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STATE-OWNED ENTERPRISES IN BRAZIL: HISTORY AND LESSONS

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STATE-OWNED ENTERPRISES IN BRAZIL: HISTORY AND LESSONS

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INTRODUCTION

Despite decades of liberalization and privatization in many countries, state ownership and state-led business activity remains widespread (Christiansen, 2011). Governments still often use state-owned enterprises (SOEs) to promote local development and invest in sectors in which private investment is scant. Many SOEs endured over the years and turned into large corporations partnering with market investors and competing on a global scale against private multinationals.

The forms of ownership and control governments use in the set of surviving SOEs is, however, poorly understood. Beyond the traditional wholly-owned SOEs, governments also intervene to support specific industries by propping up privately held enterprises (i.e., “national champions”). These private firms receive government support in the form of minority equity investments, direct subsidized loans from development banks, and equity and debt purchases by sovereign wealth funds. In the economics and finance literature these forms of state ownership are understudied; most of the theory and empirical work has focused on either wholly-owned SOEs or firms in which the government is a majority shareholder.

In this paper we use Brazil as a case study to examine the functioning and performance implications of these new and complex forms of state capitalism. Brazil is a good laboratory to study SOEs for various reasons. The emergence of state capitalism in Brazil followed a similar path found in other countries, where governments created and managed myriad SOEs in the second half of the 20th century. Thus, after World War II, many governments in Continental Europe owned and ran water, oil, gas, electricity, telecommunications, shipping, and other companies (Millward, 2005). We label this model of state capitalism, with SOEs completely controlled and run by the state, as the *Leviathan as an entrepreneur* model (Musacchio & Lazzarini, 2014). In Brazil, state ownership of large scale enterprises began mostly after World War I when the government ended up bailing out a large portion of the railway companies of the country. Then, in the 1940s, President Getulio Vargas created many state-controlled SOEs in sectors that were considered fundamental for economic development, such as mining, steel, chemicals, and electricity. Yet, the heyday of state capitalism in Brazil took place in the early 1970s, during the military dictatorship (1964-1985). By 1976-1977, the public sector represented 43% of the total gross capital formation in the country, with around 25% of those investments coming from large SOEs (Treat, 1983).

In fact, as the importance of SOEs increased, the deficiencies of the model became increasingly salient. Governments frequently used SOEs to artificially maintain employment in the face of economic crises (such as after the oil shocks of the late 1970s) and even control consumer prices (Shirley & Nellis, 1991). Lack of insulation from social and political objectives meant that managers of SOEs had to deal with a

multiplicity of goals beyond profitability. Furthermore, SOEs lacked managerial practices commonly found in private firms, such as close monitoring by independent board members, transparency, and high-powered incentives for their managers (i.e. pay-for-performance schemes). Facing escalating debt and realizing the high opportunity cost of allocating state capital to unprofitable SOEs, many governments in the late 1970s and the turn of the 21st century experimented with reforms in the public sector (Gómez-Ibañez, 2007; Shirley, 1999) and eventually undertook large-scale privatization programs (Megginson, 2005). Despite the efforts to get countries to privatize state assets en masse, governments had political reasons to slow down the process and to keep some strategic assets under their control. That is why at the turn of the 21st century surveys such as Bortolotti and Faccio (2009) and OECD (2005) show that governments all around the world still remained as important shareholders in large SOEs, even after the privatization wave of the 1990s. In a nutshell, decades of reform and privatization did not defeat state capitalism, but transformed it. Governments adopted new forms of state ownership and reinvented the way in which state capitalism operated.

Brazil was no exception to this global process of transformation of state capitalism. The Leviathan as an entrepreneur model collapsed in the 1980s due to the failure of many SOEs to adjust to the economic crisis of the late 1970s. As we show below, after the second oil shock (in 1979) and the debt crisis of 1982, Brazilian SOEs increased employment whereas comparable private firms downsized. Faced with losses and large liabilities in foreign currency, SOEs led governments to face large budget deficits and escalating total debt. Under this scenario, the Brazilian government was forced to start privatizing a large number of SOEs, especially between 1997 and 1999. As a whole, the privatization program generated total revenues of around USD 87 billion, 54% of which were originated from foreign investors and firms (BNDES, 2002b). An interesting feature of the privatization process in Brazil is that around 50% of privatization auctions involved “mixed consortia” controlled by domestic private groups and foreign investors, oftentimes with funding from state-related actors such as the Brazilian National Development Bank (BNDES) and pension funds of SOEs (De Paula, Ferraz, & Iooty, 2002; Lazzarini, 2011). Some argue that mixed consortia helped to “dilute political criticisms that often accompany the transfer of privatized assets to foreign entities” (De Paula et al., 2002: 482). For this reason, the formation of such consortia was viewed as a means by which governments could more easily implement privatization programs, while at the same time preserve some degree of influence in the (partially) privatized companies. The privatization process thus led to the expansion of a model of *Leviathan as a minority investor* in Brazil.

While increasing the presence of the state as a minority investor, privatization reduced the relative importance of SOEs with majority state control: their share in Brazil’s fixed capital formation dropped from 25% in 1976 to 8.9% in 2002. Yet, throughout the world, many private firms and SOEs were improving the corporate governance practices of SOEs—through listing, the creation of independent boards, and improved transparency. In large flagship SOEs. These reforms reduced agency conflicts and attracted minority private investors (Gupta, 2005; Pargendler, Musacchio, & Lazzarini, 2013), giving rise to the model we refer to as *Leviathan as majority investor*. Brazil followed suit. By 2009, around 5% and 30% of the SOEs with majority control by federal and state governments respectively were listed, while the remaining non-listed federal SOEs had to report their financials to the Department of SOEs (known as DEST) and were closely monitored by different ministries. Despite these improvements, as we show below, interference by the government remained in some majority controlled SOEs, especially when, after 2012, the government used large SOEs such as Petrobras (oil), Eletrobras (electricity) and Caixa Econômica Federal (banking) to control prices.

Brazil therefore allows us to examine in detail changes in the nature of state capitalism in the 21st century, as well as the remaining threats to the efficiency of those new models. This paper is structured as follows. In the next section we report how SOEs have been traditionally used in Brazil to support development objectives, focusing mostly on SOEs with majority state control. We then describe in detail the emergence of the model where Leviathan is a minority investor, which particular emphasis on the role of BNDES, one of the largest development banks in the world. By 2013, BNDES contributed to around 21% of the total credit to the private sector and almost the totality of long-term credit. In addition, BNDES sharply increased its presence in the economy as a minority shareholder of many private firms. Thus, in the second to last section we review the extant empirical evidence on the performance implications of BNDES’s large presence in the Brazilian economy. The last section concludes by outlining some lessons for governments

interested in improving the efficiency of SOEs—with majority or minority control—and their impact on national development goals.

SOEs AND DEVELOPMENT OBJECTIVES IN BRAZIL

In this section we discuss the role of SOEs in the execution of projects aligned with development objectives of the Brazilian government. Our discussion is guided by a host of complementary theories on the economics of state ownership (Yeyati, Micco, & Panizza, 2004). The *industrial policy* view proposes that, under certain conditions, state involvement will have a positive effect in the promotion of firms and industries. In this view, state capital and state-owned enterprises can be used as tools to solve important sources of market failure and promote industrial upgrading (OECD, 2013). Namely, state capital can help firms develop *latent* capabilities by funding new knowledge and profitable projects that would otherwise remain unfunded. Constraints to finance latent capabilities are more binding in countries in early stages of industrial development or with shallow financial markets (Cameron, 1961; Gerschenkron, 1962; Yeyati et al., 2004). Rodrik (2004), in particular, points out the difficulty of starting new industries in which there is uncertainty about costs and possible demand. This is what he calls “discovery costs.” If such costs are high enough, they will prevent the development of new products or technologies. For instance, entrepreneurs need to experiment before finding out whether a product is feasible; a process that costs money and time whether it succeeds or fails. Yet if it succeeds, other entrepreneurs in that country can replicate the entrepreneur’s success (Rodrik, 2007 105-106).

State capital, and SOEs in particular, can also help coordinate the local deployment of complementary resources and support activities with high externalities and industrial linkages (Amsden, 2001; Evans, 1995; Hirschman, 1958; Rodrik, 2007). Hirschman (1958) famously proposed that backward and forward linkages in the production chain need to be created to spur local development. In other words, a “big push” by the government may be necessary to promote coordinated, complementary investments (Murphy, Shleifer, and Vishny, 1989; Rosenstein-Rodan, 1943). The Korean government, for instance, created the national steel company, POSCO, in order to foster the development of a national auto and shipbuilding industry (Amsden, 1986).

In a related way, the *social* view of SOEs suggests that governments will use SOEs to pursue social and development objectives beyond pure profitability (Ahroni, 1986; Bai & Xu, 2005; Shapiro & Willig, 1990; Toninelli, 2000). For instance, governments may force SOEs to cater to less profitable customer segments, minimize unemployment, or invest in remote areas. In other words, SOE managers will typically face a “double bottom line” involving not only financial goals but also social objectives not necessarily addressed by the private sector.

State ownership, however, can have important negative implications. According to the *agency view*, SOE managers are poorly selected (e.g., for political reasons) and lack high-powered incentives to pursue efficiency and profitability (Boardman & Vining, 1989; Dharwadkar, George, & Brandes, 2000; La Porta & López-de-Silanes, 1999; Vickers & Yarrow, 1988). The multiplicity of social and financial objectives in SOEs also imply that it will more difficult to craft incentive (pay-for-performance) contracts for SOE managers (Bai & Xu, 2005; Shirley & Nellis, 1991). The *political view*, in turn, posits that governments (and their political coalition) will use SOEs to benefit cronies and politically-connected capitalists. In addition, SOEs will face a “soft budget constraint”: they will be less incentivized to perform if they know that the government will bail them out in case of poor performance (Boycko, Shleifer, & Vishny, 1996; Kornai, 1979; Shleifer & Vishny, 1998; Vickers & Yarrow, 1988).

Below we examine the Brazilian experience through the lens of those distinct perspectives, dividing the stages of state intervention into four. First, we discuss the case in which the government owned enterprises by accident, mostly as a consequence of bailouts. Second, we examine the explicit design and development of large state-owned enterprises as a way to overcome market failure and coordinate large sectors of the economy. The third stage represents the peak of the model where Leviathan is an entrepreneur, and refers to a period that starts roughly after 1967 in which the government owned and managed a large number of SOEs in a variety of sectors. This corresponds roughly with the so-called “Brazilian miracle”: the period when Brazil

grew on average at 10% or more. Yet, this is also a period in which the monitoring of SOEs was poor and there were no controls over the actions of these firms. Thus, we end by explaining the crisis of the 1980s and the disarticulation of the SOE apparatus in the early 1990s. We end by describing the rise of new varieties of state ownership in the post-privatization era, which we call Leviathan as a majority investor and Leviathan as a minority investor.

Leviathan as an Accidental Owner (1880s-1930s)

The industrialization of Brazil began in full force in the 20th century. Yet, in the second half of the nineteenth century the country began experiencing rapid GDP growth (especially after 1880) and domestic and foreign entrepreneurs set up a nascent industrial sector. That is, the early infrastructure projects necessary for the development of a domestic market were *not* undertaken by the government directly. Before World War I the most important state-owned enterprises were the commercial, the railway Estrada Central do Brasil (Triner, 2000), which was used to connect the coast with some of the coffee regions of Rio de Janeiro, the bank Banco do Brasil, which specialized mostly in short-term lending to agricultural exporters (Bogart, 2009), and the shipping company Lloyd Brasileiro, which the government ended up owning after a series of bailouts (Bureau of Railway Economics, 1935).

In this initial stage of state intervention, the government was an insurer against failure and a residual owner. In that role, the Brazilian government ended up owning and operating SOEs mostly by accident. There was no grand plan to develop a state apparatus to promote the industrialization of the country, or at least not until the late 1930s. The case of shipping and railways illustrate this point. Between the 1880s (if not earlier) and 1930, the Brazilian government gave subsidies to private shipping companies that carried on coastal trade within Brazil. Then, in 1890, the government merged four shipping lines that were receiving subsidies into Lloyd Brasileiro and protected the new firm from foreign competition by restricting the number of firms that could receive subsidies and carry out internal trade. Even so, the company had to be bailed out in 1913, thus falling under government control. This firm, which actually operated as any other corporation in the country, was in 1937 transformed into an *autarquia*—a government body—and, in 1966, it was again corporatized and turned into an official SOE (SEST 1985-1994; Baer et al. 1973; Topik 1987).

Railway companies had a similar fate. In the 1850s the Brazilian government tried to develop the first railway lines to connect the coffee hinterland with the coast in Rio de Janeiro. In order to lure in foreign investors the federal governments gave away concessions that had a guaranteed minimum dividend of five percent for the equity holders of the first few railway lines. These incentives were not enough to coordinate foreign investors and domestic capitalists; thus, provincial governments added an additional 2% guaranteed dividend to some of the lines going through their states. Even with such guarantees, the first railway line, which tried to connect the mountains to the coast of the state of Rio de Janeiro went bankrupt and, per its concession terms, had to be taken over by the federal government. Thus, the railway Estrada Central do Brasil started early on as a corporation with majority control by the government. Over time, partly due to government support, it became the second-largest railway in the country.

The increase in government ownership of railways in the first half of the 20th century was rapid, but did not respond to a master plan to coordinate specific industries. Again, state ownership was accidental. The government controlled just over 20 percent of the kilometers of railway in operation in 1900, but ended up with almost 100 percent by 1953. Most of the transfers of lines from the private to the public sector were either direct sales or the result of nationalizations built into the concession contracts. These concession contracts usually gave residual rights to the government and guaranteed transfer of ownership if the concessionaire did not meet its contractual obligations (e.g., if the firm did not build the promised rail lines or if it went bankrupt). For example, in 1904, one of the largest railway companies in Brazil (the Companhia de Estradas de Ferro Sorocabana e Ituana) went bankrupt and the federal government took it over from private investors. Within a few months, the federal government sold it to the government of the state of São Paulo, which then leased it to Percival Farquhar, an American entrepreneur who was developing a railway trust by borrowing large sums of capital abroad and purchasing and leasing land and railway lines in Brazil. With the liquidity crunch of World War I, Farquhar's holding company (the Brazil Railway Company) went bankrupt and the rail line (Sorocabana e Ituana) returned to the state of São Paulo. Other lines operated by Farquhar

also went bankrupt and returned to federal control. After that, government ownership increased gradually, as lines all around the country failed and the state became a residual owner.¹

During the 1920s state governments also ended up controlling large commercial banks. The Bank of the State of Sao Paulo, established in 1909 with a dividend guarantee from the state government, operated mostly as a private bank helping to finance coffee exports until 1916. In 1916, the bank run into some liquidity problems and asked the state treasury for support. The government of Sao Paulo provided the bank with a convertible loan, which by 1926 gave the state government control of the bank. Interestingly, the state government did not send a representative of the Treasury to exert control until the late 1930s (Musacchio, 2009).

SOEs and the Big Industrialization Push (1934-1967)

It was in the 1930s, under President Getúlio Vargas (1930-1945), that the Brazilian state openly ventured into a variety of sectors as a way to coordinate industries and promote a big push. The government had to step in partly because it wanted to promote import substitution industrialization (ISI), but also because private stock and debt markets were in crisis and private investors were not willing to take the risks associated with the creation of new industrial companies in an environment of two-digit inflation (Musacchio 2009). Consistent with the social view of SOEs, the Brazilian government also had a tendency to use SOEs to directly control prices.

Thus, in 1934, the government of Vargas, a nationalist military president, passed the first Water Code, bestowing the ownership of waterways and waterfalls on the nation and allowing the government to regulate electricity rates. Therefore, the Brazilian government controlled tariffs in such a way to cap the maximum return on investment for private electricity generators and distributors at 10% of historical capital. The existing companies in charge of generation of electricity had traditionally charged tariffs indexed to the exchange rate (or to gold). Thus, over time, these controls on tariffs led to low returns and underinvestment, leading private companies to sell their assets to the government in the 1950s, 1960s, and 1970s (Centro de Memória da Eletricidade 2000; Baer et al. 1973).

In 1937, President Vargas created the Carteira de Crédito Agrícola e Industrial, a special section of the state-owned Banco do Brasil, with the aim of providing long-term credit to industrial firms. This form of development bank was financed with bonds that insurance companies and pension funds were required to buy (Dean 1969, 214). Additionally, after running a pro-free-trade government in the early 1930s, Vargas turned protectionist in the late 1930s. During World War II, Vargas and the Brazilian military realized the dangers of relying on imported raw materials and manufactures and began following an ISI policy with significant state ownership of manufacturing firms.

For instance, between 1938 and 1942, Vargas, associated with the United States government and the private sector, financed and built the first integrated steel mill in Brazil, Companhia Siderúrgica Nacional (CSN). Developing a steel mill required coordination with other parts of the supply chain, especially getting iron ore from the center of Brazil to the Southeast, where the mill was going to be located. Thus, in 1942, with financing from the American Eximbank, Vargas created the Companhia Vale do Rio Doce (CVRD), an iron ore mining firm that consolidated a variety of small and medium firms, and a railway (from the mining areas in the center of Brazil to the port of Victoria a few hours north of Rio de Janeiro). Initially, the government wanted the private sector to participate in the financing of both firms, but to scant private participation in the subscription of capital of these firms, the Brazilian Treasury ended up having to buy the bulk of voting shares while pension funds bought the majority of the preferred (nonvoting) shares. Therefore, with the creation of both CSN and CVRD, the government connected the iron ore sector with the new steel industry and provided the first push for heavy industrialization.

¹ For the history of railway subsidies in Brazil, see David et al. (2006).

Thus, beyond CSN, established in 1941, and CVRD, established in 1942, the government created a variety of SOEs between the 1930s and 1940s. These SOEs include the Fábrica Nacional de Motores (FNM), a manufacturer of buses, trucks and cars, founded in 1943; the soda ash producer Companhia Nacional de Álcalis, established in 1943; the electricity company Companhia Hidroelétrica do São Francisco (Chesf), projected in 1945 and opened in 1948; and the specialty steel products firms Companhia de Ferro e Aços de Vitória (Cofavi), established in 1942, and Companhia de Aços Especiais Itabira (Acesita), opened in 1944 (SEST 1981-1985). Boxes 1 and 2 present the cases of FNM and CVRD in more detail. Although the former was a case of failure, the latter eventually became a profitable SOE—in large part due to Brazil's natural advantage in iron ore extraction but also due to an independent, technical management subject to competitive pressure from external markets (e.g. Bartel & Harrison, 2005).

Preliminary version

Box 1. Fabrica Nacional de Motores (FNM)

In 1938, the Minister of Transportation and Public Works commissioned a study to examine the possibility of establishing an airplane engine in Brazil. The project was prepared rather rapidly, but the onset of World War II stalled any progress on it until 1942 when President Getúlio Vargas himself secured funding from the United States, as part of their support for their allies. Production at the Fabrica Nacional de Motores got started in 1943 and the first airplane engines (outdated radial engines of 450HP) were ready by 1946. After building those engines, FNM focused on repairing engines for airlines, and producing engines and industrial parts for textile mills and railways. The domestic sales of airplane engines did not really take off because as soon as World War II was over, American engine makers started selling their own products commercially around the world, including Brazil. Thus, FNM struggled financially in the next few years. Still, the company sustained its operation with internally generated funds.

In 1946, the government authorized the transformation of the engine factory into a corporation, Fabrica Nacional de Motores S.A., charging the firm with the assembly of tractors and trucks. The financing of the new firm came from the federal government, the government of Rio de Janeiro, pension funds and Caixa Economica (a state-owned bank). The new company was considered a national priority and enjoyed tax exemptions on everything, from profits to imports of inputs and capital.

Beyond tractors, FNM became a truck and bus producer after 1946 as well, while the idea of building airplane engines was stopped altogether. In 1948, FNM signed a contract with the Italian firm Isotta-Fraschini, which led to the construction of a truck with a diesel engine (FNM D-7,300) and 30% of national content. The high national content was possible thanks to the growth in the Brazilian metal works and auto parts industry. FNM also started producing buses, selling a couple hundred units in less than five years. Yet, in 1951, with the bankruptcy of Isotta-Fraschini, FNM had to seek new partners and signed a licensing deal with Alfa Romeo, the then state-owned Italian auto maker, to make trucks. The new trucks had 31% of national content. This was accompanied by the expansion of the factory in 1953, thanks to a loan from BNDE, the national development bank. As a consequence, FNM dominated the domestic market for trucks and buses during most of the 1950s.

In 1956, diverse interest groups interested in the development of the auto industry in Brazil recommended the entry of foreign auto manufacturers to develop a strong private auto industry. These groups also recommended the dismantling of FNM, by then perceived as inefficient and lacking the required capabilities to operate in a complex industry. The government began a gradual divesting of FNM in 1956, selling almost half of its voting shares, keeping 51% of voting equity. Between 1956 and 1959 there were two equity increases in which the private sector increased its ownership share. In 1959, FNM got the license to produce a car, the Alfa Romeo 2000. Yet a financial crisis ensued at FNM as the government controlled the prices of the buses, trucks and tractors built by FNM. Additionally Scania-Vabia and Mercedes-Benz entered Brazil at the end of the 1950s, further eroding the company's market share in the truck and bus sectors. In 1967, the government ordered a recapitalization of the company using BNDE as an investor and authorized the Ministers of Finance and Commerce to privatize the shares that belonged to the Treasury, as part of the government policy of "divesting firms that do not justify government ownership." (Decree-law 103, 1967). As a consequence of the divestiture, Alfa Romeo acquired control of the company in 1968. By 1973 Alfa Romeo had signed a joint venture agreement with Fiat (51% for Alfa, 43% for Fiat and 6% for minority shareholders) and they split the ownership of FNM after that. Thus ended the Brazilian government attempt to use state capital to own and operate an engine factory.

Source: Decree-law 8699, 1946; Decree-law 103, 1967; Dean (1969); Musacchio (2009); Wirth (1970); Triner (2011); Baer (1965); BNDES (2002a); Schneider (1991)

Box 2. Companhia Vale do Rio Doce (CVRD)

An example of a firm that was created during the initial stages of state capitalism, and then managed to expand and have relatively good performance is CVRD. One key factor for the expansion of CVRD is that it did not rely on transfers from the treasury to finance its expansion. Instead, the company used its export profits as a source of cash flow to continue financing its investments. Thus, CVRD illustrates how an SOE can leverage its operations and enhance performance if it is exposed to competition in foreign markets.

In 1942, through an agreement with the United States government, President Vargas created the Companhia Vale do Rio Doce (CVRD, or Vale), using the facilities of the Itabira Iron Ore Company, its railway network, and loans from the American Eximbank. Simultaneously, Vargas created the Companhia Siderúrgica Nacional (CSN) (Triner 2011, 94). By the late 1940s, CVRD was already responsible for 80 percent of Brazilian iron ore exports. By the 1960s Vale became the most profitable SOE in Brazil and a leader in the world iron ore market. According to Trebat (1983, 103), Vale could focus on profitability and growth because of its relative autonomy from the government. Vale was profitable enough to avoid having to ask continuously for support from the Brazilian Treasury or from BNDES. Trebat (1983) estimated that Vale financed between 60 percent and 100 percent of its capital investment in the 1970s with its retained earnings. The remainder was financed by issuing long-term debt.

Under the leadership of Eliezer Batista and others, the company used its retained earnings to buy companies in other sectors, both to diversify its investment portfolio and to create joint ventures. Throughout the early 1970s, Vale “sought broad diversification in the natural-resource sector and moved aggressively through subsidiaries and minority-owned affiliates into bauxite, alumina and aluminum, manganese, phosphates, fertilizers, pulp, paper...and titanium” (Trebat 1983, 52). Furthermore, by the 1970s, Vale’s distribution network included railways, shipping lines, and a port. Thus, at the height of what Trebat called Vale’s “empire building” period, the company owned 12 major subsidiaries and was an active partner in 12 joint ventures, primarily fueled with foreign capital.

Despite being a state-owned enterprise, Vale was always one of Brazil’s most profitable firms and rival exporters forced it to become a cutting-edge mining company early on. Vale’s most important investment project was the development of the Carajás iron ore deposits in the state of Amazonas—estimated to be the world’s largest iron ore reserves, with at least 18 billion tons of the mineral. By 1986, Vale was exporting all of the production from the Carajás mines.

Vale’s expansion came to a grinding halt in the 1980s when the government’s stabilization policies controlled expenditures, especially capital expenditures, in all SOEs (Werneck 1987). Still, Vale was the SOE that paid the highest dividends to the Brazilian government in the 1980s and 1990s and was the SOE that contributed more to gross capital formation in those decades (Pinheiro & Giambiagi, 1994). Eventually the firm was privatized in 1997, however with remaining (minority) state capital (see Box 6).

Source: Khanna, Musacchio, and Reisen de Pinho (2010); Musacchio and Lazzarini (2014)

In the 1950s, the Brazilian government had a second wave of SOE creation. These firms again were created to either provide a big push in infrastructure, as a way to either supply important inputs for domestic industry (e.g., electricity, oil and steel) or reduce market failure, especially in capital markets. One of the most important efforts to develop a new industry and to reduce bottlenecks was the creation of Petrobras, the flagship state-owned national oil company. The creation of Petrobras came after almost two decades of political debate about the model Brazil should follow for its oil industry. In the 1940s, the demand for oil and refined products increased rapidly and the government realized it needed to have a plan for the industry. The question was both who would control the rights to exploit oil and who would control the rights to import, refine, and distribute oil and oil products. In the end, the government created Petrobras in 1953, granting it a

monopoly on the exploration, extraction, refining, and transportation of crude oil and refined products (Law 2,004 of October 1953).

This second wave also saw the creation of the giant national development bank, BNDE. While the early industrialization in Brazil had been financed by a large stock and bond market, by the 1950s there were few initial public offers and the long-term bond market had disappeared. Since Brazil had experienced two-digit inflation since the 1930s, by the 1940s the stock of long-term loans to GDP had decreased to around 5%, from a peak of almost 20% in 1914 (Musacchio, 2009). Thus, in 1952, a series of joint studies by the governments of Brazil and the United States concerned with the expansion of Brazil's infrastructure, led to the creation of the Brazilian National Bank of Economic Development (BNDE in Portuguese, later changed to BNDES when "social development" was added to its mission in 1982). BNDE soon assumed a key role in the long-term credit for infrastructure projects such as energy, steel and transportation.

BNDES started out as a vehicle to provide long-term financing for the renewal of large infrastructure projects. During its first 10 years of operation, BNDE focused on providing long-term funding for the renewal of the railway system and the construction of new hydroelectric power plants. Most of the large projects BNDE financed were carried out by SOEs. For instance, Furnas, Cemig, and others SOEs built most of Brazil's largest hydroelectric plants and transmission lines with funding from BNDE and the World Bank (Tendler 1968).

In the late 1950s, the bank's focus began to switch to supporting the development of the still infant steel industry. In its beginning, BNDE operated as a giant holding company, initially providing minority equity; then, through equity injections or through convertible debt, it ended up becoming the majority shareholder of the largest steel mills. For instance, in 1956, BNDE and the government of the state of São Paulo financed the creation of a steel mill, Companhia Siderúrgica Paulista (Cosipa). Although BNDE began as a minority shareholder, subsequent capital injections made it the majority shareholder from 1968 until 1974, when the government transferred its controlling shares to a new holding company for the steel industry: Siderbras. A similar story took place with Usiminas, another steel mill, partly financed by the government of Minas Gerais. This firm was controlled at first by a consortium of Japanese firms, but BNDE became the controlling shareholder through subsequent equity purchases in the late 1960s (BNDES 2002; Schneider 1991; Baer 1969). In fact, in the 1960s BNDE financed about 70 to 80 percent of all capital investments in the steel industry (BNDES 2002).

During the 1950s and 1960s, most of the loans BNDEs gave had long maturities and low real interest rates. The average interest rate was 9.5 percent per year. For infrastructure loans, the rates were about 8 percent and for industrial loans, the rates reached 11 percent. Yet, with double digit interest rates, especially in the early 1960s, these loans carried a negative interest rate (Currello 1998, 20).

Under the military government (1964-1985), BNDES changed its focus from lending to public projects to financing private companies. Before 1964, almost 100 percent of the loans went to finance public projects, either directly by a government agency or indirectly by an SOE. But by 1970, the private sector received almost 70 percent of the loans and by the late 1970s, public projects received less than 20 percent of the loans (Najberg, 1989 18). In 1965, as part of the push to support the domestic machinery and equipment industry, the military government created Finame, the first subsidiary of BNDE. For the Brazilian government and the BNDE technocrats, the development of a domestic machinery industry was seen as a *sine qua non* for industrial development that was not dependent on foreign imports. Thus, Finame had the sole objective of providing medium- and long-term funding for the purchase of equipment in Brazil (BNDES, 1987). Most of its loans went to private companies who were trying to substitute imports. Furthermore, Finame was designed to support the development of the dynamic domestic machinery sector, which, according to Leff (1968, 2), had average growth rate of 27% per year in the previous two decades.

In sum, before the 1970s, BNDE and the newly created SOEs were a vehicle to promote improvements in infrastructure (railway and utilities) and prop up nascent industries. In a market with severe credit rationing and with high discovery costs, the Brazilian government, through BNDE, was providing long-

term financing and sometimes acting as an entrepreneur itself to finance the development of new industries such as steel, electricity, and chemicals.

The outcome of this period of rapid growth in state-owned enterprises, however, was not an overwhelming dominance of SOEs in the Brazilian economy. The Brazilian government, instead, developed a large apparatus in sectors that were key for the industrialization of Brazil and still left the private sector as the dominant player in other sectors where state action was not perceived as necessary. The state dominated mining, metallurgy and steel, public utilities and petroleum. For instance, by the end of the 1960s, among the ten largest firms in those sectors, SOEs represented 60% of assets in mining, 70% in metallurgy and steel, 86% in public utilities, and 80% in petroleum, petrochemicals, and oil and gas distribution (Baer, Kerstenetzky, & Villela, 1973). Consistent with the industrial policy view, these key industries in which the state operated were also industries with high spillovers and forward linkages. In sum, in this initial stage the Brazilian state focused on coordinating sectors to develop basic infrastructure and to provide basic inputs for the industrialization of the country.

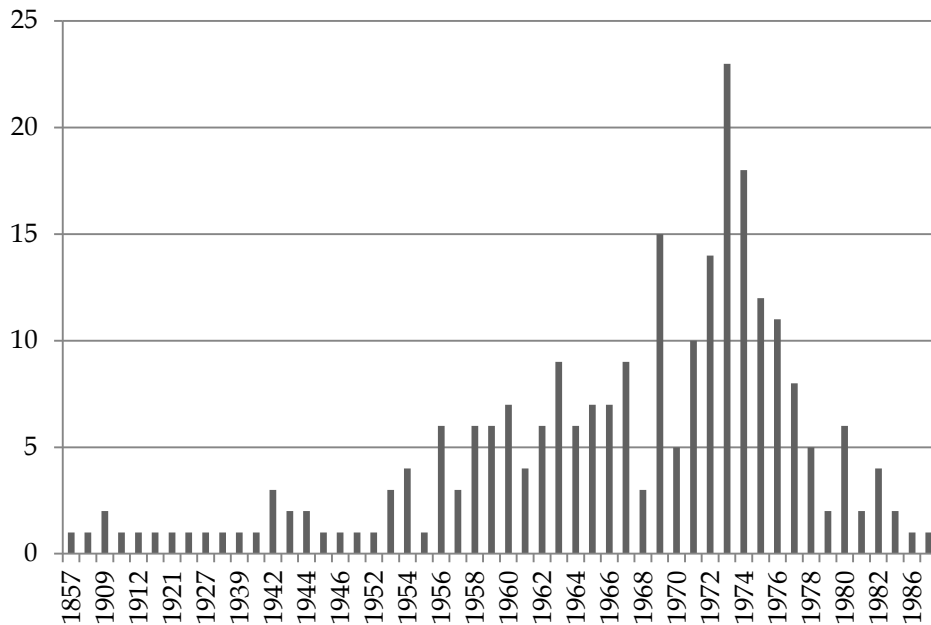
The Zenith of Leviathan as an Entrepreneur (1967-1979)

In this third stage of state capitalism in Brazil, the Brazilian government ventured into industries beyond utilities, mining, steel, and petroleum, not necessarily by design, but due to the action of the managers of SOEs. It is in this period when state intervention in the economy, in the form of direct ownership of SOEs, reaches a historical peak. Figure 1 shows the number of SOEs by their year of creation. The graph was built using data on SOEs observed in the 1970s and 1980s. Thus, the total number of SOEs may be underestimated due to attrition. With this caveat in mind, we see that that a large number of SOEs was created during the military dictatorship (1964-1985) and, in particular, during the administration of President Ernesto Geisel (1974-1979), a general who had served as the CEO of Petrobras between 1969 and 1974. It also shows that the peak in SOE creation actually took place in the late 1970s.

The number of SOEs exploded once Ernesto Geisel took over as president in 1974. He was a strong believer in state planning and saw an explicit need for the government to guide and support economic development (Gaspari, 2003: 298). He was also a strong supporter of ISI and believed that foreign participation was only warranted in cases where domestic technology was lacking. According to Trebat (1983), “public enterprise has been considered in Brazil as a shortcut to industrialization—an expediency forced upon policymakers by the absence of a well-financed domestic private sector and by Brazil’s reluctance to allow transnational corporations into certain strategic sectors” (p. 116).

Figure 1

Number of SOEs in Brazil according to the date when they were founded, 1857–1986



Source: Musacchio and Lazzarini (2014).

Note: The sample of firms used to plot this graph excludes companies that failed or were privatized before 1973, such as FNM. After 1973, the sample includes all of the Federal SOEs and a large number of state-level SOEs.

The development of the telecommunications sector in Brazil illustrates this point. Defendants of state control of that sector argued that foreign companies tend to focus on short-term profitability and fail to promote satisfactory coverage of phone lines at cheap prices. At the same time, private domestic capital was perceived to be insufficient or unwilling to take the required risk to invest in telecommunication infrastructure; local industrialists complained about “the lack of resources and low tariffs” (Díaz-Alejandro, 1984). The Brazilian Telecommunications Code of 1963 established a state-granted monopoly, followed by the creation of Embratel in 1965 and the subsequent organization of the Telebras system in 1972 with a host of regional telecoms, Embratel (responsible for interstate and international calls) and CPqD (an R&D unit).

One could argue that, in this period, state ownership in the Brazilian telecom sector is explained by the industrial policy argument that state-led intervention may be necessary to promote risky, coordinated investments. Yet, by the late 1960s the Brazilian government already had mechanisms to support domestic private entrepreneurs through subsidized credit (e.g. through BNDE). In addition, a great deal of the state-led industrial big push already occurred in the period after the World War II and the early 1960s. A more plausible explanation, again in line with the social view, is that the government wanted to guarantee sufficient coverage at low prices, thus reducing the expected profitability of private investment. A tendency of military governments in Brazil to avoid foreign control of “strategic assets” further reduced the extent of private capital required to fund large infrastructure projects. Thus, state ownership prevailed due to the sheer desire by the government to directly control a wide range of industrial sectors.

In fact, in the 1970s state action focused on ISI and state-funded fixed capital formation. In the Second National Development Plan of 1974, created by Geisel’s economic team, the government set targets for SOEs and for BNDE. According to this plan, the priorities were to change the energy matrix of Brazil (especially after the oil shock of 1979); to propel the development of a domestic raw materials industry (to

depend less on imports); and to consolidate the machinery and equipment industries (BNDES, 1987).² Thus, the government ventured more heavily in petrochemicals, created firms to control the distribution and storage of foods, invested in research and development of the National Agricultural Research Company (known as Embrapa), either supported or bailed out private firms in petrochemicals, metals, and technology, and continued using Finame to subsidize capital expenditures.

Some SOES also resulted from the objective of promoting new technology in the realm of the state. A clear illustration is Embraer (Box 3): it was launched in 1969 as a state-controlled SOE but eventually resulted from previous state-led investments in aeronautical engineering and military technology. Like Vale, Embraer had an autonomous management and benefitted from local resources such as research and education centers. Furthermore, it was since its inception integrated in external markets and foreign production chains; that is, Embraer did not operate as a typical SOE focused on ISI. Yet it was only after its privatization in 1994 that the company became truly competitive, with new product lines for regional routes such as the ERJ-145 and, more recently, the so-called E-Jets. Also like Vale, Embraer became an example of Leviathan as a minority investor, with capital from pension funds and especially BNDES.

As a consequence of the investments associated with the second development plan, gross capital formation by federal SOEs jumped to 4.3% of GDP or 16.3% of the total fixed capital formation in 1975 (Treat, 1983: 15). Moreover, as the National Development Plan unfolded, Brazil had its highest GDP growth rates in years. Between 1965 and 1979 Brazil grew at approximately 9-10% per year. Part of the growth came from the relocation of labor from agriculture to manufacturing, but also from the rapid accumulation of capital. Furthermore, value added in manufacturing grew at 10% per year between 1967 and 1980.

Yet, not everything went according to plan. Since 1967, the government had decentralized the control of SOEs among different ministries. The idea of decentralizing control was based on the assumption that it would ensure faster execution because of the relevant monitoring bodies would be close to the actual operations. In practice, the decentralization of control gave ample autonomy for SOEs, especially those that did not require continuous support by the Brazilian Treasury (Wahrlich, 1980).

Decentralization created, however, two problems for the federal government. First, the government had no control of the number of SOEs and the kind of subsidiaries each of these firms had. A census conducted by Fundação Getúlio Vargas in the early 1970s showed that the federal and state governments controlled 251 firms (1983). In 1976, another census conducted by the magazine *Visão* reported that the federal and state governments controlled 200 and 339 SOEs respectively (Treat, 1983: 116). But an explicit plan to count and control federal SOEs only began in 1979 with the creation of the Secretary for SOE control, known as SEST. Figure 2 shows some of the most important SOEs and the ministry in charge of monitoring them. Above the ministries there were three agencies in charge of supposedly coordinating the actions of SOEs, the Council for Economic Development, the Council for Social Development, the Ministry of Planning and the Secretary of Planning. The last two were under the direction of the Minister of Planning. Yet, in practice SOEs responded to their ministries, which in turn preferred to have larger firms with more jobs under their command than having efficient firms achieving development goals.

² The National Development Plan II of 1974 (known in Brazil as PNDII) stated that the government and BNDE had to give special attention to the support of the following industries: steel, nonferrous metals, petrochemical products, fertilizers, paper and cellulose, cement and construction materials, and the raw materials for these industries (Brazil, 1974).

Box 3. Leviathan as an Entrepreneur: the Case of Embraer

In 1941, the administration of Getúlio Vargas created the Ministry of Aeronautics with the objective of coordinating the development of a national aeronautics industry. FNM (see Box 1) was part of this effort. In 1949, the government furthered its efforts to develop an aeronautics industry by creating the Aerospace Technology Centre (CTA – modelled on the Massachusetts Institute of Technology). The CTA spawned a number of sister organizations specializing in various aspects of sector-specific training and research. Initially the role of this setup was to support private sector initiatives in the aeronautical industry. The government, thus, played three roles. First it provided financing, coordinated actors (and by demanding planes provided the demand), and also reduced discovery costs for companies by subsidizing research, both in universities and SOEs such as FNM.

In an effort to develop a mass of aeronautic engineers and invest in a technology deemed as a “strategic,” the government created in 1950 (through Law 27,695 of 1950) the Aeronautics Technology Institute (known as ITA), which operated in the campus of CTA in Sao Jose dos Campos, Sao Paulo state. Initially ITA offered an aeronautics engineering major, and subsequently added electrical engineering (1951), mechanical engineering (1962), computer science (1989) and others. It was also the first education institution to offer a graduate degree in engineering in Brazil. In 1954, inside CTA, the government created the Institute for Research and Development (known as IPD in Portuguese). Thus, once CTA, ITA and IPD were created, they coordinated to develop projects envisioned by the military, the Ministry of Aeronautics and professors at ITA. Moreover, Sao Jose dos Campos quickly became a center for aeronautics, as private companies established in the region, working closely with CTA, IPD and ITA.

Between 1964 and 1965 the Ministry of Aeronautics tasked CTA with the development of a medium-sized airplane manufactured nationally; this was the so-called “Bandeirante” Project. By 1968, a group coordinated by the Ministry of Aeronautics, which included a variety of private firms, CTA, IPD and ITA, had a first prototype for the Bandeirante plane ready.

In 1969 Embraer was established as a majority SOE, taking over some core projects from CTA, including the development of the twin-engine, turbo-prop Bandeirante airplane. The creation of Embraer was not, however, part of any formal governmental plan; it actually resulted from the insistence of a former Aeronautics colonel, Ozires Silva, who had led the Bandeirante project. The new company was supported by the state through close links with the Ministry of Aeronautics, generous tax holidays, concessionary loans and an access to offer its customers preferential financing through BNDES. Commercial production of the Bandeirante started in the 1970s in cooperation with foreign partners under co-production and licensing arrangements. Meanwhile CTA and the Brazilian Air Force developed other military planes, including the Ipanema light plane, the Tucano fighter plane and the AMX fighter jet, intended to be produced on a commercial basis by Embraer.

Embraer’s production facilities were designed to limit the degree of domestic vertical integration that was thought to have dogged earlier attempts to establish a viable aircraft manufacturer. A number of light aircrafts were developed relying on Brazilian design but contracting of high-value, high-tech components abroad. A strong focus on the export market was a priority from the start, and proved crucial in offsetting the development costs.

Like some other SOEs such as Vale/CVRD, management was more or less autonomous and insulated. Half of the board of directors was appointed from among private sector corporate executives. The company’s apparent success was at the time described as the outcome of a “triple alliance” between multinational enterprises, local private companies and SOEs.

Yet around 1990 Embraer faced the most severe crisis in its existence. This was partly related to lingering fiscal constraints following the Latin American crisis in the early 1980s, but it has been mostly attributed to an increased politicization and a focus on engineering over commerce in a company relying heavily on

government procurement. For example, Embraer was forced into a loss-making cooperation with the military aircraft manufacturer of a neighboring country for political reasons.

In December 1994, after several failed attempts, Embraer was privatized. Embraer recovered spectacularly under private ownership, though it should be noted that the groundwork for the recovery was done in the late 1980s with the decision to develop the company's first regional jet, the ERJ-145. The state remained with a minority equity position through BNDES and Previ, the pension fund of state-owned bank Banco do Brasil.

Source: OECD (2013); Bernardes (2000); Lazzarini and Bourgeois (2008)

Thus, decentralization also led to “empire building,” or the process by which managers of large SOEs used internally generated resources to expand their empire into sectors that were not necessarily part of their original mandate (Treat, 1983). That is, many managers made sure their firms were profitable to enjoy independence from the government and to be able to invest in the sectors they deemed relevant for their SOEs. This course of action, questioned the government's capacity to coordinate its productive apparatus. For instance, the SOEs of three different ministries invested in aluminum firms, fertilizers, shipping, and chemicals. Two SOEs, controlled by different ministries had investments in railways.

The tremendous size of the SOE sector, however, worried some government officials, such as Marcos Vianna, President of BNDES. In May 1976, Vianna wrote a confidential memorandum to the Minister of Planning, João Paulo dos Reis Velloso in which he noted that there were “few private firms among the top 100 companies of the country...” He also argued that the widespread presence of SOEs “created a problematic picture whereby national private entrepreneurs are inhibited, leaving the impression of a deliberate policy of statization, which is definitely not the desire of the government” (Vianna, 1976).³ His proposed remedy was to promote a form of “coordinated privatization” whereby BNDE itself would assign sectors populated by SOEs to selected private groups. BNDE's participation, in his proposed scheme, would involve a mechanism whereby “the debt should be repaid in proportion of the net profits effectively generated” and the period of amortization “would not be pre-specified.” Thus, in essence, privatization would entail state capital in a form very similar to minority equity investments (i.e., long term investments with no pre-specified repayment dates). Although Vianna's plan was not executed, his proposal set the stage for the privatization process and the subsequent model of state investment in which Leviathan is a minority investor and in which BNDES became a central actor as a lender and shareholder.

³ We thank Elio Gaspari for providing us with a copy of this memorandum.

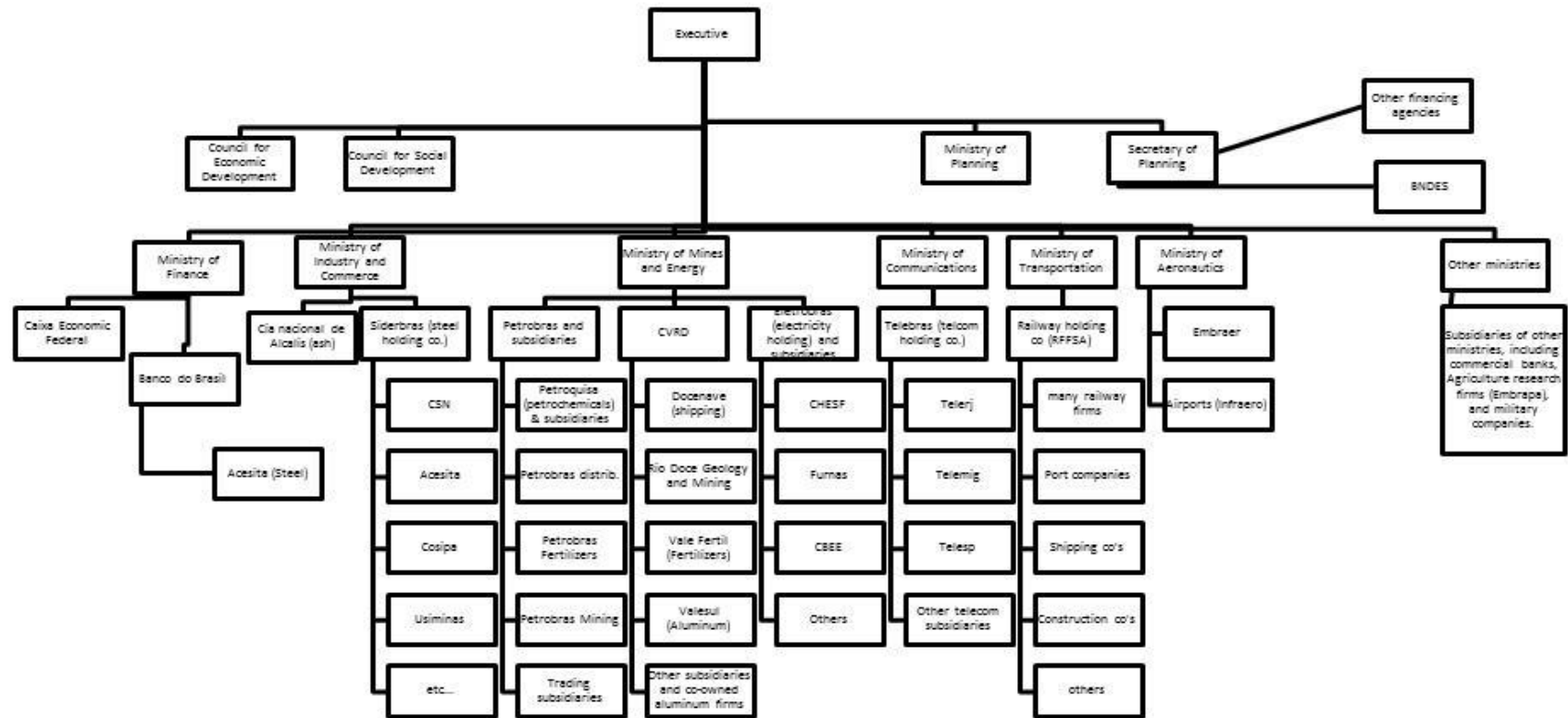
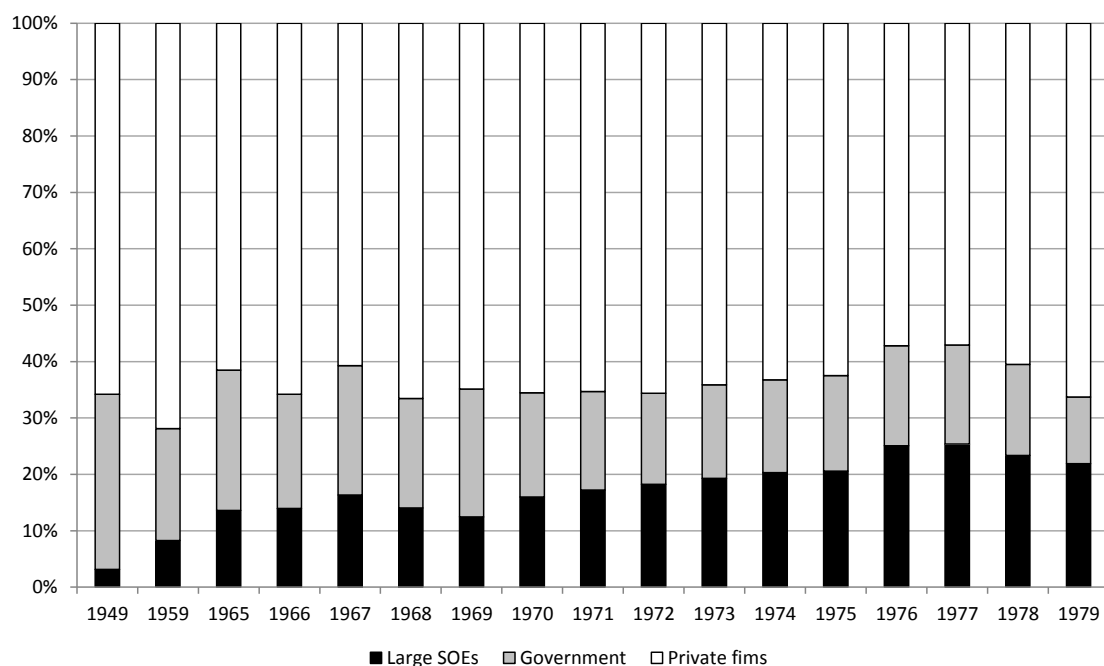


Figure 2
 Organizational chart of the instances of control of Brazilian SOEs, c. 1979
 Source: Created by the authors with data from Wahrlich (1980)

Despite their ubiquitous role in the Brazilian economy until the 1980s, it hard to precisely quantify how much SOEs contributed to the development of Brazil in the 20th century. After World War II, large SOEs progressively became important sources of country-level investment. By 1976-1997, they were responsible for around 25% of the total gross fixed capital formation in Brazil (see Figure 3). Furthermore, thanks to SOEs Brazil developed large sectors that initially were not funded by the private sector alone, such as steel, airplane manufacturing, telephony, national oil, gas, petrochemicals, mining, and an integrated electric grid (which was not integrated when it was operated by private parties, e.g. Tendler, 1968). Most applied innovation efforts were also essentially executed by state agencies (such as Embrapa in agriculture) as well as large SOEs such as Petrobras and Embraer.

Figure 3
Gross fixed capital formation in Brazil originated from large SOEs, government units and private firms



Source: From Trebat (1983), Table 5.2.

The Fall of Leviathan as an Entrepreneur in Brazil and the Wave of Privatizations (1980s-1990s)

The expansion of SOEs in the 1960s and early 1970s was partly facilitated by an external environment with cheap available credit. In the early 1970s, the government had relatively easy access to lines of credit from international banks, both directly and indirectly through SOEs focused on tradables, such as Vale do Rio Doce. According to former Minister Delfim Netto, “Arab countries would sell us oil and would deposit their profits in an American bank, which would then lend us the money.”⁴

Such externally-financed expansion, however, reached its limit by the late 1970s. With the second oil shock of 1979, causing a sharp increase in oil prices, the terms of trade for Brazil progressively deteriorated. Because Brazil was a net importer of oil, the new external environment strained the country’s balance of trade and current account. Brazil had to borrow

⁴ Interview with Delfim Netto, Former Minister of Finance and Minister of Planning, Sao Paulo, Brazil, August 2012.

abroad; yet, complicating matters, the Federal Reserve Board of the United States hiked up its benchmark interest rate in 1980. Although rates began to fall by 1982, there was another external shock that destabilized the Brazilian economy. In the fall of 1982 Mexico declared a moratorium on payments of its foreign currency and trickled a debt crisis in several developing countries. As a consequence, credit lines from private banks, which had been abundant before 1980, dried up and the U.S. Treasury, the IMF, the Federal Reserve, and a group of international bankers had to ration credit globally.

The rapid depreciation of the currency after 1982 created three complications for the Brazilian government and its SOEs. First, it made it more difficult for the federal government to meet its external debt obligations (Díaz-Alejandro, 1984). Second, currency depreciation also led to rampant inflation. Third, the rapid rise in global interest rates and the rationing of credit dramatically hurt the finances of some of the largest SOEs, which had been financing their current expenditures with foreign debt denominated in dollars or yen.

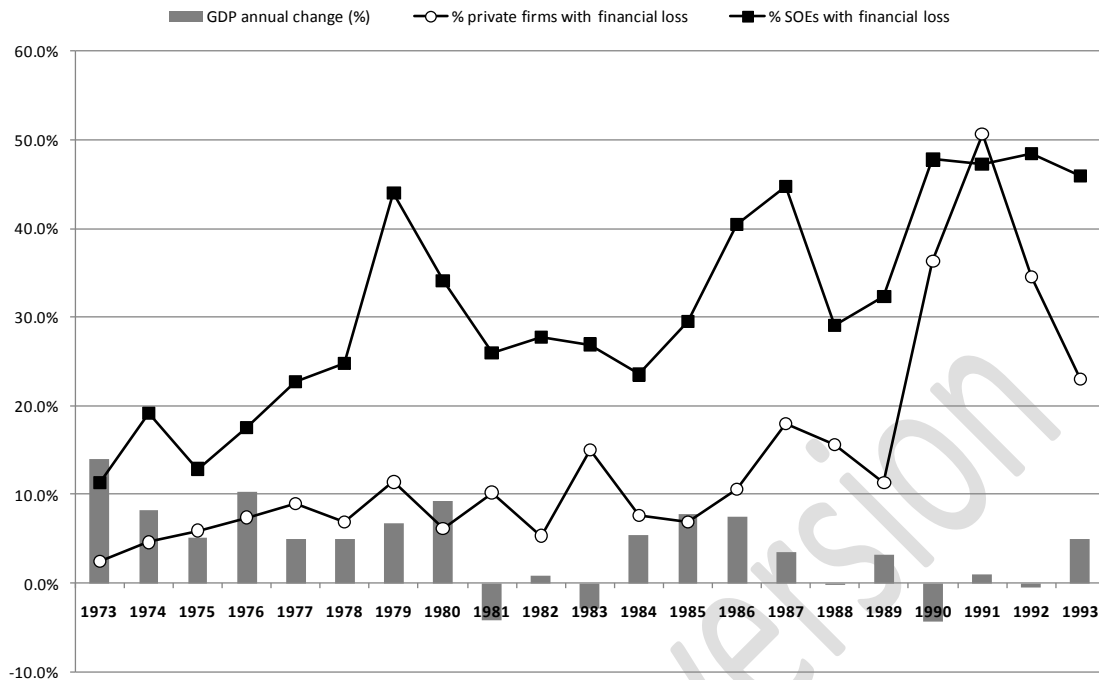
Between 1980 and 1983, the financial expenditures of SOEs went, on average, from 7% of total expenditures to 16.6%. SOEs belonging to the electricity conglomerate Eletrobras had their financial expenditures increased from 26% of total expenditures to almost 53%, while SOEs belonging to the steel conglomerate Siderbras had financial expenditures increased from 10% to almost 35% of total expenditures. Other firms, such as the state railways, the aircraft manufacturer Embraer and the specialty steel mill Acesita saw their financial expenditures double as a consequence of global increases in interest rates (and the depreciation of the Brazilian currency) (Werneck, 1987).

Moreover, the government started to use SOEs to pursue “social objectives” such as price stability and low unemployment. This had two consequences for SOEs. First, as the government imposed expenditure and price controls on SOEs, their revenues stalled, while salaries and other costs skyrocketed due to domestic inflation. This led to losses and a rapid decline in capital expenditures. This is because the government controlled SOE expenditures tightly as a way to push prices down, but that also led to a dramatic fall in aggregate gross capital formation. Gross capital formation by SOEs fell from 5% to 3% of GDP two years after the 1982 crisis started and continued falling until 1990, when it reached just below 2%.

Second, SOEs were not able to adjust the size of their labor force during the pronounced recession, thus facing severe losses. Figure 4 shows the performance of SOEs compared to private firms before and after the crisis (1979-1983). We plot the percentage of SOEs versus private firms reporting losses. To build this figure, we relied on a database of 136 Brazilian SOEs at the federal level between 1973 and 1993. We also include 156 top private firms to serve as a control group (see Musacchio and Lazzarini, 2014 for further details). Having a control group of private firms is important because, in essence, the crisis is expected to affect state-owned and private firms. However, we expect SOEs to be more severely affected given that they pursue social and political objectives that distract them from the focus on profitability. As mentioned before, if governments force SOEs to control prices then they should be much more negatively affected than their private counterparts. Indeed, we see in Figure 4 that the percentage of SOEs reporting losses increased to a greater extent than private firms in the 1980s, reaching almost 50% by the early 1990s. (In 1990 and 1991, there was an unsuccessful plan to curb inflation through confiscation of savings, which affected private firms and SOEs alike.)

Figure 4

Percentage of SOEs reporting losses, compared to a control group of private firms, 1973-1993



Source: Musacchio and Lazzarini (2014)

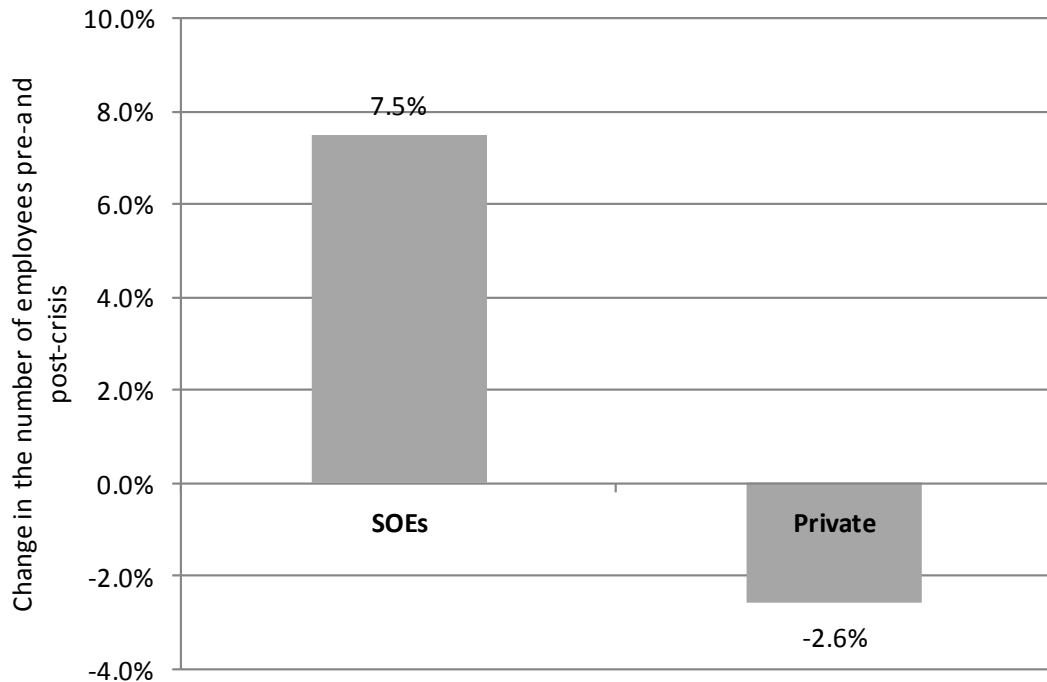
The social view of SOEs suggests that state-owned firms will not only be used to control prices but also to artificially hold investment and employment even in moments of crisis. Figure 5 shows how SOEs and private firms comparatively behaved in terms of employment, based on estimates reported by Musacchio and Lazzarini (2014). Again, we can hypothesize that unemployment as a result of the crisis should be observed more in SOEs than in private firms. Faced with an external shock, private firms are expected to downsize, whereas SOEs may even *increase* hiring as a way to buffer the impact of the crisis on the national labor market.

A problem with comparing SOEs and private firms, however, is that they greatly differ, especially when we consider that many SOEs until the 1980s were operating as state-granted monopolies, thereby lacking comparable industry peers. To circumvent this potential source of bias, Musacchio and Lazzarini (2014) identify a host of company-level “fundamentals”—such as size, leverage and profitability—that would allow to match SOEs with comparable private firms. Namely, the technique of differences-in-differences estimation with propensity score matching is implemented (Heckman, Ichimura, & Todd, 1997). Employment before and after the crisis is measured in two periods: 1979-1981 and 1982-1984. Next, the change in employment (in logarithm form) is computed as the difference between those two periods, for SOEs and private firms. Propensity score matching is then used to give more weight to private firms whose fundamental traits are more similar to the sample of observed SOEs. In line with the hypothesis derived from the social view, SOEs increased employment by 7.5% after the shock, while comparable private firms downsized by 2.6% in the same period.⁵

⁵ This is not a result of legal impediments of SOEs to fire employees. In 1967, the military government passed the Administrative Reform Law (Decree-Law 200, 1967), which granted SOEs the same treatment as private companies.

Figure 5

Change in the number of employees of Brazilian SOEs and a control group of private firms, before and after the economic crisis (1981-1983).



Source: Based on estimates reported in Musacchio and Lazzarini (2014)

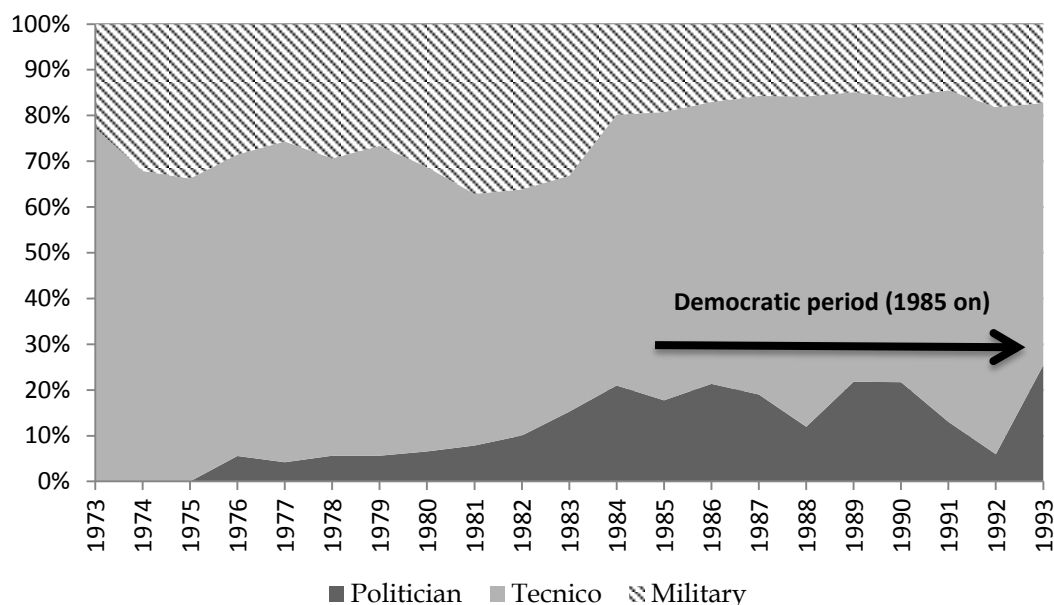
Note: Preoutcomes measured as 1979-1981 average; postoutcomes measured as 1982-1984 average.

Sample of private firms adjusted with propensity score matching

An alternative hypothesis for the poor performance of SOEs emanates from the political view. Namely, SOEs can be used as vehicles of patronage: governments may choose employees on the basis of their political connections instead of merit or technical background. This effect is expected to be particularly strong when the government has to build political coalitions and hence compensate its cronies with benefits from the public bureaucracy. The need to build such coalitions is expected to increase under democracy. Because Brazil transitioned to a democracy in 1985, we can thus expect that a higher proportion of politicians running SOEs. In contrast, a large literature on industrial policy identifies the need of a technical, insulated bureaucracy as a key condition for the success of state-led development strategies (Amsden, 1989; Evans, 1995; Schneider, 1991).

To examine this possibility, we rely on basic biographical information for between 100 and 250 CEOs of SOEs (see Musacchio and Lazzarini, 2014). Figure 6 shows the distribution of CEO backgrounds throughout the same period, 1973-1993. There general types are identified: CEOs with a technical education, the so-called *técnicos* (for example, when the CEO majored in engineering); CEOs with a military background (mostly due to their assignment as managers in the military dictatorship); and CEOs with a political background (e.g. the executive had a political post at some point in his or her career). As expected, the number of politicians running SOEs rises after the democratic transition in 1985, increasing to over 10% of the sample. Yet, the proportion of technical CEOs running SOEs remained relatively high, around 60%. In addition, Musacchio and Lazzarini (2014) do not find a negative effect of having a political CEO on the performance of SOEs. The most important trait influencing performance was whether the CEO graduated from a top university in Brazil. Because those top universities have highly competitive entrance tests, this variable is likely correlated with skill and ability. A caveat is that these results only apply to CEOs instead of other managers of SOEs. Hiring politicians has been a common practice also in the mid echelons of state-owned firms.

Figure 6
Types of CEOs of SOEs in Brazil, 1973-1993, according to background



Source: Musacchio and Lazzarini (2014)

Therefore, even if we cannot completely reject the political hypothesis that the poor performance of SOEs in Brazil during the 1980s was due to increased pressure to hire non-technical managers, probably the most relevant cause for the demise of the model where Leviathan is an entrepreneur was the unrestrained use of SOEs to pursue multiple objectives conflicting with profitability. When external and internal conditions deteriorated and made it more difficult to financially sustain those multiple objectives, the model collapsed. For instance, the average dividend paid by all federal SOEs was close to 0.4% between 1988 and 1999—a dim outcome given that the government had to make yearly payments ranging from 20% for all debt to 1,000% in the case of short-term debt (Pinheiro & Giambiagi, 1994). Thus, given the large opportunity cost of government assets, the government started to reduce its debt by privatizing some of its flagship companies.

As the end result of this situation, from 1990 to 2002, the government privatized 165 enterprises, obtaining total revenues of around 87 billion dollars (BNDES, 2002b). Privatization revenues helped reduce public debt by an amount equivalent to 8% of GDP (Carvalho, 2001). Pinheiro (1996) analyzes the performance of privatized firms in two periods, 1981-89 and 1991-94, and finds a positive effect on firm-level performance especially in the latter period. A comprehensive panel study by Anuatti-Neto, Barossi-Filho, Carvalho and Roberto Macedo (2005) showed that privatized companies increased their operational margin and return on investment by 5.6 and 1.6 percentage points respectively, compared to the previous period when they were state-controlled. These results are consistent with a large literature estimating country- and firm-level gains from privatization (e.g. Megginson, 2005).

Governance of Remaining SOEs and the Emergence of Leviathan as a Majority Investor in Brazil

Table 1 summarizes the set of SOEs that remained after state control by the first decade of the 21st century. Using data from DEST, we found 47 controlled by the federal government, with \$626 billion dollars in total assets. State-level SOEs, in turn, totaled 49 under direct control by the state governments, with total assets worth \$66 billion. These numbers, however, include only SOEs directly controlled by the government; some are themselves state-owned holding companies with a host of subsidiaries. Summing up SOEs with direct and indirect

stakes, Musacchio and Lazzarini (2014) estimate that Brazilian governments at the federal and state levels controlled more than \$757 billion dollars in total assets. Remaining SOEs were present in sectors deemed by the government as “strategic.” Examples of top SOEs include Petrobras (oil), Eletrobras (electricity generation), Banco do Brasil (banking) and Caixa Econômica Federal (also banking) at the federal level; and Sabesp (sewage/water), Cesp (electricity) and Barisul (banking) at the state-level. State banks, in particular, were used to target segments not covered by private banks such as agricultural and housing credit.

Table 1
Remaining majority-owned Brazilian SOEs, by 2009

	Federal level	State level
Number of SOEs	47	49
Number of listed SOEs	6	16
Total assets of SOEs (US\$ million)	625,356	66,152
% of total assets held by listed SOEs	58.3%	67.8%
Top listed SOEs, by assets	Banco do Brasil (banking)	Cesp (electricity)
	Petrobras (oil)	Banrisul (banking)
	Eletrobras (electricity)	Sabesp (water/sewage)
	Banco do Nordeste (banking)	Cemig (electricity)
	Banco da Amazônia (banking)	Copel (electricity)

Source: Compiled based on data from the Securities and Exchange Commission of Brazil and the Department of Coordination and Governance of State-owned Enterprises (DEST), Ministry of Planning. Total assets include only firms with direct stakes by the government.

We also see in Table 1 that although most SOEs are not publicly traded, the largest SOEs are listed in the Brazilian stock market. Thus, by 2009 listed SOEs comprised respectively 58% and 68% of the total assets under direct control of the federal and state governments respectively. Although SOEs in Brazil had to report their audited financials to DEST even before they became publicly traded, listing was expected to mitigate agency problems and improve the governance of SOEs in important ways (see e.g. Gupta, 2005). For instance, SOEs had to commit, at least in principle, to the principles that grant legal protection to minority shareholders as defined by the Brazilian Joint Stock Company Law of 2001 (Law 10,303). Minority shareholders, for instance, have the right to elect a representative to the board of directors if their total shareholding is higher than 10%. In addition, some decisions had to be approved by a qualified majority (two-thirds) instead of a simple majority.⁶ This is the model we refer to as Leviathan as a majority investor: the state remains the controlling shareholder, but to a great extent agrees to follow certain rules that facilitate the attraction of private minority investors (Pargendler, 2012a; Pargendler et al., 2013).

⁶ See e.g. the new Joint Stock Company Law, No. 10,303 of 2001. In particular, Section IV on controlling shareholders and Section XIX on “Mixed Enterprises” or SOEs.

Innovations in the Brazilian regulatory system allowed some SOEs to commit to even higher governance practices. Thus, firms can follow three higher levels of corporate practices in the Brazilian stock market: the “Novo Mercado” (“New Market”) and the Level 1 and Level 2 segments. In the Novo Mercado, for instance, companies are not allowed to have dual-class shares (that is, all shares must have voting power) and the board of directors must have at least 20 percent of external members. Firms listed in the Level 1 need to guarantee more detailed reporting, while firms listed in the Level 2 need to guarantee rights for holders of preferred shares in case of corporate mergers or acquisitions.

A key motivation to adhere to such higher governance standards was to send a signal of improved management and eventually attract external, private funding. Sabesp, the water company of the State of São Paulo, decided to join the Novo Mercado in April 2002 and simultaneously issued convertible bonds in local currency to lower its dependence on foreign debt. Interestingly, relatively more SOEs at the state level adhered to higher governance standards than SOEs at the federal level (Musacchio and Lazzarini, 2014). Just one SOE at the federal level, Banco do Brasil, is listed on the Novo Mercado, while only Eletrobras is listed as a Level 1 company.

Although Petrobras is not in one of these higher governance segments, the company listed its shares on the New York Stock Exchange in 2000 and later in Europe (2002). Petrobras was in talks to join the Level 2 segment in 2002, but in the end the idea was abandoned because the statutes of the firm would not allow minority shareholders to have a significant voice in mergers and acquisitions. The company, indeed, exemplifies the limits of the Leviathan as a minority investor model; sometimes the temptation of governments to intervene is too high even when SOEs are listed and with improved management. Box 4 discusses the governance reforms at Petrobras and the subsequent interventions by the government such as the control of gasoline prices.

Box 4. Petrobras: Governance Reforms and Remaining Intervention

President Vargas created Petrobras in 1953 and gave it a monopoly over the production of oil and gas. Yet, Petrobras was not very successful at finding oil in Brazilian soil, at least not in the amount necessary to supply the domestic market. That is why, until the 1970s, Petrobras operated mainly as a trading company, importing crude oil and refined products. In that decade it partnered with the private sector to develop the petrochemical sector in Brazil, eventually absorbing all of its private partners into Petroquisa. By the early 1990s Petrobras was one of the largest companies in the Americas, with distinct capabilities in oil exploration.

As part of the privatization and liberalization policies of the 1990s, President Fernando Henrique Cardoso designed the partial privatization of the oil industry. In 1997 he enacted the “Petroleum Law,” ending Petrobras’s oil monopoly and opening oil and gas markets in Brazil to foreign investment. Cardoso also allowed foreigners to own shares in Petrobras. Finally, in August 2000, still under Cardoso, Petrobras listed its shares on the New York Stock Exchange, through the American Depository Receipts (ADR) program. By listing shares in New York and later in Europe (2002), Petrobras had to improve its corporate governance practices and had to become more transparent, publishing audited financials quarterly and adhering to generally accepted accounting principles (GAAP). After 2001, Petrobras also had to comply with the Sarbanes-Oxley Act (which demanded further disclosure of related-party transactions and executive compensation). By listing in major stock exchanges the company also opened itself up to the scrutiny and monitoring of rating agencies and large mutual and pension funds from all around the world.

These reforms allowed Petrobras and the Brazilian government to gain international credibility and the Brazilian oil sector had a boom in the first few years of the 21st century. Companies from all over the world partnered with Petrobras to pursue large exploration projects and large mutual funds from all over the world bought Petrobras shares. Kenyon (2006), referring to the listing of Petrobras, argued 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 governance reform of Petrobras, the most important items to highlight are the changes in the board of directors, which started to include independent members, as well as new statutory protections and rights for minority shareholders. Also of importance was the fact that Petrobras privatized a relevant part of its capital, keeping the majority of the voting capital and a golden share to veto major decisions of the firm. Petrobras had traditionally chosen CEOs with technical backgrounds, but as it was listed it changed the incentives of its executives by including pay-for-performance provisions. Finally, the monitoring of the actions of the firm fell not only on a variety of institutional investors and rating agencies, but also on the National Oil Agency (ANP), a regulatory body established in 1998.

All of these reforms, however, did not prevent government intervention in the oil industry. Two examples of intervention illustrate this point. After the Brazilian government announced the discovery of new oil reserves in deep water (“pre-salt”) areas in 2007, a discussion emerged on who would be allowed to exploit the newly discovered oil. In the end, it was decided that Petrobras itself would be the single operator of the oil fields in partnership with other investors who would share part of the oil revenues. Because operations would require substantial investment—estimated to be around \$45 billion per year in the initial years—the company soon had to raise external capital. In 2010, Petrobras executed one of the largest public offerings in the world, selling shares worth \$70 billion.

However, the Brazilian government wanted to increase its stake in Petrobras while at the same time guaranteeing the presence of the SOE as the major operator of the new oil fields. Thus, the government engineered a complex transaction whereby Petrobras would pay for the rights to extract oil, and the government would use the proceeds to purchase new shares. Private minority shareholders complained that the operation would dilute their participation in the company and argued that the price paid by Petrobras for the oil rights was too high. Minority shareholders also contended that they were not adequately heard in this operation.

Conflicts escalated in early 2012, when the government decided to deliberately use Petrobras to control the price of gasoline. Maria das Graças Foster, referred to as Graça Foster, was appointed as a CEO of Petrobras in February 2012. This appointment was well received by the market; Graça Foster was a technical executive with a long-term career at the firm and deep knowledge of the sector. By the time she was appointed, the price of the gasoline was kept low even though the price of imports was escalating. Right after she started her job as CEO, Foster declared that “it is evident that it is necessary to adjust the price.” Yet the federal government was worried that increasing the price of the gasoline would undermine efforts to reduce inflation and benchmark interest rates (given that the Brazilian Central Bank followed inflation targets).

Share prices of Petrobras dropped, hurting minority shareholders again. Although the government allowed a minor increase in the price of gasoline in June 2012, the increase was not considered sufficient to improve the cash flow of the company. And, in the second quarter of 2012, Petrobras announced a record loss of \$1.34 billion reais (around \$662 million dollars), its first loss in 13 years. Although the loss was not caused only by the price control, this event

continued to undermine investors' confidence in the governance of Petrobras, especially its insulation from governmental pressure.

Source: Musacchio, Goldberg and Reisen de Pinho (2009); Musacchio and Lazzarini (2014); Pargendler (2012b); Pargendler et al. (2013); newspaper article "Graça defende correção do preço dos combustíveis," *Agência Estado*, February 27, 2012.

The price control of Petrobras resembles the various instances of interference described in the previous section. Sometimes the desire to pursue objectives other than profitability will make governments willing to directly intervene in SOEs with majority state equity. Petrobras, however, was not the sole case of such type of intervention. In September 2012, the Brazilian government also pursued a forced anticipation of concessions in the electricity generation sector. Firms with existing concessions were offered the possibility to renew their contracts as long as there was a reduction in electricity prices. With few private firms interested in the deal, Eletrobras and its affiliated SOEs had to take over the concessions with substantial losses. The President of Eletrobras, José da Costa Carvalho Neto, declared in September 2013 that the company was "losing 1 million reais [around 450 thousand dollars] per hour."⁷

A strong external regulation, in fact, appears to be an important aspect to buffer SOEs with majority state control against outright intervention (Bortolotti, Cambini, & Rondi, Forthcoming). With this respect, it is useful to compare Petrobras to Norway's Statoil, another SOE in the oil sector (Pargendler et al., 2013). Norway's regulatory agency, the Norwegian Petroleum Directorate (NPD), although reporting to the Ministry of Energy, is functionally autonomous and strong. According to Thurber and Istad (2010 28), "what ultimately protected the NPD from undue interference was the growing dependence of the Ministry on it for critical technical services and advice... Any actions that would have severely disrupted this function would have been detrimental to both organizations." In contrast, the Brazilian National Oil Agency (ANP) is relatively weak, with past allegations of corruption and with direct influence by the government; the president of Brazil and the Minister of Mines and Energy are the *de facto* "regulators" of Petrobras. In the electrical sector, the pressure to reduce prices was also not backed by some technical officials working at the Brazilian Electricity Regulatory Agency (ANEEL). The absence of strong regulatory bodies in this case failed to create the necessary checks-and-balances against discretionary governmental action threatening the performance of SOEs.

⁷ "Eletrobras: perda de R\$ 1 milhão por hora," *O Globo*, June 2, 2013.

STATE-RELATED ALTERNATIVES TO SOEs: THE ROLE OF THE BRAZILIAN NATIONAL DEVELOPMENT BANK (BNDES)

As noted before, the Brazilian government, besides relying on majority-owned SOEs until the late 1980s, was very active in the financing of private companies through BNDES. In 1949, the Joint Brazil-United States Development Commission—comprised of technocrats from Brazil, the United States, and the World Bank—came to the conclusion that Brazil needed to expand and improve infrastructure. BNDE was then created in 1952 to supplant a scarcity of long-term credit for the required infrastructure investments, especially in energy and transportation. Although Brazil had an emerging bond market in the early 20th century, the Great Depression shrunk the availability of long-term credit and most banks started focusing on short-term loans (Musacchio, 2009). Reflecting the early prominence of the model where Leviathan is an entrepreneur, 84% of the lending activity of BNDE, an SOE itself, went to other Brazilian SOEs between 1952 and 1964 (Leff, 1968: 53). Over time, however, the bank greatly expanded its operations, with new lines of credit to finance machinery purchases and lending directly to many large private corporations. By the late 1970s, 87% of all BNDES's loans went to the private sector (Najberg, 1989: 18). Besides lending, BNDE also began to invest in equity in the 1970s. To manage these shareholdings, BNDE, then renamed BNDES, created in 1982 BNDESPAR (“BNDES Participations”).

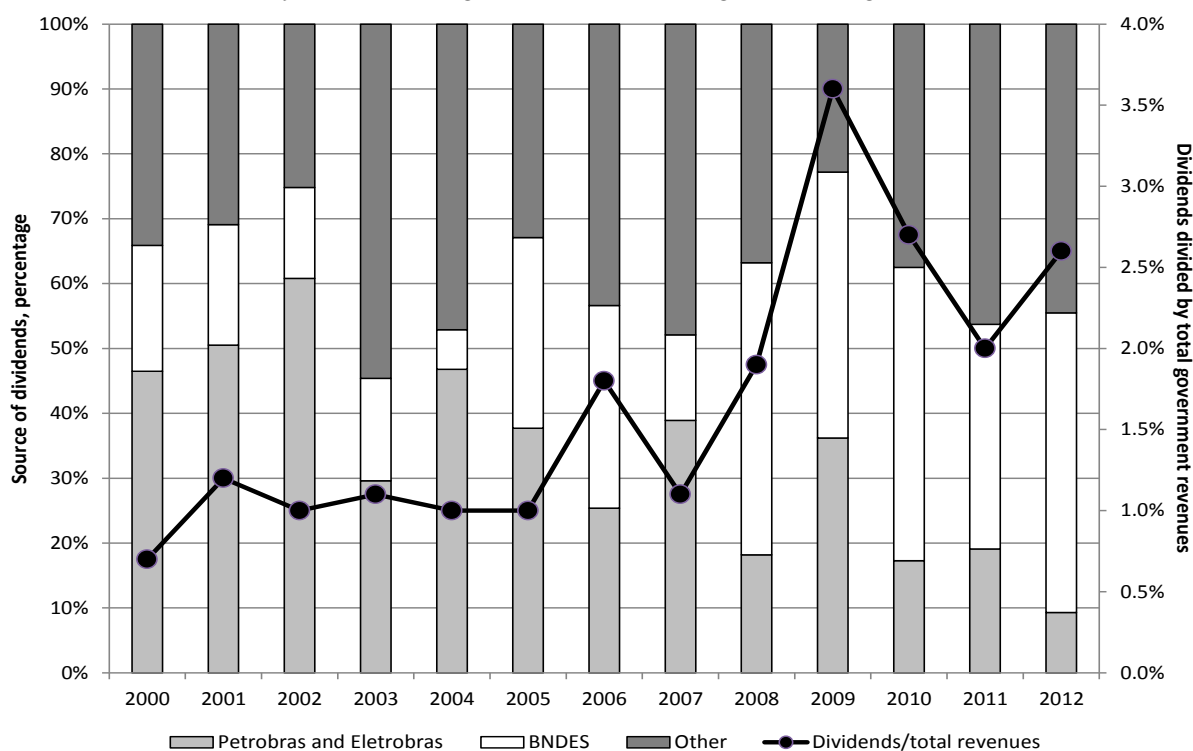
Interestingly, even after the demise of Brazilian SOEs and the implementation of privatization programs, BNDES remained as a central actor in the economy. When President Fernando Collor (1990-1992) started the National Privatization Program (*Programa Nacional de Desestatização*, PND), BNDES was selected as an “operational agent” and remained so in the subsequent wave of privatization under President Fernando Henrique Cardoso (1995-2002). Because BNDES was run by a technical elite with expertise in many industrial sectors (Schneider, 1991), its involvement in the privatization process was seen as a natural move to guarantee credibility and smooth execution. For each SOE that would be privatized, BNDES coordinated studies and hired external consultants to define minimum auction prices (Baer, 2008). BNDES also provided acquirers with loans and minority equity—which, as we discussed earlier, was suggested by its former president Marcos Vianna back in the 1970s. Around 86% of the privatization revenues came from sales of control blocks to “mixed consortia” involving domestic groups, foreign investors, and state-related entities such as BNDESPAR and pension funds of SOEs (Anuatti-Neto et al., 2005; De Paula et al., 2002; Lazzarini, 2011). Therefore, privatization itself was a shock that reinforced the model where Leviathan is a minority investor.

In fact, BNDES remains with growing importance even as of today. According to data from the Central Bank of Brazil, between October 2000 and 2013, the value of BNDES's operations to GDP more than doubled, from 4.8% to 11.1%. In the same period, its participation in the total credit to the private sector increased from 19% to 21%. By the end of 2012, the total equity held by BNDESPAR had a market value of \$44.8 billion dollars. (In contrast, according to *Forbes*, the wealthiest private owner in Brazil was Jorge Paulo Lemann, with \$17.8 billion). The dividends from such equity investments also became a relevant source of revenue for the government. A study by Afonso and Barros (2013) showed, from the point of view of received dividends, how Leviathan in Brazil was transformed from majority to minority (Figure 7). While in 2000 around 46% of received dividends came from majority-owned SOEs Petrobras and Eletrobras, by 2012 a similar share was provided by BNDES alone. Even in comparative perspective the scale of BNDES is impressive (Torres Filho, 2009). As seen in Table 2, the value of loans disbursed by BNDES in 2010 was more than three times the total amount provided by the World Bank. BNDES also fares well when compared to other banks in terms of return of equity and labor efficiency.

Next we examine in greater detail how BNDES has acted as minority shareholder and lender and discuss the results of empirical studies assessing the impact of such credit allocations. We then discuss a host of concerns that have been raised regarding the resilient and increasing role of BNDES in the Brazilian economy.

Figure 7

Dividends received by the Brazilian government, according to their origin (2000-2012)



Source: Afonso e Barros (2013)

Table 2

Comparison between BNDES and other Development Banks (2010)

	BNDES	Inter-American Dev. Bank (IDB)	World Bank	Korea Dev. Bank	Germany's KfW	China Dev. Bank
<i>Financials and employment (US\$ bn unless indicated)</i>						
Total assets	330	87	428	123	596	751.8
Equity	40	21	166	17	21	59.2
Profit	6.0	0.3	1.7	1.3	3.5	5.5
New loans	101	10	26	n.a.	113	84.2
Outstanding loans	218	63	234	64	571	663.2
Staff	2,982	~2,000	~10,000	2,266	4,531	4,000
<i>Performance ratios</i>						
Return on equity (%)	15.0	1.6	1.0	7.8	16.7	9.2

Return on assets (%)	1.8	0.4	0.4	1.1	0.6	0.7
Profit/employee (US\$ M)	2.0	0.2	0.2	0.6	0.8	1.4
Equity/assets (%)	12.0	24.0	38.7	14.0	3.5	7.9
Assets /employee (US\$ M)	110.8	43.6	42.8	54.4	131.5	188.0

Source: Musacchio and Lazzarini (2014), based on Teixeira (2009) and annual reports of the banks. For the World Bank, the financial year is from June 2009 to June 2010.

BNDES as a Minority Shareholder

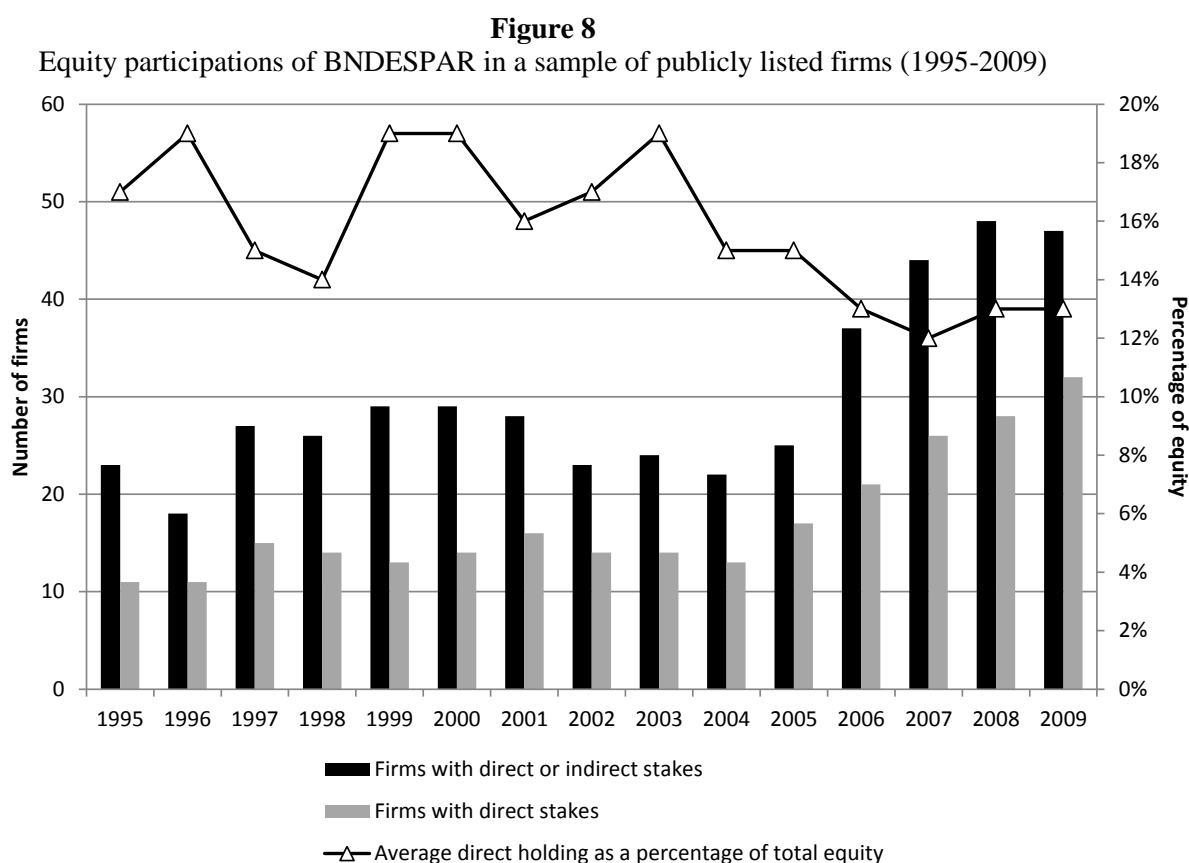
Figure 8 shows how BNDES's holdings (through BNDESPAR) increased in a sample of listed firms between 1995 and 2009. Holdings can be *direct* or *indirect*. Direct stakes are observed when BNDESPAR appears in the direct shareholding structure of the target firm. Indirect stakes, in turn, occur when BNDESPAR is the owner of an intermediate organization that is the direct owner of a target firm. For instance, Vale is directly controlled by Valepar, which is a consortium of owners including BNDES, Japanese group Mitsui, Brazilian banking group Bradesco, and a host of pension funds of SOEs such as Previ (from Banco do Brasil) and Petros (from Petrobras). BNDESPAR indirectly owns Vale through Valepar.

We see in Figure 8 that there was an increase in publicly listed firms directly or indirectly owners by BNDESPAR. There was, however, a moderate reduction in the percentage of equity directly held by BNDESPAR, from around 17% in 1995 to 13% in 2009. Apparently BNDESPAR sought to increase its portfolio with a larger number of firms while slightly diluting its share in the equity of the target companies. Unfortunately, we do not have data on the extent of equity stakes in the case of indirect stakes because these stakes involve complex ownership pyramids for which data are not always available.

We can examine the implications of BNDESPAR's equity stakes in two complementary ways: from the point of view of the target companies receiving minority state equity and from the point of view of BNDES (and ultimately the state) as an investor. Using the sample of publicly listed firms summarize in Figure 8, Inoue, Lazzarini and Musacchio (2013) examine what happens when BNDESPAR participate as a minority shareholder in terms of firm-level variables such as profitability and investment. Because BNDESPAR does not choose its target firms randomly, substantial care must be taken to avoid spurious inference. The authors then perform regressions with firm- and industry-year- fixed effects to control for fixed unobservable factors at the firm level and time-varying unobservable factors at the industry level. They also run alternative specifications using propensity score matching to build a comparable control group of firms without BNDESPAR. Thus, they essentially measure variations in firm-level outcomes as a function of variations in state equity compared to similar firms without such stakes.

The industrial policy view suggests that equity investments by BNDESPAR can increase firm-level profitability as long as they reduce the financing constraints of entrepreneurs with latent capabilities (Amsden, 1989; Rodrik, 2004). The literature on development banks, in particular, emphasizes that such banks are specialized in long-term credit (Armendáriz de Aghion, 1999) and its technical bureaucracy can help screen and support projects that would otherwise remain unfunded (Amsden, 2001; Gerschenkron, 1962). If this is the case, then we should expect a positive effect on profitability and investment; for instance, an entrepreneur may be able to increase the scale of its operations and invest in new technology, all of which

will positively affect firm-level performance. Drawing from Williamson (1988), Inoue et al. (2013) also suggest that equity may have another beneficial feature: compared to debt, equity yields greater flexibility to provide required adjustments in strategy, given the highly uncertain nature of projects devised to revamp latent capabilities. Debt holders, in contrast, are expected to require a fixed return irrespective of the future evolution of the project. Not less important, because stakes are *minority*, at least in theory the government will not have sufficient power to intervene in the target company as per the social and political views; also, because target firms are usually private, the inefficiencies predicted by the agency view when firms are state-controlled are also expected to be less relevant.



Source: Created based on data presented in Musacchio and Lazzarini (2014).

Note: Indirect stakes occur when BNDESPAR buys a company that is part of a pyramidal ownership structure; that is, when it owns a company that, in turn, is a shareholder in another corporation (e.g., BNDES owns Valepar, which in turn owns Vale; see Figure 12).

However, not all firms should be positively affected by minority state equity. Inoue et al. (2013) propose that stakes will have a more pronounced effect on investment when firms face *constrained opportunity*, that is, when firms have profitable projects (more generally, latent capabilities) but, at the same time, are constrained by their lack of sufficient capital.⁸ In addition, they predict that the positive effect of minority state equity will be attenuated when firms belong to *business groups*, i.e., collection of firms under the umbrella of a holding company, usually controlled by families. Because the literature has proposed that such groups create “internal capital markets” that supplant the lack of credit in emerging economies (Khanna

⁸ Inoue et al. (2013) gauge constrained opportunity in the following way. “Opportunity” was measured as cases where the Tobin’s Q of the firm was higher than 1 (David et al., 2006), while “constraint” was measured by a dummy indicating where the firm is below the sample median in terms of its ratio of net profits to the initial stock of fixed capital (Behr, Norden, & North, 2012; Fazzari, Hubbard, & Petersen, 1988). Constrained opportunity was then computed as the interaction of those two variables.

& Palepu, 2000; Khanna & Yafeh, 2007; Leff, 1978; Wan & Hoskisson, 2003), then we should expect that firms belong to groups will be relatively less in need of state capital. Furthermore, groups entail the risk that the *state* will be expropriated: for instance, families may use the new injections of capital to support failing projects elsewhere in the group (Bae, Kang, & Kim, 2002; Bertrand, Djankov, Hanna, & Mullainathan, 2007). Consistent with this discussion, Giannetti and Laeven (2009) find that equity investments by public pension funds in Sweden are less beneficial when firms belong to groups. A related prediction is that, as capital markets develop, the benefits of state equity should diminish because firms will be able to leverage their latent capabilities using other sources of funding (e.g. Sarkar, Sarkar, & Bhaumik, 1998). Thus, private firms can go public for the first time while listed firms can pursue a secondary issue of equity to raise more capital.

In line with these predictions, Inoue et al. (2013) indeed find that the stakes by BNDESPAR increase firm-level profitability and investment in the case of firms with constrained opportunity; and that these positive effects are completely neutralized when firms belong to business groups. In Box 5 we present two cases to illustrate this finding. They also find that the effect on investment diminished over time as credit markets evolved in Brazil. Thus, between 1995 and 2009, stock market capitalization to GDP in Brazil jumped from 19% to 73%. In fact, after 2002, the effect of BNDESPAR becomes non-significant for all outcome variables examined in the study.

Box 5. BNDES as a Minority Shareholder: Aracruz and NET (Globo)

Aracruz, a leading worldwide producer of cellulose pulp, was a vertically integrated firm with forest cultivation technology as well as in processing plants. Highly focused on exports, Aracruz was considered a highly competitive firm. With 38% of voting shares in 1975, BNDES helped fund approximately 55% of the industrial investments that enabled the firm to initiate pulp production in 1978 (Spers, 1997). In the 1990s, production efficiency was substantially improved through new capital expenditures; 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. Despite the presence of some families as owners, Aracruz was practically managed as a standalone firm with improved governance. In 1992, Aracruz pioneered in Brazil the use of NYSE American Depository Shares (ADS) with enhanced transparency and external monitoring. The case of Aracruz therefore shows how state equity can be used to promote initial fixed investments by well-run, standalone private firms.

In contrast, BNDESPAR also supported NET, a cable firm belonging to Globo, a powerful media group in Brazil owned by the Marinho family. Through Globopar, the Marinho family held stakes in various firms in publishing, printing, cable, satellite and internet services, among many others. By 1999, the Marinho family, through Globopar, had acquired majority control of Globo Cabo, also known as NET. BNDESPAR agreed to purchase shares of the company worth 160 million reais (around \$89 million). Before that, BNDES had also provided Globo with loans to support its expansion in newspapers and satellite broadcasting. However, NET's market expansion proved successful and the group as a whole, with escalating debt from its expansion plan, had to be rescued. BNDES agreed to make another capital injection through BNDESPAR, part of which being used to buy equity while the other used to buy debentures issued by Globo. Eleazar de Carvalho, who was appointed president of BNDES in 2001, declared that governance was a "basic and primordial" cause of the problem; the bank had no control of the expansion strategy of the group and how injections of capital would be used. This case thus illustrates the risk of allocating state capital to groups with complex shareholdings and potential shareholder conflict.

Source: Inoue et al. (2013); Spers (1997); interview by Eleazar de Carvalho in the article "Para BNDES, ajuda à Globo não é garantida," *O Estado de São Paulo*, March 17, 2002.

Now we can examine the effect of minority equity from the point of view of the bank (and BNDESPAR) as an investor. Musacchio and Lazzarini (2014) show that BNDES's revenue model changed significantly during and after the national privatization program. Figure 9 shows that equity investments, since 1994 until 2009, were the most profitable line of business. Loans, in contrast, did not become "profitable" until after 2004. (A caveat, discussed later, is that reported results from loans do not incorporate the cost of governmental subsidies.) The data thus indicate that BNDESPAR's minority shareholdings were not only profitable but also represented an important determinant of the bank's overall results.

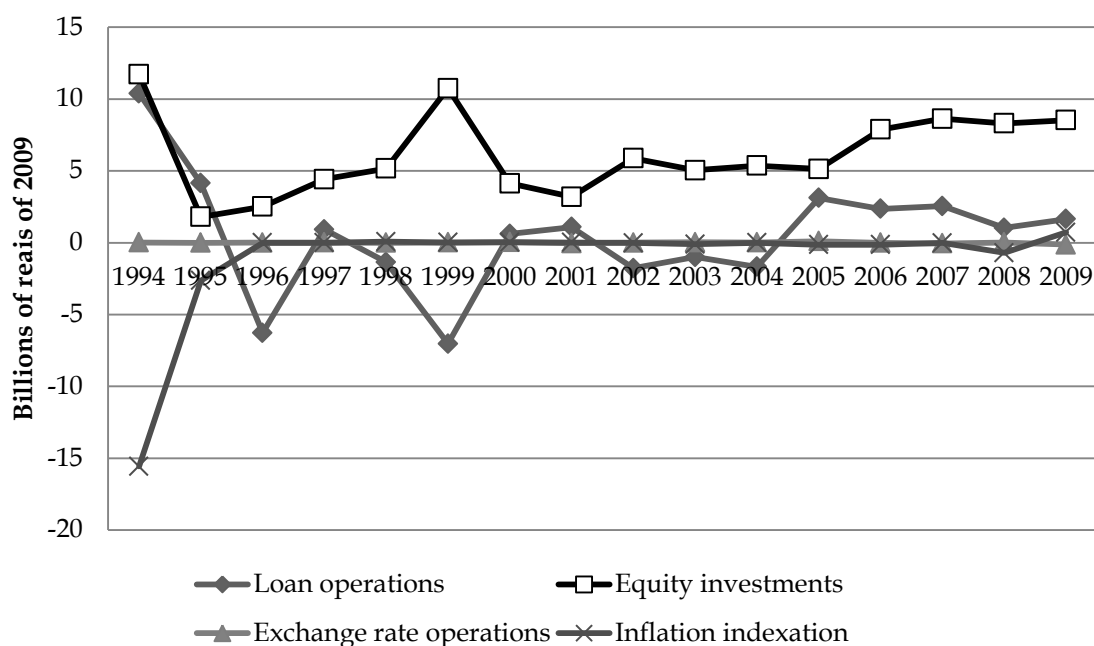
Yet being profitable does not necessarily mean that the bank is doing the best it can with its investment. How do these investments compare to the market? Lacking complete and precise data on BNDESPAR's overall portfolio, what we can do is to examine the individual performance of the shares held by BNDESPAR. Bruschi, Lazzarini and Musacchio (2013) assess three groups of shares: investments before 2004, for which the initial acquisition date was not found; investments after 2004, for which the acquisition date was available; and reinvestments in existing firms up until December 2012. They find that 60% of the shares performed worse than the stock market index in the same period, especially shares that received new investment after 2004.

An explanation is that investments before 2004 were in large, established firms such as Banco do Brasil and Vale, while investments after 2004 involved some other new firms that received substantial investment by the bank. For instance, in 2007 BNDESPAR acquired stakes in two meat packing firms, JBS and Marfrig. They were singled out as national champions, receiving support to perform acquisitions and expand abroad. JBS, for instance, received around \$4 billion dollars and acquired Swift and Pilgrim's Pride in the United States. Yet the monthly stock returns of JBS and Marfrig were -0.41% and -0.98% respectively, well below the performance of the stock market index in the same period. From the acquisition date of each stock until the end of 2012, the Ibovespa index had a monthly return of 0.43% in the case of JBS and 0.18% in the case of Marfrig. The situation got even worse after 2012, when, as discussed in the previous section, the government started intervening in many SOEs in the portfolio of BNDESPAR – including Petrobras and a host of energy companies. Between 2011 and 2012, the market value of BNDESPAR's portfolio shrunk by 12.9%, while the Ibovespa index evolved by 7.4% in the same period.⁹

In sum, it is not likely that BNDES will continue generating the bulk of its profits out of the equity business. In addition, because capital markets have developed in Brazil and firms have other sources of funding, it will also become increasingly difficult to find firms with real constrained opportunity. As a minority shareholder, BNDES will have to find new ways to make a difference along the lines of the industrial policy view.

⁹ Vinicius Neder, "Perdas com estatais e 'campeãs nacionais' derrubam lucro do BNDES," in *O Estado de São Paulo*, February 25, 2013.

Figure 9
BNDES: operational results by type of investment, 1994-2009



Source: Musacchio and Lazzarini (2014).

BNDES as a Lender

The volume of loans disbursed by BNDES is massive. For instance, in 2010, BNDES's new loans were more than three times the total amount provided by the World Bank in the same year (Table 2). In 2013, most loans (58.2%) went to large firms with revenues higher than \$300 million reais (around \$130 million dollars).¹⁰ Although BNDES does not disclose firm-level data on loans for confidentiality reasons, it is possible to observe the borrowing activity of publicly traded firms because they need to declare the origin (and rate) of their loans. Lazzarini, Musacchio, Bandeira-de-Mello and Marcon (2012), for instance, collected data from the annual reports of 286 listed Brazilian firms between 2002 and 2009. They measure the presence and extent of loans in two ways: through a direct inspection of the declared source of funding or, in cases where this information was not available, through an examination of the reported the interest rate paid. As we discuss below, BNDES lends at a subsidized rate, called *Taxa de Juros de Longo Prazo* (TJLP, "long-term interest rate"), which is lower than the benchmark market rate.

In Table 3, we can see the distribution of loans by firm, i.e., which firms got a larger bulk of loans among publicly listed companies for which the origin of funding could be identified. Although by 2004 loans were more or less distributed across firms and sectors, by 2009 Petrobras became by far the largest borrower, with almost 40% percent of total loans held by listed corporations. In addition, although industrial policy scholars recommend that state capital should preferably stimulate novel learning instead of reinforced specialization (Amsden, 1989; Rodrik, 2004), the largest borrowers, as first noticed by Almeida (2009), are either utilities or large firms established commodity sectors such as mining, oil, steel, and agribusiness. After 2007, as mentioned before, BNDES sought to promote national champions:

¹⁰ From

<http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/BNDES_Transparente/Estatisticas_Operacionais/porte.html> (accessed on January 3, 2014).

large, existing firms that could grow bigger with new acquisitions and internationalization efforts. Luciano Coutinho, President of BNDES, justified such type of industrial targeting as follows: “We chose sectors in which Brazil had superior competitiveness, agribusiness and commodities... Brazil was a great exporter, but it was not possible to prop up international companies in these sectors. For this reason, we defined that, whenever there was competitive capacity, such internationalization would be implemented” (interview in Dieguez, 2010).

Table 3
Distribution of loans by BNDES in a sample of publicly listed firms

Company	Percentage of total loans in the database	
	In 2004	In 2009
Petrobras (oil)	14.5	39.4
Telemar Norte Leste (telecom)	10.4	7.7
Vale do Rio Doce (mining)	n.a.	8.5
Suzano (paper & energy)	3.4	2.6
Brasil Telecom	n.a.	3.2
Neoenergia (electricity)	3.2	2.5
CPFL Energia (electricity)	6.8	n.a.
VBC Energia (electricity)	2.7	2.0
CSN (steel)	4.2	2.3
Klabin (paper)	1.3	2.1
Aracruz (cellulose)	2.4	n.a.
Cesp (electricity)	11.2	n.a.
Sadia (food and agribusiness)	3.2	n.a.
CPFL Geração (electricity)	n.a.	2.1
Embraer (airplanes)	n.a.	1.4

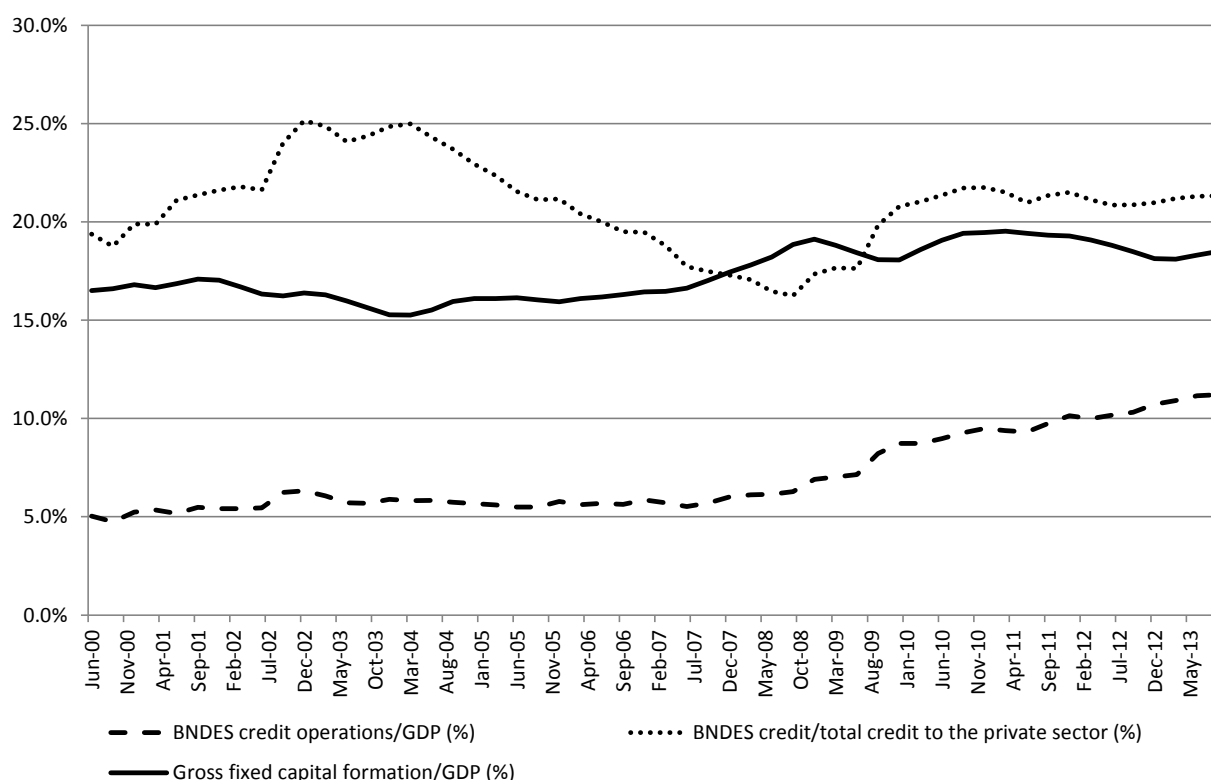
Source: Musacchio and Lazzarini (2014), using the database employed by Lazzarini et al. (2012).

To assess the impact of this policy orientation, as before, we can examine the loan business of BNDES in two ways: from the point of view of the target firms (i.e. the effect of loans on firm performance and investment) and from the point of view of the bank as a whole (i.e. the operational result of BNDES’s lending activity). Some studies have examined the impact of loans on a host of performance variables at the firm level. Using a large sample of Brazilian firms, 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 the extent of exports, but not on productivity. Using a more restricted sample of listed firms between 2002 and 2009 (reported in Table 3), Lazzarini et al. (2012) find that loans have no significant effect on firm-level performance, except for a reduction in financial expenditures due to the subsidies that accompany loans. Therefore, the impact of loans on relevant firm-level performance variables such as profitability or productivity is inconclusive at best.

Studies on the effect of loans on investment are even more scarce and inconclusive. According to Villela (1995), most of BNDES's loans between 1985 and 1994 were used either to refinance previous loans or to cover losses by entrepreneurs who borrowed in foreign currency. In his calculations, BNDES's loans contributed to 4% to 6% of the total gross capital formation in Brazil. In their analysis of listed firms, Lazzarini et al. (2012) find no consistent effect of loans on firm-level capital expenditures. A caveat, however, is that the sample of publicly listed firms probably captures the proportion of firms in the economy that are least financially constrained. Using aggregated data on loans and gross fixed capital formation between 1999 and 2009, Pereira, Simões and Carvalhal (2011) report that subsidized loans have positively affected investment. Yet, a simple inspection of these aggregated variables show that, while BNDES's credit operations to GDP more than doubled between 2000 and 2013, gross fixed capital formation in Brazil remained below 20% and hardly changed in the period post-2008 when BNDES substantially expanded its activities (Figure 10).

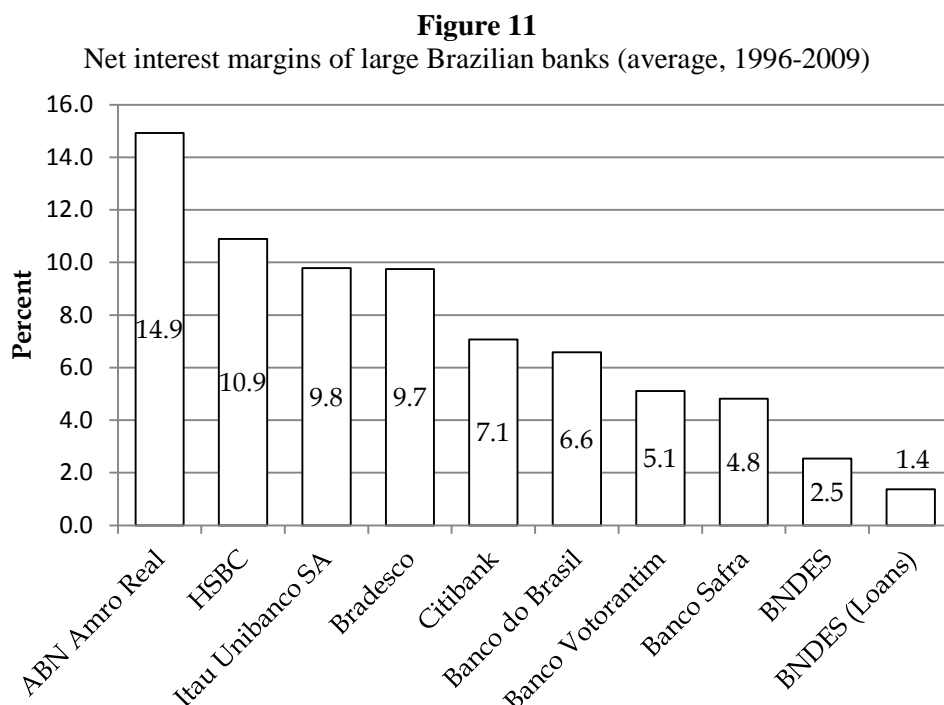
Figure 10
Evolution of BNDES's credit and gross fixed capital formation in Brazil (2000-2013)



Source: Created based on original data from the Central Bank of Brazil

We can also examine how BNDES, as a whole, has performed in its loan business. The net interest margin (NIM) of loans is the difference between their lending rates and the rates they pay to deposits. The NIM of BNDES's loans, although positive, is below other private

banks in Brazil (Figure 11). When we consider all interests and fees generated from all income-earning assets over earning assets, we arrive at a NIM margin of 2.4%. When we only consider the loan business, our computed NIM is 1.4%. Although BNDES makes very small margins on its loan business, loans also apparently have very low risk. In 2010, the index of nonperforming loans was only 0.15 percent of total loans (BNDES, 2010).



Source: Musacchio and Lazzarini (2014), using data from Bankscope and BNDES.

However, part of this positive margin is due to the implicit subsidies received by BNDES in its own funding operations. Before we proceed, it is then useful to discuss first the bank's sources of funds. In 1974, the government introduced two new payroll taxes, the *Programa de Integração Social* (PIS) and the *Programa de Formação do Patrimônio do Servidor Público* (PASEP), which were used by BNDES as subordinated debt. Later, in 1990, worker unemployment insurance funds were consolidated under the *Fundo de Amparo ao Trabalhador* (FAT) and transferred to BNDES in the form of subordinated debt. Essentially, the bank relied on forced savings to, at least in theory, channel resources to foster new investment. FAT funds are transferred to BNDES and paid using the previously mentioned TJLP, which is below the benchmark market interest rate, SELIC, set by the Central Bank of Brazil (Prochnik & Machado, 2008). Over the years, BNDES saw retained earnings grow—including the returns from investments by BNDESPAR—and began using them as its main source of funds. Yet, after 2009, the government pursued an aggressive expansion of the bank's operations and thus directly transferred Treasury capital to BNDES through long-term loans paid by the bank at low interest rates, between TJLP and TJLP+2.5% (Lamenza, Pinheiro, & Giambiagi, 2011). In 2009 and 2010, such direct transfers reached \$180 billion reais (around US\$ 100 billion) (Pereira et al., 2011).

Musacchio and Lazzarini (2014) present simple counterfactual estimates of BNDES's actual result by taking into account the opportunity cost of its funding. The money used to capitalize the bank could be, in principle, used to reduce public debt or support activities with a higher social rate of return. Thus, one can suppose that the capital transferred to BNDES should at least yield something close to what the government pays for its debt (the benchmark SELIC

rate). Between 2005 and 2009, the difference between the net interest margin of loans and the SELIC rate was, on average, -7.6%, which is close to the difference between the TJLP and the SELIC in the same period (-6.7%). Thus, if we take into account the subsidies embodied in its loan operations, BNDES's actually incurred losses, paying around 7.6 cents per each dollar loaned.

Concerns on BNDES

Credit Misallocation

Studies on the lending activity of state-owned banks generally conclude that these banks misallocate credit based on criteria other than the merit of target firms' projects. For instance, Bailey, Huang and Yang's (2011) and Khwaja and Mian's (2005), examining state-owned banks in China e Pakistan respectively, unveil a negative selection of firms requesting or receiving loans. BNDES, differently, tends to target large, established firms that would be able to borrow elsewhere using private and foreign sources of capital such as bonds and foreign loans. Although there are growing credit lines to small firms, large corporations still represent a large portion of BNDES's clients. Lazzarini et al. (2012) examine the likelihood that a given publicly listed firms will receive loans from BNDES and report an even moderately significant effect of firm-level past operational performance; that is, the bank, if anything, is not systematically giving loans to bad firms. In addition, as noted before, although BNDES makes very small margins on its loan business, the overall index of nonperforming loans has been very low. Therefore, the most important misallocation caused by BNDES is probably its emphasis on firms that are not necessarily financially constrained (e.g. Antunes, Cavalcanti, & Villamil, 2012; Cull, Li, Sun, & Xu, 2013).

In other words, the bank is probably transferring subsidies to a substantial set of firms that would not need subsidies in the first place. This is particularly important given the opportunity cost of capital that BNDES receives. The FAT (unemployment insurance) account that represents a portion of BNDES's funding is ultimately part of the myriad taxes with which Brazilian firms already need to comply. Moreover, when the government borrows to capitalize BNDES, a recurring practice in recent years, then aggregate gross debt increases. Executives from BNDES justify this practice on two grounds. First, they argue that the government is essentially borrowing and then investing in assets through BNDES; that is, *net* debt should not increase. However, the government is investing in risky assets that are subject to market fluctuations. Net debt may not increase but the risk exposure of the operation does. BNDES officials also argue that transfers from the Treasury may generate revenues for the governments that are not accounted for when one simply analyzes the opportunity cost of loans. For instance, they argue that loans promote new investment, which in turn generate more taxes and, in the case of SOEs, dividends (Pereira et al., 2011). The problem with this argument is that we need to believe in the counterfactual that investment would be lower without new loans from BNDES. Yet, as we discussed before, studies on the link between loans and investment are inconclusive. If BNDES is lending to large firms that could borrow elsewhere, then, in principle, they could equally invest without subsidies.

Another potential problem has do to with the effect that a big development bank such as BNDES has on the private credit market. Some correctly point out that BNDES has been, by far, the most important source of credit with long maturity. Yet, if BNDES's key clients are large, established firms with substantial cash, then the bank is getting the "cream of the market," i.e., the subset of firms in the economy with higher capacity to repay their loans. Private banks may thus become more reluctant to invest in the business of loan-term loans because they will be left with higher-risk clients. In other words, the mere presence of BNDES as a relevant lender to large firms probably "crowds out" the development of a private market for long-term credit.

Selection of “Champions”

Proponents of the political view stress that governments often channel funds to certain firms singled out as “national champions.” In Brazil, especially after 2007, BNDES itself participated in many instances of industrial consolidation whereby some firms received debt or equity to acquire competitors and expand abroad. However, some argue, the criteria used to select those firms are not clear and may lead to corruption (Ades & Di Tella, 1997). In particular, it is very likely that firms will compete for the subsidies and politically connect with governments to obtain preferential lending.

In Brazil, there is mounting evidence that a key channel of political connection involves donations for politicians in elections. Campaigns in Brazil are costly due to the presence of numerous parties and large election territories (Samuels, 2002). Firms are allowed to donate large sums of money to candidates—up to two percent of their gross revenues—, in addition to “under the table” donations, which are also pervasive (Araújo, 2004). Studies have unveiled a positive association between campaign donations in Brazil and several firm-level outcomes such as profitability (Bandeira-de-Mello & Marcon, 2005), access to government contracts (Boas, Hidalgo, & Richardson, 2011), stock market valuation and preferential finance (Claessens, Feijen, & Laeven, 2008). Specifically examining BNDES’s loans, Lazzarini et al. (2012) and Sztutman and Aldrighi (2013) find that firms that donate to winning candidates are more likely observed with such loans. In a different approach using industry-level data, Carvalho (2010) studies the criteria for the allocation of loans and finds that firms in regions governed by politicians allied with the federal government receive more funding from BNDES.

We do not think, however, that this is evidence of corruption within BNDES. As mentioned before, BNDES does not appear to be targeting bad firms in general; we do not have evidence that firms systematically donate to obtain extended credit for inefficient projects. Indeed, BNDES has a technical, competent staff which tries to examine the eligibility of borrowers and their capacity to repay their debt (Evans, 1995; Schneider, 1991). The link between political connections and loans is apparently indirect. Namely, connections should increase the likelihood that a certain firm will be selected for valuable governmental contracts (Boas et al., 2011). It has been customary in Brazil to involve BNDES in the project financing of large projects, concessions and privatizations even before the winners are selected (Lazzarini, 2011). Thus, being selected by the government will also increase the odds that the firm will receive funds from BNDES and other state-owned banks. In addition, certain donors may have improved ability to convince the government to select their firms as national champions, thereby increasing their likelihood to receive preferential lending.

Soft-budget Constraints and Bailouts

Although we argued that BNDES is not systematically lending to poor performers, bailouts do happen from time to time, especially in the form of conversion of debt into minority equity. For example, with the privatization of the electric sector, the Spanish group Iberdrola associated itself with Previ (the pension fund of state-owned bank Banco do Brasil) and Banco do Brasil Investimentos (the investment arm of the bank) in the creation of the consortium Guaraniã, with the goal of acquiring control of Coelba, Celpe and Cosern (energy distributors in the States of Bahia, Pernambuco and Rio Grande do Norte, respectively). Part of the acquisition was financed by BNDES, financing which would have been difficult to acquire without the participation of local actors. Moreover, when some privatized companies failed to deliver positive returns (such as Light and Brasil Ferrovias), BNDES helped rescue investors by turning part of the debt into equity stakes held by the bank.¹¹

¹¹ See “Um lobby multinacional,” *Correio Braziliense*, May 16, 2002; and “Reestatiza-se sob Lula o que FHC fingiu privatizar” (article by Josias de Souza), *Folha de São Paulo*, May 5, 2005.

Another example involves Brazilian meat packer JBS. As mentioned before, JBS was singled out as a national champion and BNDES backed its aggressive international expansion. In May 2007, JBS acquired Colorado-based Swift & Co for \$1.4 billion, becoming the largest beef processing company in the world. Then, in September 2009, JBS paid \$2.8 billion for another large meat firm in the United States, Pilgrim's Pride. With escalating debt and disappointing results, it became increasingly difficult for JBS to finance its operations. In May 2011, JBS and BNDES agreed to reconvert part of BNDES loans into shares; the participation of BNDES in the equity of the firm increased from 17% to 31%. Yet, although these cases are important, they do not appear to be the norm, at least in more recent years.

Residual Interference in the Target Firms

We argued that in the model where Leviathan is a minority investor, the types of problems predicted by the agency, social and political views (e.g. governmental interference to control prices or intervene in the management) should be relatively less important because target firms are controlled by private owners. Yet, some conditions will increase the government's temptation to intervene even when it has a minority position in the corporation.

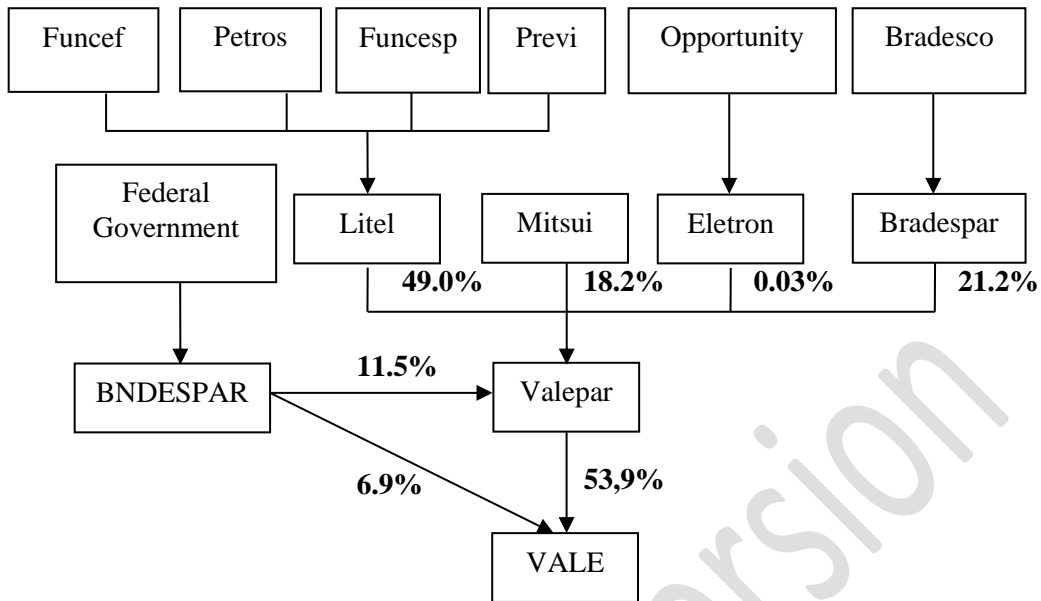
Brazilian mining firm Vale provides a clear illustration. Figure 12 shows the ownership structure of the company in 2009. As noted before, BNDES's participation can be direct and indirect. In the case of Vale, BNDES is a direct owner of Vale itself (6.9%) and an indirect owner of Valepar, the controlling entity of Vale. Besides BNDES, with a shareholding of 11.5%, Valepar is controlled by Japanese group Mitsui (18.2%), Bradespar (the investment arm of Bradesco, a domestic bank, with 21.2%), Litel (49.0%) and Eletron (owned by another domestic financial firm, Opportunity, with 0.03%). Litel, in turn, is controlled by a group of pension funds of Brazilian SOEs: Previ (Banco do Brasil), Petros (Petrobras), Funcef (Caixa Econômica Federal) and Funesp (Cesp). Those pension funds have increasingly become salient investors in Brazil, given their huge amount of capital largely originated from the contributions of SOEs themselves. By the end of 2012, the total equity of Previ alone was \$83.5 billion dollars, which was much higher than the total equity of BNDESPAR in the same period (\$44.8 billion). Because the government has voice in the management of state-controlled SOEs and these companies have a voice in the management of their pension funds, governments in Brazil (from distinct political factions) have been able to strategically use pension funds in their favor (Lazzarini, 2011).

Box 9 discusses Vale's strategy after its privatization and the attempted governmental intervention in 2009. Musacchio and Lazzarini (2014) argue that this form of *residual* intervention in firms with minority state control should happen when certain conditions are met. First, firms with minority stakes should have substantial rents to be captured by the government. Vale, after 2005, benefitted from a booming commodity market driven by a strong demand from China. Second, there should be collusion among state or non-state actors with minority stakes. In the case of Vale, collusion was facilitated by the presence of BNDES and pension funds of SOEs which, together, held more than 60% of the shares. A minister of Lula once declared that "Vale's main shareholder is the government."¹² When residual interference is a possibility, firms with minority stakes by the state may be pressured to follow social and political objectives commonly found in firms with majority state control.

¹² "Agnelli tenta aproximar Vale do governo em visita a Lula", *Valor Econômico*, September 11, 2009.

Figure 12

Vale: ownership structure by October 2009 (percentages refer to voting shares)



Source: Lazzarini (2011) and Musacchio and Lazzarini (2014).

Box 6. Vale: residual interference in the model where Leviathan is a minority investor

Vale's strategy after privatization was essentially to export iron ore and other mineral commodities to regions with high demand growth, such as China. The company relied on its competitive advantage in mining and transportation infrastructure. Vale's CEO, Roger Agnelli, with previous ties to Bradesco, pursued an aggressive strategy of international expansion and acquisitions.

Yet this strategy began to call the attention of President Lula and some of his ministers. Although no individual was the major shareholder with Valepar (with more than 50%), state-related actors, namely BNDES and the pension funds, jointly held 60.5% of the voting shares (Figure 12). By colluding, they could possibly have superior influence in the management of the corporation. In addition, the Brazilian government held golden shares reminiscent of the privatization auction, granting distinctive voice in strategic matters such as the control of mines and concessions. In other others, the government could easily exert residual interference.

Several points of conflict triggered a desire to intervene in the management of Vale. The government thought that Vale should not only export commodities but instead vertically integrate in steel production to promote more investment in the domestic market. The government was also concerned about the so called "Dutch disease" in the Brazilian economy; that is, an increase in the export of commodities could increase local prices and damage the competitiveness of manufacturing industries.

Agnelli's decision to fire around 1,500 employees worldwide as a response to the 2008 financial crisis also infuriated the government. In early 2009, Lula declared that "Vale has a lot of cash, earned a lot of money. Well, it is exactly in those moments of difficulty that executives also need to do their part." In addition, Agnelli had plans to purchase large ships from Chinese manufacturers, in a moment where the government wanted to revamp the naval industry and, more generally, give preferential treatment for Brazilian suppliers.

As a response to this pressure, Agnelli announced, in October 2009, an investment plan of \$20 billion reais, including two steel mills. Yet this was not sufficient to placate the desire of the government to intervene. In 2010, Agnelli publicly declared that Lula's Worker's Party was interested in controlling Vale. He was eventually ousted in May 2011, at the same time the company reported profits 292% higher than in the previous year. During his departure, Agnelli declared that "the mission of the [private] company is to generate results to foster capacity and investments. The mission of the government is different. Completely different."

Source: Khanna, Musacchio, and Reisen de Pinho (2010); Musacchio and Lazzarini (2014); Lazzarini (2011); and the newspaper articles "Lula afirma que empresários 'exageraram' nas demissões," *Folha de São Paulo*, February 14, 2009; "Agnelli deixa Vale com lucro de R\$ 11,3 bi," *Folha de São Paulo*, May 6, 2011.

CONCLUSIONS AND LESSONS

Below we outline some conclusions and lessons in light of the Brazilian experience.

1. As in many other countries, early development and industrialization in Brazil was led by the state through fully-controlled SOEs—the model we call Leviathan as an entrepreneur. In a sense, as proposed by the industrial policy view of SOEs, this model resulted from the sheer lack of private capital willing to take substantial risk and the need to coordinate multiple infrastructure investments. Yet, the state (as per the social view) also attempted to control prices and the profitability of private projects. Thus, it is not clear what would have happened if the government were less willing to meddle with private profits, focusing instead on activities that entail higher risk or require coordinated effort. In other words, although early development stages may require some degree of state entrepreneurship, it seems possible to do this in a more selective way, leaving room for a diversified and competitive private sector to thrive. There is evidence that in the late nineteenth century Brazil already had some embryonic institutional conditions allowing for the attraction foreign capital and private investment in infrastructure projects.
2. Indiscriminate use and growth of the SOE sector also creates important downstream risk. The shock that affected Brazil and other development countries in the late 1970s hit SOEs particularly hard and created a spiraling cycle whereby SOEs were used to control macroeconomic distortions (such as high inflation or unemployment), which in turn further undermined their performance and ability to invest. Again, governments should avoid a swollen SOE sector, trying instead to use state-controlled SOEs only in areas with substantial externalities and with less interest by the private sector.
3. The experience of some SOEs that evolved in the heyday of Brazil's state capitalism, such as Vale and Embraer, also suggests two conditions that might improve the performance of firms under state ownership. First, SOEs with more autonomous governance and funding can better develop technical capabilities and execute their own, performance-enhancing growth strategies. Yet the downside of autonomy is that SOE managers may engage in empire building, thus further reinforcing the tendency of an excessively augmented SOE sector. For this reason, whenever possible SOEs should also be subject to competition to discipline managers and lead to more efficient choices. This is precisely the case of SOEs operating in competitive foreign markets.
4. Brazil has also followed other countries in the transformation of many SOEs through corporatization and public listing. Although privatization was a way to solve myriad problems that plagued SOEs, many remaining state-controlled firms adopted new

governance practices to solve agency problems and restrain governmental interference as a way to lure private investors acting as minority shareholders or debtholders. A new model, Leviathan as majority investor, emerged. Perhaps paradoxically, this model requires a rather sophisticated capital market not only to attract private capital but also to promote external monitoring and transparency. In other words, when stimulating the public listing of SOEs, governments should also encourage the development of private capital markets, organized exchanges and institutional rules to protect minority investors.

5. Even when Leviathan is a majority investor, however, oftentimes the temptation to intervene becomes too high. We saw that after 2012 the Brazilian government used many state-controlled SOEs to directly control customer prices. Therefore, it is also important to have a broader institutional framework to create checks-and-balances against uncertain governmental interference. The presence of strong, independent regulatory agencies appears to be critical. One might ask: why should firms remain state-owned if governments tie their hands to *not* follow social objectives? A possible answer is that, in many countries, ideology or other path-dependent factors will create strong opposition against privatization. Another possible answer is that the pursuit of social objectives is not *per se* a problem. If such strategy is communicated *ex ante* to investors, then they will change their expectations (and reservation prices) accordingly. The problem is when there is *uncertain* intervention, that is, successive governments changing how they approach and influence SOEs *ex post*. A robust regulatory system can increase governmental commitment to follow more stable rules, even when they are designed to guarantee aspects other than pure profitability.
6. Brazil also offers lessons for the model where Leviathan is a minority investor, especially with respect to the role of development banks. BNDES was and continues to be a large and important actor in the Brazilian financial system. In the case where the state acts as a minority shareholder, the Brazilian experience suggests that equity will work under particular conditions. The state should target private firms with clear constrained opportunity, that is, firms exhibiting latent capabilities but at the same time limited by their lack of resources to invest and grow. In addition, the state should avoid firms belonging to complex, pyramidal groups that either have their own internal capital markets or that entail substantial risk of expropriation. Minority equity stakes should also be more beneficial at moderate stages of capital market development. As new instruments of capitalization emerge, local stock exchanges develop and new investors are lured to the market, the state should progressively exit firms. This was, however, exactly the opposite of what BNDES did in Brazil.
7. BNDES also greatly expanded its loan business and created novel ways to fund their operations with direct transfers from the government, beyond the more traditional model whereby forced savings (from corporate taxes) are allocated to support its lending activity. Yet, all these actions increase public debt and the tax burden in the Brazilian economy, already at high levels. Furthermore, subsidies accompanying loans entail important costs whose clear benefits are rarely assessed. Development banks should strive to show how each dollar in subsidies generate gains in terms of new investment and other externalities that would not have been observed without those subsidies. The extant literature examining the effects of BNDES's loans on firm-level profitability, productivity or investment is inconclusive at best.
8. BNDES also apparently induces a form of credit misallocation different from what is usually discussed in the literature of state-owned banks (e.g. as when such banks lend to poor firms). Most of BNDES's credit still goes to large corporations that could apparently fund their projects with other sources of capital. For this particular subset of firms, unless their projects generate clear social externalities, the benefits of allocating

subsidized credit should not outweigh the opportunity cost of state capital. In 2013, BNDES announced a change in course whereby, at least in principle, there would be a new focus on infrastructure investments. However, even some profitable infrastructure investments led by large firms, such as high-traffic roads or airports, continue receiving substantial credit from the debt. Some Brazilian executives argue that subsidized credit is important because of the more recently tendency of the government to meddle with prices. Yet, this is a type of risk created by the government itself, which then “compensates” investors with subsidized capital. Once again, the recommendation is to create more stable rules to encourage private investment and use state capital in a much more selective way, for activities with high social externalities and with scant interest by the private sector.

9. Related to the previous point, the recent Brazilian experience of creating national champions can hardly be considered a success and has even strained the results of BNDES’s equity arm, which has traditionally been an important source of earnings. Many development institutions throughout the world are emphasizing instead entrepreneurial firms with latent capabilities. For instance, Chile’s Corfo has avoided giving credit to large firms and has even refrained from direct leading. Instead, it provides guarantees to entrepreneurs raising capital in private banks. Corfo also manages an innovation program, funded by mining revenues, which provides entrepreneurs with seed capital to launch new businesses.

We surely do not intend to exhaust the debate on the benefits and cost of using SOEs to support development objectives, but hope that the Brazilian experience, herein reported, will shed more light on this important discussion.

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