

Mission-oriented development banks: the case of KfW and BNDES

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Mission-oriented development banks: the case of KfW and BNDES

Mariana Mazzucato and Laurie Macfarlane

Abstract:

There is an urgent need for channelling long-term finance towards addressing major social, environmental, and economic challenges. The paper argues that state investment banks (SIBs) can play a crucial role in mobilizing the needed capital, and that they can most effectively do so when structured and governed to play a 'mission-oriented' role. We provide an empirical account of two SIBs that have played an active mission-oriented role in their respective economies: Germany's KfW and Brazil's BNDES. We reflect on these empirical findings and identify key institutional characteristics that have enabled them to play this role, including challenge-led mandates, use of progressive conditionalities, stable sources of finance, diverse in-house expertise, and robust governance structures. The paper concludes with a discussion on how mission-oriented SIBs can be complemented by wider reforms to the global financial system.

Keywords:

State investment banks, green finance, patient finance, mission-oriented policy, innovation

Introduction

The 21st century is becoming increasingly defined by the need to respond to major social, environmental, and economic challenges. Sometimes referred to as “grand challenges,” these include environmental threats like climate change, demographic, health and well-being concerns, and the difficulties of generating sustainable and inclusive growth.

In response to these challenges, an increasing number of countries across the globe are embracing industrial policy. The European Union (EU), for example, is investing over EUR 2 trillion in economic recovery and transformation while U.S. President Joe Biden has set aside over USD 2 trillion for a “modern American industrial strategy”. At the international level, the UN’s 17 Sustainable Development Goals (SDGs) act as globally agreed grand challenges. Meeting these goals require governments and businesses to prioritize investment-driven growth that is both inclusive and sustainable. However, the Sustainable Development Report 2023 shows that of the roughly 140 Targets only about 15 per cent are on track (UN, 2023a). Recent studies estimate that the SDG financing gap has widened from \$2.5 trillion before the COVID-19 pandemic to an estimated \$3.9–7 trillion annually today (Zhan and Santos-Paulino, 2021; High-Level Advisory Board on Effective Multilateralism, 2023). As such, tackling 21st century challenges must involve transforming the structure of the financial system.

Finance is not neutral; the type of finance available can affect both the investments made and the type of activity that occurs (O’Sullivan 2004; Mazzucato 2013). Contrary to the idea that money merely facilitates exchanges without affecting the real economy (Modigliani and Miller, 1958), different financial instruments and institutions shape economic activities (Spence, 2021). Short-termism and risk-aversion means that the private sector will often not invest in higher-risk areas until future returns become more certain. Given the uncertainty and long-term aspect of innovation, financing for it must be both tolerant of high risk and focused on the long-run not the short-run (Lazonick and Mazzucato, 2013). Since innovation is a collective effort, it requires diverse forms of financing from both public and private entities, and both risks and rewards socialized.

Across the world, the early stages of the innovation chain are disproportionately occupied by public sector actors. This early-stage public investment helps to create and shape new markets, nurturing new landscapes which the private sector can develop further (Block and Keller 2011). In countries that have achieved smart, innovation-led growth, the state has often supplied the patient strategic finance that the private sector was unwilling to provide (Mazzucato, 2013b). In Korea, Taiwan, and Singapore—countries that made the leap to development in the 1970s and 80s – an active, visible hand allowed them to “kick away the ladder” (Reinert, 2019; Chang, 2002). In these places, the state has not just sought to fix market failures but has acted boldly to create new technological and industrial landscapes by acting as investor of first resort, not simply as lender of last resort. Equally, the most advanced and successful capitalist economies, even with a powerful private financial sector and banks, have had active states that made risky investments, contributing to the advancement of general-purpose technologies (GPTs). This includes the development of the Internet, the nanotechnology sector, the biotechnology sector, and the emerging clean-tech sector (Block and Keller, 2011; Sampat, 2012). Rather than just fixing market failures, public investments shaped and co-created the markets, helping to crowd-in private investment (Mazzucato, 2016).

Public finance presents the possibility to change the rules of the game on the relationship between public and private sectors. First, rather than market fixing, the objective should be market shaping to help direct economic growth so that it is more inclusive and sustainable. Second, by focussing not just on ‘financing gaps’ but on the quality of finance, finance can become more patient, long term, committed and outcomes oriented. Third, by focussing on

outcomes rather than just key sectors or types of firms to fund (e.g. SMEs), a more symbiotic relationship between public and private actors can be built, though the use of dynamic conditionalities around the access to finance. Conditions that are not about 'levelling the playing field' but help make sure that the private actors receiving the funds are playing the right game, e.g. paying workers well, improving working conditions, investing in greening supply chains and not becoming overly financialized (e.g. reinvesting profits into production rather than excessive distribution to shareholders).

This patient, strategic finance can take different institutional forms, but in many countries patient strategic finance is increasingly coming from state investment banks (SIBs), or development banks¹. The remainder of this chapter looks at how SIBs can become more market shaping, outcomes oriented, and build conditionalities into public-private relationships. After focussing on the emergence of dynamic SIBs in modern capitalism, we focus on two particular ones: KfW in Germany and Bndes in Brazil.

State investment banks in the 21st century

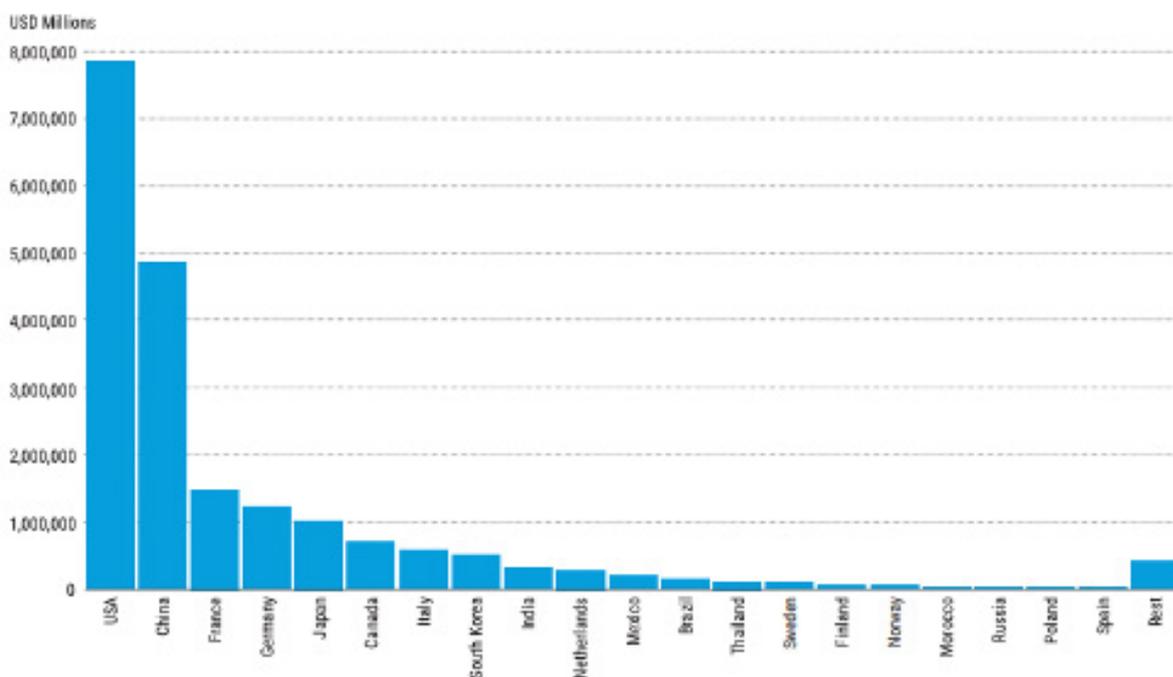
SIBs can be defined as publicly owned entities that have a mandate to pursue socio-economic goals in a defined geographical area, sector or market segment through the use of repayable financial instruments. Modern SIBs have their historical roots in the reconstruction plans for Europe following the Second World War. The aim was to create institutions that promoted financial stability through a flow of patient finance to fund the post-war reconstruction, and avoid the destabilising effects that speculative private finance could have on the economic recovery (World Bank 2015). In subsequent decades, many regional, national, or subnational SIBs were created, with a diverse set of operational focus and roles (see Mazzucato and Penna 2016). However, this momentum stalled in the 1980s when development banks were criticised in the context of the prevailing free-market-oriented consensus.

In recent years however, the world has witnessed a renaissance of SIBs (Figure 2), at both the international and national levels (Mazzucato, 2023a). A recent survey identified at least 500 state investment banks worldwide: 90% are classified as national SIBs, and 10% as multilateral development banks (MDBs).² As of June 2023, SIBs manage total assets (AuM) valued at around \$20.2 trillion. Over 70% of these assets are controlled by just five countries: the US, China, France, Germany, and Japan (Figure 1). However, this figure is based on data from only 58% of SIBs, suggesting that the actual total might be higher.

1 The terms 'development bank' and 'state investment bank' are often used interchangeably. However, we prefer the later expression, to differentiate from 'development finance institutions', which are active in developing countries (e.g. providing aid). SIBs are active both in the developing and developed world.

2 The remainder of this paper focuses on the role of national SIBs.

Figure 1: State investment banks' assets under management as of 2021. USD million (Total USD 20.2tn)



Source: Mazzucato (2023a)

Recent studies have shown how the conventional market failure justification for SIBs fails to capture the active ‘mission-oriented’ role that some banks are playing in shaping and creating markets, not just fixing them (Mazzucato and Penna, 2016). Internationally, there is mounting evidence that patient finance for mission-oriented investments have come from SIBs. In these countries, mission-driven SIBs have helped to create new technologies, firms and sectors – all of which have helped to address a key societal challenge. As an increasing number of countries across the globe embrace industrial strategy, it is clear that SIBs – with large balance sheets in many countries – can play an important role in addressing key challenges such as climate change. At present however, many SIBs around the world are not sufficiently mission-oriented, and instead remain locked in the market-fixing paradigm. As such, they are not optimized for achieving climate and other key goals. Reorienting the design and governance of SIBs towards a mission-oriented approach therefore has the potential to help countries overcome the key challenges of the twenty-first century.

But what is it that enables some SIBs to play a mission-oriented role? Understanding how mission-oriented banks operate – what works, what does not – requires learning from international experiences. As such, this paper provides an empirical account of two SIBs that have played an active mission-oriented role in their respective economies, and seeks to identify the key institutional characteristics that enabled them to play this role.

The rest of the paper is structured as follows. Section 3 contrasts the mission-oriented role of SIBs against the standard ‘market failure’ perspective; Section 4 examines the mission-oriented roles played by our two case study SIBs; and Section 5 identifies key design features that can help unlock the potential of SIBs. Section 6 concludes by discussing how scaling up SIBs can be complimented by wider reforms to definancialise global finance.

Figure 2: SIBs in the 21st century

Historically, SIBs were predominantly focused on capital-intensive projects, such as infrastructure. However, in recent times, there has been a shift. They are now increasingly channelling funds towards sustainable development. At a time when countries are failing to meet the Sustainable Development Goals (SDGs), and in the context of widening global fragmentation and regionalization, the need for SIBs to play a more strategic and aligned role has been highlighted (UN 2023b; 2023c). The challenge-orientation can not only promote economic development but also address critical challenges like climate change, health disparities, and the digital divide. SIBs play a critical role in providing patient long-term finance to tackle socio-economic challenges, supporting projects that traditional financiers shy away from.

Source: Adopted from Mazzucato (2023a)

From market fixing to market shaping: the rise of mission-oriented SIBs

The traditional perspective on what SIBs aim to do is based on the 'market failure' perspective. Market failures are 'imperfections' in the price system that prevent markets from efficiently allocating resources (Samuelson and Nordhaus 2009 [1948]). Under specific conditions, markets are efficient allocators of resources in a 'Pareto' sense: no other allocation will make a consumer or producer better off without making someone else worse off (Arrow 1951; Debreu 1959).

Market failures have different types of sources, which can be typified into four broad categories (Ledyard 2008): (1) negative externalities, e.g. air pollution or climate change, for which there is no market; (2) public goods (positive/network externalities), e.g. clean air or knowledge, for which there is no market and/or no equilibrium price (Stiglitz 1989); (3) information asymmetries, e.g. bad vs good borrowers, which result in a non-equilibrium situation (Stiglitz and Weiss 1981); and (4) non-competitive behaviours, e.g. monopolies or monopsonies, where competition is limited.

Based on the notion of market failures, SIBs would, for example, provide finance for investments that internalize the costs associated with 'negative externalities' or that develop 'public goods' to address societal challenges, by subsidizing key infrastructural projects (Mazzucato, 2023b). However, market failure theory provides only a partial and limited justification for what SIBs do; and it does not explain historical and contemporary developments (Mazzucato 2016). As modern capitalism has become increasingly 'financialized', with a focus on short-run profits rather than long-run development, the financial sector has become more speculative ('short-termist') and disconnected from the real economy (Kay 2012). Companies in the real economy itself have also become financialized (Krippner 2005; Dore 2008). In this sense, lack of finance for capital development and innovation is not a problem of coordination of expectations and risk-taking (as conceptualized by market failure theory), but is due to a long-term financialization process that has taken place in the capitalist world since the early 1970s, which Minsky referred to as the rise of 'Money Manager Capitalism' (1996).

Market failure theory also ignores and fails to explain the role that the active hand of the state plays in shaping and creating markets – not just 'fixing' their failures (Burlamaqui 2012). Karl

Polanyi's historical work showed that '[t]he road to the free market was opened and kept open by an enormous increase in continuous, centrally organized and controlled interventionism' (Polanyi 2001 [1944]: 144). Polanyi described how the state created the conditions for the emergence of a market-based economy, revealing that the 'state vs market' dichotomy is artificial and a myth, because the most capitalist of all markets, i.e. the national market, was 'pushed' into existence through the very actions of the visible hand of the state (Mazzucato 2013a).

Evidence shows that in the most economically successful and innovative countries, public policies go beyond fixing market failures. In particular, in creating specific technologies and in some cases whole sectors, state investments have not been relegated to only funding 'basic research' (something advocated by market failure theorists); they were the engine behind economic development and industrialization (Wade 1990; Amsden 2001; Chang 2002). The market failure framework does not capture how in countries that have been successful in achieving 'smart' (innovation-led) growth, the breadth of such public investments has (always) been driven by broad 'mission-oriented' justifications (Ergas 1987; Mowery 2010; Foray et al. 2012), such as those that drove investments by the National Aeronautics and Space Administration (NASA), DARPA, and the National Institutes of Health, all of which have gone beyond simply funding public goods like research. In fact, mission-oriented policies represent a type of governmental intervention that shifts economic priorities and bias allocation of resources in the economy towards visionary non-existing areas, creating new technologies, industries, sectors, and, ultimately, new markets (Mazzucato & Penna 2016a).

Internationally, there is mounting evidence that patient finance for mission-oriented investments – in countries like Germany, China, and Brazil – have come from SIBs (Schäfer et al. 2004; Fried et al. 2012; Schapiro 2012; Sanderson and Forsythe 2013). Since 2007, it has been "the development banks [that] have made significant project finance contributions to renewable energy projects across the world" (Fried et al. 2012: 5). Indeed, in the context of financialization and pursuit of short-run returns, SIBs are becoming important not only for 'countercyclical' lending or funding catching-up strategies (though both are still crucial), but also for funding the uncertain world of innovation.

Starting with a discussion of market failure theory's rationales and justifications for these roles, Mazzucato and Penna (2016) developed a theoretically-informed typology of the roles played by SIBs, drawing on concepts and insights from heterodox political economy:

- **Countercyclical role:** From a market failure perspective, this role is an attempt to correct for 'coordination failures': when agents are unable to coordinate their expectations and preferences throughout the business cycle so that markets do not reach an equilibrium – supply does not match demand, workers do not find employment, and savings do not get invested. Promoting financial stability through a permanent flow of funding in order to prevent the deleterious effects that speculative, pro-cyclical private financial sector could have on the economy is one of the original roles conceived for modern public development banks, which were created before market failure theory was formalized. The business cycles of capitalist economies lead to periods of economic prosperity that are followed by periods of recession or crisis (Perez 2002; Schumpeter 1939). It is in the times of crisis that SIBs supply countercyclical finance that would otherwise be in shortage due to the higher risk-aversion of private financial institutions. The issue is compounded by the financialization process of the past 50 years, which exacerbated the swings of business cycles. The business cycle problem is therefore one not only about the risk aversion and the failure to coordinate investors' preferences but also about processes of financialisation and speculation. Thus, in playing their countercyclical role, SIBs direct finance to productive opportunities throughout the business cycle. In this sense, this role provides also a basis

for the others, underpinning investments in the capital development of the economy and the full utilisation of resources, the establishment of new technologies and sectors, and the direction of techno-economic change through mission-oriented investments.

- **Capital development role:** Investment in long term industrial development or infrastructure projects is the other original role of modern SIBs. The market failure perspective justifies this role due to the lack of incentives for private investors to finance projects with 'public good' characteristics (non-excludable and non-rival) or that lead to positive externalities. The existence of such a market failures would call for public intervention (such as investments) to correct it. As such, the capital development role of SIBs includes investments in knowledge development and infrastructure (both with public goods characteristics), as well as coordinating socioeconomic development initiatives and fostering synergies amongst industrial sectors. Due to its broad focus on such activities, the developmental role also underlies or overlaps with the venture capitalist and the mission-oriented roles, which thus represent a particular type of capital development.
- **Venture capitalist role:** Mazzucato and Penna (2016) conceptualised the venture capitalist role of SIBs by directly drawing on Minsky's proposal for community development banks, which he saw as a way to promote the inclusion and development of individuals, firms and communities that were otherwise excluded from the financial system (Minsky et al. 1993). Because the private sector often fails to provide finance for individual entrepreneurs or high-tech start-ups, SIBs have stepped in and increasingly provided venture capital. Such actions are related to information asymmetries and adverse selection (i.e., market failures), but also to a recognition of the importance of financial inclusion and financial entrepreneurship. The challenge in playing this VC role is not so much to provide abundant finance to all small ventures or entrepreneurs but to find and nurture the so-called 'gazelles' (Birch & Medoff 1994) – that is, young, high-tech firms that often happen to be small or medium enterprises. This requires social capital (sometimes networking and co-management) as much as financial capital. Another challenge for SIBs acting as venture capitalists is how to deal with techno-economic risks and uncertainties when they invest in innovation, which is a venture surmounted by fundamental uncertainty (no one knows the chances of success). Because innovation takes a long time to develop, and most attempts end in failure, patient, long-term, committed finance is required. The venture capitalist role often provides a basis for mission-oriented investments, particularly when SIBs seek to promote radical innovations that address societal challenges.
- **Mission-oriented role:** In some countries, SIBs have increasingly been dedicating their resources to investments that aim to address a societal challenge. In market failure theory, societal challenges are seen as 'negative externalities': they impose a cost to society that is not accounted for by markets and reflected in prices. Thus, in order to address these problems, public policies should simply aim to internalize those costs. However, such a view is limited in its ability to explain what SIBs do to help addressing societal challenges. Research on mission-oriented initiatives can help us develop an alternative and complementary conceptualisation of this systemic role performed by SIBs. In performing this role, SIBs go beyond addressing a market failure in order to internalise costs – instead they help to make things happen that otherwise would not, as Keynes called for the state to do (Keynes 1926). More importantly, they pave the way for what Polanyi (2001 [1944]) called a 'Great Transformation'. Polanyi showed that capitalist markets are deeply embedded in social and political institutions, rendering the usual static state vs. market juxtaposition meaningless. In their mission-oriented role, SIBs aim at shaping and creating new technologies, firms and sectors, and, ultimately, markets – all of which will help to address a societal challenge.

The first three roles of SIBs have been reasonably well documented and explained by market failure theory. This paper therefore focuses on the fourth role, where research undertaken so far has been mostly conceptual.

While in theory SIBs have characteristics and serve functions that follow a market shaping logic, in practice they do not. For example, when it comes to tackling the Sustainable Development Goals (SDGs), public development banks still only see their role as filling a SDG financing gap – which currently stands at \$3.8-7 trillion – instead of ambitiously directing finance to shape and co-create markets that can help tackle global challenges (High-Level Advisory Board on Effective Multilateralism, 2023). How this finance is used matters because globally public development banks, including multilateral development banks (MDBs) and SIBs, have a huge amount of assets under management. The total assets held by the 526 public development banks and development finance institutions globally amounts to no less than \$22.5 trillion, of which \$20.2 trillion is held by SIBs, and \$2.2 trillion is held by MDBs (UN, 2023a; Xu et al., 2023). But this money is wasted if the public development banks do not work together in a more strategic, aligned, and outcomes-oriented way.

Mission-oriented finance can help stimulate a multiplier effect by crowding in private sector investment (Mazzucato, 2023). Indeed, if an MDB (e.g. the African Development Bank) lends in a mission-oriented way to a national SIB (e.g. the public bank in Nigeria), and if in turn the SIB lends to the private sector with conditions attached linked to transformational change (e.g. as in the example of KfW lending to steel companies conditional on material reduction), then a multiplier effect can result which goes way beyond the total funds in MDBs. Far from seeing their role as filling a financing gap, in this scenario the public development banks are working together with a clear mission, purpose, and direction.

Case studies: KfW and BNDES

The institutional design of SIBs varies significantly between countries, as does as the political characteristics and the economic environments in which they act. The roles performed by SIBs, and their investment activities, also evolve over time in line with country-specific developments and challenges, as well as the wider institutional landscape.

In this section, we provide an empirical account of two case study SIBs that play an active mission-oriented role in their respective economies. We review how different institutional characteristics such as mandates, investment activities, governance structures, funding instruments and financing arrangements have affected their ability to play a mission-oriented role.

The two case study SIBs examined in this paper are:

- **KfW:** KfW, formerly KfW Bankengruppe (banking group) is a German public bank based in Frankfurt. Its name originally comes from Kreditanstalt für Wiederaufbau ('Reconstruction Credit Institute') and was established in 1948 after the Second World War as part of the 'Marshall Plan' to support post-war reconstruction. Since then the development of KfW Group has been closely connected to the economic development of the Federal Republic of Germany. Today its activities include SME support, export promotion, environmental protection, innovation and international development. In recent years KfW has been critical in supporting Germany's economic transformation to a green economy, both in terms of supply (through the support of green technology firms) as well as demand (through the financing of solar and wind power). In total KfW has provided more than one trillion euros in

loans over nearly seven decades (KfW n.d.). With total assets of EUR 546.4 billion in 2020, KfW has long stood strong as the world's second biggest national development bank and Germany's third largest bank.

- **Banco Nacional de Desenvolvimento Econômico e Social (BNDES):** BNDES is a Brazilian bank founded in 1952 to finance the construction of key infrastructure projects, expand industry and assist with the mechanisation of agriculture in Brazil. Although initially established to finance Brazil's catch-up strategies, over the course of the bank's history its operations have evolved in line with the Brazil's socio-economic challenges. BNDES' activities now include support for exports, technological innovation, sustainable socio-environmental development and the modernization of public administration. In recent decades, BNDES has had a catalytic role in promoting transformational investments in different phases of Brazil's development. In 2020 BNDES held R\$1,737 billion of assets (\$348 billion) and employed nearly 3,000 people.

These banks have been selected because they have existed for a similar length of time, and have both played important mission-oriented roles. In addition, they have both developed tools such to stimulate new firm creation in high-risk areas, thus creating and shaping markets, not just fixing them. Furthermore, recent political events landscape in Brazil have changed the scale and scope of BNDES's operations, which provides an opportunity to explore how changes in institutional characteristics can affect an SIB's economic role.

KfW

After being established KfW initially channelled investment in the housing, agricultural, power, and heavy industrial sectors in order to aid the reconstruction of post-war Germany. Beginning in the 1960s, KfW assumed more global responsibilities, and began providing financing for foreign investments to secure primary commodities for German manufacturers as well as for international development aid projects. The KfW also began emphasizing SME financing, education, and more advanced industrial projects.

In recent decades however, KfW has expanded its activities into other areas such as housing efficiency projects and student loans, and has been instrumental in the reconfiguration of the German economy towards innovation and green technology.

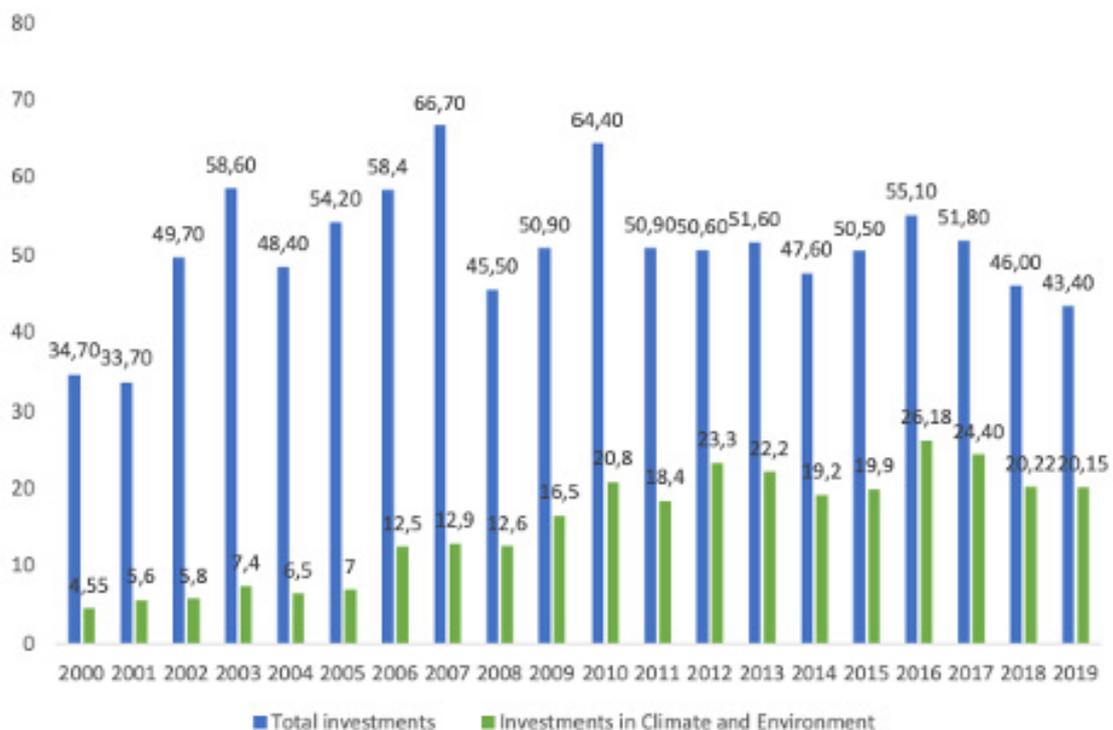
Today KfW's lending and promotional activities are focused on three pre-established missions, or 'megatrends':

- **Climate change and the environment:** KfW finances measures to support renewable energies, improve energy efficiency, safeguard biodiversity and prevent and/or reduce environmental pollution. To address the special importance of this megatrend, KfW has set an environmental commitment ratio of around 35% of total promotional business volume. KfW's history of investing in energy efficiency and environmental protection dates back to the 1970s, but it was in the 2000s that KfW activities in the area accelerated. As will be discussed further below, since 2011 KfW has been played an instrumental role in the systemic greening of the German economy through the Energiewende policy.
- **Globalisation and technological progress:** KfW contributes to strengthening the international competitiveness of German companies by granting loans in the following areas, among others: research and innovation, projects to secure Germany's supply of raw materials, and infrastructure and transport.
- **Demographic change:** KfW's objective is to address the consequences that result from a declining and aging population, including the following focus areas: age-appropriate

infrastructure, vocational and further training, family policy and childcare as well as corporate succession.

This mission-oriented mandate has enabled KfW to go beyond fixing market failures, and play an important market-shaping role in Germany's economy. Perhaps the greatest example of KfW's mission-oriented approach has been the role it played in promoting Germany's *Energiewende* ('energy transition'), which aimed to combat climate change, phase-out nuclear power, improve energy security by substituting imported fossil fuel with renewable sources, and increase energy efficiency. In 2011, KfW announced it would invest 100 billion euros over the following five years to support the innovation in clean technologies and promote the supply of wind and solar energy. By the end of 2011, KfW together with the World Bank was the most important promoter of renewable energies globally and had funded 46 per cent of the newly added electrical output in Germany (KfW, 2012). To further support the innovation in clean technologies, Germany deployed demand-side policies to support economies of scale and boost the export of German renewable technologies to developing countries (Naqvi et al, 2017). KfW's subsidiary for international project and export finance, IPEX, took on a central role in supporting German renewable firms' sales abroad. Over the years, KfW IPEX has become one of the global leaders in financing the deployment of wind and solar energy technologies (KfW IPEX-Bank, 2020). Figure 4 shows the dramatic increase of investments by KfW into environmental and climate protection since 2000.

Figure 3: KfW's domestic total and investments in environmental and climate protection (in € bn)



Conditionalities

A key factor in KfW's mission-oriented role has been the attachment of progressive conditionalities to low-interest loans in order to shape investment and reinvestment behaviours in borrowers. Conditionalities have often been used problematically by multilateral lenders such as the IMF to impose regressive policies on low and middle-income countries, such as limits

on fiscal expenditures or changes in regulations. In the case of KfW however, conditionalities have been attached to loans in return for firms undertaking behavioral changes towards meeting environmental objectives, helping to maximise public value (Mazzucato and Rodrik, 2023). For example, KfW has set out Paris Climate Agreement-compatible guidelines with minimum requirements for their loans. Under these requirements, 95% of financing for steel production technologies is reserved only for transformative technologies that directly contribute to greenhouse gas neutrality, and by 2026, this will rise to 100%. Investments are, for instance, going to technologies aimed at pushing up the recycling quota in steel production.

Another example is KfW's Energy-efficient Refurbishment and New Construction programme. This programme aims to incentivise both residences and businesses to adhere to advanced energy-efficient standards and promote thermally enhanced construction and renovation. This endeavor is further facilitated by KfW's substantial support for Small and Medium Enterprises (SMEs), local communities, and households. Recipients benefit from attractive financial packages during this transition, including low-interest loans, and a structured debt relief system.

For new constructions, KfW offers loans up to EUR 100,000, which come with a preferential interest rate of 0.75% p.a. – notably lower than the long-term rate of 2.68%. Accompanying these loans are extended maturities and flexible repayment terms, such as potential extensions and early repayment options. Upon the completion and subsequent certification of the building, demonstrating adherence to the requisite energy standards, debt relief of up to 25% is granted; the higher the energy efficiency, the greater the relief (KfW, 2022; KfW, 2020). The offerings for retrofitting existing buildings are even more enticing. Recognizing the typically higher costs associated with retrofit activities compared to new constructions, the interest rate on the concessional loans, along with the step-up bonus, is made more attractive. As of 2020, retrofitting a building to the highest energy efficiency category, KfW-55, qualifies for a generous 40% repayment bonus.

To date, KfW has allocated approximately EUR 100 billion to recipients in the form of loans. This generous financial backing has incentivized the construction of buildings to the highest standards, as they promise greater repayment rates. The majority of these loans is taken up by private firms, predominantly channelling about three-quarters of these funds into the erection of new administrative and office buildings. KfW's financial contributions for building construction or retrofitting are restricted to a set amount per dwelling. Consequently, the cumulative investments in construction and modernization surpass KfW's commitments by about threefold. The projects buoyed by KfW have stimulated gross value creation effects nearing EUR 4.6 billion (effect-adjusted: roughly EUR 3.6 billion) (Heinrich, 2020). These value generation impacts correspond to employment ramifications, accounting for around 64,000 full-time positions (effect-adjusted: 51,000).

Moreover, these activities generate substantial returns for the Government. From the Value Added Tax (VAT) alone, with a current rate at 19%, the revenues eclipse the government's budgetary allocation for KfW programs. Factoring in indirect taxes, social contributions, and the reduced unemployment-related expenditures, an external analysis deduced that the Government garners an approximate return of 4 Euros for every Euro allocated from the budget to the Energy Efficient Construction and Retrofit Programme (Heinrich, 2020).

The environmental impact of the programme has also been significant. The annual CO₂ savings, calculated over the lifespan of the buildings financed within a single year, approximate 700,000 tons p.a., constituting 0.33% of the German building sector's total CO₂ emissions annually (Schroder et al 2011). Given the durability of energy-efficient buildings (typically 30 years and beyond), the cumulative carbon savings from the program since its inception in 2006 surpass 9 million tons p.a. Collectively, the enhancements in building standards via the KfW Program have

considerably bolstered Germany's national CO2 mitigation objectives.

In addition to its funding programmes, the KfW also provides support in the form of technical assistance. KfW's mandate establishes that KfW shall provide 'advisory services and the implementation of promotional measures in the field of technical progress and innovations' for the promotional areas of (a) SMEs, liberal professionals and start-ups and (b) risk capital (Mazzucato and Penna 2015). In practice, this means that KfW performs a coordinating role in the German system of innovation. This is particularly visible in Germany's Energiewende programme, in which KfW engages in non-financial activities such as lobbying, networking, information and consulting (Gumb 2012). These service-side measures also include training of external consultants in energy efficiency, which is a pre-requisite for being listed in KfW's energy efficiency expert database (a network of experienced consultants that is available for firms willing to invest in energy efficiency).

An important feature of KfW's operating model is breadth of expertise contained within its staff. In addition to staff with substantive financial expertise, KfW also employs experts with specific knowledge in areas such as agriculture, energy, transport, water, natural resources, and civil engineering. This differentiates KfW from the private banking sector, and means it can base investment decisions on a wider set of criteria than relying on market signals alone and assess the potential of firms and projects more robustly. It also enhances the ability of the KfW to crowd-in private investment, as KfW's endorsement of a project acts as a rubber stamp which gives private sector actors confidence to invest.

The KfW's in-house technical expertise also allows it to serve as an important conduit between the private sector and government policy (Moslener et al, 2017). With its staff of technical experts, the KfW is well placed to provide objective advice to the government on the best way to achieve desired policy outcomes. This close operational relationship between the KfW and the German government creates a powerful synergy which means that policy, regulation and financing can be simultaneously coordinated for maximal societal benefit impact. In practice KfW has often complimented new government regulations (e.g. environmental regulations), with new financing instruments in order to transmit policy objectives more efficiently. This has been instrumental to the systemic greening of Germany's economy. By financing both the supply side (through the support of green technology firms) and the demand side (through the financing of solar and wind power) the KfW has been a key driving force behind the German government's Energiewende policy (Moslener et al, 2017).

In terms of governance, KfW Group is 80% owned by the Federal Republic of Germany, with the remaining 20% owned by the German Federal States or 'Länder'. KfW operates as an independent entity on a commercial basis. KfW has two key governing bodies. The Board of Supervisory Directors is responsible for the supervision of bank's conduct, the appointment and dismissal of members of the Executive Board, the approval of the financial statements as well as the planning and selection of the auditor. It comprises a mixture of political representatives, including seven federal ministers and 14 members appointed by the Bundesrat and the Bundestag; as well as representatives from Germany's financial sector, municipalities, trade bodies and trade unions. (KfW n.d.). The Executive Board is responsible for conducting the KfW's business, administering its assets in accordance with public laws, and implementing resolutions taken by the Board of Supervisory Directors. The members of the Executive Board are appointed and dismissed by the Board of Supervisory Directors and is made up of senior staff, including the chief executive.

With regards to KfW's funding, originally the bank was funded with public resources and support from the United States through the European Reconstruction Program (ERP), commonly known as the 'Marshall Plan'. However, KfW now raises over 90% of its funding on

capital markets (EUR 72.8 billion in 2016) with a small percentage of its funding received from the federal government for reducing interest rates on certain types of loan (e.g. for energy efficiency projects) (KfW 2016). The funding raised on capital markets is diversified across different currencies: the Euro (55%), the US Dollar (34%) and six other international currencies (11%). This reflects the change in KfW's official funding strategy, which became focused on 'repositioning KfW as a European benchmark issuer in the global capital markets' (Naqvi, Henov and Chang 2017).

Since 2014 KfW has also been a major issuer of green bonds. As of July 2023 the bank has an outstanding green bond portfolio of around €60 billion, and in 2022 alone the bank issued EUR 10.6 billion of green bonds in international capital markets (KfW, 2023). To date the majority of green bond proceeds have been allocated towards two lending programmes (KfW, 2022). The first is the "Renewable Energies – Standard" initiative, which promotes projects for the use of renewable energy sources such as wind energy, photovoltaic, hydropower and biogas. The second is the "Energy-efficient Construction" initiative, which promotes projects for the construction of new energy-efficient residential buildings in Germany. Following the revised Green Bond Framework 2022, a third promotional programme called "Clean Transportation" became eligible for green bond proceeds, which offers low-interest financing for pedestrian and cycling infrastructure, climate-friendly passenger and freight transport vehicles, such as local public transport, rail and waterway transport.

KfW also benefits from a direct, explicit and unconditional guarantee from the Federal Republic of Germany, which means that all obligations of KfW in respect of loans extended to and debt securities issued by KfW, fixed forward transactions or options entered into by KfW – are underwritten by the state. This helps ensure that KfW receives the highest possible credit rating from all the major credit rating agencies, even while it engages in the kind of risk-taking taking that a mission-oriented role requires (KfW 2017).

BNDES

BNDES is a 100% state-owned company established under private law. The legal mandate of BNDES is set out in legislation which states that "BNDES is the main instrument to implement and carry out the Federal Government's investment policy, and its foremost purpose is to support programmes, projects, construction and services related to the country's economic and social development" (BNDES n.d.).

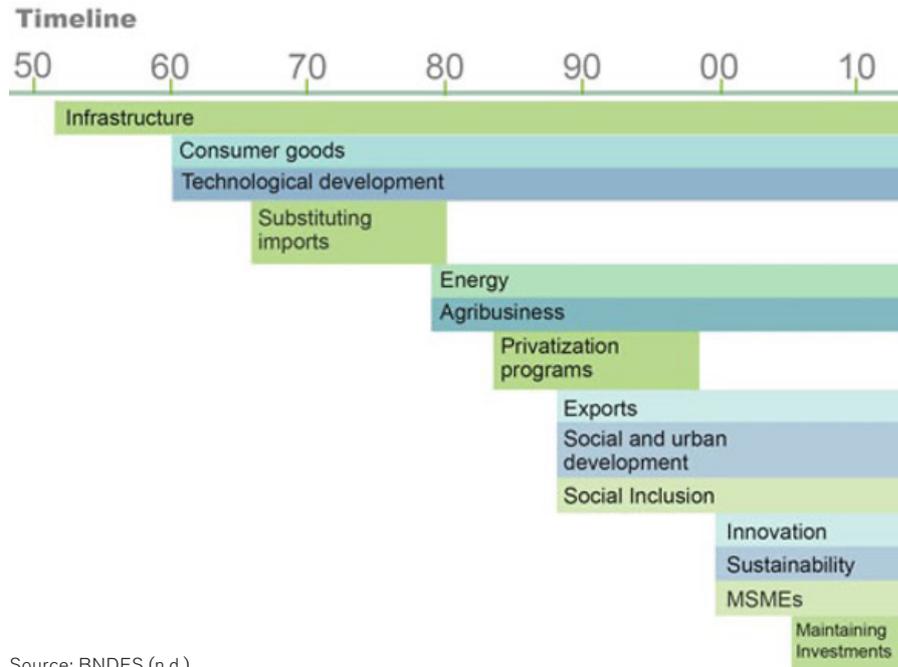
Since its creation in 1952, BNDES has played a key capital development role by financing the construction of key infrastructure projects, expanding industry and assisting with the mechanisation of agriculture in Brazil – all of which have been crucial to Brazil's catch-up strategy. Initially BNDES invested heavily in infrastructure, but beginning in the 1970s the bank expanded into a number of other areas. Notably, the BNDES played a fundamental role in promoting a strategy of import substitution by encouraging Brazilian companies to compete with imported products on the domestic market, and stimulating exports. In the 1980s, support expanded to energy sectors and agribusiness, and integrating social concerns with development policy.

In the 1990s, the BNDES emphasized its role in regional decentralisation through heavier investment in less developed regions in Brazil, as well as support for promoting exports among micro, small and medium-sized companies. Following the Global Financial Crisis BNDES also played a major counter-cyclical role by executing a major stimulus package to offset the effects of the downturn (Studart and Ramos 2017).

In 2008, BNDES established a new mission to "foster sustainable and competitive development in the Brazilian economy, generating employment while reducing social and regional

inequalities.” (BNDES n.d.) As with KfW, this new strategy stipulates that BNDES's investments should be guided by the interrelated themes that represent “the new challenges to be tackled”: innovation; socio-environmental development; and local and regional development, prioritising the less developed regions in Brazil.

Figure 4: Timeline on BNDES' sectoral support



Source: BNDES (n.d.)

In recent decades BNDES has begun to play an important venture capitalist role, creating specific targeted programmes aimed at fostering new technological landscapes and innovative solutions which address key societal challenges. Although some of BNDES's other activities can be viewed as mission-oriented, it is the bank's venture capitalist role has formed the key basis of its mission-oriented role (Studart and Ramos 2017).

The first of these targeted programmes was 'Prosoft', which was established in the 1990s and focused on companies in the software sector (Bastos 2012). Then in the 2000s Prosoft model was then replicated for the pharmaceutical sector in the form of a new programme, 'Profarma'. Profarma was established to contribute to addressing specific issues that damaged the Brazilian state ability to deliver its mission of universal, free and public health care. In order to fulfil the constitutional and legal mission of public, free and universal health care that should include the supply of drugs and other products, it was recognised that Brazil would have to promote and develop its own “health industrial complex” (Gadelha 2003). To tackle these issues, BNDES proposed a series of key goals that were to orient its programme: modernization and expansion of public R&D labs; fabrication of generics by Brazilian firms; production of pharmacochemical inputs; promotion of R&D activities for the development of new products; and supporting mergers and acquisitions between/of small pharmaceutical firms. As such, BNDES's support to the pharmaceutical sector has been conditioned on recipients developing drugs that are readily available to underserved populations.

Since the establishment of Profarma, the evolution of BNDES's programs have closely followed Brazilian government's industrial policy. In particular the Trade, Technology and Industrial Policy plan (2003 to 2007), the Productive Development Policy plan (2008 to 2010) and the Brasil Maior Plan (2011 to 2014) gave increasing emphasis to innovation and strategic sectors including IT, pharmaceuticals and health, oil and gas, defence, aerospace, and renewables. Other

programmes created include FUNTEC, a non-refundable category of finance for technology and innovation which targets strategic sectors (Bastos, 2012), and the CRIATEC investment fund, which supplies seed capital for innovative start-up companies that develop disruptive technologies in high-tech and new sectors, particularly the ICT and biotechnology sectors. In the case of FUNTEC, BNDES fulfils the role of angel investor, making non-repayable grants. However, recipients of funds are required to fulfil their technological mission and establish an intellectual property sharing agreement (Mazzucato and Penna, 2015). BNDES's expectation is that the recipients return to the Bank for a loan repayable once the production of prototypes has been made possible. In contrast, CRIATEC aims to achieve capital gains through long-term investment in early stage companies that have an innovative profile and offer high return prospects (Mazzucato and Penna 2015).

BNDES's strategy of making equity investments in innovative enterprises has established a strong link between risk-sharing and reward-sharing, helping to promote a type of risk–reward nexus that is conducive to the development of the Brazilian economy. The upside gained from successful investments contribute to BNDES's profits, which translate into dividends to the Brazilian Treasury and returns to Brazilian workers' social security funds (FAT). As with KfW, in addition to staff with substantive financial expertise, the BNDES also employs a significant number of engineering experts (BNDES 2016).

The result of this two-decade-long process was the establishment of legal, managerial and institutional capacity inside BNDES, with a set of different types of funding for innovation under four categories (variable and fixed income; variable income; fixed income; and non-refundable resources), which covered an array of tools and programmes (Mazzucato and Penna 2015). The wide variety of products and programs offered by BNDES means that it has been able to invest along the entire innovation chain, from basic and applied research to the early-stage funding of companies. By helping to create new landscapes aimed at tackling societal challenges, BNDES has therefore played a role that is similar to other mission-oriented agencies (Mazzucato 2018).

Since the late 1990s BNDES has also sought to promote environmental sustainability, and since then support for the green economy has dramatically increased. The bank has developed a number of programmes that direct financing towards areas which help address environmental challenges, including renewable energy (biofuel, solar and wind energy), energy efficiency, sustainable transport, and water, forest and waste management (including grants to local communities that protect their natural resources) (Mazzucato and Penna 2015). Between 2003 and 2017, BNDES financed more than 90% of the total investment in wind power generation, according to estimates based on data from Brazilian energy agency ANEEL (Brasil Innovation Lab for Climate Finance, 2017). In 2022, BNDES provided the first loan in Brazil to be certified as 'green' by a verified third party. The bank provided a R\$ 1.3 billion loan to the energy company Neoenergia to finance the construction of more than 1,100 kilometres of transmission lines to support low carbon energy and enhance energy security (Neoenergia, 2022). The loan has been independently certified as aligning with the Green Loan Principles (LPG) – a set of guidelines that provide a framework for clarifying under what circumstances a loan can be considered green across four key categories (i) use of proceeds; (ii) process for project evaluation and selection; (iii) management of proceeds and (iv) reporting (Loan Market Association, 2021).

BNDES has on occasion been criticised on the basis of 'picking winners', 'crowding out' or funding large incumbent companies (Lisboa and Latif 2013; Lazzarini et al. 2015). In contrast however, a study by Carreras (2020) examined the impact of BNDES lending over an eight-year period, and found that companies increased their level of R&D intensity after receiving funding from BNDES. As such, instead of crowding-out private investment, the study identified a clear "crowding-in impact of receiving funding from BNDES on business-funded innovation intensity."

In addition, a study examining the impact of BNDES's Profarma initiative over a ten-year period found that the programme increased beneficiaries' internal R&D expenditures by up to 76%, and total innovation expenditures by up to 59% (Machado et al, 2019).

However, recent political developments in Brazil have led to changes to the scale and scope of BNDES's operations which have constrained mission-oriented role. While critics have long accused BNDES for allowing too much political influence over lending decisions and offering favourable terms to politically connected clients (Lazzarini and Musacchio 2011), the election of Brazilian president Jair Bolsonaro, who took power in January 2019, ushered in a new phase of government interference.

In 2019, four senior BNDES officials were forced to leave their positions to since Bolsonaro's inauguration, including the chief of the bank's environment department (Bloomberg 2019). Most recently, the former BNDES president Joaquim Levy resigned in 2019 after President Bolsonaro threatened to fire him after he appointed Marcos Pinto to head the capital markets unit of BNDES, who once worked for Mr Bolsonaro's political opponents (Financial Times 2019). BNDES is also being forced to sell \$29 billion worth of equity stakes as part of Economy Minister Paulo Guedes's plans to reverse more than a decade of government investments in "national champions" (Reuters 2019). As a result, the capacities and have enabled BNDES to play a mission-oriented venture capital role over recent decades are now being undermined, and a new strategic direction is being imposed on the bank.

How has this been possible? One reason is the bank's governance structures. The most senior governing body of BNDES is the Advisory Board, which is responsible for approving the bank's policies and programmes and signing off financial accounts. BNDES' board is dominated by political representatives, with 90% of appointees being nominated by government ministers and all requiring formal approval by the President of Brazil. Moreover, BNDES's Advisory Board is restricted by statute to only providing guidance ('orientação superior'), while day-to-day management of BNDES is the responsibility of the Board of Directors which consists of the President, the Vice-President and seven Managing Directors, all of which are appointed by the President of Brazil and subject to dismissal at their sole discretion (Frischatak et al 2017; BNDES n.d.). This governance regime has therefore made it possible for governments to regularly interfere with BNDES' policies and operations.

Another area that has caused problems for BNDES is its financing model. Until recently BNDES' main sources of funding were two "quasi-public" funds (known as the PIS-PASEP and the FAT) which are associated with social insurance and workers' safety nets. Small amounts of funding also came from returns of its outstanding loans and equity investments, as well as international borrowing, mainly from multilateral institutions (Frischatak et al 2017).

However, the composition of BNDES' funding has changed dramatically since 2009 after the bank significantly increased disbursements in order to counteract the retrenchment of private financing that followed the Global Financial Crisis. Because BNDES was unable to borrow from capital markets at a pace compatible with the expansion of its loan portfolio, funding became highly dependent on transfers from the National Treasury, which increased from below 10% of total liabilities to more than 50% of the total (Stuart and Ramos, 2017).

After the impeachment of former president Dilma Rousseff in July 2016, a new government was formed which appointed a new leadership team at BNDES and implemented a new strategy. BNDES was asked to make an unanticipated repayment of the money it had borrowed from the National Treasury, starting with a payment of R\$ 100 billion (US\$ 30 billion) in December 2016. This transfer, which comprised of R\$ 40 billion in securities and R\$ 60 billion in cash, was justified by a political desire to reduce Brazil's overall national debt. This early payment was equivalent to 19% of the total amount that BNDES owes the Treasury, and over 120% of the

bank's disbursements in 2016. This lack of stable, low-cost funding has meant that the bank has had to constrain its activities in recent years, which has further undermined its ability to play a dynamic mission-oriented role.

Discussion

The previous sections provided an empirical account of two SIBs that have played a mission-oriented role in their respective economies. It is clear that in these countries mission-driven SIBs have helped to create new technologies, firms or sectors – all of which have helped to address a key societal challenge. As an increasing number of countries across the globe embrace industrial strategy, it is clear that SIBs – with large balance sheets in many countries – can play an important role in providing patient long-term finance to tackle socio-economic challenges, supporting projects that traditional financiers shy away from. At present however, many SIBs around the world are not sufficiently mission-oriented, and instead remain locked in the market-fixing paradigm. Of those that are mission-oriented, not all are equally effective at performing it. Reorienting the design and governance of SIBs towards a successful mission-oriented approach therefore has the potential to help countries overcome the key challenges of the 21st century.

In this section, we reflect on our analysis and identify key institutional characteristics that can help unlock the potential of SIBs, and redirect global finance towards tackling global challenges.

Challenge-led mandate

The overarching mandate of SIBs is critical to the role they play in their economies. Mandates are often set out in law or in articles of association, and often change and evolve over time. Some authors (Gutierrez et al. 2011; Schapiro 2012) have argued that the establishment of a well-defined mandate is key for the effectiveness of a SIB. For Gutierrez et al. (2011), a clearly defined mandate is one that assigns to SIBs a 'gap filling' role, such as closing the funding gap for SMEs; in other words, a mandate justified by a market failure.

While a market failure mandate may be useful in certain circumstances, we consider that this is where SIBs are aiming to support existing techno-economic trajectories provided by markets. It is less useful insofar as there is a need to dynamically create and shape new trajectories and overcome key societal challenges (i.e. to foster economic transformation). This is because markets are 'blind' – that is, incapable of providing a new, qualitatively different direction to economic development. Fixing market failures may influence the rate of change, not the direction of change (Mazzucato, 2014). A market failure focused mandate cannot therefore generate the kind of transformative, catalytic, mission-oriented public investments that in the past created new technologies and sectors which did not exist before (Mazzucato, 2013a).

In contrast, the 'challenge-led' mandates and mission statements deployed by KfW and BNDES signal a desired direction for the economy, and this in turn helps to catalyse investments in areas for which markets do not yet exist, as is common with other mission-oriented agencies (Mazzucato 2018). At a time when governments around the world must make major investments to overcome the broad array of societal and environmental challenges, it seems appropriate that SIBs focus on challenge-led mandates rather than market failures. Mission-oriented mandates can help to transform broad SDG-related challenges, like global health and climate change, into

investment pathways where strong publicly set goals mobilize coordinated action around shared

challenges.

Both KfW and BNDES do this by offering instruments that direct financing towards specific areas which help address key societal challenges. These programmes offer loans to customers which meet certain criteria, often with concessional financing terms. While SIBs are often criticised on the basis of 'crowding out' private investment, it is clear that both KfW and BNDES have played a key role creating and shaping new markets, crowding in private investment and generating additionality (i.e. making investments happen that would otherwise not have). This is consistent with other evidence has shown a greater multiplier for investments guided by mission-oriented policies responding to grand socio-economic and environmental challenges (Deleidi and Mazzucato, 2019).

While there may be some instances where the 'crowding out' criticism of SIBs is merited, a key problem lies in the absence of monitoring and evaluation frameworks which adequately capture the dynamic outcomes of mission-oriented investments and the additionality they generate. As a result, new monitoring and evaluation frameworks may be required in order to fully capture the multiplier effect and crowding in potential of mission-oriented investments (Mazzucato and Rodrik, 2023).

Progressive conditionalities

Conditionalities are most prominently – and often problematically – associated with interactions between multilateral or bilateral donors and international financial institutions, and the governments of low and middle-income countries. The donor or lender requests recipient governments to undertake specific policy changes – limits on fiscal expenditures, changes in regulations, etc. – in return for financial assistance. This has led to the reduction of public investments in many countries, often self-defeating when those investments are required for long-term growth (Alesina and Reich 2018).

However, conditionalities can also be used to maximize the value of public financial support provided to private firms – such as public grants, loans, procurement contracts and guarantees. In exchange for receiving this support, firms are required to undertake behavioral changes towards meeting certain public objectives. As such, progressive conditionalities can be a powerful tool that governments can use to co-shape investment and co-create markets with the private sector, and set a 'reciprocity' relationship between public and private sectors. In this context, conditionalities are about empowering governments, rather than constraining them.

Mazzucato and Rodrik (2023) identify four spheres of company behaviour that progressive conditionalities can be attached to:

- Access: ensuring equitable and affordable access to the resulting products and services (dependent on areas like pricing and intellectual property rights);
- Directionality: directing firms' activities towards socially desirable goals (e.g.net zero);
- Profit-sharing: requiring profitable firms to share returns (e.g. via royalties or equity with government);
- Reinvestment: requiring reinvestment of profits into productive activities (e.g. such as R&D or worker training).

In the context of SIBs, conditionalities play a crucial role. By attaching conditions to loans,

SIB can promote economic transformation by shaping and directing business investment, and incentivising desirable behaviour. In the absence of conditions however, the provision of low-cost finance by SIBs risks subsidising firms to remain inertial. In addition, when public institutions don't only de-risk but take risks through high-risk investments (both direct and indirect), it is inevitable that some investments will be successful, while some will not. As such, conditionalities provide a mechanism for the state to not just cover the downside, but also get a share in the upside (socializing both risks and rewards) (Laplane and Mazzucato, 2020). These state rewards can be monetary, or in the form of wider social, economic and environmental returns.

Both KfW and BNDES have made use of conditionalities to direct firm activities towards socially desirable goals, such as improved energy efficiency standards, greater investment in renewable energy, and the development of new pharmaceuticals for underserved populations. This in turn has generated significant environmental, social and macroeconomic returns in their respective countries. In addition, BNDES's experience shows that SIBs can also learn from portfolio strategies of venture capitalists, ensuring that the upside of investments can be captured and structuring investments across a risk-return spectrum (including through the use of equity stakes) so that lower risk investments help to cover higher risk ones. The profits from successful investments have in turn boosted BNDES's earnings, which in turn benefit the Brazilian Treasury and the social security funds of Brazilian workers.

As industrial strategy experiences a revival globally, there is an opportunity to rethink how SIBs can use conditionalities to achieve more symbiotic and mutualistic public-private partnerships (Mazzucato and Rodrik, 2023). Lessons on how to achieve this can also be drawn from other fields. For example, the US Government's CHIPS and Science Act provides \$52.7 billion for American semiconductor research, development, manufacturing and workforce development. The funding opportunity included conditionalities related to profit-sharing, limiting share buybacks and worker protections. Another example is how COVID relief packages in France, included conditions on companies like Renault and Air France to commit to lowering their carbon emissions. Conditions could be attached regarding the price or design of products that emanate from SIB support, or sharing of intellectual property rights, as the European Investment Bank has explored (Macfarlane and Mazzucato, 2018).

Capabilities and diverse expertise

Structural transformation requires strong and capable governments to steer financial investments in a more strategic and deliberate way. The transition to greener and more resilient economies needs more ambitious and capable states that embrace their role as 'market-shapers'.

A key difference between both SIBs examined in this paper and private banks is breadth of expertise contained within staff. In many cases this includes not only financial expertise but significant in-house engineering and scientific knowledge about the sectors the bank is active in. This allows these SIBs to base investment decisions on a wider set of criteria, and are better placed to appraise social and environmental considerations. This is particularly important for SIBs, who investments are by nature risky and uncertain, and market signals are less reliable. This also means that in some cases SIB staff are drawn on to provide expert advice on government policy design and implementation, as well as financing. Significant in-house expertise can also enhance the ability of the SIBs to crowd-in private investment by acting as a 'hallmark' of quality which gives private investors the confidence to co-invest (Macfarlane and Mazzucato, 2018). In addition, the experience of KfW indicates that providing advisory services such as strategic planning, capacity building, and technical assistance can help to create viable projects and encourage businesses to make investments that otherwise would not happen.

Lessons in this regard can also be learned from mission-oriented organizations like DARPA

and ARPA-E in the US, Yozma in Israel, SITRA in Finland and Vinnova in Sweden. The point is not to copy these organizations, but to learn from key sources of their success. For example, these organizations have explicitly welcomed risk-taking at the organizational level; they have used secondment practices to bring high-level scientists into the civil service for limited time periods; they have often aligned goals with national procurement practices; and they have been extremely good at drawing on the expertise of wider networks (Mazzucato and Macfarlane, 2018).

Robust governance

Governance arrangements are particularly important for SIBs. On the one hand, it is the distinct governance structures of SIBs that enable them to play a fundamentally different role in the economy compared to that of private financial institutions (SIB governance arrangements typically do not create pressure to deliver short-term returns, meaning that they can provide patient financing over a longer time horizon and prioritise wider social and environmental objectives). On the other hand, many of the problems that have commonly been associated with SIBs, such as weak performance, financial problems, unfair competition with the private sector, capture by interest groups, can be attributed to poor governance (Luna-Martinez and Vicente 2012).

Achieving the right balance between political representation and independent decision making is a key challenge for all publicly owned financial institutions, but this is particularly important for mission-oriented SIBs. Both SIBs examined in this paper have a formal duty to support government policy. In the case of KfW, close alignment between the bank and the government has created a powerful synergy between policy, regulation and financing, which have been simultaneously coordinated for maximum impact (Moslener et al, 2017). Although potentially powerful, this relationship is highly dependent on effective governance arrangements to ensure that sound banking principles around maintained and undue political interference is avoided.

While political representation can help to maintain alignment with government policy and maintain a path of democratic accountability, the experience of BNDES suggests that steps should be taken to prevent undue political interference or capture by interest groups (Lazzarini and Musacchio 2011). KfW's experience indicates that including independent, non-political representatives and a wider range of stakeholders such as industrial trade bodies, trade unions and regional representatives may be beneficial as long as mechanisms are in place to make sure that none of these groups ask for special favours but remain objective evaluators.

Stable sources of finance

There are many different ways that SIBs can fund their business operations, including taking savings and deposits from the public, raising money in the domestic or international capital markets, borrowing from other financial institutions, using return on investments, receiving budget allocations from the national Treasury, managing public pension or social security funds, or receiving financing from the central bank.

A key question is whether the source of funding impacts the ability of SIBs to successfully meet their mandates. In this regard, our case studies have identified three key issues. The first is the extent to which sources can provide funding on the scale required. It is clear that some SIBs, such as BNDES, have not been able to access capital markets on the scale required to meet their financing demands, which has led it to seek other sources. The second factor is the extent to which a source of funding is stable on an on-going basis. The experienced of BNDES demonstrates that if a funding source proves to be volatile or unstable, or susceptible to political pressures, then it can seriously impair the ability of the SIB to fulfil its mandate.

A third factor that is particularly important for mission-oriented SIBs is the extent to which different sources of funding affect SIBs appetite for risk, and ability to invest in more risky, innovative projects. Here it is clear that wider institutional context matters. KfW benefits from a direct, explicit and unconditional guarantee from the Federal Republic of Germany. This means that KfW is able to secure the highest possible credit rating, and pass on these lower financing costs to its customers. Other SIBs that rely on capital market financing, but which do not have the benefit of being underwritten by AAA rated nation-state, may find that their risk appetite will be constrained by the need to satisfy credit rating methodologies in order to keep financing costs low.

In the case of BNDES, when the bank wanted to expand its lending beyond what its main sources of funding could support (the two “quasi-public” funds known as the PIS-PASEP and the FAT), it was forced to seek funding from the National Treasury budget as it was unable to meet its full financing needs on global capital markets. One possible hypothesis is that sources of funding which draw heavily on government budgets or household savings create political pressure to minimise risk taking and thus reduce investment in higher risk areas.

Conclusion: definancializing global finance

This paper has shown how mission-oriented SIBs can help to steer investment and innovation towards tackling 21st century challenges, and can stimulate a multiplier effect by crowding in private sector investment directed towards these challenges. Scaling up SIBs, and ensuring they are designed and governed effectively, should therefore be a priority for policymakers. Importantly however, this should not be done in isolation. Mobilising finance on the magnitude required to meet goals such as the SDG also requires wider reforms to the global financial system. A central issue is not the lack of finance, but how it is utilized in dysfunctional manners: it is too short-term, leans more towards ‘brown’ than ‘green’ investments, is not reinvested in the real economy but is used for other financial purposes, and evades taxation. As such, the scaling up of mission-oriented SIBs should be complimented with other policies that aim to address all these challenges.

For example, the Tax Justice Network estimates that the total annual tax losses incurred by countries globally amount to \$480 billion: \$311 billion due to tax abuse and \$169 billion resulting from offshore tax evasion. This rise in annual tax losses also increases the projected amount that countries will forfeit to tax havens over the next decade, estimated at \$4.8 trillion (Tax Justice Network, 2023). As observed during the COVID-19 pandemic, there are methods to introduce conditionalities that penalize companies that evade taxes: such companies are unable to benefit from government programs in times of need.

Tax rates and rules should change. For example, multinationals should be treated as unitary businesses and their global profits allocated between countries using a formula, thus abandoning the century-old system of transfer pricing which allows multinationals to avoid taxation. This new system should be underpinned by a global effective minimum tax of 25%, the current international average rate (Ghosh, 2023). Another key discussion element is the current corporation-tax regimes, which allow firms to deduct virtually all costs, including labour and capital. Corporate taxes are close to a pure profit tax, which does not distort economic decisions and thus does not lead to higher prices, less investment or lower wages and employment. Thus, corporation taxes can be raised without fear of adverse effects on growth or welfare. The major distortions and gross inequities in the current international tax system come from inadequate enforcement and large loopholes.

Taxes on capital gains represent another loophole. Capital gains, which are profits from selling assets, can be taxable. While long-term gains, like those from stocks held for an extended period, generally enjoy lower tax rates than regular income, not all gains are taxed equally. The disparity in tax rates between short-term and long-term gains can be exploited, resulting in tax abuses. Simple modifications to tax codes can close this loophole, ensuring that long-term trades receive more favorable tax treatment than short-term ones (Enda and Gale, 2020). In this same respect, the tax on materials should be greater than the tax on labor, helping to tilt the playing field towards business practices that are labor enhancing, and green, with low material content (Daly, 2008).

The current situation provides a compelling foundation for proposing a Global Financial Transaction Tax (GFTT). After WWII, the US, having reaped the economic benefits of the war without suffering its destruction, was positioned to launch the Marshall Plan. Today, we face past socio-economic devastation and anticipate future environmental challenges. It's imperative that we identify a major funding source, akin to the Marshall Plan, to facilitate the socio-economic and environmental transition in the global south. The most viable solution to amplify available funds lies in the GFTT. Financial transaction taxes (FTT) have a proven track record as effective policy tools worldwide. Implementing a trading tax is straightforward: stock sales might incur a minor percentage of the sale price as tax, while bond taxation could depend on their duration (Pollin, 2009).

These policies, combined with enhanced coordination among global and regional MDBs, alongside nationally-oriented SIBs, can help to advance a genuinely mission-driven approach to tackling 21st century challenges.

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