

The Political Economy of Development Banking

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Abstract and Keywords

Because protectionism is now less relevant for supporting learning and innovation, development banking has assumed a greater role in industrial policy. This chapter presents the economic reasoning as to why state-sponsored development banking corrects market failures and creates productive capacities. Drawing on case studies, it explores how development banking enhances firm capacities to learn and innovate while also enhancing the technical capacity of state bureaucracy to design and monitor state support of industrial policy. The chapter makes an original contribution, discussing why and how economies that encourage or mobilize diversified sources of long-run finance (rather than relying on one state-owned development bank) enhance the effectiveness of their industrial policies. Finally, it examines one of the world's largest and well-run national development banks, the Brazilian Development Bank (BNDES). This case study is useful for emphasizing the broader political economy and macroeconomic context in which national development banking takes place.

Keywords: development banks, industrial policy, political economy, long-run financing, late development, innovation, structural transformation, Brazilian Development Bank (BNDES), China Development Bank (CDB), German Development Bank (KfW)

13.1 Introduction

NATIONAL development banks (NDBs) have played a dominant role in the provision of long-run investment, 'patient' financing of catch-up in agriculture, industry, and infrastructure in the context of late development (Gerschenkron, 1962; Amsden, 2001; De Aghion, 1999; UNCTAD, 2016), and in the context of innovation in advanced and emerging economies (Mazzucato, 2015; Mazzucato and Penna, 2016, 2018).¹ For less developed economies, late industrialization entails substantial risks (because many projects are large scale and have long learning and maturation periods) that banks are often unwilling to undertake. Long-term finance requires maturity transformation, which involves a risk that banks usually prefer to avoid (UNCTAD, 2016). For these reasons, NDBs are

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designed and mandated to fulfil the role of facilitating risk-taking and learning through the provision of long-run development finance.

As Alexander Hamilton noted, in the context of post-colonial United States: ‘capital is wayward and timid in lending itself to new undertakings...the State ought to excite the confidence of capitalists who are ever cautious and sagacious, and in doing so, overcome the obstacles that lie in the way of all experiments’ (Alexander Hamilton, (p. 338) *Report on Manufacturers*, 1781). State-sponsored development banking providing low-cost, long-run credit is thus central to socializing risk and inducing risk-taking and learning (Amsden, 2001). Due to the lack of private-sector capacity and commitment to financing the inherently risky ventures of late development and innovation, it is thus not surprising to find that NDBs are often the only source of long-run credit in least-developing countries (LDCs), and form one of the main instruments of both vertical and horizontal industrial policy.

Surveys of the share of NDBs clearly indicate that they are not things of the past, nor relevant only to low-income contexts. A World Bank survey of NDBs found that 37 per cent were established during the import-substitution years between 1946 and 1980, nearly one-half (47 per cent) came into existence between 1980 and 2015 and 25 per cent since 2000, periods characterized by increasing globalization and the growing predominance of neo-liberal policy reforms (De Luna-Martinez et al., 2017). Their presence in the financial system thus remains significant, as they account for 25 per cent of total banking assets around the world (De Luna-Martinez et al., 2017).² This suggests that, irrespective of policy orientation or global technological production patterns, policymakers across a diverse set of economies at varying stages of development have found that private financial markets do not deliver adequate long-term finance to support catch-up, innovation, and structural transformation. These patterns contradict notions of a ‘life cycle’ of development banks: the idea that a more active role for state-owned banks may be necessary, given the lack of private capital markets and private entrepreneurship in less advanced stages of development, but may become less important as economies transform and their financial markets develop (Torres and Zeidan, 2016).

Moreover, the three largest NDBs in the world (China Development Bank (CDB), KfW Group in Germany,³ and BNDES in Brazil) have substantially increased their asset and loan disbursement as a share of GDP since 2000. As of 2015, these three NDBs had assets-to-GDP ratios in the range of 14–18 per cent of GDP (Ferraz and Coutinho, 2019: 91).⁴

While there are several roles that NDBs can play in an economy,⁵ this chapter primarily explores why and how they have played a dominant role in the provision of long-run investment finance to support industrial policy and production strategies more generally. The chapter’s main aim is to identify common technical and political economy factors that have contributed to the effectiveness of national development banking. Prominent among the factors that matter to such NDB effectiveness and their (p. 339) role in promoting dynamic structural transformation include: developing sectoral technical expertise among

staff to monitor projects and the capacity to crowd in financing (that is, to promote co-financing) for projects from other government agencies, private banks, and business groups. To assist policymakers to identify political economy challenges, the chapter also addresses why and when such factors fail to emerge. These political economy factors provide a different view of less successful NDB performance from that of neo-liberal critics.

Section 13.2 considers the economic reasoning behind the argument that state-sponsored development banking is central to socializing risk and inducing risk-taking and learning as well as more innovative ventures across a range of LDCs, and indeed in advanced capitalist countries. In doing so, it challenges the mainstream view that advocates financial deregulation. Next, we draw on the historical experience of successful national development banking across a range of countries (Germany, Japan, South Korea, China, and Brazil), to determine what effective development banking is and how it has contributed to industrial policy across a range of cases in advanced and less developed countries. An important message that emerges, and something that is neglected in the literature, is that national development banks, when successful, can provide a focal point not only for enhancing firm capacities to learn and innovate but also for enhancing the technical capacity of the state bureaucracy to design and monitor state support of such activities. We make an original contribution to the literature with a discussion of the implications of whether economies develop single or multiple sources of long-run finance. In particular, we discuss why and how economies that encourage or mobilize diversified sources of long-run finance (rather than relying on one or a small number of state-owned development banks, which is common practice) enhance the prospects of their industrial policies meeting the challenges of large-scale, long-gestating projects which entail risk and uncertainty. We next take a more extended look at one of the world's largest national development banks, the Brazilian Development Bank (BNDES), the source of most of the Brazilian economy's long-run financing. This case study is useful for examining issues in the broader political economy and macroeconomic context in which national development banking takes place. It also highlights some of the limitations of relying on a single source of long-run financing, even when that source is one of the largest and most well-run development banks in the world. Section 13.6 summarizes the general policy implications of the link between development banking and industrial policy.

13.2 The Economic Rationale for Development Banking

The general logic of subsidization to promote industrial production in the context of late development is well known: investments (especially in high-productivity sectors where scale and gestation period are large) entail significant risks. There are several (p. 340) reasons for this. First, the existence of learning by doing (Arrow, 1962) implies that the now more advanced countries have a 'first-mover advantage' of accumulated knowledge compared with producers in late developers. Second, in advanced economies, frontier firms have an implicit advantage because of the generally lower transaction costs of do-

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ing business, which is the result of institutions being more predictable, and the quality of physical infrastructure and education systems being higher (Abramovitz, 1986; North, 1990). Third, the risk inherent in undertaking industrial development in a late developer in the context of relatively underdeveloped capital markets is generally too high to induce investment in the absence of subsidization and protection.

The supply of state-sponsored, long-run credit in even advanced late developers is all the more necessary because firms in OECD countries have further significant advantages. First, there are indirect and direct mechanisms that support the technological advance of their own frontier firms (Mazzucato, 2015). While R&D spending as a *share* of GDP may be only slightly higher in advanced countries compared with late developers, the *absolute* amounts of such spending are vastly higher in most OECD countries because GDP levels are five to ten times higher. Second, the depth of financial markets makes the advanced economies better able to withstand banking, financial, and balance-of-payments crises. This reduces the level of business uncertainty over the long run. Third, the depth of financial markets in OECD countries allows them to provide a diversity of long-run financing sources, which increases the prospects of selecting winners in the uncertain and risky world of innovation-driven investments. Finally, the high level of retained earnings in established Fortune 500 companies provides a vast supply of investment resources for undertaking R&D.

Gerschenkron (1962), who examined the late development process in Germany and Russia, argued that catching up occurs by undertaking more capital-intensive investment in individual plants, even though overall capital intensity of the backward economy is less. In his analysis, investment banks and national development banks served as a functional substitute for stock markets and commercial banking, both of which financed (along with retained earnings) industrial investment in the forerunner country, Britain. Germany (as a more advanced, but backward economy) relied on relation-based private investment banking as the key to successful catch-up. Investment banks owned substantial shares in industrial ventures. Russia (a much more backward economy) relied primarily on a state development bank to finance industrialization. The key insight is that the stage of development is relevant to the type of development finance required, challenging the idea that late developers should adopt 'best practice' of more advanced countries.

There are sound economic reasons why NDBs have enhanced the prospects of late development. Standard models of financing suggest that the private banking system is unlikely to be able to provide long-run financing on its own for such risky ventures without state coordination and guarantees (Stiglitz and Weiss, 1981; Dewatripont and Maskin, 1995; De Aghion, 1999). The logic of the basic models is as follows. In a competitive banking system in a low-income economy, banks tend to underinvest in long-term projects. This is because long-term projects involve large sunk costs (p. 341) requiring co-financing by several banks. However, each bank will tend to provide a limited monitoring effort in the knowledge that part of the marginal return from this effort will accrue to the other banks. Insufficient monitoring jeopardizes project profitability, discouraging the co-financing of long-term projects. This suggests a role for a coordinating agency in order to overcome

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'free-rider' problems and prevent short-termism. Given the inadequate private provision of long-term finance, coordinating agencies are often sponsored by national governments.

The role of government-led and government-regulated state development banking goes beyond standard market failure arguments. Late development plans or mission-oriented governments are not simply 'fixing market failures'. Rather, development involves the processes of creating markets and firms that do not exist in the first place. Such 'missing markets' are the result of inherent risks and uncertainty both in late development and in innovation. In this sense, NDBs and their accompanying policies and organizations enable and shape the creation of firms and markets, whether this involves infant industry production or innovation (Burlamaqui, 2012; Mazzucato and Wray, 2015).⁶

However, neo-liberal critics claim that state-controlled subsidized credit leads to several problems: financial repression (negative interest rates reducing the incentives to save); the crowding out of private-sector investment; relation-based governance which can generate 'insider privileges'; non-competitive markets; cronyism and corruption; and misallocation of resources towards over-ambitious capital-intensive projects in labour-surplus economies (McKinnon and Shaw, 1973; Acemoğlu et al., 2004; Musacchio and Lazzarini, 2014a). Their policy advice is to liberalize the banking sector, attract foreign banking, let private competitive markets determine the interest rate, avoid capital controls, maintain fiscal and monetary discipline (balance budgets and target inflation), create independent central banks insulated from political pressures, and adopt a rules-based system of financing to promote private stock and bond markets.

Neo-liberal policy advice has some important shortcomings. First, there is no historical evidence that effective catch-up strategies have been based on following neo-liberal policy advice (Gerschenkron, 1962; Rodrik, 2004; Amsden, 2001). Second, private financial markets are subject to 'manias, panics, and crashes' (Kindleberger and Aliber, 2011) such as the Great Depression and the 2008 global financial crisis, among many others in advanced countries. Independent central banks, 'light touch' regulation, and monetarist policies reigned supreme leading up to the 2008 financial crash. The private financial sector seems subject to a massive 'soft budget constraint'⁷—since (p. 342) large banks are deemed 'too big to fail'; in fact, taxpayers bail them out when they fail to the tune of trillions of dollars.

Moreover, according to Stiglitz and Uy (1996), assessing the success or failure of a directed credit programme is difficult for three reasons. First, there is usually no way of knowing whether growth would have been higher or lower in the absence of the programme. Second, a good programme requires risk-taking, which means that failures are inevitable. A programme with nothing but successes would necessarily have been too conservative. Third, many of the returns may be long term, so current profitability may not provide an adequate measure of success. For example, the measure of Korea's chemical and heavy industry programme, Japan's car industry, or Brazil's aerospace industry should not be how those industries fared in the first decade of their existence, but what eventually became of their technological development, world market share, and so on thirty years after

they began. Similarly, low profits may reflect cyclical conditions rather than long-run prospects.

Despite the shortcomings of the neo-liberal view, it is still important to examine the factors and conditions that have allowed a select set of NDBs to make positive contributions to industrial policy and structural transformation, and to identify why many other countries, even when they have well-run NDBs, fail to achieve similar outcomes.

13.3 Lessons from Effective Development Banks

The aim of this section is not to recount the historical experiences of development banks. Indeed, there is a substantial literature that covers cases such as Japan, Korea, Taiwan, China, Germany, and Brazil, among others (see e.g. Griffith-Jones and Ocampo, 2018; UNCTAD, 2016; Naqvi et al., 2018; Ferraz and Coutinho, 2019). Rather, it is to draw out some of the general patterns and mechanisms underlying why and how development banking supports effective industrial policy.

First, NDBs, unlike most commercial banks, have developed and mobilized the specialized sectoral and financial skills required to deal with higher-risk, long-term investments. As noted by Sayers (1957):

The logically sound basis for the presumption against long-term commitments is that it is much more difficult to estimate a borrower's creditworthiness twenty years ahead than six months ahead. The factors relevant to creditworthiness are substantially different over the longer period and the capacity and experience required in (p. 343) the bank manager are of an altogether different order, an order it is not reasonable generally to expect unless he has specialized expert staff.

(Sayers, 1957)

There have been many forms of long-run investment financing that have served the function of socializing the risks inherent in late development. The French experience in the nineteenth century, where significant developments in long-term state-sponsored finance occurred, provides the pioneering example. The creation in 1848–52 of institutions such as the *Crédit Foncier*, the *Comptoir d'Escompte*, and the *Crédit Mobilier* was particularly important.

The involvement of the *Crédit Mobilier* in Continental European railway investment was notable. The bank acquired substantial expertise in long-term finance as a result of railway investments. This expertise was then disseminated to other Continental European banks in which the *Crédit Mobilier* held shares. Of even greater importance than the outcome of the operations of the *Crédit Mobilier* were intangible benefits such as the imitated skills of the engineers and technicians which it sent abroad, the efficiency of its admin-

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istrators, and its organizational banking techniques, which were so widely copied (Cameron, 1953).

Indeed, one of the main reasons why private banking in LDCs cannot easily assume the risks of long-run financing is precisely their lack of sectoral expertise in assessing and monitoring risk. There is substantial evidence that the subsequent success of development banks in Japan, South Korea, Germany, France, and Brazil owes much to the well-trained staff with engineering and sectoral skills able to monitor loans and form teams that contribute to and influence planning and coordinate government policies (Amsden, 2001; UNCTAD, 2016; Ferraz and Coutinho, 2019; Griffith-Jones and Ocampo, 2018; Naqvi et al., 2018).

In explaining why and how the German state development bank staff expertise is relevant to enhancing the effectiveness of industrial policy, Moslener et al. (2018) note:

Apart from the financial expertise that KfW staff has, it additionally employs experts with specific—often engineering-type—sector knowledge in agriculture, energy, transport, water, natural resources, and civil engineering, to name but a few. This substantively distinguishes KfW from the commercial banking sector. This allows KfW to base its investment decisions on a broader set of criteria from internal employees rather than relying on the market generally or external actors, such as consulting firms. This deeper understanding of sectors and the related markets is also essential not only to identify market imperfections, but also to anticipate the consequences of the respective interventions and programmes...Such knowledge further increases the likelihood that a particular project will be more successful from a socio-economic as well as a commercial perspective. Technical expertise further allows KfW to serve as an important conduit between its investments in the private sector and government policy, adding to its information advantage. Finally, KfW's stamp of approval can effectively signal to other private investors that the project is viable.

(Moslener et al., 2018: 71; italics added)

Moreover, the financial expertise of KfW staff allowed them to monitor industrial loans effectively, especially during downturns in the business cycles or during financial crises.

(p. 344) In particular, staff were better able than simple government agencies to separate insolvent companies from healthy ones that were merely suffering from the reduced lending capacity of the private sector due to fallouts from the financial crisis (Moslener et al., 2018: 80–1).

Second, NDBs have increasingly taken on a macroeconomic role of countercyclical financing to combat increasingly unstable and volatile financial markets (Griffith-Jones and Ocampo, 2008). This is important to help maintain long-term investment, including in infrastructure, ensuring the continuity of existing projects and helping new ones start, valuable both for short-term growth and long-term development. The multilateral development banks (MDBs) collectively increased their lending commitments to emerging and

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developing economies by 72 per cent between 2008 and 2009, the year when private capital flows to these countries fell most sharply as a result of the crisis (Griffith-Jones and Gottschalk, 2012). This countercyclical lending by multilateral and regional development banks was complemented by that of NDBs in emerging and developed countries.⁸

Third, successful state development lending has complemented and ‘crowded in’ private-sector lending rather than displacing it. The high private savings and investment rates in East Asian countries in the 1960s and 1970s, for example, would not have been possible if this were not the case. Although directed credit amounts to as much as 75 per cent of the loans of financial institutions in some countries (such as Brazil), in the period 1960 to 1980, even in Korea (which used directed credit most aggressively), directed credit amounted to only about 40 per cent of total credit, and in Japan it never exceeded 15 per cent (Stiglitz and Uy, 1996).

There are several reasons why development banks have been more influential than their small share in lending might suggest. Because of their close ties to the government, their lending provided information to entrepreneurs and other banks on the areas that the government was promoting. In addition, other financial institutions valued information on the development banks’ choice of clients (as distinct from sectors). This signalling effect only works, of course, if development banks have sound institutional reputations, which they did in Japan, Singapore, Taiwan (China), and, by and large, Korea (Stiglitz and Uy, 1996).

A fourth factor that enhanced effectiveness was substantial amounts of directed credit to industry, based on broad functional criteria (such as whether the firm produced exports), typically using objective performance measures (Amsden, 1989, 2001; Stiglitz and Uy, 1996). This was particularly important in the rapid growth cases of North East Asia (Amsden, 2001) but has also been important in the export manufacturing drive in Germany (Naqvi et al., 2018). This dynamic export performance results from domestic processes of learning, effort, and contestation among competing firms (Woetzel et al., 2018). Of course, it is also necessary for state competition policy to prevent oligopolistic collusion and capture of state subsidies, since internal (p. 345) competition among the selected few subsidy recipients is central to inducing the maximum efforts of firms learning to become as efficient as possible (Studwell, 2013).

Fifth, effective export performance has been the result of explicit NDB strategies to promote large firms and/or industrial conglomerates. The literature on ‘strategic trade’ (see Krugman, 1987) finds that state subsidization matters to export competitiveness in the context of increasing returns and imperfect competition. It is well known that development finance has been central to national firm formation and ‘national champions’ such as Toyota, POSCO steel, or Hyundai in East Asia (Amsden, 2001). In Germany, in the post-2000 period, the KfW aimed much of its very selective export financing at promoting the export of industrial plant and machinery by a relatively small group of well-known firms such as Siemens, Krupp, Ferrostaal, Ihde, Fritz Werner, and AEG to the major newly independent developing economies, while specific export finance programmes targeted shipping and aircraft exports, including companies producing for Airbus (Naqvi et al.,

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2018). In Brazil, BNDES finance was central to the export success of national champions in agri-business, aerospace (Embraer, the world's third-largest passenger jet company), mining, oil and gas, among others.

Sixth, macroeconomic policies need to enable the generation of high levels of savings and investment, and public and private development banking. Indeed, there is considerable debate about what range of inflation and fiscal deficits is compatible with rapid growth (Rodrik, 2016: 8). However, especially in less developed countries that do not have well developed capital markets for government bonds, the greater the use of the inflation tax (by printing money), the greater the prospects that hyper-inflationary pressure will emerge.

Hyper-inflationary pressures result in increasing uncertainty and an increase in transaction costs, both of which are likely to slow down private-sector investment. Second, they limit the credibility of government bonds which reduces the borrowing capacity of the state to fund investments. It also tends to restrict the development of private banking credit, which limits both the level and diversity of private credit expansion through the banking system, which, in turn, limits the financing of investment (Calomiris and Haber, 2014). Finally, strong inflationary pressure tends to generate cycles of overvalued exchange rates which reduces the competitiveness of infant industry exporters, reducing in turn the extent to which export markets can become an opportunity to either expand market share or provide a realistic focal point for domestic firms to compete abroad (see Rodrik, 2008, on exchange rate policy and industrial policy).

Avoiding balance-of-payments crises is a large part of maintaining a viable macro environment (Thirlwall, 2011, 2019).⁹ Because 'big push' industrialization drives (p. 346) generate widespread 'investment hunger', the macroeconomic challenges of industrial policy are formidable. The danger of overexpansion in a 'big push' strategy is typically the build-up of unsustainable and destabilizing external debt positions that will occur if the investment does not lead to productivity improvements, increasing competitiveness and net export earnings. The debt overhang that could result also leads to increases in the share of interest payments on the external debt, which in turn will reduce the state resource available for investment in infrastructure, which is a central input into growth in this strategy. As Amsden (2001) notes:

That conditions of 'lateness' are inherently conducive to overexpansion is suggested by the fact that when a debt crisis occurs, it almost always occurs in a latecomer country. This is because diversification in the presence of already well-established global industries involves moving from labour-intensive to capital-intensive sectors characterized by economies of scale.

(Amsden, 2001: 252)

The scale of 'big push' investments was, indeed, instrumental in the debt crises in Latin America in 1982 and in East Asia in 1997, as both were preceded by a surge in investment (Amsden, 2001: 253). Thus, mobilizing national savings, both public and private, be-

comes central to sustaining a high investment effort without incurring potentially destabilizing levels of external debt. The higher savings and investment level in East Asia is probably the main reason why its growth rates recovered after its macro crises, unlike Latin America, where savings and investment rates are considerably lower. It is well known that high levels of national public savings have supported robust investment rates (Stiglitz and Uy, 1996; Krieckhaus, 2002).¹⁰

Thus, it is not surprising that NDB disbursements tend to grow and crowd in private investment the most in East Asia and the OECD, economies where macroeconomic conditions generally allowed governments to develop deep capital markets, especially in the issuance of long-run bonds. An often neglected and paradoxical trend is that the asset size of the two largest NDBs in the world, CDB in China and KfW in Germany, have grown fastest since the late 1990s, an era characterized by financial deregulation processes of ‘financialization’. The triple A credit ratings in Germany have allowed the KfW to become one of the first national development banks to follow in the footsteps of the supranational World Bank and European Investment Bank in tapping into international capital markets (Naqvi et al., 2018). The dramatic rise in assets of the CDB have all been driven by its ability to issue primarily domestic (but also international) bonds. Indeed, it has played a central role in creating the domestic bond market (Xu, 2018). On the other hand, BNDES in Brazil has grown substantially on the more (p. 347) precarious and politically fragile basis of relying on government transfers of earmarked taxes and treasury transfers (Musacchio et al., 2017). This is because the legacy of hyperinflation in the 1980s and 1990s generated macro stabilization policies anchored in high real interest rates to accommodate investors’ demand for short-term returns and liquidity (see section 13.4).

13.4 Diversification of Development Financing Matters for Industrial Policy

While most national development banks are majority or wholly state owned, it is important to note that the vast majority of total investment, even where NDBs have been pivotal to effective industrial policy and structural transformation (East Asia, Germany, France, Brazil) is private, particularly for middle-income and high-income economies. This draws attention to why and how NDBs can crowd in private investment and thus leverage their benefits to the greatest possible extent.

The early experiences of development banking marked the role of government in enabling the development of private development banking. In France and Germany from the nineteenth century until the Second World War, government support for private emerging development banks took the form of share capital provision, loans at lower than market interest rates, the provision of state guarantees underwriting these institutions’ bond issues, or a combination of the three. From the early 1900s, the Japanese government bought a substantial share of the bonds issued by private long-term credit banks and was a catalyst ensuring that other private banks and financial institutions subscribed to these bonds. It allowed development banks to issue long-term bonds or debentures, whose mar-

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ket the government helped create. This privilege helped redress the mismatch between the maturity structure of the banks' assets and their liabilities, a problem that had plagued commercial banks (Stiglitz and Uy, 1996). Limiting competition also enabled the long-term credit banks to obtain funds more cheaply than they otherwise could have (Stiglitz and Uy, 1996). Only in the post-Second World War period do we find that almost all national development banks are state-owned enterprises (SOEs), mostly financed through retained profits and domestic taxation (particularly a portion of personal income taxes [PAYE], but also through domestic government bonds, international capital markets, and concessional finance) (on the varied sources of NDB finances, ownership and lending patterns, see UNCTAD, 2016; and Griffith-Jones and Ocampo, 2018).¹¹

(p. 348) The current association of national development banking as a state-led process distracts attention from the wide variation in the importance of private long-run financing across countries, particularly at low- and middle-income levels. Indeed, it is possible to identify two basic patterns of relation-based sources of late-development and innovation-oriented financing. The dominant pattern in most LDCs since the Second World War has been the single/limited long-run financing model. This generally involves reliance on one dominant national development bank financing public and private industrial firms. Perhaps the most well-known example is BNDES in Brazil (for a discussion of BNDES and how it has worked, see Amsden, 2001; Musacchio and Lazzarini, 2014a, 2014b; Colby, 2012; Tavares de Araujo, 2013). In single long-run financing situations, such economies lack depth but also diversity in long-run financing mechanisms. This may, as we shall see in the case of Brazil, be the result of macro instability and chronically high inflation and uncertainty due to balance-of-payments crises that inhibit long-run government and corporate bond markets, and/or explicit government policies limiting cross-shareholdings between banks and industrial firms. The latter would mean that while business conglomerates may develop, such groups grow outside manufacturing.

The second basic model, and one more likely to sustain the investment and innovative capacity of the economy, is a diversified/multiple financing model. This would include a national development bank co-financing projects with state/regional development banks and bank-based industrial conglomerates, as in Japan, South Korea, Taiwan, and Germany. In China, the model is based around a national development bank, policy banks in agriculture and trade, and a decentralized system of state government (town and village enterprises [TVEs,] and later local government financing vehicles), which constitute multiple poles of long-run financing as well as competing with each other in the large internal market (Qian and Weingast, 1997; Ang, 2016). In the United States, it is based on the large retained earnings of corporations, public banks, and a vibrant investment and venture-capital sector.

Indeed, national development banking has been effective in crowding in productive investment when it has been able to draw on and nurture the construction of bank-based industrial business groups. Historical evidence suggests that bank-based industrial business groups have been central to the catch-up processes in Germany, France, Italy, Sweden, Japan, South Korea, Taiwan, and Israel (Khanna and Yafeh, 2007). Such relation-

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based financiers are able to take a longer-run view of catch-up investments (and therefore become more 'patient' investors) than either stock markets or independent commercial banks, both of which operate under impersonal, rules-based systems. There is evidence that, when a dominant national development bank intervenes, co-financing arrangements and/or co-ownership with private financial institutions can enhance the returns to capital of state-led long-run financing (De Aghion, 1999).

The multi-financing model has several advantages for crowding in private investment in productive ways. First, it reduces the extent to which rent-seeking in search of long-run funds becomes a political game centred on one or a small number of state (p. 349) banks. While there may be considerable legal and illegal rent-seeking involved in trying to obtain access to selective long-run state finance, the existence of several bank-based industrial conglomerates will likely increase the competition and contestation over such funds. Such contestation, even in countries with substantial cronyism and corruption, may provide incentives to generate more viable and dynamic production empires, since economic prowess will improve the prospects of winning these rent-seeking contests.

Second, it enhances the prospects of exchange of information, expertise, and collaboration between the public and private development banks. Business conglomerates are able to pool scarce managerial talent and provide internal financing to undertake risky ventures that are difficult to otherwise finance in the context of underdeveloped capital markets (Leff, 1978; Amsden, 2001; Khanna and Yafeh, 2007). The so-called transaction banks in such conglomerates (particularly in Germany, Japan, Taiwan, and South Korea) complement the financial, engineering, and other technical expertise to monitor sectoral investments. Such conglomerates are important not only because in many catch-up processes, large and concentrated firm size is a key to competitiveness (where scale economies are relevant), but also because they provide an important complement to state planning and coordination (Mahmood and Rufin, 2005: 352–3).

Third, it increases the incentives for private business groups to monitor the quality of investments, to increase their technology learning efforts, and to become more innovative, because they have a stake in long-gestating and complex ventures. Indeed, one of the reasons behind the successes of NDBs in East Asia in developing dynamic firms and sectors has been the requirement on the part of governments to demand substantial collateral in return for loans as a way to incentivize effort (Stiglitz and Uy, 1996; Xu, 2018).

Finally, the diversity of long-run financing enhances innovation because it enables a greater variety of experimentation. Apart from the need to generate a high volume of long-run investment funds, the diversity of these funds becomes as important. This is because a greater diversity of venture capital 'bets' increases the likelihood of success. As Mokyr (1994) notes: 'Diversity is the root of creativity, and much of what we call technological creativity is the ability to absorb, assimilate and apply ideas borrowed from others' (1994: 48). Indeed, the diversity of experimentation is also central to why the process of market competition and rivalry produces discovery and innovation, a process neoclassical economics has been ill-equipped to explain (Hayek, 1945). It is not a coincidence that

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the highest rate of patent applications and approvals (an albeit imperfect proxy of innovation) come from OECD countries but also emerging economies with diverse sources of long-run financing (e.g. South Korea, China).

Recent evidence from the McKinsey Global Institute on the characteristics of countries with the fastest long-run growth rates (so-called 'outperformers') suggests a greater presence and performance of large firms (defined as firms with at least US\$500 million in sales). Moreover, this success is accompanied by greater competition or 'creative destruction' among large firms within these economies: 55 per cent of the top quintile are replaced within a decade compared to less than 40 per cent among (p. 350) slower-growing economies (Woetzel et al., 2018). The report further argues that, rather than just picking winning firms or sectors, the focus was on boosting productivity and enabling competition. Performance criteria and the limited time frame of subsidies, and exposure to export markets, all increased firm effort and disciplined lagging performance. Large firm development also received government support in the form of subsidies for infant industries, including low-cost loans, preferential exchange rates, low tax rates, and R&D subsidies.

In sum, scale, and diversity of long-run financing are two central features of industrial policy that delivers dynamic growth and structural transformation. As Amsden (2001) first observed, the structure and size of business organizations matters for achieving the scale and scope necessary to achieve dynamic infant industries and exporters in latecomers. The above discussion suggests it matters in other ways, such as providing a diversity of financing options to support learning and experimentation, as well as providing the prospect of internal competition among competing business groups. All the cases of long-run growth identified as 'outperformers' have been countries with access to multiple sources of long-run financing. For economies without this diversity in sources of long-run financing, an important policy issue is how to diversify these sources. Several options are being pursued today. First, setting up several, more specialized policy banks could diversify organizational effort. In fact, apart from the main development bank, CDB, China has large policy banks such as the Export-Import Bank of China and the Agricultural Development Bank of China. Second, attracting foreign direct investment (FDI) diversifies long-run finance since multinationals have retained earnings and access to global capital markets. Third, reaching out to a large diaspora is an option for some countries such as Israel, India, Bangladesh, and Ethiopia. The latter, for instance, raised substantial capital through diaspora bonds to fund the Renaissance Dam project. Finally, and most important for low-income countries, international development banks have enhanced the diversity of funding. The World Bank Group has done this in two ways. First, it has undertaken local currency bond issuance through their signalling and demonstration effects, which strengthens confidence in a country's domestic bond markets attracting foreign issuers and investors. Second, investment funds, such as the International Finance Corporation (IFC), have invested in both established and emerging private-sector companies.

13.5 Case Study: The Political Economy of Development Banking in Brazil

The Brazilian case is useful for examining the broader political economy in which national development banking takes place. While Brazil's main national development bank, BNDES, has been central to one of the most remarkable stories of growth and structural transformation since the 1950s, its policies have been insufficient to prevent (p. 351) a dramatic slowdown in manufacturing performance in the post-1990 period. Even more intriguing is that the latter period is subject to enormous variations in manufacturing performance: a great industrial divide involving the rise of national champions and the fall of the rest.

13.5.1 The Positive Side of Development Banking in Brazil

On the one hand, Brazil has had one of the best-performing and most successful national development banks in the world. The national development bank, founded in 1952, initially focused on financing infrastructure as part of the country's drive towards modernization and industrialization. Later in the decade, its focus broadened to support the country's capital goods industry and then, in the 1960s and 1970s, other industrial sectors (Armijo, 2013). The state also introduced important 'forced savings' schemes which were used to fund significant growth of the national development bank, BNDES, and the spectacular growth of relatively well-run SOEs in heavy industry and mining, which contributed to public savings via their profitability and provided a focal point for technological development (Treat, 1983).¹² BNDES was central to the long-run financing that enabled rapid growth and structural transformation in the period 1950 to 1980 during which Brazil developed one of the most diversified and sophisticated industrial and manufacturing sectors among middle-income countries.¹³

Since the 1990s, BNDES has been the focal point of industrial restructuring and 'strategic' large-scale privatizations (maintaining corporate control through 'golden share' minority positions), and has supported exporting sectors (with a focus on capital goods and engineering services) and, more recently, the internationalization of large national corporations, the so-called national champions.¹⁴

The extensive privatization programme, in particular, transferred ownership on preferential terms to established and emerging domestic business groups (Almeida, 2009; Massi, 2015). This process resulted in the emergence of firms in agri-business, steel, aerospace, mining, oil and gas, paper and pulp, engineering and construction, and telecommunications, many of whom have become innovative frontier firms.

(p. 352) The restructuring of Brazilian capitalism, or what Musacchio and Lazzarini (2014a) refer to as the 're-invention of state capitalism', involved the construction of multiple and diversified sources of long-run financing and a governance focal point around sectoral restructuring for these targeted firms. This process took two basic forms. First, under BNDES leadership, the government pursued a policy of purposefully constructing

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'national champions', largely through what were called 'strategic privatizations'. The equity of many of the viable, but financially strapped SOEs was transferred to private domestic business groups, but BNDES (through its investment banking arm, BNDESPar) and state pension funds also maintained strategic minority shares. In the case of oil and gas and some electricity firms, the state maintained a majority share but also received vast amounts of BNDES loans.¹⁵ In both cases, export credits also increased substantially. These state policies enhanced the value of rents by enhancing the profitability and technical capacity of these firms to compete in export markets.

Second, the centrepiece of the construction of innovative 'national champions' was long-run subsidized credit financing, most of which came from BNDES.¹⁶ The outcome of the processes of privatization coordinated in the Cardoso administrations (1994–2002) had created a change in ownership patterns that was effectively a 'coordinated' process of restructuring innovative firms close to the technological frontier. The basic pattern is described by Aldrighi and Postali (2010) as follows:

The complex arrays that have led BNDESPar, Banco do Brasil, Petrobras, and pension funds of companies currently or formerly controlled by the government to hold large equity stakes or even to take part in the controlling coalitions in some business groups stem primarily from their participation in the privatization process. Given its intent to maximize revenues from the privatization auctions, the Federal Government urged BNDES and pension funds to act as financiers for the bidders, notably Brazilian private groups.

(Aldrighi and Postali, 2010: 372)

The state created rents by assuming the socialization of risk in promoting innovative activity and increasing the scale of business groups and firms through a combination of loans and taking equity positions. With the rise in BNDES funding in the post-2002 period (reaching a peak of 4.3 per cent of GDP in 2010), these loans tended to target the largest firms in the country: in the period 2002 to 2011, the ten largest loans made up 35 per cent of all BNDES disbursements (Hochstetler and Montero, 2013: 1491, table 1). Other mechanisms through which the state increased the diversity of long-run financing and growth potential of emerging national champions were the increasing equity (p. 353) participation of state pension funds (Almeida, 2009), the provision of export subsidies and credits,¹⁷ and the promotion of local content laws, through public procurement policies, in sectors such as oil, shipbuilding, automobiles, and wind turbines (Almeida and Schneider, 2012: 17).

The strategy of creating frontier, innovative firms was not just about financing, but also about increasing their scale, promoting their internationalization into emerging multinationals able to compete at the apex of global value chains, and promoting their innovative capacity. The result of this process is a series of world-class Brazilian multinationals at the cutting edge of frontier technologies¹⁸ in aerospace, high-tech agriculture, agri-business, steel, telecoms, mining, oil and gas, bio-fuels, automobiles, and bio-technology (Brainard and Martinez-Diaz, 2009; Musacchio and Lazzarini, 2014a, 2014b; Perez-Ale-

man and Chaves-Alves, 2016; Ferraz and Coutinho, 2019).¹⁹ Many of Brazil's 'national champions owe their existence to past capacities that were constructed and developed as state firms in this period' (Aldrichi and Postali, 2010).

By 2015, BNDES was the third-largest national development bank in the world, after the China Development Bank and Germany's KfW. In the context of a country where commercial banking has focused on short-term loans, BNDES, with its strong technical expertise and record of promoting structural transformation, has been held up as a role model for countries considering setting up development banks (UNCTAD, 2016). (p. 354)

13.5.2 The Limitations of BNDES and the Importance of Broad Political Economy Factors

Since 1990, despite the best efforts of BNDES to increase disbursements and fund world-class national champions, overall GDP and manufacturing output and productivity growth rates have collapsed and there was substantial de-industrialization from as early as 1980.²⁰ The share of the manufacturing sector in total GDP fell from a peak of 31.3 per cent in 1980 to less than 14 per cent in 2015. While BNDES investment may have 'crowded in' private-sector investments, it has done so within a range that is far too low: the private investment rate maintained a rate in the 14–15 per cent range throughout the period, which is well below East Asian counterparts. Whatever the particular design of industrial policy, this low level of investment ultimately generates fewer experiments, risks, and learning processes.

The Brazilian experience suggests that macroeconomic policy and context as well as policy decisions on banking laws have contributed to reliance on a single/limited long-run financing model. As a result, both scale and diversity of long-run financing mechanisms have been limited, even during periods of rapid growth. The subsequent slowdown in growth after 1980 suggests that the nature of development patterns matters more for avoiding growth collapses that are common features of LDCs. Let us examine the historical evolution of the processes behind this problem.

First, a series of development banking laws and policies inhibited the development of private-bank-based industrial conglomerates, and therefore limited multiple sources of long-run finances. Many of these policies, either initiated or enforced by BNDES, were meant to promote internal competition. BNDES put conditions on its loans specifying low debt/equity ratio ceilings that constrained the size of national firms (Amsden, 2001: 226). This decision, along with a banking law in 1964 which restricted banks and industrial firms from having cross-holdings (Armijo, 1993) was meant to both create internal competition and prevent further concentration of industrial assets which historically were linked to the 'insider' advantages that big businesses had with a banking system with limited access to credit (Calomiris and Haber, 2014: 390–414). In a country with historically very high levels of income and asset distribution, the rationale for this policy is understandable. However, the policy constrained the size of domestic manufacturing firms (Amsden, 2001: 227) which is one of the reasons why there were very few capital goods firms that

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exported. They simply did not have the scale and scope to compete. It was thus not surprising to find, among all less developed (that is, non-OECD) countries, there was no private Brazilian business group in (p. 355) manufacturing in the top 50 (ranked by sales) in the world in 1993 (Amsden, 2001: 203, table 8.5).

The second factor that limited the development of private investment banking in the twentieth century was the increasingly excessive use of the inflation tax (by printing money) through the mid-1990s. Inflation rates averaged over 20 per cent in the period 1946 to 1963, and were to reach 60–70 per cent by 1962–64 (Calomiris and Haber, 2014: 391). This ultimately culminated in hyperinflation in the 1980s and early 1990s. Chronic and high inflation resulted in increasing uncertainty and an increase in transaction costs, both of which inhibited the emergence of a private investment banking sector and resulted in the state becoming the main source of long-run development financing. Second, it limited the credibility of government bonds, reducing the borrowing capacity of the state to fund investments, and also tended to restrict the development of private banking credit. This limited both the level and diversity of private credit expansion through the banking system, which, in turn, limited the financing of investment (Calomiris and Haber, 2014). Finally, strong inflationary pressure tended to generate cycles of overvalued exchange rates which reduced the competitiveness of domestic manufacturing firms and thus their ability to increase exports.²¹

Third, the growing reliance on external debt made the economy vulnerable to balance-of-payments crises. The main culprit behind the worsening economic performance of the late 1970s to the mid-1980s was the reliance on a debt-led growth strategy, which resulted in a growing balance-of-payments crisis, increasing external debt and rising inflation (Fishlow, 1989; Bacha and Bonelli, 2013). Due to the unforeseen dramatic rise in world interest rates, the country was forced to declare a suspension of external debt payments at the end of 1982.²² The inability of the central government to control and discipline state financing contributed to a spiralling and unsustainable debt. Throughout the 1980s and into the 1990s, governors used the state banks to finance expanding deficits, accumulating staggering debts. State bank debts had reached US\$70 billion by 1991 and amounted to a massive US\$96 billion in 1998 (Kingstone, 1999: 177). State and local governments were responsible for about two-thirds of Brazil's US\$148 billion foreign debt (Mainwaring, 1999: 191). The climate of hyperinflation and the debt restructuring imposed led to a series of policies that would both hamper state finances and negatively affect the investment climate (Aldrich and Postali, 2010: 360–1).

Fourth, the macro policies after 1994 to handle the legacy of inflation also inhibited private investment banking. Macro stability, in particular sustaining low inflation, was a (p. 356) main priority of each of the administrations in this period. The history of inflation taxes and episodes of hyperinflation had eroded the political support of the poor (who mostly paid for this tax) and asset owners, particularly within industry, who were unable to undertake meaningful long-run strategic planning. This price stability was achieved, however, by maintaining real interest rates that were among the highest in the world, as well as an overvalued exchange rate, in the period 1999 to 2015 (Afonso et al., 2016).²³

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The legacy of hyperinflation meant that Brazilian savers demanded two things: high interest rates and short-term returns to ensure liquidity (Orair and Gobetti, 2017: 14).

Among the consequences of this macro policy environment is that it reduces the effectiveness of BNDES action on industrial policy. First, in the period 1998 to 2014, interest payments on debt absorbed more government spending than did infrastructure, education, and health (De Magalhães and Costa, 2018: 18–22). Second, high real interest rates reduced the extent to which BNDES policies could ‘crowd in’ private investors who were unwilling to undertake risks despite government efforts provide a substantial amount of loans at subsidized interest rates (Ferraz and Coutinho, 2019).

As a result, the ‘national champions’ policies, while generally successful, appropriated a significant proportion of long-run financing. This occurred in the context of an economy that did not have alternative forms of long-run financing investment arrangements, such as bank-based industrial conglomerates, or well-financed regional development banks. While BNDES disbursements increased to 4.5 per cent of GDP after 2007, 60 per cent of that funding essentially went to fund the formation of ‘national champions’. That left only 40 per cent (or a little over 1.5 per cent of GDP) available for long-run subsidized funding for potentially innovative smaller and medium-sized firms—not enough to drive productive investment. Moreover, policies to reduce the role of state development banks, while understandable given their previous activities building up massive external debts in the 1980s, undermined the extent to which a more decentralized and diversified set of long-run financing organizations would emerge across levels of government, as has occurred in China, South Korea, or Germany. In 2000, fiscal governance was reformed by the adoption of hard-budget constraint legislation—the Fiscal Responsibility Law—which imposed transparency requirements on states, and municipalities’ accounts and imposed a ceiling on states’ spending.

13.5.3 Policy Debates: Assessing the Role and Effectiveness of BNDES in Brazil

There are several specific criticisms of the ‘national champions’ model. The first set of arguments revolves around the criticism that BNDES was focusing too much of its (p. 357) lending on sectors that were already internationally competitive, such as Petrobras and the agri-business sector (Almeida, 2009; Almeida and Schneider, 2012; Tavares de Araujo, 2013; Musacchio and Lazzarini, 2014b). According to this line of argument, lending should not have focused on firms that were at the frontier, since industrial policy should focus on providing incentives to stimulate novel learning instead of reinforced specialization in utilities and commodities such as mining, oil, steel, agri-business, and aerospace (Almeida and Schneider, 2012; Musacchio and Lazzarini, 2014b: 31–2).

It is true that BNDES followed a strategy of ‘going with winners’ or ‘betting on the strong’ rather than ‘picking winners’. This is revealed in the fact that the default rates on its loans in the period 2009 to 2011 are almost nil, at 0.16 per cent compared to the national financial system rate of 3.8 per cent (Colby, 2012: 19). This is hardly the profile of a

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venture capitalist investment fund. One can also make the case that because BNDES maintains these equity shares, they are not 'letting go of winners' by selling on these shares to private equity firms.

The second, and related, criticism is that BNDES lending reinforced a pattern of so-called 'low-technology-intensive' sectors. Almeida and Schneider (2012) argue that 'if industrial policy is supposed to create new competitive advantages, then it has failed to do so: the most competitive industrial sectors in 2011, measured by the trade surplus, are the same as in 1996, despite the goals in successive industrial policies to promote technology-intensive sectors...Rather the bias towards conservatism has consolidated the specialization of Brazilian exports around resource-based industries and commodities' (2012: 18–20). Both criticisms add up to the diagnosis that there was a misplaced focus on competitive 'insiders' at the expense of potentially more innovative 'outsiders' who were not yet competitive and thus the share of medium- and high-tech production suffered as a result.

A third criticism concerns the returns to capital investment that BNDES equity participations, through its investment banking arm, BNDESPar, have yielded. Bruschi et al. (2013) compare the individual performance of the shares held by BNDESPar with returns on the Ibovespa index, the main stock market index in Brazil. For firms that BNDESPar acquired after 2004, they find that 60 per cent of the shares performed worse than the stock market index in the same period, 2004 to 2012. Their conclusion is that BNDES will be unlikely to continue to generate the majority of their income from equity investments.

The criticism that BNDES subsidized already competitive firms is misleading. These lending patterns need to be seen in historical and political context. First, the fragility of BNDES financing in the 1980s has created an understandable conservative bias in its spending since 1994. The legacy of macroeconomic instability can impair the ability of state development banks to finance risky new ventures in the high-tech and capital goods sectors, since the very legitimacy of the bank's mission needs to be reconstructed.

Second, it is not clear that many of these near-frontier technology firms would have been competitive in the context of the well-known *custo Brazil* (Brazil Cost)—the relatively high prices of many domestic goods and services, a reflection of the (p. 358) concentrated production structure, and the failure of government regulation to introduce competition laws (which implicitly meant that producers in several sectors are effectively earning large rents).²⁴

Third, it is not at all clear that without long-run subsidized financing and state equity injections many of them would have become the innovative firms they did. There are not many examples of foreign investment banks funding long-run R&D programmes of firms in LDCs and there is little evidence that the private domestic banking system would have done so either. Moreover, many of the export credits were essential to the export success of these firms: Embraer, for instance, depended on them to keep its products competitive (as KfW has done with Airbus).

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Fourth, since NDBs take risks, there will be inevitable failures. Equity positions will allow them to reap some of the financial rewards in order to offset the inevitable failures and ensure a stable funding source so it does not lose its appetite for risk (Mazzucato and Penna, 2018).

Fifth, the idea that BNDES lending patterns have reinforced the pattern of 'low-technology' exports is misleading. The categories 'low-tech' and 'high-tech' direct attention away from the point made by Baldwin (2013) that the integration of global value and supply chains means sectors are less relevant than the stages of production. And what matters is the capacity to innovate at the level of design and product development. In this respect, most of the 'national champion' firms are innovative or based on state-supported R&D investments. The fact that Brazil is competitive in agri-business (supposedly 'low-tech') as well as in aerospace (supposedly 'high-tech') owes more to the capacity to design and develop new products than to the sector it is producing for. There are many countries in South Asia and sub-Saharan Africa, including South Africa, and even in South East Asia, that would more than welcome the innovative capacity of so many so-called 'low-tech' sectors in agri-business, steel, and oil and gas that Brazil has developed (see Chapter 1 of this volume for a discussion of the problems of outdated categorization of what is 'industrial' or 'low-tech', which obscures dynamic, technologically sophisticated activities taking place within resource-based industries, agriculture, and services).

13.5.4 The Politics of Development Banking in Brazil

This discussion of development banking in Brazil suggests that policy design and reform need to be understood in terms of broader political economy dynamics. The economy in the post-1990 period maintained a limited diversity of long-run financing (p. 359) organizations, in large part because the dominant large business groups had their core businesses outside manufacturing, and also because commercial banks were deriving substantial profits from purchasing high-yielding government assets (as a result of anchoring inflation on high real interest rates and maintaining fiscal surpluses) and other financial assets (particularly equities and derivatives). This made the opportunity cost of investing in risky innovation-based start-ups and/or in experienced but financially strapped capital goods industries and start-up ventures very high. In this context, the amount of subsidized long-run financing that was left over for 'outsider' but potentially innovative firms was simply too small to provide the vast amount of long-run financing that innovation-based strategies require. What is more, the BNDES leadership was well aware of the need to promote innovation and there were indeed many smaller loans to a variety of innovative firms (see Hochstetler and Montero, 2013). The 'insider/outsider' problem was not due to a lack of technically competent, well-meaning, and informed technocrats; it is generally accepted that Brazil does not have a skills shortage in its main development and banking agencies. Rather, this problem, along with the insufficient savings and investment rates, has much more to do with the historical political economy dynamics, and in particular, the way economic and political order was maintained in this period.

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The political nature of development banking is evident in recent political crises in Brazil. The discovery of the disappearance of nearly US\$10 billion from the accounts of Petrobras in late 2014 set off the largest corruption scandal in Latin American history. The Lava Jato probe, undertaken by an increasingly proactive and independent judiciary and federal police in 2015, has uncovered a complex bribery and kickback scheme in which, among other things, the biggest construction companies and other private industrial groups, many of whom received massive BNDES financing, paid bribes to politicians' personal accounts and to political party campaign funds in exchange for padded government contracts in construction, shipbuilding, and other Petrobras investments.

Large-scale corruption scandals are not new to Brazil, nor is there evidence that BNDES knew of the corrupt practices of its clients, but the magnitude and political fall-out reveal more profound tensions than the merely political. An important aspect of the discontent concerns the alienation, for a number of reasons, of much of the middle class. First, there was growing discontent around the poor quality of public services such as transport, education, and health, as well as increasingly expensive housing, fuelled by the boom in financial and commodity markets. Much of the frustration was compounded by the inability of the government to address the growing levels of crime and urban violence. Second, much of middle-class discontent stemmed from the fact that they have borne the brunt of the increased tax burden to fund pro-poor expansions in the welfare state and have not received proportionate benefits (Saad Filho and Morais, 2014). Third, middle-class groups were losing much of their economic privileges relative to lower income groups. This has occurred because of the stagnation of average real wages in the context of minimum wages rising, and because there was a (p. 360) decline in the creation of well-paid employment, most likely the result of the stagnation in manufacturing employment and the rise of lower-paid service employment.²⁵

A further source of discontent, not only among the middle class, but also among some big business groups, was the perceived 'insider bias' in the massive loan portfolio of BNDES, the main provider of long-run financing.²⁶ The most infamous case, and a focal point of protest, was the case of JBS, the meat-packing company, which borrowed over 8.1 billion reais from BNDES to purchase meat-packing companies in the United States, Europe, and Australia, and became the world's largest meat packer. In the process, BNDES purchased a 21.3 per cent stake in JBS in 2007 (Leahy and Schipani, 2017). While big business groups in oil, shipbuilding, and construction, along with some food groups, comprised an inner circle of support for the Workers Party (PT)-led administrations between 2004 and 2015, other groups, particularly the banking sector and media conglomerates, were committed opponents of these strategies, which they viewed as promoting crony capitalism and excessive state control over resources.

The discontent over such 'corporate welfare' became a focal point for middle-class groups, finance, and the media in street protests against the government from 2014 onwards and were a focal point of anti-corruption discourse against the PT and the broader political party system. The corruption scandal became an instrument of political contestation and protest (Leahy and Schipani, 2017). Given media and banking opposition to PT, it

was not surprising that a focal point of the scandal was the link between Petrobras and big insider supporters of PT in oil, shipbuilding, construction, and food (despite the fact that all political parties were involved in Lava Jato; Leahy and Schipani, 2017). Within Congress, the opposition to the PT ultimately led to the impeachment of President Dilma Rousseff and the demise of the legitimacy of state-led development banking.

Of course, the corruption scandal itself has had a profoundly negative effect on the economy because of increased political uncertainty. The companies involved in the scandals, some of the largest in the country, have faced profound financial consequences. Petrobras, which in 2014 accounted for approximately 13 per cent of Brazil's gross domestic product, was estimated to have lost at least US\$88 billion by mid-2015. Petrobras and Odebrecht have sold assets worth billions of dollars to pay their debts. Unemployment in Brazil hit a new high in April 2017 at 13.6 per cent, more than (p. 361) double the rate it was in late 2013, prior to the start of Lava Jato. Thus even a well-run organization like BNDES has not been immune to the tempests of political contests and controversies. The current administration under President Jair Bolsonaro has initiated a process of reducing its role in the economy.

13.6 General Policy Considerations

First, the effectiveness of a national development bank depends upon the same factors that make industrial policy effective more generally. It requires a clear set of 'carrot and sticks', and the ability to 'let go of losers' (Amsden, 2001). From this perspective, the focus on simple, objective performance criteria, such as export growth, has been helpful for implementing reciprocal control mechanisms. When successful, national development banks have been able to monitor projects and loans with sectoral experts, many of whom hold PhDs in a wide range of areas. Relying on financial experts alone is insufficient.

Of course, the effective implementation of a reciprocal control mechanism implies that the state has the power and authority to mobilize resources and provide a 'carrot-and-stick' mechanism. Implicit in this is the political power to remove subsidies from powerful economic elites when their infant industries perform poorly. Moreover, if a reciprocal control mechanism is to be financed, the state requires the political power not only to mobilize resources but to ensure that a high proportion of loanable funds in the financial sector are channelled towards long-gestating manufacturing or other high-value investments as well as securing sources of funding for development banking (Woo, 1991; Kapadia, 2016).²⁷

Second, NDBs do not necessarily need to finance all of the venture capital on projects. The experience of East Asian and other economies (such as Germany, and in some instances, Brazil) suggests that policymakers should consider diversified/multiple financing sources by getting endowment funds, donors, domestic banks, and conglomerate groups and foreign firms to co-finance targeted projects. Even when the state privatizes SOEs in strategic sectors, that does not mean it needs to lose control over industrial policy.

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Instead, the state can maintain 'golden shares' in priority projects to maintain state control over strategic decisions, as has been practised in the privatization process overseen by BNDES in Brazil. In fact, according to Musacchio and Lazzarini (2014a, 2014b), (p. 362) the 'state as minority shareholder' model has several advantages. First, it limits the use of SOEs as a conduit for clientelist practices and expensive social policies such as (uneconomic) employment creation. Second, majority private shareholding enhances the incentives for focusing on profitability, which should increase firm efficiency and growth. Third, the state is still in a position, as a significant shareholder, to influence corporate strategy and development policies in strategic sectors. Finally, state holdings provide access to long-run financing, which is underdeveloped and expensive in private Brazilian capital markets. Indeed, in a survey on the re-emergence of state capitalism, *The Economist* (2012b) refers to the 'Leviathan as minority shareholder' model as 'one of the sharpest new tools in the state-capitalist toolbox' (2012b: 5).

Third, and related to the previous point, NDBs need to secure stable sources of funds so that they can act like venture capitalists and 'lenders of first resort'. That is, NDBs 'must be able to strike the right balance between risks and rewards, ensuring that investments are structured across a risk-return spectrum so that lower risk investments help to cover higher risk ones' (Mazzucato and Penna, 2018). The ability to secure long-run bond financing is one main option along with maintaining equity stakes. The latter allows the bank to benefit from the rare successes in order to offset the inevitable failures. Equity shares also help the state more easily monitor the frequent tax evasion strategies of firms who have benefited from NDB financing. There is evidence from mineral and fuel mining that governments retain a higher share of the proceeds from mineral and fuel rents when state equity shares in these sectors are higher (Lundstøl et al., 2013, 2018). This is because state presence on boards of directors makes it harder for companies to evade tax.

Fourth, in order to ensure macroeconomic sustainability in its balance of payments, NDBs should target sectors and projects that generate net foreign exchange earnings. This is particularly the case for growth strategies that rely on the increasing use of foreign savings to finance investment as in, say, contemporary Ethiopia. When plans for NDB financing do not consider the importance of generating net foreign exchange, balance-of-payments crises tend to follow, which can in turn precipitate a growth collapse, even in countries where the NDB is sound in terms of technical capacity (e.g. Brazil, 1982–94).

Fifth, the historical evidence suggests that national development banks have contributed to effective industrial policy through the financing of 'national champions'. This has been achieved through the financing of infrastructure and agricultural research in a range of sectors and heavy industrial projects, particularly in the steel, chemical, electronics, automotive, and mining sectors, aerospace, and capital goods. This financing has been oriented towards public enterprises, but also towards large-scale domestic private conglomerates. The emphasis on financing domestic firms stems from the evidence that the most dynamic and innovative firms in LDCs are not generally subsidiaries of multinationals (Amsden, 2008). This emphasis on vertical industrial policy, or national firm formation, is central to the development of sophisticated and complex production (Amsden, 2001), since

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firms form the focal point through which people with skills and ideas can collaborate and eventually migrate to form new (p. 363) ventures. It is no accident that major industrial clusters, such as Detroit in the 1930s or Silicon Valley in the 1980s, took off from the spin-offs of workers from one lead firm in each case (Hausmann, 2018).

Sixth, effective NDB financing achieves sectoral and firm success when it involves 'targeted ambition'. NDB have unwritten complex missions in aerospace, high-tech agriculture, capital goods, high-speed trains, wind and solar technology, bio-fuels and bio-technology, among others. These missions have worked when they involved funding hundreds or even thousands of PhDs to work in relevant research centres to help firms design and develop the technology for innovative capacity, and when the NDB has collaborated with relevant government agencies (e.g. see Perez-Aleman and Alves, 2016 on Brazilian bio-technology efforts; Figueiredo, 2014 on Brazilian agriculture; Moslener et al., 2018 on Airbus). Albert Hirschman long ago pointed out that 'big push' development projects can overwhelm government capacity. However, he also argued that development is about taking on ambitious projects and developing the capacity to solve problems as they arise in the process of learning and experimentation. NDBs provide a focal point to implement selective industrial policy by providing the patient capital and sectoral expertise to undertake these missions.

Seventh, macroeconomic policy and conditions need to enable the development of private capital markets and long-run government bond markets. While financial deregulation poses many challenges to state intervention and industrial policy, the dramatic increases in the size of the Chinese and German development banks is the result of their credit ratings and ability to issue long-run bonds. In the case of China, the CDB has itself been instrumental in creating bond markets. It is ironic that some of the most orthodox central banks (e.g. Bundesbank in Germany) provide the context through which significant increases in state development banks (e.g. KfW) can grow.

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Notes:

⁽¹⁾ A World Bank survey defines a development bank as 'a bank or financial institution with at least 30 per cent state-owned equity that has been given an explicit legal mandate to reach socio-economic goals in a region, sector, or particular market segment' (De Luna-Martinez and Vicente, 2012: 4). A definition that does not require state ownership to be a necessary condition defines 'development finance institutions' (DFIs) as 'legally independent and government-supported financial institutions with explicit official missions to promote public policy objectives' (Xu et al., 2019: 14–19). See also Xu et al. (2019: 64, table A4) for competing definitions of NDBs.

⁽²⁾ According to Gallagher and Sklar (2016), the level of total assets of national development reached approximately US\$5 trillion in 2015, which is far larger than the level of loans of the multilateral development banks (around US\$1 trillion in the same year).

⁽³⁾ KfW is 'Credit Institute for Reconstruction'.

⁽⁴⁾ By 2015, the five largest development banks in terms of assets (in billions of US dollars) were: (i) China Development Bank (\$1,665); (ii) European Investment Bank (\$624); (iii) German Development Bank (KfW) (\$539); (iv) World Bank (\$276); (v) Brazilian Development Bank (BNDES) (\$238) (Ferraz and Coutinho, 2019: 910, table 1).

⁽⁵⁾ Griffith-Jones et al. (2018) identify five crucial roles for NDBs: (i) counteracting the procyclical behaviour of private financing; (ii) promoting innovation and structural transformation; (iii) enhancing financial inclusion; (iv) supporting the financing of infrastructure investment; and (v) supporting the provision of public goods, including promoting 'green growth'.

⁽⁶⁾ Indeed, from advances such as the Internet and microchips to biotechnology and nanotechnology, many major technological breakthroughs—in both basic research and downstream commercialization—were only made possible by direct public investment willing and able to take risks before the private sector was willing to (Mazzucato, 2015).

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⁽⁷⁾ The soft budget constraint (1979) holds wherever a funding source (such as a bank or government) is unable to keep an enterprise to a fixed budget, that is, whenever the enterprise can extract *ex post* a bigger subsidy or loan than would have been considered efficient *ex ante* (Maskin, 1996: 25). Kornai (1979) analysed how the centralized, socialist economies of Eastern Europe and the Soviet Union were plagued by soft-budget constraints. The term has been applied to explain problems of SOEs in capitalist economies and used as a justification for advocating privatization.

⁽⁸⁾ De Luna-Martinez and Vicente (2012) provide evidence that these banks increased their lending from US\$1.16 trillion to US\$1.58 trillion between 2007 and 2009.

⁽⁹⁾ Growth reversals or collapses in developing economies have frequently been preceded by foreign exchange shortage, marked by urgent pressure to seek increased aid flows to finance immediate imported input requirements and the rising level of external debt (Arizala et al., 2017; Bagnai et al., 2016).

⁽¹⁰⁾ The East Asian economies largely achieved high savings rates through the coercive power of the state, which was deployed through various forms of 'forced savings'. Among the coercive elements were restrictions on consumer credit, financial restraint, mandatory provident pension contributions (used in Singapore and Malaysia), and encouragement of postal savings (Stiglitz and Uy, 1996). Other factors that contributed to high levels of private savings were banking and industrial policies (including entry restrictions) that guaranteed high levels of profitability, capital accumulation, and income growth (Stiglitz and Uy, 1996; Storm, 2015).

⁽¹¹⁾ According to a World Bank survey (De Luna-Martinez and Vicente, 2012: 4), almost three-quarters of NDBs surveyed are 100 per cent state owned, 21 per cent have between 50 and 90 per cent state ownership, and in only 5 per cent do governments have minority ownership.

⁽¹²⁾ On the growth of SOEs in this period, see Musacchio and Lazzarini (2014b). The expansion of SOEs meant that the SOE share of total gross fixed capital formation increased from 13 per cent in 1965 to 29 per cent in 1979 (Frieden, 1991: 107).

⁽¹³⁾ It is well documented that BNDES played a dominant role in deploying subsidized long-run credit in this period (see Barros de Castro, 2009; Tavares de Araujo, Jr., 2013; Colby, 2013). In the period 1952 to 1961, between 80 and 90 per cent of all lending went to the public sector. In 1962 to 1971, the private sector received an average of 66 per cent of all lending, rising to an average of approximately 75 per cent of all loans going to the private sector in the period 1972 to 1977 (Colby, 2012: 164), mostly in intermediate and capital goods.

⁽¹⁴⁾ In 2007–14, loan disbursements increased from R\$96 billion to R\$188 billion at constant prices, a growth of 96 per cent in real terms (UNCTAD, 2016: 12).

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⁽¹⁵⁾ In the latter case, and in particular the case of Petrobras, the state has anchored much of its industrial policy around developing linkages from large offshore oil finds into shipbuilding, construction, and deep-sea oil exploration equipment. During this period, Petrobras set in motion a US\$237 billion investment programme for these projects.

⁽¹⁶⁾ The value of loans disbursed by BNDES in 2010 was more than three times the total amount provided by the World Bank in 2010 (Musacchio and Lazzarini, 2014b: 30) and still twice that amount in 2014 (Torres and Zeidan, 2016: 101). Between 2009 and 2016, subsidies from the treasury to BNDES loans totalled US\$48 billion (*The Economist*, 2 December 2017).

⁽¹⁷⁾ Interview with João Carlos Ferraz, vice-president of BNDES (August 2011).

⁽¹⁸⁾ In historical perspective, there are several features that unite the stories behind the emergence of these innovative firms. First, all of them have their origins as domestic business enterprises. Second, most of these firms come from sectors that have built up substantial productive and managerial capabilities over long periods of time, going back in some cases to the early twentieth century, and have benefited from long periods of protectionism (whether as a result of explicit state strategies or as unintended consequences). Third, all these firms have benefited from state policies, whether in the form of access to long-run, subsidized financing, protectionist policies, state-financed research and development, or public procurement. Fourth, exposure to international markets, and particularly growing through exports, even during the protectionist era, allowed these firms to gather information on the demands of foreign consumers and compelled them to seek out productivity-enhancing innovations to compete in world markets. Fifth, the military played a key role from the Vargas era in the 1930s through the 1970s in creating a discourse around the development of 'strategic' sectors, beginning with the steel industry, but also in oil and gas, and aerospace. This discourse not only helped governance focal points emerge around such sectors but also provided continuity of funding even in times of macroeconomic crisis and distress as well as providing research clusters and long-run financing facilities and using SOEs as focal points to train and attract scientists and engineers. This is most evident in the case of Embraer (the world's third-largest aerospace company).

⁽¹⁹⁾ By 2009, agricultural production in Brazil ranked first in the world in coffee, orange juice, and beef; it ranked second in soybeans; third in chickens; fourth in corn and pork; and fifth in cotton (Nassar, 2009). By 2012, the yields for Brazil's main crops (sugarcane, corn, cotton, soybeans, and wheat) reached levels similar to those of developed economies (Elstrodt et al., 2014: 49–50; agricultural productivity growth has been among the fastest in the world since 2000 (Arias et al., 2017: 4–8). Brazil is also a world leader in mining (e.g. Vale is the world's second-largest mining company and Petrobras is a leading oil company and a producer of sophisticated deep-sea oil exploration equipment) (Brainard and Martinez-Diaz, 2009).

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⁽²⁰⁾ Manufacturing growth in the period 1950 to 1980 averaged nearly 8 per cent per year but averaged around 2 per cent per year in the post-1990 period. According to Aldrichi and Colistete (2013), while average annual manufacturing labour productivity grew at 5.8 per cent in the period 1945 to 1980, it declined to 2.1 per cent in the period 1980 to 1990 and then collapsed to minus 0.5 per cent in the period 1995 to 2009.

⁽²¹⁾ Despite its rapid industrial catch-up, Brazil's share in world market exports was to decline from 2.9 per cent in 1950 to 1.1 per cent in 1960, and would remain at that share through 1970 (Bulmer-Thomas, 1994: 271).

⁽²²⁾ The 'big push' strategy of PNDII development plan did not generate the net foreign exchange to finance debt payments in the 1980s, something East Asian economies were able to accomplish. The country's foreign debt (in constant 1982 dollars) grew from US\$9.2 billion in 1967 to US\$27.8 billion in 1973 and further increased to US\$43.3 billion in 1979, which represented two and a half times the value of the country's exports (Malan and Bonelli, 1992: 85).

⁽²³⁾ In the new model, the guarantee of government credibility became a requirement of the international market, and the liberalization that saw the opening up of the economy commercially and financially served, together with privatization, to guarantee the Brazilian government a supply of liquidity (Afonso et al., 2016).

⁽²⁴⁾ There are numerous examples (*The Economist*, 2013: 4). In 2012, 'cost of doing business' surveys indicate that exporting costs US\$2,215 per container in Brazil compared with an average of US\$1,197 in the rest of Latin America, and US\$1,029 in the United States. To take another example, the cost of electricity for industrial users in Brazil is the third highest in the world—about twice those of China and Korea, and two and a half times that of the United States (*The Economist*, 2012a).

⁽²⁵⁾ The real wage (deflated by domestic prices), while rising slightly in the period 1995 to 1998, has generally stagnated in the period 1998 to 2009 (Aldrichi and Colistete, 2013: 37, figure 11).

⁽²⁶⁾ In the period 2008 to 2010, about US\$16 billion was channelled to the food industry, and US\$30 billion to Petrobras (Tavares de Araujo, Jr., 2013: 11). By 2009 Petrobras became by far the largest borrower, with almost 40 per cent of total loans held by listed corporations (Musacchio and Lazzarini, 2014b: 31–2). From 2007 to 2016, BNDES subsidized loans increased five-fold, reaching R\$867 billion (US\$262 billion) (Leahy and Schipani, 2017). The main beneficiaries included Odebrecht (the country's largest engineering and construction firm); Petrobras (the state oil company which accounts for 10 per cent of GDP); Embraer (the world's third-largest commercial jet builder); Ambev (the Brazilian arm of the world's largest brewer, ABInBev); and JBS (the world's largest meat packer) (Leahy and Schipani, 2017).

⁽²⁷⁾ As Woo-Cummings (1999: 10), notes: 'finance is the tie that binds the state to the industrialists in the developmental state.' Theda Skocpol (as quoted in Woo-Cummings,

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1999: 11) further adds that '[t]he answers [to questions about financial resources] provide the best possible general insight into the direct or indirect leverage a state is likely to have for realizing any sort of goal it may pursue. For a state's means of raising and deploying financial resources tell us more than could any other single factor about its existing (and its immediately potential) capacities to create or strengthen state organizations, to employ personnel, to co-opt political support, to subsidize economic enterprises, and to fund social programs.'

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