th>Leviathan as a minority investor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social view</strong></td>
<td>Double bottom line (e.g., profit maximization jointly with other social objectives such as low inflation or higher employment).</td>
<td>Maximization of shareholder value subject to political interference if the company is not insulated. Likely conflict if minority shareholders pursuing profitability clash with governments pursuing social or political goals.</td>
<td>Maximization of shareholder value. Minimizes government intervention to attain social goals (except in cases where governments have residual ability to intervene).</td>
</tr>
<tr>
<td></td>
<td>Long-term horizon; government as patient investor tolerating losses.</td>
<td>Likely shorter-term horizon: Markets are generally impatient with respect to losses; yet market pressure can help prevent short-term pressure due to political cycles.</td>
<td>Short-termism to please market analysts and investors.</td>
</tr>
<tr>
<td><strong>Political view</strong></td>
<td>Appointment of CEOs using criteria other than merit (e.g., political connections).</td>
<td>Professional management selected by the board of directors. Government has strong influence as majority shareholder.</td>
<td>Professional management selected by the board of directors. Government opinion matters only when it is an important shareholder or when it colludes with other shareholders.</td>
</tr>
<tr>
<td></td>
<td>Poor monitoring: no board of directors (ministry regulates) or else politically appointed board (low level of checks and balances).</td>
<td>Board of directors with some independent members and some political appointees; depending on numbers, it can act as a balance to the government and the CEO. Yet, government can co-opt board members.</td>
<td>Boards as principals of the CEO (monitoring/punishing).</td>
</tr>
<tr>
<td></td>
<td>Government uses SOEs to smooth business cycles (e.g., hiring more or firing fewer workers than necessary).</td>
<td>Effect is reduced if the firm is isolated from political intervention.</td>
<td>Low political interference in management, except for industries in which the government has temptation to intervene (e.g., natural resource sectors) and when the government colludes with other minority shareholders.</td>
</tr>
<tr>
<td></td>
<td>Soft-budget constraint (bailouts).</td>
<td>No clear risk of bankruptcy (governments will likely bail them out).</td>
<td>Hard-budget constraint unless firm is singled out as a national champion. Then maybe bailout because firm it “too big or important to fail.”</td>
</tr>
<tr>
<td><strong>Agency view</strong></td>
<td>Management has low-powered incentives.</td>
<td>Pay-for-performance contracts, bonuses, and stock options more likely (incentives may not be as high-powered as in private firms).</td>
<td>High-powered incentives.</td>
</tr>
<tr>
<td></td>
<td>Hard to measure performance (financial measures are not enough, not easy to measure social and political goals).</td>
<td>Stock prices and financial ratios as performance metrics. Customer satisfaction and feedback to measure quality of goods and/or services.</td>
<td>Stock prices and financial ratios as performance metrics. Customer satisfaction and feedback to measure quality of goods and/or services.</td>
</tr>
</tbody>
</table>
(Continues) **Table 1-1 Theories of SOE Efficiencies and Inefficiencies**

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<th>Leviathan as a minority investor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agency view</td>
<td>No clear punishment for managers who underperform.</td>
<td>Boards may fire managers who underperform.</td>
<td>Boards may fire managers who underperform.</td>
</tr>
<tr>
<td></td>
<td>Ministries and agencies with weak incentives to monitor.</td>
<td>Firms may act as regulatory agencies or independent agencies may monitor (effectiveness will vary).</td>
<td>Agencies regulating firms, effectiveness will vary.</td>
</tr>
<tr>
<td></td>
<td>No transparency: incomplete financial information.</td>
<td>Improved transparency; accounting standards following GAAP or IFRS in several cases.</td>
<td>Improved transparency; accounting standards following GAAP or IFRS in most cases.</td>
</tr>
<tr>
<td></td>
<td>Boards packed with politicians or bureaucrats (exacerbates political intervention and double bottom line).</td>
<td>Boards as principals of the CEO (monitoring/punishing); may also be packed with politicians depending on whether the SOE is more or less insulated from political influence.</td>
<td>Boards as principals of the CEO (monitoring/punishing).</td>
</tr>
</tbody>
</table>

In the last two chapters of the book, we look beyond governmental participation as a majority or minority shareholder to examine instances in which governments use state-owned development banks to provide private firms with long-term, subsidized loans. Development banks are, in particular, an important and understudied vehicle of minority state participation. These banks are supposed to be relatively autonomous financial intermediaries specializing in providing long-term—usually subsidized—credit to promote industrialization or infrastructure projects (Amsden, 2001; Armendáriz de Aghion, 1999; Yeyati et al., 2004). Yet, the behavior and performance implications of development banks have been neglected in the literature, despite the fact that there are 286 development banks operating in 117 countries and that the largest country-level development banks in the world, such as KfW of Germany, Korea Development Bank, China Development Bank, and BNDES, are actually profitable...
enterprises. In contrast, there is a large literature showing how state-owned commercial banks perform poorly because they have social and political objectives that prevent them from becoming lucrative (Beck, Crivelli, & Summerhill, 2005; Caprio, Fiechter, Litan, & Pomerlano, 2004).\textsuperscript{16} We do not consider commercial banks in this book because they are mainly focused on providing credit to households or working capital to firms. We are, instead, interested in looking at development banks, which provide long-term loans to promote industrialization or the construction of infrastructure and, thus, tend to be intimately linked with the process of economic development (Amsden, 2001).

**Brazil as a Case Study**

Although we present a general discussion of the new forms of state capitalism, most of our detailed empirical studies of the implications of these new forms rely on firm-level data for Brazil. We think Brazil is a good setting in which to study the evolution of state capitalism for two reasons. First, state capitalism’s rise in Brazil is similar to its rise in other parts of the Western world and in noncommunist East Asia where, partly by accident and partly by design, governments ended up owning and managing hundreds of firms between the 1960s and the 1980s (Baer, Kerstenetzky, & Villela, 1973; Trebat, 1983). Therefore, we use the case of Brazil to show how external events led to transformations in the way the government intervened in the management

\textsuperscript{16} For instance, a series of papers studies how lending in state-owned commercial banks is correlated with political cycles (Cole, 2009; Dinç, 2005; Sapienza, 2004) and how entrepreneurs with political connections are more likely to obtain loans from state-owned banks than the average entrepreneur (Bailey, Huang, & Yang, 2011; Khwaja & Mian, 2005). The literature on state-owned commercial banks in Brazil is particularly extensive (Baer & Nazmi, 2000; Beck et al., 2005; Makler, 2000; Ness, 2000), but focuses largely on explaining why they were privatized and how well they performed before and after privatization.
and ownership of firms, ending with a major dismantling of the Leviathan as an entrepreneur model.

Second, Brazil had and still has all the different models of state capitalism we want to study and we have decades of data on how those forms have worked. Through a variety of archival, public, and private sources, we have been able to compile detailed databases with a variety of financial variables to study the performance of the largest state-owned and private enterprises in Brazil between 1973 and 2009.

With this rich data on Brazilian firms, we test a series of specific hypotheses related to our study. For instance, we compare the behavior of private firms and SOEs before and after the shocks of 1979-1982 and show that SOEs adjusted their employment more slowly and, thus, faced greater losses throughout the 1980s. That is, we use the detailed case of Brazil to argue that the big crisis of the Leviathan as an entrepreneur model happened to a large extent because SOEs could not adjust to the drastic shocks of the 1970s and 1980s and therefore continuously bled the public finances of the government.

Moreover, we use the Brazilian case to describe in detail the changes that were made in the corporate governance of SOEs, especially after the 1990. Surveys such as Bortolotti and Faccio (2009) and OECD (2005) show how governments remained as either majority or minority shareholders after privatizing SOEs in the 1990s. Yet, these studies do not look at corporate governance arrangements inside SOEs. We think it is important to examine how corporate governance arrangements have changed. That is,
we think that the policy prescriptions come from looking at the bylaws that have made SOEs less prone to agency problems or political intervention. In Chapter 4, we show in detail the transformation of corporate governance in SOEs in which the Brazilian government is a majority shareholder and, in Chapter 7, pursue even more detailed studies of the corporate governance arrangements the Brazilian government adopted in the national oil company, Petrobras, comparing them with the governance arrangements of 29 national oil companies from around the world.

The Brazilian case also provides unique insights into the model in which the state is the minority shareholder. Using detailed data on the minority equity investments of BNDESPAR, the investment arm of the Brazilian National Development Bank (BNDES), we conduct detailed empirical studies of the impact of these investments on firm behavior. Moreover, by examining how BNDES selects its target firms and the impact of its loans on firm-level performance and investment, we analyze in detail how Leviathan can act as a lender.

**Our General Argument**

Our book makes three broad arguments. First, we argue that governments have learned that they need more sustainable ownership schemes and corporate governance regimes for SOEs. Our historical narrative maintains that as a consequence of the crisis of the late 1970s and early 1980s the model of government ownership and management of SOEs became too inefficient and turned into a burden on the public finances. Governments restructured their portfolios of firms, privatizing those in which they had
no policy reason to operate and changing the ownership structure of many in which they did want to keep an interest (for example, strategic firms with high rents from oil, mining, and utilities). Yet, governments learned that in order to have more sustainable models for these firms, they needed to get the private sector involved in monitoring and funding SOEs as well as in sharing the losses of these enterprises. That meant the government had to share both the management and the rents.

Second, instead of debating whether state or private ownership are universally superior, we submit that there is much heterogeneity within each model of ownership. That is, part of our argument is that there is too much variation to generalize. Granted, we still find poorly managed SOEs subject to political interference, but we also find many SOEs that changed their governance practices and in which the government acts like an investor rather than a manager. Likewise, we find many instances of minority state ownership which actually help firms develop new, profitable projects, alongside instances of unjustified support to politically-connected national champions. In sum, a generic attempt to answer whether state ownership is good or bad will necessarily miss the nuance and variation of organizational forms that emerged from the reinvention of state capitalism documented in this book.

Third, we argue that the new models of state ownership, which we call Leviathan as a majority and minority investors, will more effectively work depending on a host of conditions that are detailed throughout the book and summarized in our conclusion chapter. For instance, if full privatization of an SOE is not an option, then a
government can—and should—at least improve that SOE’s governance protections in order to mitigate agency and political intervention problems. We argue that the new models of state ownership will be more effective when they have corporate governance arrangements that prevent abuses by the controlling shareholders, not only when the government is the majority shareholder, but also when the government is a minority shareholder and private parties are able to tunnel funds out of the SOE. Thus, when adopting the model in which Leviathan is a minority investor, we argue that governments should target private firms with good governance and with severe financial constraints. Over time, as local capital markets become more developed, the state should progressively exit and leave state participation for cases in which the financing of projects with high spillovers are too risky or hard to execute for private capitalists.

Put another way, the counterfactual of our argument for the Leviathan as a majority shareholder model is that, without checks and balances on the abuses of the government as a controlling shareholder, partially privatized SOEs could end up becoming the inefficient SOEs of the past, with controlled prices, excessive debt, and endless needs for the treasury to cover their losses. That is, if the government tunnels out the rents and violates its partnership with the private sector, it may well scare away investors and go back to where it was in the 1980s.

Our counterfactual for the minority shareholder model is more complex. We argue that having the government investing in firms that have investment opportunities
but that are not financially constrained will not compensate the opportunity cost of the government funds. Governments would therefore be better off not using their investment arms to prop up such firms. For instance, when financial markets are more developed, government investments in equity may be necessary only for firms that would never be financed by the private sector; for example, small and medium-size enterprises with complex projects that are either too risky or too difficult to be financed by private financial intermediaries.

Finally, when the government acts as a provider of subsidized credit, our counterfactual is that if government banks (a) target large firms that are able to repay their loans rather than firms that face significant financial constraints and (b) do not demand specific targets for the projects they finance, then it is not clear that countries are better off funding those banks at all. The resources to fund such banks have high opportunity costs and will have been squandered with minimal welfare effect.

We have tried to keep the methodological and narrative approaches of the book as broad as possible to facilitate a conversation with a broad set of fields. Still, we have been as strict as possible in our empirical work to try to convince skeptics of our arguments. Notwithstanding such efforts, there will still be readers who will not be convinced by our statistical work simply because governments do not choose to own firms or intervene in private companies at random; that is, there is no natural experiment in this book. For that reason, we are very conscious that our work may suffer from selection bias problems and that our results should be interpreted carefully.
as we are not uncovering causality in the purest sense. In every chapter in which we deal with statistical work we have included a section explaining how selection bias may affect our results and we have added a series of tests to minimize it or, when possible, guarantee that it is not driving our results. For instance, if we study the effect of government equity investments on the performance and capital expenditure of private firms we make sure to examine what firm characteristics drive the selection of firms — to discard the possibility that governments are choosing high performing firms ex ante. We also use matching techniques and other robustness checks to make sure our results are not purely driven by selection bias.

Overview of the Book

The first three chapters elaborate our argument in a general way, describing the global history of state capitalism and building a set of hypotheses about the origins and implications of the new models of state capitalism. Chapter 2 is an historical account of the rise, fall, and reinvention of state capitalism around the world in the twentieth century. We emphasize the learning and evolution of state capitalism through trial and error as a consequence of economic shocks. That is, we describe the efforts of governments in Europe and developing countries at various times put to improve SOE performance. We end the story by explaining how various factors led to privatization in the 1990s.
Chapter 3 reviews the literature and the implications that each view of SOEs has for each of the ownership models we study. Based on this review, we create a series of hypotheses that we then test in the rest of the book.

In Chapter 4, we begin using Brazil as a case study. We first describe in detail the macroeconomic story that led to the reinvention of state capitalism there in the 1980s and 1990s and explore some of the variation within Brazilian SOEs. We also describe the transformation of SOEs in Brazil after the privatization process.

In Chapter 5, we study CEOs as a source of variation in SOE performance. In the Leviathan as an entrepreneur model, governments had few levers to influence the performance of SOEs and therefore tended to fire the CEO whenever they wanted to change the firm. Yet, we find that CEOs explain very little of the variation in performance of their firms, but we find that some of these top executives who attended elite universities actually systematically increased returns in these firms.

In Chapter 6, we examine how the Leviathan as an entrepreneur model broke down in the 1980s. We show that SOEs facing economic shocks use significantly different human resource policies than private companies do. While private companies tend to fire workers to adjust their production capacity in accordance with reductions in aggregate demand (that is, they fire workers to improve productivity while lowering output), SOEs fire significantly fewer workers or even hire new ones. The literature that compares SOEs with private firms usually assumes that the differences in performance between the two are always wide; it seems too obvious to demand proof. We show how
those differences in performance were, in fact, smaller before the 1980s and then widened in times of economic hardship.\textsuperscript{17}

Chapter 7 examines the corporate governance arrangements that governments have adopted for their national oil companies (NOCs) after partial privatizations. We study basic corporate governance traits in 30 NOCs, find wide variation, and show the extent to which some of these firms introduced important constraints on the controlling shareholder—the government. We then delve into a more detailed study of three national oil companies—Pemex, Petrobras, and Statoil—and examine the relationship between each government and its oil company. These cases highlight the importance of giving financial autonomy to managers while imposing checks and balances on the government’s power.

Chapter 8 begins our examination of Leviathan as a minority shareholder. We start by studying the effects of having the government investing in minority positions in private corporations, using a detailed database of equity investments by Brazil’s national development bank, BNDES, between 1995 and 2009. We find that these investments had positive effects between 1995 and 2002, but not after 2002.

Chapter 9 is a case study of government relations with Vale, a Brazilian mining giant in which the Brazilian government is a minority investor. Here, we discuss the limits of the Leviathan as a minority investor model. We explain how, between 2009

\textsuperscript{17} Millward (2000) is one of the exceptions in the literature. He shows that, before the 1980s, productivity in SOEs in the United Kingdom was in fact higher than productivity in comparable American private firms.
and 2011, government pressure on Vale to invest in steel mills led to the dismissal of a very successful CEO. The chapter continues our study of the circumstances that can facilitate government intervention when the government is a minority shareholder. We argue that in industries with high rents, governments can use coalitions with quasi-state actors, such as pension funds, to intervene in management.

Chapter 10 introduces a discussion of the role of development banks and provides a historical narrative of the role played by BNDES for the industrialization of Brazil. Chapter 11 shows how the loans that BNDES provided to publicly traded companies are not correlated with higher investments in plant and equipment or with higher profitability.

We conclude in Chapter 12 by compiling some of the lessons of our detailed studies. We focus on a discussion of the conditions that should make each of the models of state capitalism either work better or fail and end the chapter with a practical section for politicians and managers in charge of running SOEs, development banks, and other state-owned organizations.
As we saw in Chapters 2 and 4, after the initial wave of privatizations of the 1990s, many former SOEs were fully privatized or closed. But others—especially the largest firms in “strategic” sectors such as natural resources—underwent two transformations. First, there was the transition from Leviathan as an entrepreneur to Leviathan as a minority investor, a theme we explore in the last chapters of this book. Second, many SOEs were either corporatized or partly privatized and listed on a stock exchange. That is, we observed the transformation from Leviathan as an owner and manager to Leviathan as a majority shareholder.

In Chapter 4, we described this process of transformation in Brazil. The listing of Petrobras and the corporate governance reforms which that entailed make this company Brazil’s most important example of Leviathan as a majority shareholder. By listing a large portion of the voting shares (nonvoting shares had been listed for decades), the government improved the company’s governance by adhering to best practices such as transparency and monitoring through boards. Yet it is unclear whether or not political interference was curtailed. Kenyon (2006), referring to the listing of Petrobras, argues that “by issuing shares to private investors and adopting a commitment to transparency, politicians can raise the political costs of interference and
avert policies that are damaging to [SOE’s] interests” (p. 2). In the specific case of Petrobras the government also allowed workers to use their forced-savings account, FGTS, to buy shares of Petrobras, thus committing voters and the government to the new ownership scheme of the oil company. But is listing really enough to limit political intervention? What kind of corporate governance contracts do governments design to minimize intervention in their oil companies?

In this chapter, we examine the corporate governance of Petrobras in relation to the governance arrangements of 30 national oil companies (NOCs) across countries. With this analysis we hope to accomplish two things. First, we want to show the wide variation in corporate governance within the model in which Leviathan is a majority shareholder. Second, by discussing governance in NOCs and examining specific cases of state intervention we outline the limits of the Leviathan as a majority investor model.

Our findings come from two sets of analyses. First, we analyze corporate governance in a sample of 30 NOCs. Second, we conduct a slightly more detailed analysis of governance and incentives in Pemex, Petrobras, and Statoil, the national oil companies of Mexico, Brazil, and Norway, respectively. We use these case studies because they show variation in both the level of corporate governance sophistication (e.g., to minimize agency problems) and the level of political intervention. In the end,

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18 The strategy of privatizing minority equity position in large SOEs was first suggested as a strategy governments should follow to signal to voters their commitment to privatization and markets by Perotti and Biais (2002). The idea was that the median voter would turn into a shareholder and politicians would gain political support the more they committed to the new regime of partial privatization.
we show how NOCs that are traded on stock exchanges have solved many of the agency problems we described in Chapter 3, but we also provide examples showing that listing is not enough to prevent political intervention in SOEs. We contend that listing should be accompanied by broader institutional reforms that reconcile the conflicting demands of governments and (minority) private shareholders.

Why Study National Oil Companies?

As we explained briefly in Chapter 2, NOCs are the product of a wave of nationalizations in the post-World War II era. Before 1950, only a few governments controlled a national oil company, but the wave of nationalizations we portrayed in Chapter 2 included the nationalization of many oil companies. These oil companies gave governments access to rents and became, in most countries, the largest SOEs.

In this chapter, we study corporate governance reforms in Petrobras and a sample of national oil companies (NOCs) for three important reasons. First, NOCs are perhaps the most important SOEs in the world. NOCs control around 90 percent of the world’s oil reserves and 75 percent of oil and gas production. Analysts estimate that 60 percent of the world’s undiscovered reserves are in countries in which NOCs are dominant players (Tordo, Tracy, & Arfaa, 2011).

Second, in NOCs we can see clearly the transformation of Leviathan from an entrepreneur (owner and manager) to new organizational configurations in which some of the problems of the “original” model of state capitalism have been addressed. Thus, the transformation of many NOCs into publicly traded corporations has commonly
been equated with both a reduction of agency problems and a separation of the
government from NOC management. The process of corporatizing an NOC or listing it
on a stock market is usually accompanied by improvements in transparency,
professionalization of the management, the introduction of performance or incentive
contracts for top management and directors, and—arguably—an increase in
competitiveness. Corporatization is the process through which a firm, in our case an
SOE, “is restructured along the pattern of a modern corporation...[with] a governance
structure that includes shareholders and a board of directors...[with] a chief executive
officer and a chair of the board of directors” (Aivazian, Ge, & Qiu, 2005; p. 792) while
retaining the state as the sole owner of the company. Listing involves many of the same
changes, but adds the advantages of having other owners monitoring the managers and
having stock prices reflecting the firm’s performance. In short, the corporatization and
especially the listing of NOCs has been identified as a way to alleviate some of the
social, political, and agency problems of SOEs.

Yet, the story is not that simple. There are limits to the Leviathan as a majority
shareholder model, which we will explore in this chapter. NOCs mediate the stream of
rents governments receive from the exploitation of oil and gas reserves. Therefore, it is
in these firms that the government’s temptation to intervene in SOE management is
greatest. For instance, it is because of these rents that governments are so tempted to
use NOCs to pursue social goals. Furthermore, it is NOCs that governments usually
want to be less transparent about how they manage their revenues (Ross, 2012). Finally,
NOCs are usually the most important or only actor in the politically sensitive commercialization of gasoline and gas, sectors that affect household income and business profitability directly and thus make governments more tempted to control their prices. Studying NOCs therefore allows us to examine when the supposed political autonomy afforded by the model of Leviathan as a majority shareholder breaks down.

Additionally, the very process of listing an NOC will complicate matters in this double bottom line setting because minority private investors, who would prefer the firm to pursue a strategy of maximizing shareholder value, may clash with governments pursuing social or political goals. In that setting, governments will find it hard to credibly commit to protecting minority shareholder rights (Pargendler, 2012). Still, as we explain towards the end of the chapter, the implicit contract to share rents in NOCs also include sharing the losses from such political interventions as price controls or poor decisions of where to open refineries or who to partner with in new projects. Even if the sharing of losses is implicit in the arrangements of NOCs and investors, the better the regulation and protection of investors in a country, the less NOCs will have to share loses that are the product of the whim of politicians.

**From Leviathan as an Entrepreneur to Leviathan as a Majority Shareholder**

Governments around the world viewed the listing of state-owned enterprises as a solution to most of the problems associated with the Leviathan as an entrepreneur
model we discussed in Chapter 3. In the oil industry, too, there has been a trend towards the corporatization and listing of large national oil companies. In theory, the differences between listing an SOE or NOC and corporatizing it should not be that large. In Table 7-1, we display how corporatization and listing should—in theory—address the main problems of state-owned enterprises in the Leviathan as an entrepreneur model.

In our view, corporatization and listing differ only slightly in terms of organizational configuration. Both include professional management, a board of directors that meets regularly and monitors managers’ performance, and a certain level of transparency in the firm’s financials. Yet, while having financials audited by a recognized private firm is always required for listed firms, it is usually—but not always—required for corporatized firms. Finally, the big difference between the two systems is that, in listed firms there is more monitoring of managers, either through market mechanisms (e.g., stock prices) or simply because other shareholders have incentives to monitor the firm’s performance.

In Table 1-2, we present three basic differences—according to the social, political, and agency views—between listing an NOC and simply corporatizing it. First, in theory, corporatization does not bind NOCs to maximize shareholder value, as listing does, because the only shareholder is the government, which may want the NOC to have a double-bottom line. On the other hand, corporatized NOCs have the advantage of not having to worry about showing short-term results, as listing firms do, which
allows corporatized NOCs to focus on making long-term investments and on depleting resources at a slower pace.

Second, when NOCs are listed, they are supposed to respond to the interests of a variety of shareholders, so their boards of directors should be more diverse and less influenced by the government. This does not necessarily happen with corporatization because the government is the only shareholder picking board members (with rare exceptions such as Saudi Aramco, which is a corporatized NOC with governance arrangements similar to those of private companies and with a large number of external board members). Yet, even in listed firms, governments can co-opt board members and appoint public officials (e.g. ministers) who can influence the boards.
<table>
<thead>
<tr>
<th>Theory of SOE inefficiency</th>
<th>Features of the Leviathan as an entrepreneur model</th>
<th>How does listing change that feature?</th>
<th>Difference between listing and corporatization?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social view</td>
<td>Double bottom line</td>
<td>Maximization of shareholder value subject to political interference if the company is not insulated. Likely conflict if minority shareholders pursuing profitability clash with governments following social or political goals.</td>
<td>With corporatization, the government may pursue a double bottom line without negatively affecting minority shareholders pursuing profitability.</td>
</tr>
<tr>
<td></td>
<td>Long-term horizon, government as patient investor tolerating losses</td>
<td>Likely shorter-term horizon, markets are generally impatient</td>
<td>No short-term pressure from shareholders. Yet there could be government temptation to use SOE to smooth business cycles.</td>
</tr>
<tr>
<td>Political view</td>
<td>Appointment of CEOs using criteria other than merit (e.g., political connections)</td>
<td>Professional management selected by the board of directors</td>
<td>If isolated from politics, the board can choose managers. However, political appointment is more likely than in listed SOEs.</td>
</tr>
<tr>
<td></td>
<td>Poor monitoring: no board of directors (ministry regulates) or politically appointed board (low level of checks and balances)</td>
<td>Board of directors with some independent members and some political appointees; depending on numbers, it can act as a balance to the government and the CEO. Yet, government can co-opt board members.</td>
<td>Can have an independent board if it is isolated from the government and packed with professionals. However, political appointment is also more likely than in listed SOEs.</td>
</tr>
<tr>
<td></td>
<td>Government uses SOEs to smooth business cycles (e.g., hiring more or firing fewer workers than necessary)</td>
<td>Effect is reduced if the firm is isolated from political intervention.</td>
<td>Less government intervention than in corporatized SOEs; independent board members in listed firms may reduce, though not eliminate, outright intervention.</td>
</tr>
<tr>
<td></td>
<td>Soft budget constraint (bailouts)</td>
<td>No clear risk of bankruptcy (governments will likely bail them out)</td>
<td>No clear risk of bankruptcy (governments will likely bail them out).</td>
</tr>
</tbody>
</table>
Table 1-2 Taming Leviathan: Corporatization vs. Listing of NOCs

<table>
<thead>
<tr>
<th>Theory of SOE inefficiency</th>
<th>Features of the Leviathan as an entrepreneur model</th>
<th>How does listing change that feature?</th>
<th>Difference between listing and corporatization?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agency view</strong></td>
<td>Management has low-powered incentives</td>
<td>Pay-for-performance contracts, bonuses, and stock options more likely</td>
<td>Incentive contracts likely, except for stock options. However, double bottom line may attenuate incentives.</td>
</tr>
<tr>
<td>Hard to measure performance because of the double bottom line</td>
<td>Stock prices as performance metrics</td>
<td></td>
<td>No market pressure. Governments have to set measurable targets.</td>
</tr>
<tr>
<td>No clear punishment for managers who underperform</td>
<td>Boards may fire managers who underperform</td>
<td></td>
<td>Managers may lose their jobs if they underperform; yet pressure should be less intense than in listed firms subject to external monitoring.</td>
</tr>
<tr>
<td>Ministries and agencies with weak incentives to monitor</td>
<td>Institutional investors, debtholders, rating agencies, and analysts monitoring performance</td>
<td></td>
<td>If NOC issues bonds, debtholders can monitor. If board has external members who care about their reputations, they'll also monitor.</td>
</tr>
<tr>
<td>No transparency: incomplete financial information</td>
<td>Improved transparency; accounting standards following GAAP or IFRS</td>
<td>Same as corporatized firms</td>
<td></td>
</tr>
<tr>
<td>Boards, if any, are packed with politicians, so they also push firms to pursue social or political goals</td>
<td>Boards as principals of CEO (monitoring or punishing managers). Board could also be packed with politicians, but could also serve as checks and balances if there are external board members.</td>
<td>Boards as principals of CEO (monitoring/punishing). Sometimes external board members also as checks and balances of CEOs and of controlling shareholder (i.e., the government)</td>
<td></td>
</tr>
</tbody>
</table>

Finally, monitoring managers in listed firms should be more complex because, besides having the board to check and balance the power of the CEO, the firm might also be under pressure from markets. A company that, for example, tries to pursue a
social objective that affects the interests of minority shareholders should be penalized by the market with a lower stock price. Yet, corporatization could bring about a similar level of monitoring and make CEOs face similar market incentives if the company issues debt. Both issuing debt and selling equity offer “the added advantage of creating a group of private investors with a stake in the profitability of the company. The hope is that this group will make it harder for the government to pursue social goals” (Gómez-Ibañez, 2007; p. 38). In that case, both credit-rating agencies and bondholders will operate as monitors, penalizing actions that may endanger the repayment of such bonds.

Despite the differences between corporatized and listed SOEs, these corporate forms have been widely adopted by governments to reform their state-owned enterprises and national oil companies. In an OECD report, Christiansen (2011) estimates that 80 percent of state-owned enterprises in member countries operate as statutory corporations (i.e., they are corporatized). These firms account for 50 percent of total SOE employment in the OECD. This report also shows that the largest state-owned enterprises are usually listed, rather than just being corporatized. (One big exception is Pemex, the Mexican national oil company, which is not listed.)

The academic literature has found strong evidence to support listing over corporatization as a better way of running SOEs. For instance, a series of studies summarized in Megginson (2005b; pp. 106-107) find overwhelming support for improvements in performance when SOEs are listed. Gupta (2005) finds that listed
firms or SOEs that sold minority positions perform better than wholly-owned SOEs in India. In contrast, Aivazian (2005) also finds that corporatization leads to improvements in performance in Chinese SOEs, especially because of corporate governance reforms that usually accompany the process of corporatization.

The pushback against corporatization is that without major changes in corporate governance, the reforms do not seem to be that efficient. Zhu (1999), for instance, argues against corporatization in China because, without a culture of autonomy and a system of corporate governance that monitors managers and keeps the government at bay, SOE reforms of this sort would not lead to major improvements in SOE performance. Studies of specific reforms, such as incentive contracts for managers, also fail to find improvements in SOE performance (Shirley & Xu, 1998). Finally, Wang, Xu, and Zhu (2004) show that Chinese SOEs that have privatized some of their capital and listed on stock exchanges rely less on debt finance and increase their capital expenditures, yet they do not seem to perform better than they did before listing.

**Corporate Governance in National Oil Companies**

In order to gauge the extent to which governments have corporatized and listed their national oil companies, in Table 1-3 we present a list of basic corporate governance characteristics in the largest national oil companies in the world. We define national oil companies as petroleum and gas firms in which the government is either the largest shareholder or the controlling investor.
Ownership

Out of the 30 NOCs we include in Table 1-3, 15 are now listed on a stock exchange in their home country, New York, or both. Those 15 companies have corporate governance regimes that, on paper, resemble those of private companies. For instance, listed NOCs have boards of directors with a good portion of external members (members who do not work directly at the firm but who have expertise in the industry) and they enjoy more financial autonomy from the government than non-listed firms.

There is significant variation in terms of the percentage of equity that remains in the government’s hands after listing a company. In some firms, such as ENI (Italy) and GDF Suez (France), the government kept minority positions, while in the rest of the listed firms the government kept a majority of the voting shares.

The governments of some countries have chosen to corporatize their NOCs rather than list them. Therefore, in NOCs such as Aramco (Saudi Arabia), PDO (Oman), KPC (Kuwait), Pemex (Mexico), and Pertamina (Indonesia), corporate governance is somewhat similar to that of listed firms. For instance, they have boards of directors with external members who have technical expertise (and perhaps experience in the industry). Those firms also have audited financials (with the exception of Aramco, which is extremely secretive with its financials).
Board of Directors

According to our analysis of NOC boards of directors presented in Table 1-3, there is enormous variation across companies in terms of the size and composition of the board. Of particular interest to us is the variation in composition. Out of 30 firms, only Statoil, Ecopetrol, and Saudi Aramco have a majority of external board members. The rest of the listed firms have external or “independent” board members to the extent that these members are not employees, but they are for the most part government officials. The board chairmen of Gazprom (Russia), GDF Suez (France), OGDCL (Pakistan), ONGC (India), PTT (Thailand), Petrobras, and Petronas (Malaysia), for instance, are all by definition directly connected to their governments. In other, less transparent NOCs, the board includes no external or independent members. This is the case in NNPC (Nigeria), PDVSA (Venezuela), and NIOC (Iran).

In fact, in most of the listed NOCs, the chairman is the Minister of Oil and Mines, Minister of Gas and Mines, or Minister of Finance. In Sinopec, CNOOC, and Petro China, the chairman of the board is usually someone with a long career in the industry, but who has rotated among firms as part of the Chinese Communist Party’s rotation of officers.

Financial Autonomy

Table 1-3 shows that listed NOCs, in general, have budgetary autonomy. That is, major investment decisions and the allocations of internally generated resources do not have to be approved by the government. This usually means that firms can pursue
profitable projects more often and can spend more on exploration, R&D, and so on. (Exceptions are Petrobras and the three Chinese companies included—Sinopec, CNOOC, and Petro China. In these firms, some investments need government approval.)

Financial Transparency and External Monitoring of NOCs

Another important element to study is the level of transparency and external auditing in NOCs. According to the agency view, the difficulty of monitoring—or the lack of it altogether—is one of the biggest problems of SOEs. In Table 1-3, we can see that among corporatized, nonlisted NOCs there is a lot of secrecy in the financial reporting. Many of these companies are not audited by external or reputable auditing firms. In contrast, listed NOCs have their financials audited by a private accounting firm, usually one with an international reputation. Here, the exception is Thailand’s PTT, which is audited by the country’s auditor general.

A Corporate Governance Index for National Oil Companies

To avoid portraying NOCs as having more separation from the state than they actually have, we included in the last column of Table 7-2 a corporate governance index that captures how independent NOCs are in practice rather than in theory. We calculate this index by adding eight scores that we assign to specific governance provisions. First, we assign a score of one if the company has privatized some equity (we code it as zero otherwise). Second, we assign a score of 1 if the government is a minority shareholder, 0 otherwise. Third, we add one if the number of external board members is larger than
zero. Fourth, we add one if external members have a majority of votes. This is an extremely important score because it is a true sign that there are credible checks and balances to the CEO’s power. Fifth, we add one if there are no government officials holding board seats. Sixth, we add one if the chairman of the board is an external board member (that is, not a government official or politician linked with the government’s party or coalition or someone affiliated with the firm). Fifth, we add one if the firm has budgetary autonomy. Finally, we add one if the company’s financials are audited by a private auditing firm. This sum gives us an index that can range from 0 to 8. We sort the NOCs in Table 1-3 according to their corporate governance indexes, from those with stronger governance to those with greater government intervention.

Our corporate governance index provides three insights. First, many listed NOCs have corporate governance arrangements that are very similar to those of private firms. This is not to argue that governance in private firms is the panacea as large corporations still face corporate scandals and abuses by controlling shareholders and CEOs. Yet, these new arrangements mitigate most of the agency problems that the literature in economics associates with NOCs. Also, some of these governance arrangements reduce political intervention by introducing checks and balances on the power of the controlling shareholder and the managers, mitigating some of the concerns of the political view.

Second, the variation in corporate governance is wide and there are many listed NOCs that have little independence from the government, either because they do not
have budgetary autonomy or because the board is packed with government officials or government-appointed members.

Finally, corporatized firms that are not listed do seem, in practice, to be less isolated from government influence than listed firms. Even if many of them have some independent board members, few have budgetary autonomy; governments still have to approve major investment decisions or directly decide the firm’s budget each year.

Our sample of NOCs also includes more secretive companies—neither corporatized nor listed—with extremely low corporate governance indexes. Gathering the data for this table we realized how difficult some NOCs make it to find basic information about themselves, ranging from financial data to written statements about how the board works or who appoints its members. Many NOCs do not issue annual reports at all. Ross (2012) links the lack of transparency in some of the NOCs at the bottom of our governance table to the desires of dictators or autocratic regimes to siphon funds to enrich members of the ruling coalition, to buy votes, or to benefit the party in power. The IMF, in fact, has included transparency provisions for NOCs in some of its financial aid packages for developing countries. Such has been the case in Angola, where the IMF has been trying to get Sonangol, the national oil company, to improve its transparency and have its financials audited (Musacchio, Werker, & Schlefer, 2009).
<table>
<thead>
<tr>
<th>NOC</th>
<th>Country</th>
<th>Listed NOC</th>
<th>Total gov’t share of voting stock</th>
<th>Size of BOD</th>
<th>External Board members</th>
<th>BOD members appointed by gov’t</th>
<th>Board members term (years)</th>
<th>Gov’t officials on BOD</th>
<th>CEO and chair of BOD are not same person</th>
<th>Chairman is an external board member &amp; non-gov’t official</th>
<th>Budgetary autonomy</th>
<th>External auditors</th>
<th>Governance index#</th>
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<td>Y</td>
<td>70.8</td>
<td>10</td>
<td>7</td>
<td>0</td>
<td>2</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>7</td>
</tr>
<tr>
<td>ENI</td>
<td>Italy</td>
<td>Y</td>
<td>30.3</td>
<td>9</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>6</td>
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<td>89.9</td>
<td>9</td>
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<td>Y</td>
<td>5</td>
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<td>France</td>
<td>Y</td>
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<td>9</td>
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<td>Y</td>
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<td>100</td>
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<td>Y</td>
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<td>Y</td>
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<td>Y</td>
<td>N(**)</td>
<td>N</td>
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<td>PTT</td>
<td>Thailand</td>
<td>Y</td>
<td>67.1</td>
<td>15</td>
<td>6 (min.)</td>
<td>0</td>
<td>3</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
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<td>17</td>
<td>8</td>
<td>17</td>
<td>2</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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<td>Petro China</td>
<td>China</td>
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<td>5</td>
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<td>N</td>
<td>Y</td>
<td>N(**)</td>
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<td>9</td>
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<td>Y</td>
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<td>N</td>
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<tr>
<td>KazMunayGas</td>
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<td>8</td>
<td>3</td>
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<td>Y</td>
<td>N(*)</td>
<td>N</td>
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<td>KPC</td>
<td>Kuwait</td>
<td>N</td>
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<td>15</td>
<td>11(?)</td>
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<td>?</td>
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<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y(**)</td>
<td>2</td>
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<td>6</td>
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<td>7</td>
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<td>N</td>
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<td>N</td>
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<td>N</td>
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<td>UAE</td>
<td>N</td>
<td>100</td>
<td>10</td>
<td>10</td>
<td>?</td>
<td>Y</td>
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<td>N</td>
<td>N</td>
<td>N</td>
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</tr>
<tr>
<td>EGPC</td>
<td>Egypt</td>
<td>N</td>
<td>100</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>N</td>
<td>N</td>
<td>N</td>
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</table>
(Continues) Table 6-2 Corporate Governance in National Oil Companies

<table>
<thead>
<tr>
<th>NOC</th>
<th>Country</th>
<th>Listed NOC</th>
<th>Total gov’t share of voting stock</th>
<th>Size of BOD</th>
<th>External Board members</th>
<th>BOD members appointed by gov’t</th>
<th>Board members term (years)</th>
<th>Gov’t officials on BOD are not same person</th>
<th>CEO and chair of BOD are not same person</th>
<th>Chairman is an external board member &amp; non-gov’t official</th>
<th>Budgetary autonomy</th>
<th>External auditors</th>
<th>Governance index #</th>
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</thead>
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<td>INOC</td>
<td>Iraq</td>
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<td></td>
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<td>Y</td>
<td>N</td>
<td>N</td>
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</tr>
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<td>Libya NOC</td>
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<td>100</td>
<td>5</td>
<td>5</td>
<td>Y</td>
<td>Y</td>
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<td>Y</td>
<td>Y</td>
<td>N</td>
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<td>0</td>
</tr>
<tr>
<td>NIOC</td>
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<td>0</td>
<td>8</td>
<td>?</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>0</td>
</tr>
<tr>
<td>NNPC</td>
<td>Nigeria</td>
<td>N</td>
<td>100</td>
<td>9</td>
<td>0</td>
<td>9</td>
<td>?</td>
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<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>0</td>
</tr>
<tr>
<td>PDVSA</td>
<td>Venezuela</td>
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<td>100</td>
<td>10</td>
<td>0</td>
<td>10</td>
<td>2</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>0</td>
</tr>
</tbody>
</table>

Sources: Tordo et al. (2011), Tables 4.6 and 4.7; Capital IQ; the relevant chapters in Hults, Thurber, and Victor (2012); and corporate websites.

Notes: Question marks denote uncertainty about the information, not because it does not exist, but because it is not reported. For instance, when board members are appointed by the government, their tenure is linked to electoral or political cycles. In other boards, the members’ terms are not explicitly defined.

*According to Capital IQ, Timur A. Kulibayev, chairman of the board of directors of KazMunayGas, has close ties to the president of Kazakhstan. Thus, it is questionable how independent he is as chairman.

**Chairmen in Chinese firms are usually portrayed as independent/external, but they are distinguished members of the Communist Party, so their independence is questionable.

*** (Stevens, 2012a) explains that the Kuwait government passed a series of reforms in 2004 that made KPC relatively autonomous from the government and the holding company.

# Governance Index: We calculate it as the sum of eight scores. First, we add 1 if some of the equity of the NOC has been privatized (0 otherwise). Second, we add 1 if the government is a minority shareholder because that signals less explicit desire to intervene politically. Third, we add 1 if there are independent board members. Fourth, we add 1 if the independent board members have a simple majority on the board of directors. Fifth, we add 1 if there are no government officials holding board seats. Sixth, we add 1 if the chairman is an external board member. Seventh, we add 1 if the firm has budgetary autonomy. Finally, we add 1 if the company’s financials are audited by a private auditing firm. This give us an index that can range from 0 to 8.
Thus, in general, governments in many large economies have either corporatized their NOCs or listed them on stock markets in order to improve the firm’s efficiency. Why have these governments tried to make their NOCs more efficient? The answer perhaps has to do with the aftermath of the crises of the 1970s and 1980s and the financial difficulties some countries faced in the 1990s (for example, in Eastern Europe after the fall of Communism and in Asia in the wake of the Asian financial crisis). The double bottom line problem notwithstanding, governments have realized that underperforming SOEs make states weaker and can lead to fiscal difficulties. Alternatively, profitable SOEs can make states stronger. Thus, gearing SOEs towards profitability and efficiency in the long run can be aligned with the government’s own financial objectives. For instance, profitable NOCs can generate dividend payments for the government, while simultaneously securing resources for the country. The question is whether those intentions can prevail when governments face emergencies or extreme voter pressure (for example, if there is a rapid increase in gasoline or gas prices before an election).

In general, listed firms have more autonomy to make investment decisions and have more control over their profits than corporatized firms do. Moreover, some listed NOCs—though not all of them—seem to be more isolated from political intervention, not only with regard to profits, but also with regard to national strategy and objectives. This is partly due to the composition of their boards, but mostly because they have important shareholders that have money at stake if the government decides to steer the
company towards a goal that destroys value. The expectation of SOE reformers was that
governments would intervene less in listed NOCs because states care about their
reputations vis-à-vis with minority shareholders or because some of these shareholders
are, in effect, their own voting public (for example, through pension funds) (Perotti &
Biais, 2002). The idea is that if governments intervene in listed NOCs, the pushback
from shareholders such as large institutional shareholders, big banks, and pension
funds should be strong enough to tame the majority shareholder (the government) from
trying to extract benefits from its control over the company. In sum, the commitment
mechanism tying Leviathan’s hands is linked to how much the government cares about
minority shareholders, which is not to say that such a commitment will always occur in
listed SOEs. As we shall see next, there is important variation in political intervention
in those listed companies.

**Does Governance Matter for Performance?**

One obvious question when looking at corporate governance is whether it really
matters for performance. In the case of SOEs or NOCs, we want to know two things.
First, we want to see corporate governance aligning the incentives of owners (the
government) and managers. Second, we want to know if the corporate governance
arrangements, by isolating management from social or political goals, is causing NOCs
to perform better. These questions are hard to answer and require sophisticated data
that unfortunately is only available for a handful of oil companies (i.e., there is not
enough observations to do serious econometric work). Thus, in this section, we only
provide basic evidence to argue that, for NOCs, better governance, measured through
our corporate governance index in Table 7-2, seems to be correlated with better performance.

**Figure 1-2 Corporate Governance and Return on Assets in NOCs, 2011.**

Source: Created by the authors with data from Table 7-2 and with financial and operational data from Capital IQ and PIW (2011).

**Figure 1-3 Corporate Governance and Labor Productivity in NOCs, 2011.**
In Figure 7-1, we can see that there is a high correlation between autonomy from the government and return on assets. A similar correlation is observed in Figure 7-2, which shows a scatter plot of the governance index versus the logarithm of labor productivity (net income per worker). There are at least two hypotheses that could explain this relationship. First, companies with a higher governance index allow managers to operate with profitability as the main objective rather than having to maximize social and political variables. Second, for most of the companies with a low governance index, such as Mexico’s Pemex, the government taxes revenues heavily or directly controls the budget. Thus, in those companies CEOs can use less internally-generated resources to invest in profitable opportunities. Alternatively, these graphs may be telling us that companies with better governance can attract more outside capital and exploit more their profitable opportunities in a more efficient way (with higher labor productivity).

If the checks and balances embedded in the new corporate regimes of the publicly-traded NOCs are reducing political intervention we would expect to see labor productivity correlated with our governance index. Figure 7-2 shows precisely this. Companies that have higher corporate governance indices tend to be firms in which labor is used in a more productive way. This is, the new corporate governance arrangements of these NOCs may be mitigating the kind of political and social pressures to increase employment we discussed in Chapter 3.
Corporate Governance in Pemex, Petrobras, and Statoil

After looking at the corporate governance of NOCs in the previous section, we now dig deeper in order to understand how Leviathan as a majority shareholder works in practice. For this purpose, we compare Petrobras with Statoil and Pemex. These comparisons allow us to study the main differences between corporatization and listing as well as the variation in the level of political intervention among listed firms.

Ownership

In Table 7-3, we show variation in ownership (the share of votes held) by the government) and in levels of autonomy from the government (the firm’s control over its own resources) in these three firms. Pemex is a nonlisted firm that has most of the features of the corporatized firms which we discussed in the previous section, while Petrobras and Statoil are publicly traded firms with government control.

Board of Directors

At a glance, the configurations of all three boards of directors seem very similar: They are all relatively large with external members. A look at who is on the board reveals that the boards of Petrobras and Pemex are packed with government officials and that external members are a minority. That is, despite the fact that Petrobras is listed, there is a high level of political intervention in the firm through the board of directors as well as through outright fiat power (for example, the president of Brazil requesting the CEO of Petrobras to pursue certain investments or actions).
Table 1-4 Corporate Governance in Petrobras, Statoil, and Pemex (July 2012)

<table>
<thead>
<tr>
<th>Corporate governance</th>
<th>Petrobras</th>
<th>Statoil</th>
<th>Pemex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is it chartered as a standalone company?</td>
<td>Yes (corporation)</td>
<td>Yes (public limited liability co.)</td>
<td>No, part of government</td>
</tr>
<tr>
<td>Listed on a major stock exchange</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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</table>

<table>
<thead>
<tr>
<th>Board of directors (BOD)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of seats</td>
<td>9</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Number of external directors</td>
<td>2</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>External directors are a majority?</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Are government officials on BOD?</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shareholder rights and gov’t power</th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual-class shares (voting/nonvoting)</td>
<td>Yes</td>
<td>One class (one-share, one-vote)</td>
<td>Does not have shares</td>
</tr>
<tr>
<td>Share of votes held by government</td>
<td>50.2% (gov’t) + 8.2% (BNDES-PAR)</td>
<td>67%</td>
<td>100%</td>
</tr>
<tr>
<td>Gov’t cash flow rights (% of total equity)</td>
<td>28.70%</td>
<td>67%</td>
<td>100%</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Golden share or veto over major decisions</th>
<th>Veto rights because it owns majority of votes</th>
<th>Veto rights because it owns majority of votes</th>
<th>Veto rights over everything</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do minority shareholders have the right to elect a board member?</td>
<td>Yes, up to two</td>
<td>No</td>
<td>Not applicable</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Relations with the government</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxes as a % of revenues (2011)</td>
<td>25.2% net (34% minus deductions)</td>
<td>28% of revenues minus deductions for exploration and depreciation</td>
<td>56.2% of revenues</td>
</tr>
<tr>
<td>Additional payments to government</td>
<td>Dividends</td>
<td>Dividends according to ownership and taxes over all dividends of 3%</td>
<td>All additional profits minus deductions for exploration and depreciation</td>
</tr>
</tbody>
</table>

Source: Compiled from the companies’ websites and from questionnaires sent to Pemex.

Norwegian law forbids government officials on Statoil’s board of directors. In 1962, there was an accident in a state-owned mining company that had the Minister of Industry serving on the board. A political scandal ensued, blaming the accident on government negligence; the Labour government lost a confidence vote because of that.
“Since then, no civil servant in Norway has been allowed to serve on the board of any state-owned company, protecting politicians and government officials when state-owned ventures go bad” (Thurber & Istad, 2010; p. 20).

**Financial Autonomy and the Government’s Take**

At the bottom of Table 1-4, we include a section that shows the extent to which the governments of Brazil, Norway, and Mexico tax their NOCs and how much the government takes in the form of dividends. The fiscal regimes of Petrobras and Statoil seem extremely similar. The government takes between 25 and 28 percent in taxes on revenues and then gets dividends according to the cash-flow rights of its shares (28.7 percent in Petrobras and 67 percent in Statoil). In Mexico, the government takes all of Pemex’s profits—about 56 percent in taxes on revenues and the rest in dividends—then gives Pemex back some deductions for depreciation and to pay for exploration projects. In fact, between the government’s cut and the payments Pemex has to make for pensions and interest payments to bondholders, the company often has negative profits.

Table 7-3 shows an interesting and puzzling pattern. Comparing the amount of taxes and dividends that the Brazilian and Norwegian governments take from Petrobras and Statoil, respectively, it would seem that the Brazilian government gives more financial autonomy to Petrobras than the Norwegian government gives to Statoil. Yet, the government of Brazil needs to approve some of Petrobras’s big investment projects, while Statoil seems to have more financial autonomy on paper.
In Table 7-4, we also compare basic indicators of financial transparency and budgetary autonomy. As we mentioned before, only the Norwegian government seems to give its national oil company complete budgetary autonomy. Petrobras needs government approval for certain investment projects, while Pemex needs approval for all investment projects and for its whole budget. In fact, Pemex has an internal control office and, additionally, needs to run major budget changes through the Minister of Finance. Of the three, then, Pemex has the least flexibility when it comes to the use of the resources it generates.

Management Selection and Incentives

In Table 7-4, we also present a comparison of how these three firms choose a CEO. Petrobras’s and Statoil’s CEOs are selected by the boards, while Pemex’s CEO is selected by the president of Mexico. In Petrobras, however, the board is packed with government officials and government-appointed members. Therefore, the appointment of a CEO is, in practice, a political process and the president of Brazil has ultimate fiat power when it comes to who runs Petrobras. As a way to gauge political intervention in the appointment of top executives, in the same table we calculate that, in Petrobras, the CEO has changed after three out of the last seven presidential elections. In Pemex, the appointment of CEOs is also highly correlated with presidential elections. In Statoil, however, the appointment of CEOs is relatively independent of the electoral cycles. That is perhaps why the CEOs of Pemex and Petrobras turn over approximately every three years, while Statoil’s CEOs stay, on average, for seven years.
### Table 1-5 CEOs, Incentives, and Reporting in Petrobras, Statoil, and Pemex (July 2012)

<table>
<thead>
<tr>
<th><strong>CEOs/incentives</strong></th>
<th>Petrobras</th>
<th>Statoil</th>
<th>Pemex</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO selected by</td>
<td>BOD</td>
<td>BOD</td>
<td>President of Mexico</td>
</tr>
<tr>
<td>Current CEO</td>
<td>Maria das Graças Foster (technical CEO, though with close ties to Pres. Dilma Rousseff)</td>
<td>Helge Lund (technical-politician)</td>
<td>Juan José Suárez Coppel (technical)</td>
</tr>
<tr>
<td>Background</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profile of previous CEOs</td>
<td>9 technical, 1 technical-politician</td>
<td>2 technical-politicians, 2 technical, 2 politicians</td>
<td>4 technical, 2 technical-politicians, 3 politicians</td>
</tr>
<tr>
<td>Avg. CEO tenure in years</td>
<td>2.7</td>
<td>6.7</td>
<td>3.2</td>
</tr>
<tr>
<td>Do CEOs usually change after presidential elections</td>
<td>In 3 out of 7 elections</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>CEO compensation has pay-for-performance component</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>CEOs get stock options</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Do CEOs have shares</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Financials/transparency</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autonomous budget</td>
<td>No, some investments need gov't approval</td>
<td>Yes</td>
<td>No, some investments need gov't approval</td>
</tr>
<tr>
<td>Audited financials (by a private firm)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Accounting standards</td>
<td>IFRS</td>
<td>IFRS</td>
<td>IFRS (since 2012)</td>
</tr>
<tr>
<td>Frequency of financial reporting</td>
<td>Quarterly</td>
<td>Quarterly</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Main institutional investors</td>
<td>Local pension funds, Black Rock</td>
<td>Norwegian national insurance fund</td>
<td>Bondholders &amp; Ex-Im Bank</td>
</tr>
<tr>
<td>S&amp;P rating of long-term domestic currency bonds</td>
<td>BBB</td>
<td>AA-</td>
<td>A-</td>
</tr>
<tr>
<td>Regulation</td>
<td>National Oil Agency (ANP), linked to the Ministry of Mines and Energy</td>
<td>Norwegian Petroleum Directorate (NPD), reporting to the Ministry of Petroleum and Energy</td>
<td>National Carbohydrates Commission (CNH in Spanish), a decentralized agency linked to the Ministry of Energy (SENER)</td>
</tr>
</tbody>
</table>

Source: Compiled from the companies’ websites and from questionnaires sent to Pemex.

Note: IFRS stands for International Financial Reporting Standards, which are the standards set by the International Accounting Standards Board. IFRS usually requires companies to disclose more detailed accounts than the generally accepted accounting principles (GAAP), which are the required accounting standards to list shares or trade bonds on the New York Stock Exchange.
Our analysis also suggests that the backgrounds of CEOs are less political in listed firms, but it is hard to say because more than half of Pemex’s CEOs, though politically connected, have strong technical backgrounds in the industry and Statoil’s CEOs, though generally technical, have also traditionally been politicians.

Finally, we also look at the variation in incentives and compensation for CEOs in these three NOCs. Statoil is the only firm with a pay-for-performance contract for its CEO. Statoil also gives stock options to its CEO. In both Petrobras and Statoil, the CEO actually owns shares of the company. Moreover, Petrobras and Statoil pay their CEOs salaries that are somewhat compatible with the salaries of CEOs in private oil industry firms (for example, two million dollars per year at Statoil), while Pemex pays its CEO approximately $200,000 per year.

Financial Transparency and External Monitoring of NOCs

In terms of financial reporting and transparency, we can see that Petrobras, Statoil, and Pemex all comply with International Financial Reporting Standards (IFRS). The three firms report their financials quarterly and they all have a credit rating agency rating their bond issues. In part, the high levels of transparency in Pemex have to do with the fact that it issues bonds in various stock markets, which forces it to comply with international financial standards and to have a credit rating.

Who monitors the CEO of these NOCs? In addition to the board of directors, the credit rating agencies, and bond holders, institutional investors play a part in monitoring the executives of Statoil and Petrobras. Local pension funds and American
funds such as Black Rock are Petrobras’s largest minority shareholders. Although Pemex, being unlisted, is not monitored by institutional investors, it does have creditors and rating agencies following the actions of its managers. Actions that destroy value for the company are penalized with lower ratings or higher interest rates.

Regulation of NOCs in Brazil, Norway, and Mexico

Another important factor in understanding NOCs is regulation. In all three cases, there are established regulatory agencies which report to governmental bodies (such as the Ministry of Energy) and which are, at least on paper, run by technical professionals. However, a deeper inspection of the roles of those agencies reveals profound differences. In Brazil, the National Oil Agency (ANP) is relatively weak and heavily influenced by the government. Furthermore, it has had a stained reputation since ANP officials were caught requesting bribes from private companies.19 As a consequence, the president of Brazil and the Minister of Mines and Energy are the de facto “regulators” of Petrobras.

In Mexico, the government passed a law in 2008 creating the National Carbohydrates Commission (known as CNH). It was intended to be an autonomous agency run by commissioners with technical knowledge of the sector. In practice, however, not all the commissioners have been experts. Moreover, the de facto regulator of Pemex’s actions is the Ministry of Finance, which controls the company’s budget line by line and the minister of which is chairman of Pemex’s board.

In contrast to the Mexican and Brazilian cases, the Norwegian Petroleum Directorate (NPD), while also subordinate to the Ministry, is functionally autonomous and strong. As put by Thurber and Istad (2010; p. 28):

Since the Norwegian Petroleum Directorate formally reported to the Ministry, it was initially felt necessary to have an independent board oversee the directorate to guarantee its independence from politics. In time, however, this board was judged to be superfluous, and in 1991 it was disbanded... What ultimately protected the NPD from undue interference was the growing dependence of the Ministry on it for critical technical services and advice. (One early Ministry official said that the NPD tended to be viewed within the Ministry as its own technical department.) Any actions that would have severely disrupted this function would have been detrimental to both organizations.

The existence of an autonomous regulatory agency thus helped create institutional checks and balances that reduced the government’s ability to directly intervene. And, in the case of NPD, such autonomy was apparently due to the presence of technical regulators with distinct knowledge.

**The Risk of Political Intervention in the Leviathan as a Majority Shareholder Model**

In our analysis of NOCs above, we have shown that listing SOEs (including NOCs) mitigates or eliminates many of their common agency problems. Yet, the model of Leviathan as a majority investor has its limits. That is, even listed NOCs are not necessarily free from political intervention.

For instance, even at Statoil, which has many checks and balances on government intervention, there have been instances of political intervention. Although “direct intervention of the Ministry of Petroleum and Energy in Statoil strategy has
mostly disappeared, politicians continue to weigh in as though they were making policy for the company” (Thurber & Istad, 2010; p. 9). Even if Statoil is considered to be isolated from the government, Thurber & Istad (2010) mention that in October 2007 the government halted further developments of natural gas in the Troll field in Norway “on the grounds that such activity would likely harm the ultimate oil recovery from the field…Statoil was highly displeased based on commercial considerations” (p. 33). Yet, these are relatively isolated instances compared to other examples we mention below.

**Political Intervention in Petrobras**

In this section, we will see that Petrobras has not managed to shield itself from political intervention, despite its listing in New York (through Advisory Depository Receipts) and São Paulo.

*The Public Offer of Petrobras’ Shares in 2010*

On June 22, 2010, the board of directors of Petrobras approved an ambitious capital expenditure plan of $224 billion for 2011 to 2014, including expenditures to explore and develop the pre-salt oil fields off the coast of São Paulo. Foreseeing expenditures on the order of $45 billion per year for at least five years – more than Petrobras’s cash flows could cover – the company decided to issue a mix of debt and equity. In fact, the company planned what might be the largest public offer in the world, with the sale of shares totaling $50 billion (Pargendler, 2012). The share issue, in
and of itself, was a major accomplishment for any corporation, involving six investment
banks acting as global coordinators and nine as joint managers (Dwyer, 2011).

Yet, the government did not want Petrobras to sell voting shares to the public in
a way that would dilute its own voting power. In fact, Brazilian law forced firms issuing
new shares to give existing shareholders first priority to buy them. Simultaneously, the
government of Brazil sold to Petrobras the rights to extract five billion barrels of oil or
the equivalent at a price of $8.51 per barrel. Technically Petrobras would pay $42.5
billion to the government. Yet, the government decided to use those proceeds to
purchase new shares, thus increasing its voting power in the company.

Minority shareholders in Petrobras worried about this transaction. Of particular
concern were the dilution of minority shareholder power, the fact that exploitation
rights were negotiated without consultation with minority shareholders, and the fact
that those rights were paid for before they were going to be used. Other minority
shareholders complained that the price agreed to by Petrobras was too high.

Implicit Gasoline Price Controls

The price of gasoline had been controlled in Brazil for years, but direct
intervention in the management of the company mounted in early 2012. The
appointment of Maria das Graças Foster, referred to as Graça Foster, as CEO of

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20 The details of the transaction are publicly known in Brazil. We base our analysis on the detailed
work of (Dwyer, 2011)

21 Some of these arguments came out in the press, but we also heard some of them from one of
the most influential minority investors, who preferred to remain anonymous.
Petrobras in February 2012 was well received by market participants, due to her technical background; she had had a long career at the firm and was considered very knowledgeable about the sector. Graça Foster recognized that keeping gasoline prices low would undermine profitability and deteriorate the cash flow necessary to support future investments. At the time of her appointment, she gave an interview declaring:

If you ask me, is it necessary to adjust the price [of gasoline]? It is evident that it is necessary to adjust the price… It is not sensible to imagine that someone who sells anything—anything at all, a cup, a notepad, gasoline, diesel—should not transfer to the market his or her advantages or disadvantages.22

Yet President Dilma Rousseff and her Minister of Energy publicly disavowed Graça Foster’s statement and said that the price of gasoline would not be raised. They were both concerned that an increase in gasoline prices would accelerate inflation at a moment when the government was trying to force reductions in interest rates. In June 2012, the government allowed a minor adjustment—not enough to compensate for the large increases in the price of oil (at that moment trading close to $100 per barrel). These price controls directly affect the profitability of Petrobras’s refining division. Therefore, investments in refining are less profitable for minority shareholders than investments in the profitable lines of business.

In May 2012, a group of foreign investors sent a letter to Graça Foster, criticizing the company’s investment plan—approved by the board of directors—which would

invest heavily in refining despite there being no clear plan to lift price controls for gasoline. Echoing these investors’ concerns, Petrobras announced a record loss of $1,34 billion reais (around $662 million dollars) in the second quarter of 2012, its first loss in 13 years. Even if the loss was related to the write-off of a failed exploration attempt offshore, having the price of gasoline capped by the government certainly did not help profitability at Petrobras.

Investors also complained that the two board seats that the statutes of Petrobras guarantee for minority shareholders were not really representing minority shareholders (Rostás, 2012). These complaints echoed the concerns of institutional investors Polo Capital and Black Rock; the candidates they had nominated for the board had been defeated. The winners, Jorge Gerdau Johannpeter and Josué Gomes da Silva, were seen by these institutional investors as too close to the government: the former was a steel industrialist regularly consulted by Presidents Lula and Rousseff and the latter, also a businessman, was the son of Lula’s vice president. They were elected by the pension funds of two SOEs—the banks Banco do Brasil and Caixa Econômica Federal—and by BNDESPAR, the investment arm of Brazil’s national development bank. The Securities and Exchange Commission of Brazil supposedly investigated the incident, but without major consequences.

To be sure, political intervention in the oil business is commonplace across the world. However, it is not clear from the point of view of the Leviathan as a majority shareholder model why governments sometimes try to portray their NOCs as well-
behaved listed firms, maximizing value for shareholders, if in the end the majority
shareholder is willing to expropriate minority shareholders by tunneling or siphoning
away profits to affiliated “businesses.” The evidence presented above and below makes
us conclude that the Leviathan as a majority shareholder model gave the government of
Brazil a license to expropriate minority shareholders and use Petrobras for social and
political purposes. Moreover, the absence of a strong regulatory agency, such as the
Norwegian Petroleum Directorate, allowed the government to intervene; that is, to
“regulate” prices at will, even at the cost of reduced profitability.

Other Interventions in Petrobras

Petrobras has procurement policies that force its suppliers to have a high
national content. Those policies are of interest to the government, the controlling
shareholder; they help Brazilian industries develop and help Brazilian labor (and
companies) acquire knowledge from abroad. But they are equivalent to an
expropriation of minority shareholders, because national suppliers that are acquiring
capabilities may be slower or more expensive to provide the parts, equipment, and
services than comparable international suppliers.

Government interference can also occur when the NOC directly supports the
governments’ geopolitical pet projects. In 2005, for example, Petrobras signed up for a
joint venture with the Venezuelan oil company PDVSA to build a refinery in the
Brazilian state of Pernambuco. This was a pet project of President Lula and President
Hugo Chávez of Venezuela. Petrobras originally projected costs to be around $2.3 billion, but by 2012, the costs were expected to be $20 billion.\(^{23}\)

Other Cases of State Intervention in Listed SOEs

Brazilian government intervention is not limited to Petrobras. In 2012, for example, President Rousseff realized that her administration needed to take measures to tackle the recession that had hit Brazil that year. She began asking state-owned banks—in particular Banco do Brasil, the largest state-owned commercial bank in the Americas—to reduce interest rates somewhat artificially in order to push other Brazilian banks to follow suit (Romero, 2012).

In September 2012, Rousseff announced extensions of private concessions to produce electricity that would otherwise be transferred to Eletrobras, a state-owned enterprise listed on the São Paulo Stock Exchange. The government is Electrobras’s majority shareholder, but minority shareholders hold 35% of the equity. Therefore, government actions that affect profitability end up affecting the value of cash flows to those minority shareholders. Preliminary calculations by Eletrobras estimated that the government’s extension of concessions to private companies would generate losses of about $2.5 billion (R$5 billion), which could drive the company to report overall losses in 2013 (Polito, Shuffner, & Nogueira, 2012).

Conclusion

In the Leviathan as a majority shareholder model, some governments have managed to separate ownership and management by following improved governance practices. These SOEs have more professional CEOs (selected on merit or talent), higher-powered incentive contracts, and more transparent reporting systems. Transparency in the financial reporting of listed and corporatized firms makes it easier for both the government and private investors to monitor performance. In fact, governments can outsource the monitoring of these SOEs to the private investors who are minority shareholders, especially when these are large institutional investors.

Yet, governments have also used NOCs for social and political goals. The Brazilian government has found ways to tunnel resources out of SOEs to support objectives other than profitable investment. In the 1980s, economic shocks led governments to control prices. Those price controls led to losses that went directly into the public finances of the government and that affected the government’s capacity to pay its debt and to borrow in international markets. By the second decade of the twenty-first century, however, the Leviathan as a majority shareholder model seemed to be dealing with losses in a different way. Again, the objective of the Brazilian government was to use SOEs to control prices and inflation, but the effects on public finances were different, in two ways, from those we observed in the 1980s. First, price controls (for example, of gasoline) generated losses for SOEs in both the 1980s and the 2000s. Yet, in the latter period, the government, rather than face the losses itself, shared
them with minority shareholders. Second, in the 1980s, both price controls and political intervention to avoid layoffs led to many years of significant losses for SOEs. In the years that followed the privatization of Brazil’s large SOEs, things changed. Price controls could lead to losses, but because SOEs were run by professional managers and operated in many ways like private companies, these firms could adjust to government price controls just as any private company would adjust to a lower market price, by adjusting investment plans, selling non-core assets, firing workers, or increasing its leverage. That means that, under the Leviathan as a majority shareholder model, even if governments have a preference for profits in SOEs, governments can tolerate losses because they can share them with other investors. Governments also are no longer politically compelled to keep unnecessary workers on board because these firms with partial government ownership have slightly more flexibility to adjust to shocks. In sum, the model is unfair for investors but has given governments more flexibility in dealing with complex financial and political situations.

8. Leviathan as a Minority Shareholder

In this chapter we turn to the study of the effects of government investments in minority equity positions in private firms. Although governments sometimes purchase minority equity positions as part of a bailout, as was the case when the United States government bought a minority position in General Motors in 2008, in many countries
governments actively invest in equity using professional analysts and portfolio managers. Governments also become indirect minority shareholders by buying direct equity stakes in companies that own other companies. For example, the United States government became an indirect minority shareholder of PSA Peugeot when General Motors—of which the U.S. government was a minority shareholder at the time—bought a seven-percent stake in that company in March of 2012.24

In this chapter, we ask a simple question: What are the firm-level performance implications when Leviathan becomes a minority shareholder? We use a database of equity investments by BNDES from 1995 to 2009 to study this question. We assess how equity purchases by BNDES affected the performance and investment of target firms.25

Hypotheses

According to the industrial policy view, discussed in Chapter 3, government purchases of equity can help firms by alleviating capital constraints. If a firm finds it hard to access long-term financing, government injections of new equity will help it to make investments in plant and equipment to achieve economies of scale, improve operations, acquire new technology, and so on—all of which should improve firm-level performance. This should be particularly true in the case of firms that have “latent”

25 In this chapter we present a very simple approach to think about government minority equity positions. We pursue more complex empirical tests in Inoue et al. (Forthcoming)
capabilities to invest in profitable projects but that are, at the same time, financially constrained because they do not have access to “patient” capital.

How can equity stakes by the state help in this context? Here we borrow from Williamson’s (1988) discussion of the relative merits of debt and equity as a function of a firm’s asset profile. Williamson (1988) argues that investments in nonredeployable assets (such as dedicated industrial plants and machinery) are best served by equity due to the higher flexibility of this financing mode. While debt requires a fixed return over the duration of the contract, equity can better adapt to changing circumstances that might negatively affect the value of such assets. Furthermore, shareholders have more discretion to meet and discuss strategies to reorganize the company and provide a longer-term time frame for the necessary changes.

Applying Williamson’s logic to our context, we can predict state ownership of minority stakes will help improve firm performance by expanding firms’ investment opportunities. This should be observed especially when firms have the possibility of investing in long-term fixed assets. Although not all fixed assets are nonredeployable (e.g., generic land), the extent to which the firm invests in fixed capital signalsthe degree to which the firm has projects with long term maturity that are, therefore, riskier. This is precisely, according to Williamson, the kind of project that can benefit from the flexibility of equity as a financing mode. Furthermore, state capital will be particularly helpful when entrepreneurs do not have access to private equity investors willing to accept riskier projects with longer time horizon. In other words, the state itself will act
as a private equity investor. This would occur, for instance, in countries in the initial stages of industrial development (Cameron, 1967; Mahmood & Rufin, 2005).

In addition, minority ownership attenuates political intervention and, thus, helps governments solve some of the agency problems that state majority ownership usually entails. For instance, when the government is a minority shareholder, the majority owners and institutional investors (if they want to maximize profits) are likely to closely monitor executives or implement pay-for-performance compensation schemestoreduce agency problems, thus freeing the government from having to do that. The risk of a bankruptcy or hostile takeover should also provide managers with powerful incentives to try to perform at least as well as or better than their peers (Alchian, 1965; Ehrlich, Gallais-Hamonno, Liu, & Lutter, 1994; Karpoff, 2001).

Yet, there are two alternative views of why governments end up with minority equity positions. One view, partly linked to the path-dependence view, is that such positions are the product of complex political processes whereby governments try to preserve their influence on the economy through embedded intertwined networks with local capitalists (McDermott, 2003; Pistor & Turkewitz, 1996; Stark, 1996). The political view, on the other hand, would argue that governments may choose to allocate capital to specific firms in the form of equity investments for political reasons, perhaps because the firm owners have political connections and want access to cheap capital (Ades & Di Tella, 1997).
Therefore, according to either these two views, when the government buys a minority equity stake in a corporation, we should not necessarily find an improvement in performance or investment. The political view additionally suggests that the government may try to use equity as a bailout mechanism. For instance, convertible bonds purchased by the state may eventually turn into equity if the firm is in financial distress, and the government will in turn become a minority shareholder. This is precisely what happened to JBS, the meat processor that became a national champion in Brazil. There the government became a large minority shareholder because the firm could not repay its convertible bonds. If this phenomenon occurs systematically, then we should expect that equity investments by the state will primarily target firms with poor financial performance. In other words, instead of equity affecting performance, we should expect that past (negative) performance should influence whether a given firm will be observed with minority equity.26

The Contingent Effect of State Ownership of Minority Stakes

The effect of governments purchases of minority equity positions will depend on two major factors: the corporate governance of the target firm and the depth of existing

26 Still another possibility is that the government, despite being a minority shareholder, will have an ability to influence the firms with minority state equity. This problem of residual state interference in the Leviathan as a minority investor model is discussed at length in Chapter 9.
financial markets (i.e., how bad the capital market failure is). We discuss these two contingent effects in turn.

**Corporate Governance of the Target Firm**

We expect the effect of equity investments by the government to be attenuated in firms that belong to *business groups*—collections of firms controlled by a holding company—for two reasons. First, business groups provide member firms that are credit-constrained with financing opportunities that flow through internal capital markets. That is, groups can substitute for financial markets when external financing is scarce or costly (Khanna & Palepu, 2000; Khanna & Yafeh, 2007; Wan & Hoskisson, 2003). In other words, group affiliates do not need government equity investments because they can use the internal capital market of the group to promote their new projects.

Second, minority shareholders of firms that belong to business groups are at the expense of controlling shareholders (the holding company of the group) and can be expropriated (Morck, 2000). Most business groups are organized through complex pyramids involving firms that have stakes in other firms (Morck, Wolfenzon, & Yeung, 2005). Therefore, in countries with weaker protection for minority owners, equity investments by the government or by a development bank in a firm affiliated with a business group can be “tunneled” away through complex pyramids to support the controlling owners’ private projects or to rescue struggling companies in other parts of the group (Bae, Kang, & Kim, 2002; Bertrand, Djankov, Hanna, & Mullainathan, 2007).
The government may thus add value for a business group’s majority owners without necessarily improving the performance of the companies in which it invests. Consistent with this prediction, Giannetti and Laeven (2009) find that investments in minority equity positions by public pension funds in Sweden increase firm value, but the effect is reduced when firms are part of business groups.

**Capital Market Development**

For students of institutions, debt and equity markets in emerging and underdeveloped countries are frequently inhibited by poor legal protection and high transaction costs. Moreover, in developing markets that suffer occasional or continuous inflation shocks or that suffer from external shocks (e.g., balance-of-payments shocks), financial markets tend to be underdeveloped, debt markets tend to be shallow, and debt instruments tend to have short maturities (Goldsmith, 1986; Perotti & von Thadden, 2006; Roe & Siegel, 2006).

Part of our argument in this chapter is that minority equity purchases by the state can alleviate some of the constraints firms face in the capital markets of less-developed economies. That is, governments may sometimes substitute in part for markets. But once capital markets have developed, firms can raise equity capital by selling equity, issuing bonds, or obtaining loans (even long-term loans) from banks or financial institutions engaged in project finance. For instance, firms on the stock market

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27 The literature on the institutional conditions that inhibit or promote financial market development is extremely large. Among the most relevant paper see (Beck & Levine, 2005); Engerman and Davis (2003); Haber (2012); Haber, North, and Weingast (2008); Hoffman, Postel-Vinay, and Rosenthal (2000); La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998); Lamoreaux (1994).
can have a secondary issue of equity to raise more capital and private firms can go public for the first time (by having an initial public offering or IPO). Moreover, if equity markets thrive and are liquid, it is easy for investors to sell their equity or exit investments after a certain period (Haber et al., 2008). There should, therefore, be less need for government investment and the positive effect of governmental equity stakes should decline.

Shallow capital markets pose other problems besides the rationing of capital. The protections necessary to entice investors to buy equity or bonds are not present or are poorly enforced and the information necessary to monitor managers is sometimes lacking (La Porta et al., 1998). Dyck and Zingales (2004) and Nenova (2005) assert that underdeveloped capital markets make takeovers less likely and magnify governance conflicts. In fact, both of these studies find that Brazil was the worst place to be a minority shareholder in the 1990s, because controlling shareholders could easily divert corporate resources away from the firm either to themselves, either through perquisites (e.g., using company assets for private purposes), or to other firms they owned (Johnson, La Porta, Lopez-de-Silanes, & Shleifer, 2000).

Under those circumstances, we think that governments can perhaps replace markets as providers of capital and, more specifically, act as minority shareholders providing equity. Sarkar’s et al. (1998) comparison of state-owned and private banks in

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28Dyck and Zingales (2004) called this abuse of minority shareholders “private benefits of corporate control” and calculated it using the difference in price between voting and nonvoting shares at the time of a corporate takeover.
India indicates that, in the absence of well-functioning capital markets, private companies are not unambiguously superior to SOEs. However, as capital markets develop and offer more sophisticated mechanisms for capitalization and monitoring, new private investors will gradually replace governments as sources of equity capital.

![Figure 0-1: The Evolution of Capital Markets in Brazil, compared to the United States and Chile (1995-2009)](http://data.worldbank.org/data-catalog/global-financial-development)

We think it makes sense to take financial development into consideration in our study, given that Brazil experienced a process of financial deepening during our period, with private actors and the government both pushing for significant changes in corporate governance. Between 1995 and 2009, Brazil’s average stock market capitalization to GDP was 43.1 percent, compared to 98.7 percent in Chile and 129.7 percent in the United States. Thus, relative to other countries, Brazilian firms were
more constrained in terms of equity financing. Yet, over the same period, stock market capitalization to GDP in Brazil jumped from 19 percent in 1995 to 73 percent in 2009 (Figure 0-1). Moreover, Brazil experienced a radical transformation of corporate governance practices, at least for a subset of firms. This was particularly true after 2001, when Congress passed a new Joint Stock Company Law that included more protections for minority shareholders and when the Brazilian Stock Exchange (Bovespa) launched the New Market (Novo Mercado). As we explained on Chapter 4, Bovespa segmented its listings according to corporate governance standards (Perkins & Zajac, 2012).

**Measuring the Effect of State Purchases of Minority Equity**

In an ideal setting, in order to test the effect of government purchases of minority stakes we would like BNDES to buy shares of Brazilian companies randomly. But BNDES buys stakes in firms that it chooses or that choose the bank. Consequently, we pursue a second-best solution, which is to study what happens to firm performance when BNDES becomes a shareholder, using company fixed effects and time-varying industry-level effects (i.e., industry membership dummies interacted with year dummies) to control for unobservable factors that might affect ownership choice and performance (Wooldridge, 2002). We thus essentially measure if performance and investment increase in firms that see increases in government ownership of minority positions. This is possible with our dataset because our period of analysis is associated with intense corporate restructuring and changes in corporate control (e.g.,
privatizations). In other words, our database exhibits variation over time in terms of ownership, essentially caused by external shocks.

In order to examine the effects of having the government as a minority shareholder, we created a database of ownership and financial variables for about 358 publicly traded corporations in Brazil between 1995 and 2009. Our database is not a balanced panel of firms; some firms come into the database as they join the stock market and others leave the database as they are de-listed, acquired, or go bankrupt. See the Appendix 8-1 for a definition of our variables and summary statistics.

A crucial aspect in the construction of our database was to track BNDES’s minority equity stakes in Brazilian firms. We started by compiling the extent of BNDES’ direct ownership, i.e., cases where BNDES or BNDESpar, the investment arm, appear as a direct owner of the target firm. We call this variable BNDESDir. But we also wanted to measure cases where BNDES is an indirect shareholder, that is, when BNDES owns shares in a given firm which in turn owns the target firm. If BNDES purchases the equity of the target firm either directly or through this cascading pattern of indirect ownership, we coded a dummy variable BNDES, as 1. Unfortunately, the extent of equity participation in pyramids is not readily available. Thus, cases where the BNDES dummy is equal to 1 indicate that BNDES is a direct or indirect owner of the target firm.

29 We compiled the financial and ownership data from the databases Economática, Interinvest, and Valor Grandes Grupos. Further financials and most of our ownership information were compiled from the reports companies have to file with the Brazilian Securities and Exchange Commission (Comissão de Valores Mobiliários, or CVM).
We also wanted to know if the target company was part of a business group, i.e., a collection of firms with the same controlling shareholders. If so, we coded the set of affiliates in our database as members of a business group. This allowed us to study if equity investments by the government have a different impact on companies affiliated with business groups. To define group membership, we conducted a detailed analysis of shareholders’ agreements available on the Securities Exchange Commission’s website. We identified owners that had distinctive control rights over a firm (i.e., those who had the largest number of seats in the board of directors). Multinationals with single subsidiaries in Brazil were not treated as groups, even though they usually control multiple units across the world, mostly because our goal was to find instances in which local controlling shareholders could use new allocations to transfer funds to other local units (what is called in the finance literature “tunneling”). About 46.7 percent of the observations in our database came from firms belonging to some group.

To test our hypotheses that the effect of BNDES’s equity depends on business group membership, we multiply the \( BNDESDir \) and \( BNDES \) variables by the dummy variable coding for group membership.

**Effect of BNDES’s Equity on Performance and Investment**

Table 8-1 presents regressions examining how direct and indirect stakes by BNDES affect firm-level performance (measured as ROA, return on assets) and investment (measured as variations in the ratio of fixed assets to total assets, \( \Delta \text{Fixed} \), and the ratio of yearly capital expenditures to total assets, \( \text{CapEx} \)). For simplicity, we
report only the most important results. More detailed analyses and alternative specifications – including the use of propensity score matching to guarantee a more comparable assessment of firms with and without BNDES – are presented in Inoue et al. (Forthcoming).

We see in specification 1 that companies in which BNDES entered as a minority shareholder (directly or indirectly) have a return on assets seven percentage points higher than that of other firms. In specification 2, we find that the effect of an increase in the percentage of equity owned by BNDES has a significant and large effect on return on assets. The coefficient for our variable $BNDESDir$, a continuous variable capturing the fraction of the firm’s equity owned by BNDES, implies that a 10-percentage-point increase in BNDES’s direct equity (the average BNDES equity stake is over 10 percent) is associated with a 7.25-percentage-point increase in the firm’s return on assets.

In specifications 1 and 2, we also test whether the impact of having the government as a minority shareholder changes when the target firm belongs to a business group. The interactions of $BNDES \times Belongs to a group$ and $BNDESDir \times Belongs to a group$ are negative and significant, implying that when BNDES buys equity in a company that belongs to a business group, the positive effect on performance is practically neutralized. This finding does not imply that belonging to a business group is detrimental to a firm’s performance or access to resources. In fact, the main effect of our group membership variable indicates that belonging to such groups has a positive effect on ROA. This finding is consistent with the findings of the literature that defend
that business groups have ways to fill in institutional and capital market voids in emerging economies (Khanna & Palepu, 2000; Khanna & Yafeh, 2007; Wan & Hoskisson, 2003). However, because group affiliates tend to be less financially constrained, then the benefit of state equity should be lower than in the case of firms that do not belong to groups.

In specifications 3 and 4, we examine if increases in BNDES minority shareholdings lead firms to increase their fixed assets. We thus measure if having BNDES as a partner increases firm-level capital intensity, perhaps because they undertake major capital-intensive projects they could not have undertaken without state equity. The results indicate that the effects are only positive when BNDES is a direct shareholder; that is, when BNDES injects capital directly into the firm. The effect is not positive for firms that belong to a business group; when BNDES buys an equity position in a firm that is part of a business group, the capital is apparently not used to increase investment in that firm. This finding could suggest two things. The first is that when firms that are members of a business group get equity investments, they are not doing so in order to undertake new capital investments. If this is correct, then our finding supports the idea that group affiliates are not as capital-constrained as standalone firms. Second, this finding could suggest tunneling: when BNDES comes in as a shareholder, the capital is used to benefit other firms inside the group (Bertrand, Mehta, & Mullainathan, 2002).
### Table 0-1: Regressions Examining the Effect of State Minority Ownership via BNDES, Brazil, 1995-2009

<table>
<thead>
<tr>
<th>Variables</th>
<th>ROA (1)</th>
<th>ROA (2)</th>
<th>ΔFixed (3)</th>
<th>ΔFixed (4)</th>
<th>CapEx (5)</th>
<th>CapEx (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BNDES ownership</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BNDES (direct and indirect stakes - dummy)</td>
<td>0.070**</td>
<td>0.043</td>
<td>0.020*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.035]</td>
<td>[0.033]</td>
<td>[0.011]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BNDESDir (direct stakes only - percentage)</td>
<td>0.725**</td>
<td>0.582***</td>
<td>0.236**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.280]</td>
<td>[0.212]</td>
<td>[0.105]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Group ownership</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belongs to a group</td>
<td>0.108**</td>
<td>0.104**</td>
<td>0.033</td>
<td>0.026</td>
<td>0.024</td>
<td>0.023</td>
</tr>
<tr>
<td></td>
<td>[0.045]</td>
<td>[0.045]</td>
<td>[0.028]</td>
<td>[0.027]</td>
<td>[0.017]</td>
<td>[0.017]</td>
</tr>
<tr>
<td><strong>Interactions with group ownership</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BNDES×Belongs to a group</td>
<td>-0.082**</td>
<td>-0.076*</td>
<td>-0.021</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.039]</td>
<td>[0.039]</td>
<td>[0.015]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BNDESDir×Belongs to a group</td>
<td>-0.963***</td>
<td>-0.846*</td>
<td>-0.258*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.319]</td>
<td>[0.476]</td>
<td>[0.150]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Controls</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROA</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Fixed</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Observations</td>
<td>2,920</td>
<td>2,919</td>
<td>2,149</td>
<td>2,148</td>
<td>2,021</td>
<td>2,020</td>
</tr>
<tr>
<td>Number of firms</td>
<td>367</td>
<td>367</td>
<td>324</td>
<td>324</td>
<td>317</td>
<td>317</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.163</td>
<td>0.167</td>
<td>0.319</td>
<td>0.324</td>
<td>0.188</td>
<td>0.19</td>
</tr>
</tbody>
</table>

All regressions include controls for leverage, the log of gross revenue, and whether the company is foreign, state-owned, or domestic (privately owned). We also include a constant and year, firm, and industry-year fixed effects. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors in brackets.

Source: Simplified results based on the approach employed by Inoue et al. (Forthcoming), which presents more detailed analyses and alternative specifications.
Specifications 5 and 6 confirm these results. We use capital expenditures as the dependent variable and again find positive effects of BNDES ownership—both direct and indirect—of minority stakes. In specification 6, we again see that companies belonging to a business group experience a weaker positive effect from having BNDES as a minority shareholder.

Are Results Driven by Improved Access to Debt?

One concern we have with our analysis is that BNDES could increase leverage in a firm in which it has bought equity by opening lines of credit from its own banking arm or from other banks. We can test, however, whether BNDES’s ownership has an effect on leverage in general. Using Leverage as a dependent variable (defined as total debt to total assets), and employing specifications similar to those in Table 0-, we find that BNDES’s equity allocations do not change leverage in a significant way. That is, companies are apparently not getting equity from BNDES and using this as a way to open a line of credit from BNDES or any other bank.

Still as an additional test, using data collected for the analyses presented in Chapter 11 and developed further in Lazzarini, Musacchio, Bandeira-de-Mello, and Marcon (2012b), we tested if between 2002 and 2009 firms receiving BNDES’s equity also received BNDES’s loans—which are heavily subsidized and, unlike equity allocations, are directly affect profitability—but it turns out that the correlation is very small (-0.034) and not statistically significant at conventional levels. This small correlation is consistent with allegations that BNDESPAR, BNDES’ equity arm, usually
operates independently not only of the bank unit responsible for debt financing, but of other banks as well. This fact notwithstanding, in Chapter 11 we show that BNDES’s equity reduces financial expenses, possibly because of an implicit guarantee of repayment given that the state is a shareholder and not due to a change in leverage.

The Effect of Capital Market Development

Part of our argument is based on the assumption that Leviathan’s minority shareholder investments will have more impact when capital markets are shallow or when firms are more capital-constrained (Rajan & Zingales, 1996). We thus tested if the effects of BNDES’s equity investments on return on assets change as financial markets deepened. We interacted both variables of interest, BNDES and BNDESDir, with variables that measure financial development in Brazil as a whole. We use the following measures of financial development for this exercise: private credit to GDP, stock market capitalization to GDP, the number of IPOs per year, and the turnover rate of the stock market (value negotiated over stock market capitalization). Only when we interact the change in stock market capitalization (year on year) with BNDESDir do we find a strong and significant negative coefficient. That is, we find some support for the idea that when financial markets develop, government investments in minority equity have weaker effects.

In Inoue et al. (Forthcoming), we extended the research on the effects of government minority ownership by examining specifically how BNDES helps to promote capital expenditures of firms with constrained opportunities. We measured
constrained opportunities by creating a composite variable with two key elements. First, following David, Yoshikawa, Chari, and Rasheed (2006), we measured investment opportunity as cases where Tobin’s Q was higher than one. Second, we gauged financial constraints by computing the ratio of net profits to the initial stock of fixed capital (Behr, Norden, & North, 2012; Fazzari, Hubbard, & Petersen, 1988). The larger this ratio, the higher a given firm’s ability to invest using profits from its own operations. We then considered that the firm had a constrained opportunity if its Tobin’s Q was higher than one and if at the same time it had a ratio of net profits to the stock of fixed capital that was below the sample median.

We found positive effects of BNDES purchases of minority equity positions on capital expenditures and ROA. Yet, we found this effect was sharply reduced after 2002. In fact, the effect of BNDES’s equity purchases becomes insignificant in the sub-sample of observations after 2002 (see Chapter 8). We then interacted the BNDES variables with the extent of stock market capitalization (as well as other institutional variables). Our results again confirmed that a reduction in the positive effect of state equity over time was likely induced by the evolution of local capital markets. Over time, the effect of BNDES’s equity was reduced even in the case of firms with constrained opportunity (as defined before).

30 Thus, cases with Q = 1 indicate that a unit increase in total assets is expected to yield an increase in firm market value by more than one monetary unit. In other words, the firm can create market value by expanding its assets (David et al., 2006). Tobin’s Q is proxied by the market value of stocks plus the book value of debt, divided by the book value of total assets.
A problem with the previous analyses is that we lack cross-country heterogeneity in terms of institutional development. At the country level, if our hypothesis is right, we would expect to find that governments participate more as minority shareholders in economies in which financial markets are less developed. A simple way to check for such a correlation is to plot the number of firms that have the government as a minority shareholder (normalized by population), using the same database of government ownership we used in Chapters 2 and 3 of the book, against indicators of financial development. Figure 0-2 and Figure 0-3 show that there is a negative correlation between the number of firms in which the government has minority equity and two common measures of financial development—private credit to GDP and stock market capitalization to GDP.

We obviously do not want to claim causality because, while it may be the case that government investment in equity positions in private firms is substituting for financial markets, it may also be the case that Leviathan is crowding out private financial markets—or has crowded them out in the past—which would also account for the depicted negative correlation.
Figure 0-2 Number of Firms with Government Minority Ownership and Ratio of Private Credit to GDP in 28 Countries

Source: Appendix 2-1 and World Bank, *World Development Indicators*.

Figure 0-3 Number of Firms with Government Minority Ownership and Ratio of Stock Market Capitalization to GDP in 28 Countries

Source: Appendix 2-1 and World Bank, *World Development Indicators*. 
Are Our Results Driven by Selection?

Since BNDES obviously does not make its investments randomly, we should further investigate if our results are driven by its selection process. For instance, suppose that the government is selecting the best companies in which to invest, thereby increasing the probability of finding a positive correlation between government investments and firm performance. If, as critics of industrial policy contend, governments frequently “pick winners” that were already doing well (e.g. Almeida, 2009; Pack & Saggi, 2006), then the apparent positive effect of governmental stakes may be spurious; that is, past performance may be affecting governmental equity rather than the other way around.

However, a negative selection process is also plausible. As mentioned before, a hypothesis emanating from the political view is that the state may target poor performers that want to be bailed out (Haber, 2002; Kang, 2002). If this is the case, then we should expect a negative association between past performance and likelihood of BNDES’s becoming a minority shareholder.

Another source of concern with our results is that our period of analysis covers the terms of two presidents—Fernando Henrique Cardoso (1995-2002) and Luiz Inácio Lula da Silva (2003-2010)—with quite distinct public policy orientations. While most of the privatizations in our period occurred during Cardoso’s term, Lula’s administration put a greater emphasis on using BNDES’s capital to pursue an active industrial policy and to create large domestic “national champions” (Almeida,
Thus, our finding that the effect of BNDES has changed over the years may also be a result of changes in the government itself. Because no precise directional effect can be established *ex ante*, we leave this process of selection as an empirical question to be examined in a *post-hoc* fashion.

Therefore, as an additional robustness test complementing our fixed-effect approach, we tried to shed light on the selection process by performing additional regressions using BNDES as a dependent variable. The results of our analysis—which, for the sake of simplicity, we do not display here—show that BNDES did not systematically select companies based on past performance or other financial indicators. That is, we do not find any correlation between getting a loan or getting more loans and the lagged performance of the firms. These results hold for the entire period and also for the Cardoso and Lula periods considered separately. The only exception is that we find weak evidence that group membership positively affects the likelihood that the firm will receive direct or indirect BNDES equity, but this is not a major concern because we control for group membership in our regressions in Table 0-. We thus conclude that there is no clear indication that our results are driven by BNDES's own selection process and that our detected effect of BNDES on firm performance and investment not due to selection.

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31 In our analyses, we used lagged values of ROA, Leverage, and Fixed because BNDES will likely take past performance into account in its allocation decisions. Also, given that BNDES is a discrete variable and we want to control for unobservable firm-specific characteristics that may affect BNDES's choice of companies in which to participate, we used the so-called conditional Logit model (Chamberlain, 1980), which is a fixed-effect specification for discrete data. To check whether effects change when we consider the percentage of direct stakes held by BNDES, we ran additional OLS regressions with fixed effects using our continuous measure, BNDESDir, as a dependent variable. See Inoue et al. (Forthcoming).
There would obviously be a problem if there was a universe of firms in which BNDESPAR invests that are not in our sample. Our sample of equity investments covers almost 70 percent of the total equity held by BNDES in 2009. Therefore, we have to assume that the investments that are not in our sample performed in the same way as those in our sample in order to generalize our results.32

**Some Cases of Minority Equity Investments by BNDESPar**

We present below some short cases to illustrate the quantitative findings discussed above. These cases are not intended to test our hypotheses, but rather to shed additional light on the dynamics underlying our findings, especially with respect to how BNDES’s allocations interact with the ownership profiles of target companies.

**NET (Globo Group)**

Globo is a powerful Brazilian media group. Founded by journalist Irineu Marinho in 1925 with the newspaper *O Globo* and thereafter controlled by the Marinho family, it was by the late 1990s active in television and radio broadcasting (TV Globo and Radio Globo, respectively) as well as in newspapers and a number of other activities under the holding company Globopar. Indirectly, through Globopar, the Marinho family held stakes in publishing and printing companies; cable, satellite and internet service providers; and, other businesses.

32 Unfortunately there are private equity investments in nonlisted firms that we cannot capture in our database.
By 1999, the Marinho family, through Globopar’s pyramid, had acquired majority control of Globo Cabo—also known as NET—one of the firms under Globopar. Minority shareholders included Bradesco (a large financial conglomerate in Brazil), RBS (another Brazilian media group), and Microsoft, which had established an alliance with Globo to exploit broadband and Internet services. To support its ambitious plans to expand broadband infrastructure in Brazil, NET had borrowed in foreign markets; the debt was denominated in U.S. dollars. In 1999, BNDESPar agreed to capitalize NET with the purchase of shares worth 160 million reais (around $89 million). The bank had earlier provided loans to support the group’s expansion (Globo had aggressively invested not only in cable services through NET, but also in newspapers and satellite broadcasting through Globosat and Sky, the latter a local joint venture with Rupert Murdoch’s group).

The Asian Crisis affected Brazil severely and, in 1999, the government was forced to drop the peg it had had since 1995. Following the strong devaluation of the real in 1999, Grupo Globo’s debt increased rapidly, putting financial strain on Globopar (the holding company) and a number of its units, including NET. When NET’s market expansion proved unsuccessful and demand (number of subscribers) fell short of expectations, the company posted successive losses. In March 2002, the situation became critical and Globo announced a capitalization plan of one billion reais (around $430 million) involving the issue of debentures and a public offer of shares. BNDES agreed to make an injection of 284 million reais through BNDESPar, with some of the
funds going to buy equity and the rest going to buy debentures issued by Globo for this purpose.\textsuperscript{33}

The bank’s involvement was heavily criticized; some observers suggested that it was acquiescing to the pressure of a strong domestic group and rescuing a failing corporation. Even Eleazar de Carvalho, appointed president of BNDES in December 2001, expressed concern:

Where does this debt [of the group] come from? It comes from a financial strategy that was affected by currency devaluations … and also from inadequate market strategies. The restructuring initiatives of the company in the past were shown to be ineffective. So what would guarantee that this time things would be different?\textsuperscript{34}

BNDES made its capital injection conditional on a change in NET’s governance practices, which, according to de Carvalho, were the “basic and primordial” cause of the problem. The company was to adhere to new standards of the São Paulo Stock Exchange that improved minority owners’ voice and protection. But the financial stress persisted despite the new capitalization and the group defaulted in late 2002. This case reflects our earlier observation that BNDES’s minority stakes, although instrumental in supporting new investments, can come at the cost of potential shareholder conflicts when the controlling group’s decisions fail to create value.


\textsuperscript{34} Interview in the newspaper article “Para BNDES, ajuda à Globo não é garantida,” O Estado de São Paulo, March 17, 2002.
**Eletrobras**

Established in 1961 to boost investments in the energy sector, state-owned Eletrobras was consolidated during Brazil’s military dictatorship into a pyramidal group with subsidiaries in electricity generation (Eletronorte, Chesf, Furnas, and Eletrosul), transmission (EPTE, Furnas, and Eletrosul), distribution (Light and Escelsa), and nuclear power generation (through Furnas and, later, Eletrobras Eletronuclear). Eletrobras also held investments through Lightpar, a holding company, and invested in firms such as Eletropaulo, an energy distribution firm in the State of São Paulo.

Although Eletrobras, with its subsidiaries, was instrumental in developing Brazil’s electrical infrastructure, it was not a particularly efficient corporation, recording a loss of 139.7 million reais (about $145 million) in 1995 and incurring debt to the federal government on the order of 9 billion reais in 1996. In 1999, operational problems in Furnas’s nuclear power plants sharply reduced generating capacity, requiring the purchase—at a high price—of energy from other firms to meet contractual obligations. Eletrobras also had to rescue Furnas, which owed about 578 million reais for electricity purchases. In fact, in 1997, an executive of Eletrobras expressed concern because of the likely underestimation of costs in Furnas’s nuclear operations.\(^{35}\)

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Despite these problems, BNDESPar had purchased equity in Eletrobras and some of its subsidiaries, increasing its stake in Eletrobras from 8 percent in 1995 to 19 percent in 1996. In 1999, Eletrobras managed to solve the debt problem of another subsidiary, Light, by transferring shares worth 203.8 billion reaisto BNDESPar. This case illustrates our quantitative finding that BNDES’s stakes, when they are entangled in business groups (even when the groups are controlled by the government), can be used to support inefficient internal allocations of capital and can result in no improvement in firm performance.

Aracruz

Aracruz had been a leading worldwide producer of cellulose pulp for three decades, its competitive edge derived from Brazil’s abundant land and low production costs. Because pulp production is typically vertically integrated, Aracruz had investments in eucalyptus (the tree from which pulp is extracted) farms and forest cultivation technology as well as in processing plants. Its annual revenues circa 2003 were approximately one billion dollars and its assets were $3.5 billion (about 65.7 percent fixed). With 98 percent of its production exported, Aracruz was considered a highly competitive producer with distinctive technology, especially at the farm level.

BNDES was instrumental in promoting Aracruz’s initial development. With 38 percent of voting shares in 1975, BNDES helped fund approximately 55 percent of the

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36 “Brazil’s Eletrobras transfers shares of Light to BNDESpar,” Bloomberg, August 1999.
industrial investments that enabled the firm to initiate pulp production in 1978.\textsuperscript{38} BNDES later sold some of its shares to domestic business groups such as Safra and Lorentzen. However, Aracruz was in practice managed as a standalone firm. In 1992, managers at Aracruz executed a public offer of shares to support the firm’s planned expansion, pioneering the use of NYSE American Depository Shares (ADS) in Brazil. Foreign listing required that Aracruz improve its transparency and control mechanisms to meet superior governance standards. Board members were given a voice in key decisions related to capacity expansion, acquisitions, and distribution of dividends. BNDESPar, with approximately 11 percent of Aracruz’s total equity, was active in the company’s governance, having one representative on its board.\textsuperscript{39}

In the 1990s, production efficiency was substantially improved through capital expenditures supported by the new capitalization program. Processing capacity jumped from 400,000 tons of cellulose per year in 1978 to 1,070,000 tons in 1994 and 1,240,000 tons in 1998. The ambitious expansion plan approved by the board in 2000 triggered some $800 million in new capital expenditures between 2001 and 2003, 75 percent of which was allocated to industrial processing plants and 20 percent to investments in land and forest technology. The case of Aracruz therefore illustrates how the equity of BNDES and other investors was used to boost productive fixed investments in a context in which improved governance practices helped mitigate expropriation of minority shareholders.

\textsuperscript{38} From Spers (1997).
\textsuperscript{39} “BNDES explains director’s position in Aracruz,” \textit{Gazeta Mercantil Invest News}, April 24, 1997.
Conclusion

In this chapter, we show that having the government as a minority owner can have positive effects. Those effects may be weakened, however, when a firm either does not face strong capital constraints or is part of a business group which has its own internal capital market. We find evidence that having the government as a minority shareholder improves performance and increases capital expenditures, especially for firms that are not part of a business group. That is, there is some evidence that governments can use minority equity investments to solve some market failures. This provides some support for the industrial policy view described in Chapter 3. Also, it does not seem that having the government as a minority shareholder worsens performance because of political intervention or agency problems typical of state-controlled companies. On the contrary, we find evidence of improvements in performance that support the idea that having only a minority position allows governments to solve some market failures without worsening the management of corporations, as it tends to happen in traditional state-controlled firms with poor governance.

Thus, this chapter advances our understanding of the relatively overlooked phenomenon of minority equity stakes by governments in emerging markets and, on a broader level, contributes to recent discussions about the advantages and disadvantages of state capitalism (Bremmer, 2010). Our findings suggest a new programmatic agenda where scholars not only examine how firms react to limiting institutions, but also how
local policies can positively interact with private strategies to foster superior performance. That is, our study advances the literature on institutional voids by proposing ways in which local policies can be helping to overcome voids rather than creating them.

Furthermore, our findings have clear policy implications. Some observers contend that government interference in the economy creates inefficiencies and crowds out private entrepreneurship. Our evidencesuggests, however, that the government’s purchase of equity stakes in publicly traded corporations may not be problematic depending on a host of important contingencies. In particular, our results suggest that policy makers considering minority equity stakes as an industrial policy tool should avoid pyramidal groups with poor governance and target instead stand-alone firms; focus investments where there is a clear need to undertake productive capital expenditures by well-run firms; allocate equity capital directly in target firms instead of indirectly through layers of ownership; and progressively exit targeted firms as the local institutional context develops.

Admittedly, some of our results may be idiosyncratic to Brazil and its particular mechanisms of minority governmental participation. And while we have focused on Brazil’s use of development banks, governments have also used public pension funds, life insurance companies, sovereign wealth funds, and state-owned holding companies to become minority investors (Wooldridge, 2012). Thus, future work is needed to verify the generalizability of our results in other developing and emerging economies using
other channels of state-owned equity. For instance, Vaidyanathan and Musacchio (2012) find that the government of India, using the Life Insurance Corporation as a holding company, has minority equity positions that account for over 5 percent of total market capitalization. Yet, they do not look at the implications for firm profitability.

Finally, in this chapter we examined general aspects of the investments of BNDES in equity. In the following chapter we study in detail the case of Vale, the Brazilian mining giant, as a way to examine some of the implications of minority investments by the government in politically sensitive sectors.
### Appendix 8-1

**Variables Used in the Analysis of Leviathan as a Minority Shareholder**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Mean</th>
<th>Std. dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>Net profit over total assets</td>
<td>-0.045</td>
<td>0.308</td>
</tr>
<tr>
<td>Gross revenue</td>
<td>Gross revenue of the firm (in billion dollars)</td>
<td>0.859</td>
<td>4.104</td>
</tr>
<tr>
<td>Leverage</td>
<td>Total debt over total assets</td>
<td>0.516</td>
<td>5.792</td>
</tr>
<tr>
<td>Fixed</td>
<td>Fixed assets over total assets</td>
<td>0.299</td>
<td>0.250</td>
</tr>
<tr>
<td>ΔFixed</td>
<td>$\text{Fixed}<em>t - \text{Fixed}</em>{t-1}$</td>
<td>0.000</td>
<td>0.145</td>
</tr>
<tr>
<td>CapEx</td>
<td>Capital expenditures over total assets</td>
<td>0.070</td>
<td>0.096</td>
</tr>
<tr>
<td>BNDES</td>
<td>Dummy variable equal to 1 if BNDES is a direct or indirect owner</td>
<td>0.126</td>
<td>0.332</td>
</tr>
<tr>
<td>BNDESDir</td>
<td>Fraction of the firm's equity that is directly owned by BNDES (0 to 1)</td>
<td>0.011</td>
<td>0.048</td>
</tr>
<tr>
<td>Foreign</td>
<td>Dummy variable equal to 1 if the majority shareholder is foreign</td>
<td>0.184</td>
<td>0.388</td>
</tr>
<tr>
<td>State-owned</td>
<td>Dummy variable equal to 1 if the majority shareholder is the Brazilian state</td>
<td>0.070</td>
<td>0.256</td>
</tr>
<tr>
<td>Belongs to a group</td>
<td>Dummy variable equal to 1 if the firm belongs to a business group</td>
<td>0.450</td>
<td>0.498</td>
</tr>
</tbody>
</table>
11. Leviathan as a Lender: Industrial Policy vs. Politics at BNDES

In this chapter we present empirical evidence on the role of development banks according to the *industrial policy* and *political* views. We use the same database we used in Chapter 8, which tracks firm characteristics and performance for publicly traded corporations in Brazil, together with an original database that tracks BNDES loans to firms traded on the São Paulo Stock Exchange. Because BNDES does not disclose firm-level loan data for confidentiality reasons, we focus on publicly traded companies which are required to provide detailed information on the origins of their debt.

As the reader may recall, the industrial policy view assumes that development banks operate in environments with capital scarcity. By specializing in long-term finance neglected by the private sector, development banks facilitate the execution of valuable investments and projects that would otherwise not be carried out (e.g. Armendáriz de Aghion, 1999; Bruck, 1998; Yeyati et al., 2004). Development banks may also set high standards for firms and lend to them conditional on meeting specific targets (Amsden, 2001). Thus, according to this view, development banks should improve investment and performance. For instance, if firms are constrained in long-term financing, loans from development banks may allow them to undertake capital expenditures to capture economies of scale or acquire new technology. This,
we think, should be expressed as improved firm-level profitability (ROA, EBITDA/assets) or market valuation (Tobin’s q). Of course, an observed increase in profitability may instead be due to subsidized funding (i.e., a reduction in financial expenditures to total debt). However, if development bank loans prompt investment in valuable projects, then the effect on performance should occur beyond a simple reduction in interest payments. Following the same logic, BNDES loans should also positively affect a firm’s capital expenditures and its stock of fixed capital.

As for the determinants of loan allocations, on the one hand, the industrial policy view would argue that loans from development banks should go to firms that have valuable projects for which the market could not or would not provide sufficient capital or complementary investments (e.g. Lin & Chang, 2009; Rodrik, 1995). If those advantages are “latent,” development banks may not necessarily target firms with superior (actual or past) performance. Therefore, we would not expect to find that high-performing firms get the financing, unless they use it to finance capital-intensive projects with long maturities. On the other hand, development banks may pick firms with good performance, either to boost “champions” or to guarantee repayment (Amsden, 2001).

The political view, in contrast, places more emphasis on the process of selection. Governments can use their development banks to bail out failing corporations (the soft budget constraint hypothesis) or benefit politically connected capitalists (what we call the rent-seeking hypothesis). For instance,
well-connected firms may receive subsidized loans from development banks in exchange for favors to politicians, including campaign donations. Dinç (2005) finds that, during election years in emerging markets, the lending activity of government-owned banks 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. In Brazil, Claessens, Feijen & Laeven (2008) show that a firm’s campaign donations are correlated with access to preferential financing.

Therefore, well-connected industrialists may have superior ability to attract loans or equity from development banks, even for projects for which they would be able to get capital elsewhere (Ades & Di Tella, 1997; Haber, 2002; Krueger, 1990). Because, according to this view, BNDES may give out loans for reasons other than efficiency, there is no clear prediction on the effect of loans on firm-level performance or investment. Even when development banks promote the creation of national champions through industrial consolidation, the final effect of allocations is not straightforward. On the other hand, reduced competition should increase economic rents; but it may also create incentives for restricted output and investment. In the political view, the only clear positive effect we expect to find from loan allocations is that firms should have lower financial expenditures once they get subsidized credit. When BNDES loans are given out to companies that did not need them or when firms get loans just to lower their cost of capital, then BNDES loans are simply a transfer
from the state to private capitalists, without necessarily having any effect on economic activity or investment.

In this chapter, we test these predictions using two sets of regressions (Lazzarini et al., 2012b). The first set examines the impact of BNDES loan allocations on firm-level performance and investment, while the second set assesses the determinants of allocations, using BNDES loans as dependent variables and firm-level performance and political factors as independent variables. In both cases, to control for unobservable factors, we use fixed-effects specifications, including time-invariant firm-level fixed effects and time-varying year and industry-year effects. Thus, we fundamentally measure how variations in BNDES’s loans affect variations in firm-level performance and how firm characteristics affect the level of loans companies receive.

**BNDES Loans: An Overview**

*Data*

We use the same database of firm performance used in Chapter 8, but this time we track the amount of loans received by publicly-traded corporations. Thus, besides some of the issues discussed in Chapter 8, it is important to be upfront about two limitations of our data. First, BNDES is not choosing firms at random. Therefore, there may be selection bias in our results. We address this towards the end of the chapter, making clear what these problems could be and using different estimation techniques to both study
selection (among publicly-traded corporations) and show why this is not an issue for our results.

Second, there is a different kind of selection problem with our data. Our database on loans from BNDES covers only over 30 percent of the total loan portfolio (based on data for 2009). This is because there are loans to private firms (non-listed) that we cannot capture in our database. However, our data is ideal to study BNDES credit allocations to publicly-traded corporations and our results indicates that there are important lessons to be learned about how these large corporations behave when they get subsidized loans.40

Now, one important caveat, before we continue, is to disentangle the relationship between BNDES’s equity investments and loans. Even if 84.5 percent of firms with BNDES equity also have loans, almost 90 percent of the firms with BNDES loans (87.9 percent to be precise) do not have equity investments by the bank. Therefore, we think we can separate the study of loans and equity. In fact, the correlation between the size of observed BNDES loans and equity investments is rather small, at 0.149.

Cross-sectional evidence

Let us begin with a simple cross-sectional analysis answering the following question: How do firms with and without BNDES loans differ? We consider a host of firm-level characteristics related to the above predictions on the effects and determinants of BNDES lending activity (see the Appendix 11-1).

40 The secretive nature of development banks truly makes having a broader database a difficult task.
The first set of variables is related to firm-level performance and investment activity. Thus, the profitability of firms is measured by ROA (net return on assets) and \( EBITDA/\text{assets} \) (operational return on assets). The latter is particularly important because the subsidy associated with BNDES loans may distort an analysis of profitability through ROA, which is net of financial expenses. 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 BNDES loans may help reduce the cost of capital, we also add the variable \( \text{Finex/debt} \), measuring the ratio of firm-level financial expenses (loan payments) to debt. The final two variables are related to investments: \( \text{Capex/assets} \) and \( \text{Fixed assets/assets} \) measure yearly capital expenditures and the total stock of fixed capital relative to the stock of all existing assets, respectively.

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 \( EBITDA/\text{assets} \), and lower \( \text{Finex/debt} \) (see Table 1-1). 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). Firms receiving loans also appear to have a larger proportion of fixed assets. At first glance, this seems to be consistent with the industrial policy view that development banks are associated with improved investment and performance.
When we look at the distribution of loans in our database by industry or by company, we can see that BNDES was focused on lending to electricity and telecommunications companies in the past but had changed its focus to commodities by 2009. In Table 11-2, we show the percentage of loans in our database by industry (2002-2009); the two dominant sectors are public services—such as electricity, gas, and sanitary services—and oil and gas extraction. Table 11-2 shows the distribution of loans by firm. We see that, in 2004, the distribution of loans to the largest 15 companies was more diffused, with electricity companies as the largest borrowers, but by 2009, Petrobras had become the largest borrower, taking almost 40 percent of that year’s loans to publicly traded corporations.

| Table 11-1 Characteristics of Firms with and without BNDES Loans |
|------------------------|------------------------|------------------------|------------------------|
| **Variable**           | **Firms that do not have BNDES loans** | **Firms that have BNDES loans** |
|                        | N  | Mean  | Std. error | N  | Mean  | Std. error |
| ROA                    | 290| 0.039 | 0.008      | 887| 0.056*| 0.003      |
| EBITDA/assets          | 279| 0.075 | 0.009      | 887| 0.123***| 0.004      |
| Tobin’s q              | 239| 1.199 | 0.071      | 887| 1.147| 0.032      |
| Finex/debt             | 129| 0.328 | 0.020      | 689| 0.265***| 0.007      |
| Capex/assets           | 273| 0.069 | 0.008      | 852| 0.078| 0.003      |
| Fixed assets/assets    | 290| 0.157 | 0.013      | 887| 0.266***| 0.008      |
| Ln(assets)             | 290| 12.287| 0.107      | 887| 13.119***| 0.053      |
| Tobin’s q              | 239| 1.199 | 0.071      | 887| 1.147| 0.032      |

Source: Based on Lazzarini et al. (2012b). Asterisks denote the statistical significance of a two-tailed mean comparison test, where *, **, and *** represent p < 0.05, p < 0.01, and p < 0.001, respectively.
Figure 11-1 BNDES Loans by Industry as a Percentage of Total Loans, 2002-2009

Table 11-2 Percentage of BNDES Loans in Our Database by Company

<table>
<thead>
<tr>
<th>Company</th>
<th>Percentage of total loans in our database</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In 2004</td>
</tr>
<tr>
<td>Petrobras (oil)</td>
<td>14.5</td>
</tr>
<tr>
<td>Telemar Norte Leste (telecomm.)</td>
<td>10.4</td>
</tr>
<tr>
<td>Vale do Rio Doce (mining)</td>
<td>-</td>
</tr>
<tr>
<td>Suzano (paper &amp; energy)</td>
<td>3.4</td>
</tr>
<tr>
<td>Brasil Telecom</td>
<td>-</td>
</tr>
<tr>
<td>Neoenergia (electricity)</td>
<td>3.2</td>
</tr>
<tr>
<td>CPFL Energia (electricity)</td>
<td>6.8</td>
</tr>
<tr>
<td>VBC Energia (electricity)</td>
<td>2.7</td>
</tr>
<tr>
<td>CSN (steel)</td>
<td>4.2</td>
</tr>
<tr>
<td>Klin (paper)</td>
<td>1.3</td>
</tr>
<tr>
<td>Aracruz (cellulose)</td>
<td>2.4</td>
</tr>
<tr>
<td>Cesp (electricity)</td>
<td>11.2</td>
</tr>
<tr>
<td>Sadia (frozen food)</td>
<td>3.2</td>
</tr>
<tr>
<td>CPFL Geração (electricity)</td>
<td>-</td>
</tr>
<tr>
<td>Embraer (airplanes)</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Our calculations, based on our database of publicly listed firms (Lazzarini et al., 2012b).
According to the industrial policy view, we would expect BNDES to be lending to companies in industries in which there are tighter credit constraints, perhaps because projects take longer to mature and usually have cash flows in local currency. Industries that have cash flows in foreign currency and that can therefore borrow abroad at low cost should not be among BNDES’s largest borrowers. Yet, in Figure 11-1 and Table 11-2, we can see that this is not how things have evolved in Brazil. There is a large concentration of loans to commodity companies such as Petrobras (oil and gas extraction) and Vale (mining). Almeida (2009) observed that, during our period of analysis, BNDES has focused on basic commodity sectors such as mining, oil and agribusiness.

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). This may also explain our cross-sectional finding that BNDES tends to target large and profitable firms (Table 11-1), which are natural candidates to be singled out as champions. However, these results are merely descriptive and do not control for a host of factors influencing loans. Using more robust econometric methods, we next examine whether loans have really contributed with firm-level performance and investment. We also assess in more detail the factors that are driving BNDES’ choice of its targeted firms.
Do Loans Affect Firm-level Performance and Investment?

Table 11-3 presents regression results on how BNDES affects firm-level performance ($ROA$, $EDITDA/\text{assets}$ and Tobin’s $q$) and investment variables, using fixed-effect regressions. We measure BNDES firm-level financing in both absolute and relative (percentage) terms. Thus, $\ln(\text{BNDES loans})$ measure the total (logarithmic) value of loans and $\%\text{BNDES loans}$ gauges the extent of BNDES loans relative to total debt. Although the effect of equity was already discussed in Chapter 8, we also add equity variables in our analysis to assess their role jointly with loans. In all specifications, we added lagged values of those variables to accommodate possible phased effects of the allocations. (Regressions without lags showed the same results.)

In virtually all model specifications (1 to 6), we find no significant effects for the BNDES variables on firm-level performance. Thus, although a cross-sectional examination appears to show BNDES lending to the best firms, the effect disappears once we control for firm- and industry-level factors. Our data are thus inconsistent with our prediction, derived from the industrial policy view, 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.
Table 11-3 Effects of BNDES Financing on Firm Performance and Investment, 2002-2009 (Fixed-effect Regressions)

<table>
<thead>
<tr>
<th>Loans</th>
<th>ROA</th>
<th>EBITDA/assets</th>
<th>Tobin’s q</th>
<th>Finex/debt</th>
<th>Capex/assets</th>
<th>Fixed assets/assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ln(BNDES loans)_t</td>
<td>-0.002</td>
<td>-0.003</td>
<td>-0.009</td>
<td>-0.013*</td>
<td>0.004*</td>
<td>-0.002</td>
</tr>
<tr>
<td></td>
<td>[0.002]</td>
<td>[0.003]</td>
<td>[0.008]</td>
<td>[0.005]</td>
<td>[0.002]</td>
<td>[0.005]</td>
</tr>
<tr>
<td>Ln(BNDES loans)_t-1</td>
<td>0.001</td>
<td>0.002</td>
<td>-0.01</td>
<td>0.005</td>
<td>-0.001</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>[0.003]</td>
<td>[0.003]</td>
<td>[0.015]</td>
<td>[0.006]</td>
<td>[0.002]</td>
<td>[0.002]</td>
</tr>
<tr>
<td>Ln(BNDES loans)_t-2</td>
<td>-0.001</td>
<td>-0.004</td>
<td>-0.03</td>
<td>-0.001</td>
<td>-0.004</td>
<td>-0.004</td>
</tr>
<tr>
<td></td>
<td>[0.003]</td>
<td>[0.004]</td>
<td>[0.021]</td>
<td>[0.006]</td>
<td>[0.002]</td>
<td>[0.003]</td>
</tr>
<tr>
<td>%BNDES loans_t</td>
<td>0.018</td>
<td>0.025</td>
<td>0.085</td>
<td>0.101</td>
<td>0.000</td>
<td>-0.041†</td>
</tr>
<tr>
<td></td>
<td>[0.026]</td>
<td>[0.031]</td>
<td>[0.173]</td>
<td>[0.065]</td>
<td>[0.021]</td>
<td>[0.024]</td>
</tr>
<tr>
<td>%BNDES loans_t-1</td>
<td>0.038</td>
<td>0.028</td>
<td>-0.078</td>
<td>-0.124**</td>
<td>-0.007</td>
<td>-0.018</td>
</tr>
<tr>
<td></td>
<td>[0.029]</td>
<td>[0.036]</td>
<td>[0.127]</td>
<td>[0.047]</td>
<td>[0.024]</td>
<td>[0.031]</td>
</tr>
<tr>
<td>%BNDES loans_t-2</td>
<td>-0.011</td>
<td>-0.012</td>
<td>-0.074</td>
<td>0.093</td>
<td>-0.063</td>
<td>-0.020</td>
</tr>
<tr>
<td></td>
<td>[0.027]</td>
<td>[0.029]</td>
<td>[0.173]</td>
<td>[0.069]</td>
<td>[0.061]</td>
<td>[0.045]</td>
</tr>
<tr>
<td>Equity</td>
<td>Ln(BNDES equity)_t</td>
<td>-0.002</td>
<td>-0.004</td>
<td>0.000</td>
<td>0.001</td>
<td>-0.003</td>
</tr>
<tr>
<td></td>
<td>[0.002]</td>
<td>[0.003]</td>
<td>[0.006]</td>
<td>[0.006]</td>
<td>[0.003]</td>
<td>[0.002]</td>
</tr>
<tr>
<td>Ln(BNDES equity)_t-1</td>
<td>-0.001</td>
<td>0.001</td>
<td>-0.024</td>
<td>-0.014</td>
<td>0.001</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>[0.004]</td>
<td>[0.004]</td>
<td>[0.016]</td>
<td>[0.009]</td>
<td>[0.002]</td>
<td>[0.002]</td>
</tr>
<tr>
<td>Ln(BNDES equity)_t-2</td>
<td>0.004</td>
<td>0.003</td>
<td>0.030</td>
<td>0.003</td>
<td>-0.001</td>
<td>-0.001</td>
</tr>
<tr>
<td></td>
<td>[0.005]</td>
<td>[0.005]</td>
<td>[0.019]</td>
<td>[0.007]</td>
<td>[0.002]</td>
<td>[0.004]</td>
</tr>
<tr>
<td>%BNDES equity_t</td>
<td>-0.092</td>
<td>-0.156</td>
<td>0.692</td>
<td>0.277</td>
<td>-0.135</td>
<td>0.182</td>
</tr>
<tr>
<td></td>
<td>[0.151]</td>
<td>[0.186]</td>
<td>[1.084]</td>
<td>[0.352]</td>
<td>[0.284]</td>
<td>[0.207]</td>
</tr>
<tr>
<td>%BNDES equity_t-1</td>
<td>-0.07</td>
<td>0.069</td>
<td>-1.529</td>
<td>-2.100***</td>
<td>-0.003</td>
<td>0.109</td>
</tr>
<tr>
<td></td>
<td>[0.272]</td>
<td>[0.258]</td>
<td>[0.982]</td>
<td>[0.496]</td>
<td>[0.120]</td>
<td>[0.133]</td>
</tr>
<tr>
<td>%BNDES equity_t-2</td>
<td>0.315</td>
<td>0.191</td>
<td>2.561</td>
<td>-0.171</td>
<td>-0.135</td>
<td>-0.048</td>
</tr>
<tr>
<td></td>
<td>[0.367]</td>
<td>[0.383]</td>
<td>[1.955]</td>
<td>[1.704]</td>
<td>[0.204]</td>
<td>[0.184]</td>
</tr>
</tbody>
</table>

N (total)                    | 600       | 553           | 590         | 545        | 501          | 468                 | 582          | 539          | 600         | 553          |
N (firms)                     | 172       | 161           | 168         | 159        | 160          | 150                 | 130          | 129          | 168         | 158          |
p (F test)                    | < 0.001   | < 0.001       | < 0.001     | < 0.001    | < 0.001      | < 0.001             | < 0.001      | < 0.001      | < 0.001     | < 0.001      |

Note: All specifications include the following controls: fixed assets to total assets, whether the firm is foreign, whether it belongs to a business group, the log of total assets, and leverage. Specifications also include firm, year, and industry-year fixed effects. Two-tailed tests where †, *, **, and *** represent p < 0.10, p < 0.05, p < 0.01, and p < 0.001, respectively. Robust standard errors in brackets (errors are clustered at the firm level). More detailed results are in Lazzarini et al. (2012b).
No effect is also found in terms of equity. Although in we showed a positive effect of BNDES equity on performance for the period 1995-2002, the significance disappears in more recent years. A possible explanation, discussed in that chapter, is that the development of the local capital market reduced severe financing constraints affecting Brazilian companies in the last century.

As expected, specifications 7 and 8 in Table 11-2 show that companies that borrow from BNDES pay less in interest payments overall. The subsidy included in BNDES loans reduces firms’ cost of capital. Consider the results of specification 7 in Table 11-3: Because the marginal impact of BNDES loans is simply the estimated coefficient of $\ln(\text{BNDESloans})$ 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 in 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 percent. Considering, alternatively, the results of specification 8, a one-percentage-point increase in BNDES loans relative to debt (lagged) reduces the ratio of financial expenses to debt by 0.12. Thus, our estimates indicate that BNDES loans reduce the cost of capital by a percentage differential somewhere between 4 and 12 percent, which is more or less consistent with the subsidy included in BNDES’s interest rates.
Although we do not find significant effects of BNDES equity on performance, the results of specification 8 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 11-3 also shows a significant effect of BNDES loans on the ratio of capital expenditures to assets. However, the results are not very consistent across specifications. While there is a positive effect once we consider the logarithmic value of loans (specification 9, $p < 0.05$), 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 (specification 10). As for the effect of BNDES loans on the ratio of the stock of fixed capital to assets, we find no significant result, except for a marginally significant negative effect of $\%BNDES\ loans_{it}$ in the last column ($p < 0.10$).

A potential shortcoming of our fixed-effect approach is that we may not be considering comparable groups of firms with and without BNDES loans. We saw, for instance, that firms with BNDES loans tend to be larger and distributed in selected industries. As a robustness check, Appendix 11-2 presents the results of an alternative test combining the methodology of propensity score matching.
with fixed-effect estimation, as suggested by Heckman, Ichimura, and Todd (1997). The technique essentially adds more weight to firms without BNDES loans that are more similar to the subgroup of firms with those loans. Results confirm our previous conclusion: the only significant effect of BNDES loans is on the reduction of firm-level financial expenses.

All told, these results are inconsistent with the industrial policy view: subsidized loans appear to be simply a transfer of income from the state to large firms, without any consistent effect in terms of investment or profitability. The examination of the process through which BNDES selects its targeted firms, discussed below, sheds more light on this finding.

Is BNDES Targeting Good or Bad Firms?

The lack of consistent investment- or performance-enhancing effects of loans can be explained in two ways. First, as implied by the soft-budget constraint hypothesis (of the political view), BNDES may be giving loans to underperforming firms and may even have to bail out failing companies. Those underperformers may artificially survive even if they have no real competitive advantage. Alternatively, the bank may be simply picking firms that would not need subsidized credit in the first place. Thus, if BNDES is lending to well-performing firms rather than to underperformers, then we can make the argument that the bank is “picking winners.” There is nothing wrong with picking winners if the beneficiary firms are borrowing for reasons related to the industrial policy view; that is, out of need rather than opportunistically. However, BNDES may be picking winners capable of investing in profitable
projects regardless of subsidized loans or that could be borrowing through other means (i.e., companies that are not facing capital constraints). If this is the case, increased loans should not necessarily result in more investment or enhanced firm-level performance.

In Table 11-4, we examine the issue of whether BNDES is lending to good or bad performers. We present a set of regressions that look at the determinant of BNDES loans measured both as the logarithm of the amount of loans and the ratio of BNDES loans to total debt (as a percentage). Our objective was to find out if firm-level performance variables (ROA, EBITDA/assets, and Tobin’s q) are highly correlated with the amount of loans a firm receives from BNDES. To capture temporal effects, we used lagged values of the performance variables (given that BNDES takes into consideration a firm’s past performance to approve new loans).

Specifications 7-9 of Table 11-4 reveal some positive effects of ROA and EBITDA/assets in some specifications, but the level of significance is marginal (p< 0.10). We also fail to detect any significant effect of Tobin’s q. Although we do not find strong, consistent effects of performance variables, our data do not support the soft-budget constraint hypothesis that BNDES is systematically bailing out poor-performing firms.
### Table 10-4 Determinants of BNDES Loans, 2002-2009 (Fixed-effect Regressions)

<table>
<thead>
<tr>
<th>Performance variables</th>
<th>Ln(BNDES loans)</th>
<th>%BNDES loans</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>ROA&lt;sub&gt;t&lt;/sub&gt;</td>
<td>0.924</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[1.459]</td>
<td></td>
</tr>
<tr>
<td>ROA&lt;sub&gt;t-1&lt;/sub&gt;</td>
<td>2.868*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[1.663]</td>
<td></td>
</tr>
<tr>
<td>ROA&lt;sub&gt;t-2&lt;/sub&gt;</td>
<td>0.676</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[1.535]</td>
<td></td>
</tr>
<tr>
<td>EBITDA/assets&lt;sub&gt;t&lt;/sub&gt;</td>
<td>1.430</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[1.360]</td>
<td></td>
</tr>
<tr>
<td>EBITDA/assets&lt;sub&gt;t-1&lt;/sub&gt;</td>
<td>2.157</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[1.625]</td>
<td></td>
</tr>
<tr>
<td>EBITDA/assets&lt;sub&gt;t-2&lt;/sub&gt;</td>
<td>1.744</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[1.757]</td>
<td></td>
</tr>
<tr>
<td>Tobin’s q&lt;sub&gt;t&lt;/sub&gt;</td>
<td>0.134</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.270]</td>
<td></td>
</tr>
<tr>
<td>Tobin’s q&lt;sub&gt;t-1&lt;/sub&gt;</td>
<td>0.244</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.210]</td>
<td></td>
</tr>
<tr>
<td>Tobin’s q&lt;sub&gt;t-2&lt;/sub&gt;</td>
<td>0.321</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.331]</td>
<td></td>
</tr>
<tr>
<td>Donations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.008]</td>
<td></td>
</tr>
<tr>
<td>For winning candidates</td>
<td>0.170**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.062]</td>
<td></td>
</tr>
<tr>
<td>For losing candidates</td>
<td>-0.147**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.049]</td>
<td></td>
</tr>
<tr>
<td>For winners minus losers</td>
<td>0.146**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.051]</td>
<td></td>
</tr>
<tr>
<td>N (total)</td>
<td>1,212</td>
<td>1,136</td>
</tr>
<tr>
<td></td>
<td>[0.008]</td>
<td></td>
</tr>
<tr>
<td>N (firms)</td>
<td>267</td>
<td>253</td>
</tr>
<tr>
<td></td>
<td>[0.001]</td>
<td></td>
</tr>
<tr>
<td>p (F test)</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

Note: All specifications include the following controls: fixed assets to total assets, whether the firm is foreign, whether it belongs to a business group, the log of total assets, and leverage. Specifications also include firm, year, and industry-year fixed effects. Two-tailed tests where*, **, and *** represent p < 0.10, p < 0.05, and p < 0.01, respectively. Robust standard errors in brackets (errors are clustered at the firm level). More detailed results are in Lazzarini et al. (2012b).
Thus, if anything, allocations are not generally targeting bad projects. BNDES may actually be trying to select good candidates for national champions or guarantee repayment by avoiding systematic lending to bad firms. The reader may recall from the previous chapter that only after 2004 do we find BNDES having positive net income on loans. Yet our data show that the correlation between BNDES loans and performance seems to be significant only from performance to loans and not the other way around. This, we think is evidence that the bank is indeed picking winners. Yet, when those firms get subsidized loans, they are not investing in capital-intensive projects or in projects that increase their profitability.

Every time we asked a BNDES official, government official, or entrepreneur who had gone through the process of borrowing from BNDES, we heard the same story.\textsuperscript{41} The potential borrower has to present a project plan for how the money will be spent and the impact that project will have. Those projects are then evaluated by a technical committee that makes loan recommendations. For big loans, there is also a loan committee with top executives from the bank that decides on technical and industrial policy criteria. This helps explain our finding that, contrary to the soft budget hypothesis, BNDES is not generally targeting bad projects.

\textsuperscript{41}To protect the identity of the executives we interviewed, we do not disclose their names.
Is BNDES Lending to Politically Connected Firms?

If firms benefitting from subsidized BNDES loans are not increasing capital expenditures or improving performance after they get their loans but are enjoying lower financial expenditures, one has to wonder whether there is a political channel that may be determining which firms get loans. In particular, many 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). Thus, we examine the connection between campaign donations by firms and the amount of subsidized loans those firms get from BNDES.

Brazilian corporations, unlike those in the United States, can make cash donations directly to candidates, rather than to parties, and so can foreign firms with local subsidiaries. The official limit for domestic firms is two percent of their gross revenues, but “under the table” donations are pervasive (Araújo, 2004). Furthermore, while lobbying is a common practice in Brazil, it is not necessarily carried out by business associations. Due either to the lack of business associations or to their weakness, firms have incentives to establish their own connections to politicians. According to (Schneider, 2004):

On paper, Brazilian [business] associations organized nearly all of business, had massive resources that they spent on sophisticated research and coordinating departments, and appeared regularly in the press to air business’s views on the issues of the day. Yet, most prominent businesspeople and top government officials readily admit that these impressive-looking associations were in fact weak and unrepresentative, and economic and political elites regularly circumvented them… (pp. 93-94)
Such a political environment makes political connections at the firm level extremely important. Government favors, protection, and other forms of support may depend on the direct connections firms establish with politicians through campaign financing. In fact, at least three studies have found strong associations in Brazil between campaign donations and firm-level profitability (Bandeira-de-Mello & Marcon, 2005), preferential financing (Claessens et al., 2008), and access to government contracts (Boas, Hidalgo, & Richardson, 2011).

In line with such studies, we consider campaign donations as a sign of the extent of a firm’s political connections, although we know that “under the table” donations are also common. Luckily for us, candidates in Brazil 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 number of candidates (running for president, senator, or state or federal deputy) to whose campaigns the firm officially contributed in the previous election. Given that our data on firm performance and BNDES loans runs from 2002 to 2009, we examine if the data on campaign donations for the elections in 2002 and 2006 help us understand which firms get loans from BNDES. Data from the 2002 campaign are used to see if there is a correlation with loans obtained between 2003 and 2006. We then use campaign donations for the 2006 elections to examine the correlation with loans given between 2007 and 2009.
There could obviously be self-selection in the data on campaign donations; that is, the most profitable firms may be approached by a larger number of candidates. Thus, we separate donations to candidates who won and donations to candidates who lost, considering that election results have an exogenous component due to random events affecting political competition (Claessens et al., 2008). In addition, we compute a variable we call Donations for winners minus losers, which tracks the number of donations that went to candidates who won minus the number of donations that went to candidates who lost. This variable thus measures the bets of firms in a more exogenous way, because firms clearly do not control which of the candidates they support will win or lose an election.

We use the selection regressions from the previous section and add our political variables. The results are also in Table 10-4. We find that donations in general do not affect loans (specifications 4 and 10). Clear effects appear, however, when we separate between donations to winners and to losers—either when we consider these variables separately or when we use the difference between the number of winners and the number of losers. Donations to winning candidates increase the amount of received loans, while the opposite effect is observed with donations for losing candidates ($p<0.01$, specifications 5-6 and 11-12).

To gauge the effect of campaign donations, the reader may want to consider the following calculation. As noted before, the effect of donations on BNDES loans is simply the estimated coefficient of donations on
Estimates in specification 5 suggest that a firm’s donation to an additional winning candidate increases loans to that firm by around US$ 28.2 million, whereas donating to 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 percent, the gain for donor firms from each additional donation to a winner would bring net benefits ranging between US$ 1.1 million and 3.4 million. In contrast, the average donation per winning candidate for each firm in our database was US$ 22,820 in 2002 and $43,903 in 2006. Even if we consider that there may be substantial donations under the table—estimated by Araujo (2004) as two to ten times the official figures—the magnitude of the estimated effect is far from trivial. In addition, these political ties may help firms to receive benefits beyond loans.\footnote{The effect of donations also appears cross-sectionally. Thus, if we split our sample considering the difference between donations for winners and for losers, the subgroup involving more donations for winners than losers has on average 28.7 percent of its debt in BNDES loans, while the other subgroup has on average 24.4 percent ($p< 0.05$).}

Our separate findings for winners and losers are of particular importance because they suggest 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 distribute 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 the 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 to losers than to winners. Furthermore, there is no significant correlation between these performance indicators and the difference variable computing donations for winners minus losers, which is also highly significant in our regressions. A plausible 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 to the same regression financial performance variables such as ROA and EBITDA/\textit{assets}.43

How should we interpret these findings? We do not think our results are evidence of an outright give-and-take relationship between BNDES bureaucrats and the companies making campaign donations. As noted before, the selection of loans tends to be highly technical. BNDES is well known for having a competent and technical staff that scrutinizes a borrower’s ability to repay a loan (Evans, 1995; Schneider, 1991). We think there is another channel explaining our results. There is evidence that firms that donate to winning candidates are more likely to be involved in governmental contracts (Boas et al., 2011). Because large public projects in Brazil have usually been accompanied by substantial BNDES funding (Lazzarini, 2011), winning a governmental contract increases the odds that the firm will receive substantial funding from the bank. Alternatively, certain donors are more likely selected by the government as national champions and their sectors are more likely subject to industrial policy

\begin{footnotesize}
\begin{itemize}
\item[43] Results not reported here, but available upon request.
\end{itemize}
\end{footnotesize}
targeting. Given our previous result that the bank is not systematically selecting bad firms, it seems that those champions are not necessarily underperformers. Yet, because in the Brazilian economy there are several candidates of potential champions, donations can possibly increase the likelihood that a particular firm will be singled out and supported with massive loans.

Conclusion

Collectively, our results indicate that BNDES loans are apparently transferring subsidies to large firms without any substantial benefit in terms of improved firm-level performance or investment. In addition, in line with the rent-seeking hypothesis, we find 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. A likely reason for our results is that the politically connected firms in our database are not underperformers in general. These firms want cheaper credit but they are not bankrupt firms in need of a financial lifeline. Even good firms 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.

Therefore, although our results are not aligned with the industrial policy literature, which sees 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 help and rescue failed
industrialists. This is not to say, however, that bailouts never occur. For instance, in 1998, a group of firms, including Electricité de France (EDP) and AES Corporation, acquired 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 sequence of events took place with Brazilian meatpacker, JBS-Friboi, which received loans (in the form of convertible bonds) to pursue its program of international expansion. With the funds it got, JBS-Friboi acquired Swift and Pilgrim’s Pride, among other firms. The expansion came at a cost of a substantial debt and, in 2011, JBS and BNDES agreed to reconvert part of BNDES’s loans into shares. But while these cases are important, our findings indicate that they are not the norm, at least in the period covered by our database.

A caveat, however, is that we focus only on profitability and investment; we do not measure if allocations support social initiatives or if they yield externalities that are not measured in our database. For instance, a private project, even if individually unprofitable, may encourage complementary

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The fact that BNDES sometimes prefers to finance firms through convertible bonds could indicate that its way of providing funding follows the kind of incentive that Rodrik (2004) wants in industrial policy. The receiving company has an objective and promises an amortization rate for the debt; if it does not meet those targets, BNDES can dilute the current owners by converting its debts to equity at a pre-fixed price. Yet, for two reasons, the conversion of debt to equity is not really a punishment. First, even if it dilutes all shareholders’ cash flow rights, it does not necessarily dilute control as long as firms retain substantial voting rights. Second, even if controlling and minority shareholders lose some of their cash flow when BNDES enters as a new shareholder, they usually have the first right to buy shares in the new equity issue, thus reducing the dilution effect. Therefore, convertible loans (or debentures) may act more as a bailout mechanism than as a punishment for not meeting specific goals.
investments in related industries or contribute with aggregate employment. Thus, we are not in the position to completely reject the industry policy perspective. Moreover, our results apply only to large Brazilian firms, for which we could collect loan data at the firm level. This limitation notwithstanding, by no means our results should be interpreted as not telling us something about the impact that BNDES has in the economy as a whole. At least we should wonder why the bank is targeting large firms that apparently have other means of financing.45

In sum, the role of BNDES as a lender and minority shareholder provides nuance to the discussion of the role of the government in business. The findings of this chapter do not show BNDES doing what development banks are supposed to do, or at least we do not find strong results to support that view. Yet, the results of Chapter 8 show that BNDEs as an investor can help to solve some of the capital market failures that exist in emerging markets. Given that the database used in this chapter covers the period after 2002, a likely explanation of those diverging results is that Brazilian firms, more recently, became less constrained in their access to external financing. In the following chapter we do a broader discussion of these findings.

45 Studies performed by governmental research agencies using larger datasets (which are not disclosed to the public for confidentiality reasons) also have failed to find consistent productivity-enhancing effects of BNDES loans. For instance, Ottaviano and Sousa (2007) find that although some BNDES credit lines positively affect productivity, other lines have a negative effect. In another study, Sousa (2010) reports an overall null effect of those loans on productivity. Coelho and De Negri (2010) find that loans have a larger effect on more productive firms. De Negri et al. (2011) find an effect of loans on employment and exports, but not on productivity.
Appendix 11-1: Database Used to Assess the Effect of Loans

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Mean [std. dev.]</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performance, investment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROA</td>
<td>Net profit divided by total assets</td>
<td>0.025 [0.118]</td>
<td>-0.464</td>
<td>0.308</td>
</tr>
<tr>
<td></td>
<td>Operational profit (net of taxes, depreciation and interests) to total assets</td>
<td>0.088 [0.121]</td>
<td>-0.377</td>
<td>0.403</td>
</tr>
<tr>
<td>EBITDA/assets</td>
<td>Market value of stocks plus debt divided by total assets</td>
<td>0.880 [0.794]</td>
<td>0.062</td>
<td>4.831</td>
</tr>
<tr>
<td>Tobin’s q</td>
<td>Financial expenses (loan payments) divided by total debt</td>
<td>0.303 [0.204]</td>
<td>0.000</td>
<td>0.994</td>
</tr>
<tr>
<td>Finex/debt</td>
<td>Capital expenditures divided by total assets</td>
<td>0.073 [0.092]</td>
<td>0.000</td>
<td>0.998</td>
</tr>
<tr>
<td>Fixed assets/assets</td>
<td>Fixed assets divided by total assets</td>
<td>0.293 [0.248]</td>
<td>0.000</td>
<td>0.995</td>
</tr>
<tr>
<td><strong>BNDES financing</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ln(BNDES loans)</td>
<td>Logarithmic value of BNDES loans reported in the balance sheet (1,000 US$)</td>
<td>7.479 [4.731]</td>
<td>0.000</td>
<td>16.781</td>
</tr>
<tr>
<td>Ln(BNDES equity)</td>
<td>Logarithmic value of BNDES equity (% participation times book value of equity, 1000 US$)</td>
<td>0.835 [2.988]</td>
<td>0.000</td>
<td>16.205</td>
</tr>
<tr>
<td>%BNDES loans</td>
<td>BNDES loans divided by total loans</td>
<td>0.244 [0.271]</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>%BNDES equity</td>
<td>BNDES equity divided by total equity</td>
<td>0.011 [0.049]</td>
<td>0.000</td>
<td>0.450</td>
</tr>
<tr>
<td><strong>Political variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Donations</td>
<td>Number of candidates receiving donations by the firm in the last election</td>
<td>5.814 [17.972]</td>
<td>0</td>
<td>171</td>
</tr>
<tr>
<td>Donations for winners</td>
<td>Number of candidates who received donations and won the last election</td>
<td>3.320 [10.130]</td>
<td>0</td>
<td>89</td>
</tr>
<tr>
<td>Donations for losers</td>
<td>Number of candidates who received donations and lost the last election</td>
<td>2.488 [8.119]</td>
<td>0</td>
<td>82</td>
</tr>
<tr>
<td>Donations for winners</td>
<td>Donations for winners minus donations for losers</td>
<td>0.832 [3.748]</td>
<td>-8</td>
<td>38</td>
</tr>
<tr>
<td>Foreign</td>
<td>Dummy variable coded 1 if the firm is foreign-controlled</td>
<td>0.473 [0.499]</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Belongs to a group</td>
<td>Dummy variable coded 1 if the firm belongs to a business group</td>
<td>0.186 [0.174]</td>
<td>0.000</td>
<td>0.957</td>
</tr>
<tr>
<td>Ln(assets)</td>
<td>Logarithmic value of total assets (1,000 US$)</td>
<td>12.636 [1.686]</td>
<td>1.386</td>
<td>19.015</td>
</tr>
<tr>
<td>Leverage</td>
<td>Total debt divided by total assets</td>
<td>0.200 [0.400]</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Lazzarini, Musacchio, Bandeira de Mello and Marcon (2012b).
Appendix 11-2: Propensity Score Matching and Other Robustness Checks

One way to compare firms that got loans with companies with similar characteristics that did not get loans is to follow Heckman, Ichimura, and Todd (1997) and combine fixed-effects regressions and matching techniques by using propensity-score matching to weight the data we use in our regressions. This methodology begins by creating comparison groups using a regression in which the dependent variable is a dummy for firms that receive BNDES loans (because that is the “treatment” we want to examine in our main regression). By looking at the propensity score of the first regression (with a dichotomous dependent variable), we can find firms that did not get a BNDES loan but that have characteristics similar to those of each firm that did. Using firms with propensity scores similar to those that got loans, we create comparison groups, constructed on the basis of our set of (non-BNDES) observable variables (firm size, leverage, industry membership, and so on). We then use the weights computed from the estimated propensity scores to adjust our fixed-effect regressions for the whole panel.\footnote{We use kernel estimation of the propensity scores. Given the cross-sectional nature of the technique, we compute propensity scores (and weights) in the first year of the data (2002) to avoid endogeneity bias if weights incorporate subsequent variations in the panel (e.g. Saiani, 2012).} Weights essentially make the treatment and control groups more aligned in terms of their observable characteristics, thus reducing potential bias due to the lack of comparability between treatment and control conditions (Nichols, 2007)
To further reduce comparison bias, although at the cost of a reduced sample size, we only consider matched observations in regions of common support; that is, where treated and control observations have similar probabilities of being included in the treatment based on their computed propensity scores (Heckman, 1979). Our results strongly confirm our previous findings: The only significant effect of having BNDES loans is on Finex/assets; that is, loans do not change performance and investment outcomes in any meaningful way except with respect to a reduction in the cost of capital.

Table A11-1 Effect of BNDES Loans on Performance and Investment: Fixed-effect Regressions with Weights Computed Using Propensity Score Matching

<table>
<thead>
<tr>
<th>Firm is observed with BNDES loan (0 or 1)</th>
<th>ROA</th>
<th>EBITDA/Assets</th>
<th>Tobin’s q</th>
<th>Finex/assets</th>
<th>Capex/assets</th>
<th>Fixed/assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm is observed with BNDES loan (0 or 1)</td>
<td>0.021</td>
<td>0.036</td>
<td>0.015</td>
<td>-0.148**</td>
<td>0.001</td>
<td>-0.018</td>
</tr>
<tr>
<td>[0.048]</td>
<td>[0.044]</td>
<td>[0.165]</td>
<td>[0.052]</td>
<td>[0.022]</td>
<td>[0.032]</td>
<td></td>
</tr>
<tr>
<td>N (total)</td>
<td>260</td>
<td>253</td>
<td>238</td>
<td>146</td>
<td>251</td>
<td>260</td>
</tr>
<tr>
<td>p (F test)</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

Note: All specifications include the following controls: fixed assets to total assets, whether the firm is foreign, whether it belongs to a business group, the log of total assets, and leverage. Specifications also include firm, year, and industry-year fixed effects. Two-tailed tests where †, *, **, and *** represent p < 0.10, p < 0.05, p < 0.01, and p < 0.001, respectively. Robust standard errors in brackets (errors are clustered at the firm level). Regression weights come from propensity matching score (kernel) estimation on the observed variables for the initial year of the sample (2002). Fixed-effect regressions are restricted to regions of common support. More detailed results are in Lazzarini et al. (2012b).

We also conducted further tests on our data to see if BNDES loans affect firms in different ways according to whether the firm is capital-constrained or whether it invests more on fixed assets or is a high- or low-performer; we found no significant effects. For instance, we look at whether development bank loans change the financing constraints of Brazilian firms, following the
methodology of Fazzari, Hubbard & Petersen (1988). (For an application to state-owned banks, see Behr et al., 2012) The basic idea of this model is that the investment ratios (capital expenditures to fixed assets) of financially constrained firms are more sensitive to an increase or decrease in cash flow. Thus, if BNDES’s allocations reduce capital constraints, then an increase in loans should reduce the marginal impact of the firm’s cash flows on investment; that is, cash flows should be less important to financing investment once the firm has external financing. Our results, not included here, indicate that BNDES loans do not significantly affect investments (either directly or indirectly through the interaction with our cash flow variables). That is, we do not find evidence that BNDES is reducing credit constraints for firms through loans (or equity).47

47 We also performed several other robustness checks. We examined whether the effect of the BNDES variables on performance and investment vary according to certain firm-level traits. Thus, using Ln(Assets), we split the sample (at the median) to compare the effect on smaller and larger firms; using the difference between ROA and the median industry ROA, we do the same to detect possible distinct effects for high- and low-performers. We do not find distinct effects across these groups. To see if the effect of allocations is larger for firms with high capital-intensity, we also interact the BNDES variables with a dummy coded 1 if observed capital expenditures are above the median and 0 otherwise. In addition, following Rajan and Zingales (1996), we test if BNDES loans and equity investments have a significantly different effect on performance and investment in firms with higher financial dependence and we do not find any significant results. We created a variable computed as the difference between capital expenditures and EBITDA, divided by capital expenditures. We then interacted this measure with our BNDES loan and equity variables and found that these interactions were not significant. Finally, we performed split-sample regressions to see if the effect of BNDES’s allocations on performance and investment vary depending on whether or not firms are connected to politicians. The logic of this test is that politically connected firms may be more likely to ask for loans as a way to get lower interest expenses (i.e., capture subsidies) than as a way to promote new capital investments. Using the variable measuring the difference between donations for winners and for losers as a criterion to split the sample, we find no consistent results indicating that the effect of BNDES’s allocations differs substantially across those two groups.
I. Conclusion
12. Bibliography

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