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THE ROLE OF INDUSTRIAL DEVELOPMENT BANKING IN SPURRING STRUCTURAL CHANGE

DEPARTMENT OF POLICY, RESEARCH AND STATISTICS

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**The role of industrial development banking in spurring
structural change**

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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

Vienna, 2016

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Abstract

Development banks are the financial arms of the State, channelling domestic savings towards medium- and long-term industrial projects. By facilitating access to capital, they foster structural change. In several economies, development banks have played a crucial role, allowing domestic manufacturing firms to launch and expand operations and to thus enter strategic industries. This paper looks at eight development banks in high-, middle- and low-income economies. An overview of their history and institutional settings is provided and systematic empirical evidence on the size of their loan portfolios, the average maturities of their loans and the basic conditions attached to their credit lines is presented. The data reveal that development banks fill a gap in domestic financial systems by offering loans with longer maturities and facilitating access to loans through lower interest rates. Other industrial policy instruments offered by development banks are analysed as well. These, among others, include grants, equity investments, technical support and all the financial instruments targeted at micro, small and medium enterprises, and illustrate the complexity of development banks and the challenges of creating and managing them.

Keywords: Development banks; finance; industrial development; emerging economies

List of acronyms

BNDES	<i>Banco Nacional do Desenvolvimento Social</i>
CADF	China-Africa Development Fund
CDB	China Development Bank
DBE	Development Bank of Ethiopia
DFI	Development Finance Institutions
DTI	Department of Trade and Industry
FINAME	<i>Financiamento de máquinas e equipamentos</i>
IDC	Industrial Development Corporation
KfW	<i>Kreditanstalt für Wiederaufbau</i>
MFB	<i>Magyar Fejlesztési Bank</i>
MSMEs	Micro, small and medium enterprises
NPL	Non-Performing Loans
ODA	Official Development Assistance
PSI	<i>Sustentação do Investimento</i>
SIDBI	Small Industries Development Bank of India
SPII	Support Programme for Industrial Innovation
VDB	Vietnam Development Bank

1 Introduction

Development banks have existed since the Industrial Revolution, when Britain, and later other European countries, created them to support the growth of their domestic industries. Since their inception, development banks' most salient feature has been their long-term financial instruments. Development banks became state agents of financing industrial development, aligning their activities with government industrial strategies and policy objectives.

From the 1950s onwards, active development banks in countries such as the Republic of Korea or Brazil contributed to the implementation of national industrial strategies (Amsden, 2001). Today, newly industrializing countries, including India, Viet Nam and Ethiopia, are leveraging development banks to create and assist national industries and eliminate the bottlenecks that impede their growth. In more advanced countries such as Hungary, Brazil or China, development banks play a crucial role, spurring growth in periods of economic downturn and fostering investments in innovation. Recent studies demonstrate that even at very high income levels, such as in the case of Germany, for example, the role of development banks changes but does not diminish (Mazzucato and Penna, 2014).

Development banks evaluate the developmental impact of projects that request financing, favouring industries targeted by government industrial plans or deemed strategic for industrial development. Projects serving as catalysts for further development, such as infrastructure building projects, are also preferentially financed. As the quality of infrastructure improves, capital moves to projects aimed at expanding industrial production and fostering firms' competitiveness.

This paper focuses on the role of development banks as engines of structural change, and examines the resources and services that development banks provide for structural transformation, and in particular to spur the growth of manufacturing firms. While industrial banking may not be the major focus of every development bank, it is arguably an important focal point, given the role of the industrial sector in the economy.

The remainder of the paper is structured as follows. Section 2 discusses the role of industrial development banking as an instrument for industrial policymaking, highlighting the market failures development banks deal with. Section 3 explores the experiences of selected development banks and provides an overview of their institutional characteristics. The section also presents data on the size of their loan portfolios and the significance of industry and manufacturing in their lending activities. Section 4 outlines a variety of instruments development banks use to achieve their objectives, namely easing access to long-term (patient) capital, spurring firms' growth and supporting SMEs, new ventures and innovative projects. Section 5 concludes, providing a number of policy implications for emerging and developing economies.

2. Industrial banking as an instrument for industrial policymaking

Industrial policies aim to promote structural change, especially if markets left alone are not capable of initiating the virtuous cycle that commences from structural change and leads to economic growth and development. Such market failures call for State intervention.

In developing countries, access to capital is perceived as the most binding constraint to firms' growth: scarcity of capital due to underdeveloped financial systems reduces firms' opportunities to expand production, acquire modern equipment and technological upgrading. This is crucial for boosting firms' competitiveness in regional and international markets, but requires capital, among and above other things. In this context, the State can intervene by setting up a national development bank whose main objective is to channel domestic savings and accumulate international financial resources.

Even when countries have a functioning financial system, development banks can still play a substantial role. It has been noted in the economic literature that private banks have limited incentives to finance projects that are less financially attractive but socially profitable.¹ This is the case, for example, for infrastructure projects such as the construction of a telecom network or port. Other socially profitable projects with less attractive financial prospects include innovation projects aimed, for example, at developing new products or processes. These projects require major financial resources and their chances of success are extremely uncertain. This is why the literature talks of 'under-investments' in innovation by private banks, calling for government interventions to provide investments for innovation that is socially desirable. Finally, projects to reduce social or regional disparities or in support of disadvantaged groups of society are also socially desirable but financially less attractive, thus calling for state intervention.

Micro, small and medium enterprises are generally the most financially constrained ones in the economy. In many cases, however, they are the only productive actor in the economy, generating employment and income diversification opportunities for households. Financially, they are very unattractive, due to their lack of collateral and their uncertain financial viability. While private banks tend to disregard them, it is of relevance for society that micro and small firms graduate to medium and subsequently to large firms, as production scales are essential in an industry like manufacturing characterized by increasing returns to scale. This makes micro and small enterprises preferential receivers of loans from development banks.

Even when financial systems are fully developed, medium and long-term loans are still difficult to provide, given the financial structure of private banks, based on demand deposits and relatively illiquid loans. The type of investments firms need in order to grow have medium to long-term horizons. The acquisition of new machinery, for example, is costly and while the firm acquires the machinery

¹ See, for example, Atkinson and Stiglitz (1980) and Stiglitz (1994).

and adapts its organization to the new production scale, additional costs are incurred and profits might temporarily decline. This delays the repayment of loans. In other cases, firms might envisage a medium to long-term project of expansion, aimed, for example, at building new production facilities or diversifying production. In all of these cases, firms need patient capital that allows them to realize an ambitious project.

Some governments might have ambitious industrial development plans, targeting a number of strategic and complementary industries. The implementation of these plans might require the allocation of financial resources to these industries in a coordinated manner and subsidizing interest rates on these strategic credit lines. In such cases, development banks become the financial and entrepreneurial arm of the State, facilitating access to finance, strategically channelling resources and ensuring that complementarities are fully realized.

In line with these arguments, Mazzucato and Penna (2014) outline a number of roles development banks perform. First, development banks ensure investments in periods of economic downturn, performing a counter-cyclical role. Second, especially in industrializing countries, they perform a developmental role, providing long-term capital to spur investments in strategic (manufacturing) industries. Third, high-risk R&D-intensive start-ups and innovative projects are also areas in which private capital is all too often short-term and risk-averse. By supporting new ventures, development banks spur innovation and new firm growth. Finally, capital from development banks can be directed towards projects that address societal challenges such as climate change or aging populations. This is referred to as the challenge-led role of development banks. Depending on the country's stage of development, development banks' roles might be more critical than others.

3. The experience of a few selected countries

In many of today's industrialized economies, development banks play an important role in channeling medium and long-term capital to the most constrained firms and those with high-growth potential, thus supporting the growth of domestic manufacturing industries.

The German development bank, *Kreditanstalt für Wiederaufbau* (KfW), and the Japan Development Bank (JDB) were created after the Second World War to manage the funds for post-war reconstruction. The role of these banks evolved over time, increasingly mobilizing domestic resources and supporting industrial development beyond infrastructure projects. Another rapidly industrializing country, the Republic of Korea, also relied on a strong development bank, the Korean Development Bank, providing preferential loans to the industries identified by the government's industrial plans (Amsden, 2001).

This development was common in other countries as well, such as Brazil (Brazilian Development Bank (BNDES)) (see Box 1) and Turkey (Turkish Industrial Development Bank (TSKB)).

Box 1 The long history of BNDES

After the Second World War, Brazil, along with other Latin American countries, sought to obtain financial aid from the United States. Latin American countries expected a Latin American Marshall Plan similar to the one the U.S. introduced in Europe, to be developed. In 1948, a technical commission composed of representatives from Brazil and the U.S. was set up to evaluate the economic issues Brazil was facing and identify projects to eliminate what today we call the ‘binding constraints to economic growth’.

As a result of the commission’s work, Brazil managed to attract financial assistance from the World Bank and Eximbank. Brazil would be granted access to finance under three conditions: first, the funds were to be used to finance projects aimed at eliminating those binding constraints, especially in the area of infrastructure; second, Brazil had to mobilize domestic resources to match the World Bank and Eximbank’s contribution; and third, in order to maintain fiscal discipline, these domestic funds could not be mobilized through monetary emissions. In 1951, the commission compiled a list of 41 projects to improve the transport system and energy supply. To meet the second and third requirement, a tax of 15 per cent on incomes higher than 10,000 *cruceros* was introduced. A bank had to be created to manage these funds: BNDES.

In its first years of activity, BNDES allocated funds to the infrastructure projects proposed by the technical commission. However, the scarcity of available capital due to delays in the transfers from the National Treasury, the limited resources provided by the World Bank and Eximbank and the corrosive effect of inflation that reduced the value of the funds already in the bank reduced the scope of action of BNDES. The government then decided to mobilize additional resources through special fiscal funds established to support specific industries. Funds gained from a tax (30 per cent) on incomes generated through oil production were allocated to BNDES.

BNDES also underwent important institutional reforms. In 1955, the government decided to assign the director of the Development Council, which had just been established to spur Brazil’s economic development, to head the bank. The funds to BNDES increased, as did the type of activities the bank could undertake. Gradually, the bank began engaging in the financing of basic and heavy industries and played a significant role in the development of Brazil’s automotive industry, thus becoming one of the major contributors to the *Plan de Metas*, the far-reaching industrial plan that was behind the fast growth of the Brazilian automotive industry in the 1950s.

Over the years, BNDES has managed to accumulate even more financial resources as a result also of the creation of additional special funds, and to further specialize in industrial financing, to support the Brazilian industry by providing the necessary medium and long-term capital that can establish the preconditions for a prosperous economy.

Source: de Araujo et al. (2011).

Like BNDES, TSKB was established in the early 1950s under the auspices of the World Bank. Over time, it managed to mobilize domestic resources and began playing a key role both in the import substitution and export promotion phases of the industrialization process (Ozturk et al., 2010). Today, Germany, Japan and the Republic of Korea enjoy among the highest incomes per capita in the world,

and their development banks continue to play a fundamental role. BNDES in Brazil has also grown to become one of the largest banks in the world (Mazzucato and Penna, 2014).

Several industrializing economies are creating and empowering national development banks to replicate the success of industrialized countries. Exemplary cases include China and the China Development Bank (CDB) and at lower income levels, Viet Nam and Ethiopia. In the case of China, it has been noted that “China’s rise as a global economic superpower and the success of its top companies is intricately tied to CDB” (Sanderson and Forsythe, 2013:xxii). Established in 1994, CDB played a major role in building infrastructure and houses within the scope of the urbanization process accompanying China’s economic development. Later on, CDB began investing in the manufacturing industry, supporting all the major Chinese firms in international markets. CDB can look back at a successful development in terms of industrial banking: while CDB had an extraordinarily high number of non-performing loans in its first of operation, these have decreased substantially in recent years.

Viet Nam and Ethiopia have been following a similar path, enjoying high rates of GDP and manufacturing growth. Economic growth, however, poses a number of challenges, such as the need for additional and more reliable energy, efficient transport systems and a network of firms that can produce for the domestic, regional and international markets and upgrading in global value chains. Both countries have ambitious industrial plans, with their respective development banks playing a fundamental role. The Viet Nam Development Bank acts as the financial arm of the State, guaranteeing that targeted industries receive investment and export credits (Anh et al., 2014). Ethiopia has reinvigorated its industrialization efforts since 2003: the government designed and implemented the Industrial Development Strategy and a 5-year Growth and Transformation Plan. These plans set specific targets and identify the instruments needed to achieve these and which industries should be promoted. The Development Bank of Ethiopia is in charge of channelling loans to firms willing to invest in these industries. The Bank also helps in mobilizing resources to accomplish government-funded megaprojects, especially related to infrastructure. One example is the Grand Ethiopian Renaissance Dam which will be the largest dam in Africa once completed (Gebreeyesus, 2013; Lenhardt et al., 2015).

This paper focuses on the experiences of eight development banks: the Hungarian Development Bank (MFB), Brazil’s BNDES, the China Development Bank (CDB), the South African Industrial Development Corporation (IDC), the Industrial Development Bank of Turkey (TSKB), the Small Industries Development Bank of India (SIDBI), the Vietnam Development Bank (VDB) and the Development Bank of Ethiopia (DBE).² Table 1 presents the main differences between these eight banks in terms of objectives, services offered and targeted industries.

² Formally, IDC is not a development bank, but rather a development finance institution, mainly relying on self-generated funds from equity investments, loans and borrowings from international and domestic markets, but also manages funds from the South African Department of Trade and Industry. Despite IDC not being a development bank per se, we decided to include it in our analysis due to its role of financing national industrial development, its link with the national government, the alignment of its mandate and activities with government growth and industrial plans and its significant loan portfolio.

Table 1 Overview of development banks in the analysis

Development bank	Main objectives	Services offered	Targeted industries
Hungarian Development Bank (MFB)	Enhance investments and bridge gaps in infrastructure Encourage the expansion of businesses, especially SMEs Stimulate technological and environmental development and employment	Loans Grants Equity investments Capital allocation Guarantees	Not specified
Brazilian Development Bank (BNDES)	Foster development by generating employment and reducing social and regional inequalities Finance the expansion of national companies and exports	Loans Grants Equity investments Trade finance SME support Guarantees Technical support	All industries within manufacturing: Design industries Engineering industries Pharmaceuticals Paper Plastics Sugar processing Software
China Development Bank (CDB)	Provide medium to long-term financing, aligning with the national economic strategy and tackling existing bottlenecks	Loans Equity investments Technical support	Infrastructure Basic and emerging industries National priority projects
Industrial Development Corporation (IDC)	Develop industrial capacity to facilitate job creation through industrialization Support projects in line with government policy objectives	Loans Grants Equity investments Trade finance Venture capital Technical support Sectoral schemes	Green industries Agro-processing Advanced manufacturing Motor vehicles and transport equipment Capital equipment Textiles Paper and furniture Metals Pharmaceuticals Plastics Chemicals

Industrial Development Bank of Turkey (TSKB)	Support development by providing medium and long-term financing Contribute to capital markets' development	Loans Equity investments SME support Trade finance Technical support	Energy Logistics and transportation Infrastructure Education Health
Small Industries Development Bank of India (SIDBI)	Facilitate and strengthen credit flow to MSMEs and address their growth obstacles	Loans Equity investments Risk capital Venture capital Technical services	Not specified
Vietnam Development Bank (VDB)	Mobilize national and international funds to implement state policies on investment and export financing	Loans Export credits Settlement services Loan guarantees	Engineering Automobiles and motor-bikes Pharmacy Energy Chemicals Electronics and ICTs Steel and coal Textiles and garments Machinery and equipment
Development Bank of Ethiopia (DBE)	Promote the national development agenda through development finance and technical support to projects from priority areas	Loans Export credit guarantees Technical support	Agriculture Extractives Agro-processing Textiles and leather Paper/ packaging Chemicals and rubber Non-metallic materials Metals Motor vehicles Electrical machinery Pharmaceuticals

Source: Author's elaboration based on annual reports and development bank websites. For Viet Nam: Anh et al. (2014).

The table reveals that most of the development banks included in our study have a broad focus, covering all, or the majority of industries in the economy. Only three have a more narrow focus: IDC and TSKB are purely industrial development banks, meaning that they serve firms engaged in the industrial sector. SIDBI does not take a sectoral focus but rather specializes in providing financing and technical support to micro, small and medium enterprises. This is a key focus of development banks' activities: due to their financial constraint, most of the development banks included in our analysis offer services that are specifically tailored to micro, small and medium enterprises.

The development banks covered here also differ in terms of their objectives: in lower income economies, they tend to focus on industrial development. At higher income levels, the development banks have a broader mission involving additional objectives such as creating employment, reducing regional and social inequalities and spurring technological change, including new environmental solutions.

The services and instruments offered are largely homogenous: apart from loans, development banks offer non-repayable grants to finance particularly risky innovative projects, equity investments to promote long-term fixed investments, trade finance to facilitate export, SME support and technical support in the form of managerial training and technical assistance in the preparation of business plans and conducting feasibility studies.

Finally, differences arise in terms of the detail to which development banks specify their sectoral focus. CDB, for example, defines its sectoral focus loosely as "basic and emerging industries". By contrast, Brazil, Ethiopia and South Africa specify very specific sectoral targets, reflecting the degree of detail of their governments' industrial plans.

3.1 The institutional setting of development banks

Development banks' institutional settings also vary, as shown in Table 2 . Ownership structures, regulation bodies and source of financing are only some of the relevant dimensions characteristic of the banks' institutional settings.

As already mentioned, most of these banks have long histories, rooted in State-driven industrialization phases of the 1940s and 50s (see, for example, the history of BNDES in Box 1). While all these banks were originally founded as public banks, two of them, TSKB and SIDBI, are today not wholly owned by the State.

TSKB and BNDES are the only banks that are regulated in the same way as all of the other banks operating in the two countries. By contrast, the other development banks are under the jurisdiction of the central government, ministries or the prime minister. For example, in Ethiopia, the Public Financial Enterprises Supervising Agency, a directorate under the Prime Minister's office, supervises the DBE. The connection between the development banks and national governments is necessary in order for

the banks to be able to assume the role of financial arm of the State. Indeed, in several cases development banks manage industrial development programmes on behalf of ministries and government agencies. For example, VDB can only allocate investment loans among projects from a list prepared by the government.

Table 2 Institutional settings of development banks

Bank	Year of establishment	Ownership		Who regulates it?	Source of funding
MFB	1991	100% owned	state-	Minister for National Development	Borrowings from lending institutions and government-guaranteed bonds
BNDES	1952	100% owned	state-	Fiscal Council	Workers' Assistance Fund ³
CDB	1994	100% owned	state-	Central government	Medium and long-term bonds and funds from government
IDC	1940	100% owned	state-	Economic Development Department	Borrowings from DFIs and medium-term bonds
TSKB	1950	Privately owned		Banking Regulation and Supervision Agency	Funds from DFIs and bonds
SIDBI	1990	33% state-owned		Central government	Bonds, government funds and international donors
DBE	2003	100% owned	state-	Public Financial Enterprises Supervising Agency	Government funds, government saving bonds and borrowings from DFIs
VDB	2006	100% owned	state-	Central government	Government-guaranteed bonds, State budget and ODA

Source: Annual reports of development banks and Mazzucato and Penna (2014).

Important differences exist in terms of funding source, reflecting the income level of the economies included in our study. At low income levels, countries such as Ethiopia and Viet Nam rely on official development assistance (ODA), together with government funds and government-guaranteed bonds, often with long maturity (e.g. government savings bonds). As regards donors, Ethiopia's long-term borrowings in 2013 were composed as follows: 75 per cent were loans from the National Bank of Ethiopia, 12 per cent were Ethiopian government savings bonds, and only 8.3 per cent of the borrowings came from international donors (DBE, 2013). Similarly, 69 per cent of SIDBI's borrowings consisted of national financing. Of the borrowings from outside India, 4 per cent came from the German development bank, KfW, and 14 per cent from Japan's International Cooperation Agency (SIDBI, 2014-15).

³ The Workers' Assistance Fund (*Fundo de Amparo ao Trabalhador*, FAT), is a government-established fund based on tax contributions based on all Brazilian firms' net operating revenues and used to finance economic development programmes (Ferraz et al., 2011).

At higher income levels, countries like China rely on bonds, while Brazil finances BNDES with fiscal resources. In all cases, funds have medium to long-term maturity, meaning that the banks can sustainably provide long-term credit, as long-term loans are covered by medium- and long-term funds to the bank. Matching maturities of assets and liabilities is an important issue for development banks, whose mandate is specifically to address the lack of long-term credit.

Setting up and (successfully) managing a development bank is cumbersome. Not only are considerable financial resources necessary, but defining institutional settings and resolving managerial issues is crucial. These banks are often large organizations with over 8,700 employees (see Table 3). These are huge numbers of staff, especially when compared with development banks in higher income countries, such as the Korean Development Bank with 2,266 employees in 2010 (Lazzarini et al., 2011).

Development banks need to reach out to firms operating in the country. To this end, most of the development banks in our study have regional branches (see Table 3). The bank with the highest number of branches is SIDBI, responding to the need to reach micro, small and medium enterprises in more remote areas of India's vast territory. VDB and CDB also have many branches within their national borders. By contrast, MFB has no branch offices, only a representative office in Brussels. MFB has recently proposed to establish a network of roughly 400 contact points, reaching 70 per cent of the population and helping local SMEs access EU-supported funds. This is line with the mission of EU Structural Funds to reduce regional disparities across European countries. In Ethiopia, each regional office is entitled to a specific amount of spending, indicating a certain degree of decentralization of banking activities. Some of these banks also have international branches. BNDES has three regional offices and a network of accredited financial institutions spread across the country. These are entitled to authorize credit, but are also in charge of preliminary financial analysis, negotiations and follow-up relationships with clients, and are held responsible in case of non-performing loans. With offices in Montevideo, London and Johannesburg, BNDES has a global presence, alongside CDB and TSKB.⁴

Managing such huge organizations requires considerable administrative capacities. Moreover, given the role of development banks as financiers of the state and hence as facilitators of industrial development programmes, the technical capacities of both the staff and management are pivotal to assessing projects and firms. Staff with technical knowledge and training are crucial to assess innovative high-tech projects and to assist firms in the implementation of such projects. For instance, 80 per cent of BNDES staff have a university education: out of these, 17 per cent are engineers and 13 per cent are systems analysts, while the rest is composed of lawyers, economists, accountants and managers (BNDES, 2014). In China, 60 per cent of the CDB workforce holds a master degree or higher (CDB, 2014). In South Africa, 75 per cent of IDC employees are professionally qualified experts. The bank

⁴ Apart from its 37 branches within China, and its branch in Hong Kong, CDB has representative offices in Cairo, Moscow, Caracas and Rio de Janeiro. TSKB has a branch office in Bahrain.

invests in staff training, and training 83 per cent of its staff in, inter alia, evaluation of business proposals, management and leadership skills. Overall, staff costs represented 26 per cent of IDC's expenditures (IDC, 2014). SIDBI also offers training opportunities, either internally at the SIDBI MSME International Training Institute or externally, at national or international institutions. Training courses include, for example, courses in development banking, innovation finance, sustainable finance, factoring and trade receivable discounting. Training is also used to familiarize staff with specific instruments or programmes, such as the KfW Innovation Finance Programme (SIDBI, 2014-15).

Table 3 Size of bank: Number of employees and of branches (2014)

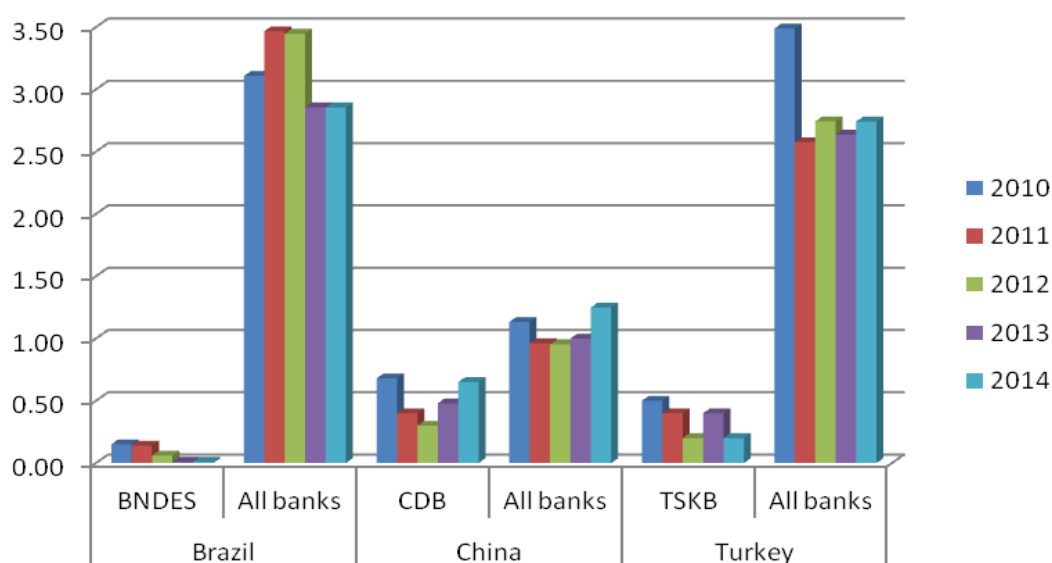
	Number of employees	Number of branches
MFB	1,708	1 representative office
BNDES	2,881	3 regional offices and 3 international offices
CDB	8,723	37 first-tier branches and 1 branch and 4 representative offices overseas
IDC	828	13 regional offices and 7 satellite offices
TSKB	334	2 branches in Turkey and 1 international branch
SIDBI	1,055	15 regional offices and 107 branches
DBE	1,147	5 regional offices, 15 branches and 20 sub-branches
VDB	n.a.	54 branches

Sources: Authors' elaboration based on annual reports and financial statements of development banks.

Note: Viet Nam: data on number of employees are not available and the information refers to 2012.

Assessing business proposals is a very daunting task, and development banks can, and often do, fail to gauge the potential success of projects requesting financing. Figure 1 compares non-performing loan (NPL) ratios for BNDES, CDB and TSKB, with NPL ratios averaged for all banks in Brazil, China and Turkey.

Figure 1 Non-performing loan ratios



Sources: Annual reports and World Development Indicators (WDI).

The NPL ratios of the three development banks are lower than the average of all banks operating in each of the three countries. The gap is highest in Brazil and Turkey, indicating that the two banks are more effectively managed than the other banks in the country. Although the CDB's NPL ratio is higher than that of the other development banks, CDB has lower NPL rates compared to any major Chinese bank (Sanderson and Forsythe, 2013; Downs, 2011).⁵ Low NPL ratios also indicate that the development banks target firms that have sufficient cash to be able to repay their loans. If this is true, it implies that development banks are not targeting the most credit-constrained firms or the riskiest projects.

3.2 How large are development banks?

Another way of capturing the size of banks is to look at the size of their loan portfolios. Table 4 presents the amount of lending by the eight development banks relative to GDP.

BNDES and CDB are the largest banks in this group, with total lending representing 12 per cent of the countries' GDP in 2014. To give a better idea of just how large these loan portfolios are, it is worth mentioning that in 2010, for example, the value of loans disbursed by BNDES was more than three times the loan amount provided by the World Bank (Lazzarini et al., 2011). Loans are rising: in 2008, BNDES loans accounted for 6.6 per cent of GDP and CDB's to 9 per cent. While these figures might denote an upward trend in lending by these banks, it could also be a sign of a counter-cyclical role of development banks' lending, given the recent economic downturn.

⁵ Lower NPL ratios are among the recent accomplishments of the bank, which in the late 1990s had NPL ratios in the region of 40 per cent. The support of the Ministry of Finance, which created corporations that took over the bad loans from the CDB portfolio, contributed to achieving these NPL ratios (Downs, 2011).

Table 4 Total lending as a percentage of GDP

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
MFB		1.6	1.5	1.3	2.1	2.8	1.0	1.1	1.3	1.2	1.2	1.1	1.0	1.0
BNDES	6.6	8.4	6.6	6.3	6.1	6.1	6.1	6.95	8.5	9.3	9.7	10.4	11.0	11.8
CDB								9.0	10.5	10.8	11.2	11.7	11.8	12.1
IDC									0.4	0.4	0.4	0.5	0.5	0.6
TSKB	0.4	0.3	0.2	0.3	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6
SIDBI						0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
DBE						2.7	2.2			1.8	1.9	1.7	1.9	
VDB				10.2	9.8	9.1	8.9	8.4	8.4	7.9	8.2	7.5		

Sources: Annual reports of the development banks and WDI.

Note: Viet Nam: VDB loans include overdue and frozen loans. These, however, consist of small amounts.

Surprisingly, the third largest bank in this group is the VDB. Considering that all other banks except DBE belong to higher income countries, VDB spends quite a high percentage of the Viet Nam's GDP on the development bank's lending. Even more surprisingly, until 2009, VDB spent more than BNDES in terms of percentage of their respective GDPs. Box 2 provides a more detailed account of the trends in the VDB's credit provision.

The gap between these three and the other development banks is substantial. DBE is the fourth largest bank, with loans representing 1.9 per cent of Ethiopia's GDP. While highest in terms of income level, Hungary's development bank spent between 1 per cent and 2.8 per cent (in 2006) of the country's GDP on loans. After the global financial crisis, the amounts more than halved to 1 per cent in 2014. This downward trend suggests that lending by the MFB is cyclical: while this is not desirable for a development bank, it might be related to the sources of financing of the MFB, mainly European and European Union institutions. The development banks of South Africa, Turkey and India are all smaller, with loans accounting for less than 0.5 per cent of GDP of these countries.

The picture changes slightly when lending is taken as a percentage of gross fixed capital formation (Table 5).

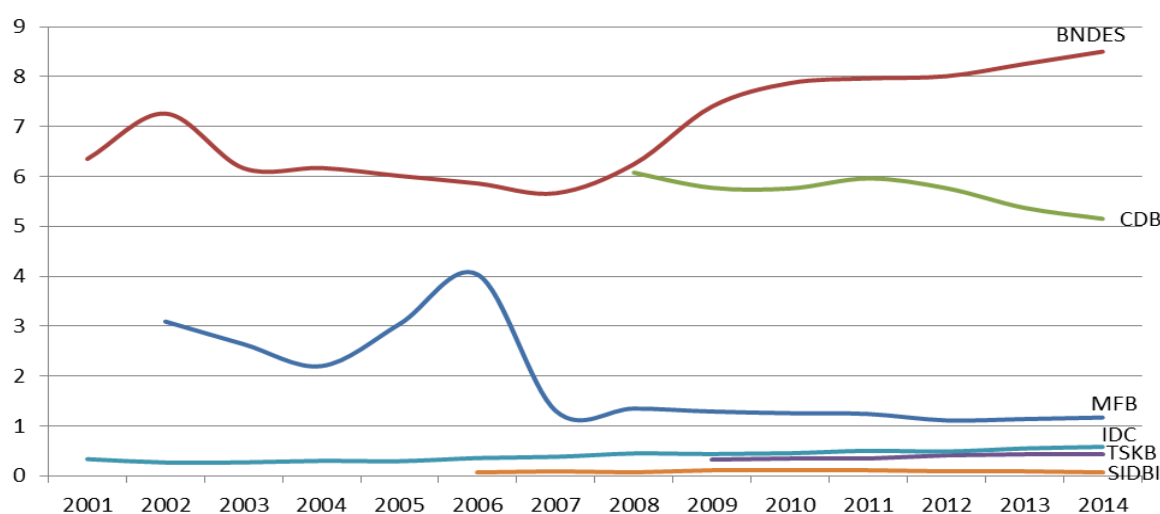
Table 5 Total lending as a percentage of gross fixed capital formation

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
MFB		6.3	6.5	5.5	8.6	12.0	4.4	4.9	5.7	5.9	6.1	5.5	5.2	
BNDES	35.8	46.5	39.6	36.0	35.6	35.3	33.5	35.7	44.4	45.2	47.1	51.7	53.4	59.7
CDB								22.3	23.3	24.1	25.1	25.8	25.8	
IDC									1.6	2.0	2.1	2.6	2.6	2.7
TSKB	2.3	1.6	1.4	1.2	1.1	1.3	1.4	1.9	2.4	2.3	2.2	2.4	2.9	3.1
SIDBI						0.3	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.3
DBE						8.3	7.9			5.7	6.0	4.6	5.4	
VDB				33.3	31.2	28.9	25.2	26.3	24.7	24.3	30.4	30.9		

Sources: Annual reports of the development banks and WDI.

BNDES, VDB and CDB are still the largest banks, but BNDES's shares are much higher than those of the other banks, reflecting, inter alia, the lower investment rates of Brazilian firms. The development banks of Ethiopia and Hungary finance roughly 5 per cent of domestic investments, while the development banks of South Africa and Turkey account for roughly 3 per cent. The shares of SIDBI are significantly smaller, representing between 0.45 per cent and 0.26 per cent of national investments. While this might reflect the smaller scale of investments by micro, small and medium enterprises, it might also be an indication of the fairly limited possibilities of the bank.

The last indicator for measuring the size of the selected banks is the size of their lending relative to total credit in the economy (Figure 2).

Figure 2 Development bank lending as a percentage of total credit in the economy

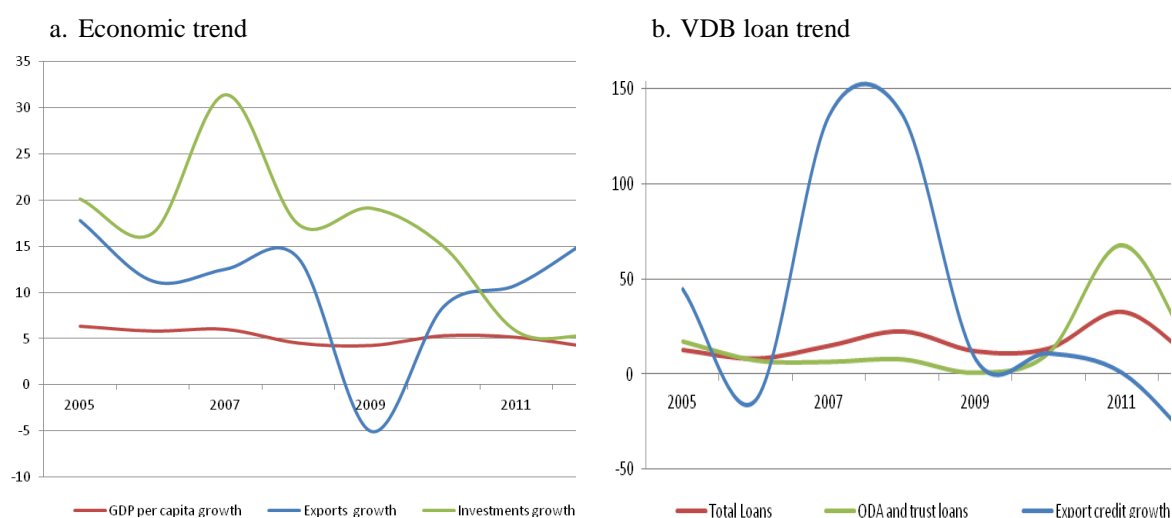
Sources: Annual reports of the development banks and Total Credit database by the Bank of International Settlement (BIS).

The figure clearly demonstrates the role of BNDES as an important source of financing in the Brazilian economy: not only is the share of BNDES loans over total loans the highest in the group, it has also been increasing since the global financial crisis of 2008. While total credit in Brazil has also increased in recent years, the rising share of BNDES credit indicates that its credit has increased more than the total credit, pointing to the strong counter-cyclical nature of BNDES financing. By contrast, the share of CDB loans over total loans has slightly decreased in the last years. In spite of this, CDB was the fifth largest lender in China in 2012 (KPMG, 2013). Confirming previous findings, MFB loans, which showed a positive trend in the first half of the 2000s, drastically dropped in 2007 and remained quite low, indicating that the bank was hit hard by the global financial crisis and the economic recession that followed. The shares of the other three banks, namely IDC, TSKB and SIDBI, are significantly lower.

Box 2 Credit trends of the Vietnam Development Bank

The Vietnam Development Bank was established in 2006 following a reorganization of the Development Assistance Fund, which had been operational since January 2000. As previous tables have shown, the VDB has a large loan portfolio. The bank offers investment and export credits and allocates loans from ODA funds. Figure 3 compares trends of GDP per capita growth, exports and investments growth (left panel), with growth rates of total loans, export credits and ODA loans (right panel).

Figure 3 Viet Nam: Economic and VDB loan trends



Sources: VDB and WDI.

First, export credits more than doubled from 2006 to 2007 and continued growing until the onset of the global financial crisis. Total loans also increased during that period and decreased when the crisis hit. Secondly, total and ODA loans move in a similar fashion: ODA loans represent between 36 per cent and 50 per cent of total loans, suggesting that ODA funds did not compensate for lower government funds in the period of the financial crisis. Third, higher export and investment growth rates in 2006-2007 are associated with a visible increase in export credits in those years. Exports temporarily fell during the financial crisis, accompanied by a decrease in export credits, suggesting once again the cyclicity in credit provision.

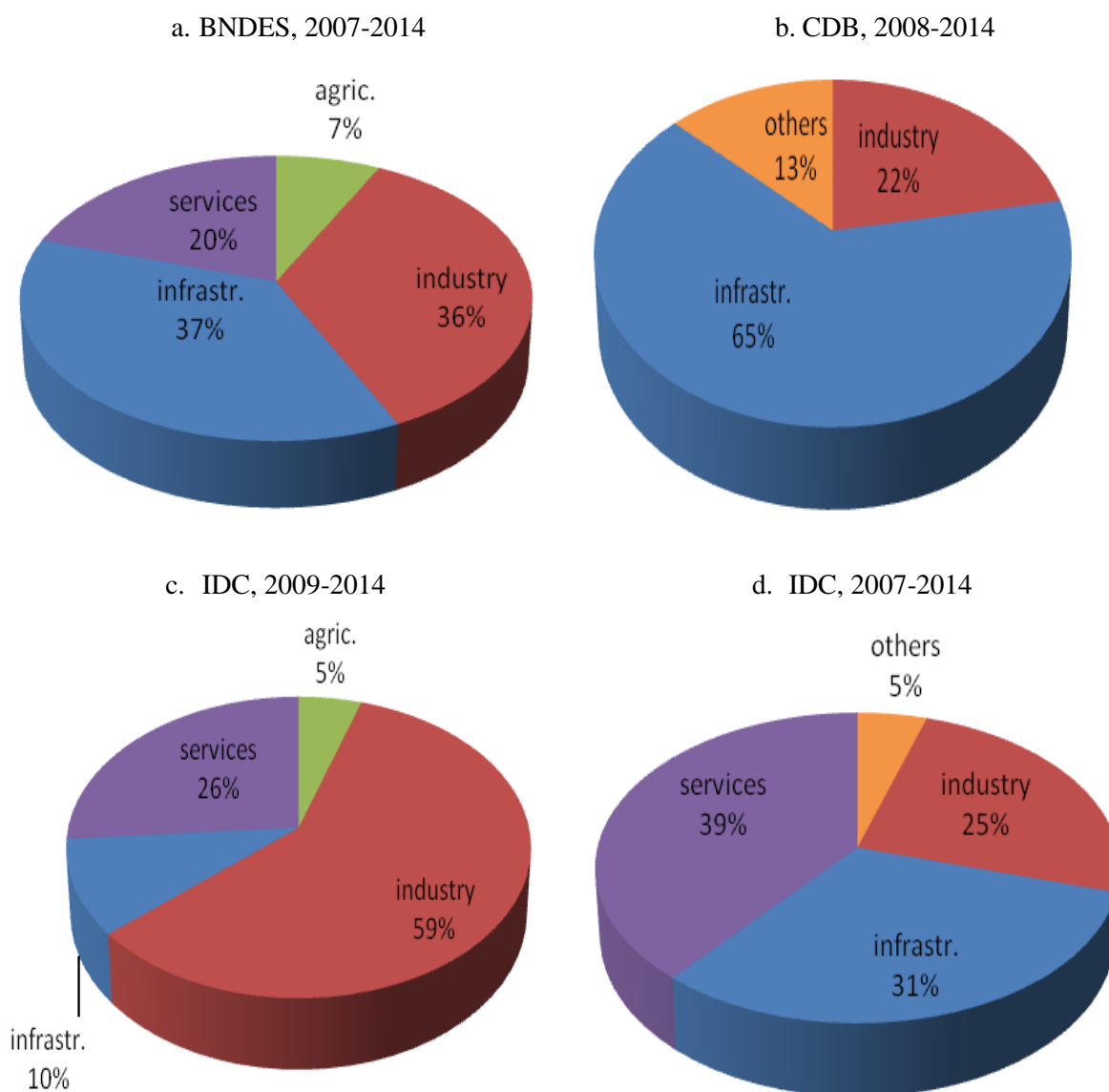
Source: VDB.

3.3 How strong is their industrial mandate?

Industrial financing is one of the main objectives of development banks. The provision of financing for manufacturing firms allows the industry to expand production and employment. This has important implications for countries' industrial development trajectories.

Some development banks report disaggregated figures for their lending activities. The degree of disaggregation varies considerably, which partly reduces the comparability of these data. Figure 4 reports available data on lending activities by sector for BNDES, CDB, IDC and TSKB.

Figure 4 Lending, disaggregated by sector



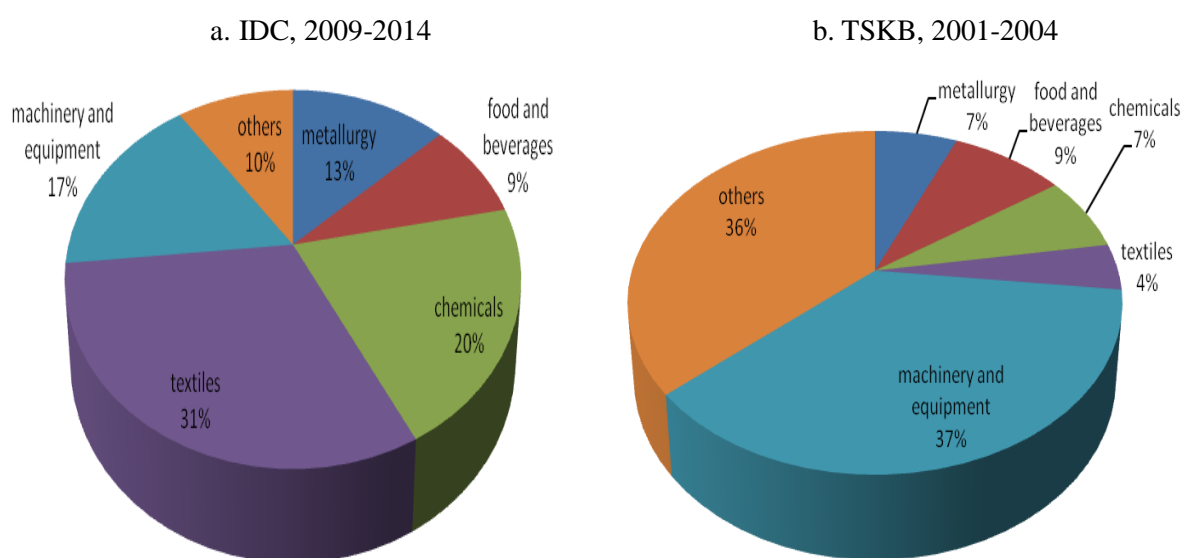
Source: Annual reports.

In Section 3.1, we discussed that BNDES and CDB are development banks with broad mandates, while IDC and TSKB are industrial development banks. The data reveals that this does not necessarily imply that industrial development banks spend more on the industrial sector. Among the banks in our

study, CDB allocates the highest share of loans to infrastructure (65 per cent), but TSKB allocates more financing to infrastructure than to industry (31 per cent *versus* 25 per cent). By contrast, South Africa’s development bank, IDC, allocates 59 per cent of its loans to industry. BNDES, widely renowned for its support to the industrial sector, allocates roughly the same amounts of resources to infrastructure and industry. The service sector also receives quite a significant share of total loans. Thirty-nine per cent of TSKB’s loans, for instance, are allocated to services, in particular to financial services. This certainly represents a deviation from the typical mandate of a development bank, especially in an industrializing country. Loans to services are also increasing in Brazil and China.

Figure 5 presents loans by the IDC and TSKB, disaggregated by five major industries, namely metallurgy, food and beverages, chemicals, textiles and machinery and equipment.

Figure 5 Lending in manufacturing, disaggregated by major industries



Source: Annual reports.

The industries supported by these two banks are very different. In South Africa, machinery and equipment is the industry that receives the most support, but the size of the category “others” suggests a larger role of the mining industry as well. By contrast, the textiles and chemical industry together account for roughly 50 per cent of all loans in Turkey to the industrial sector. Finally, over 80 per cent of all loans for machinery and equipment in Turkey are allocated to transport equipment, while the role of transport equipment is smaller, albeit increasing, in South Africa. Transport equipment has traditionally been an important industry for industrializing countries, with development banks heavily supporting its growth.

While comparable data are not available for the other banks, several considerations can be made. As in the Turkish case, those manufacturing industries that were the largest recipients of loans from

SIDBI were textiles and transport equipment. Electricity generation was also one of the largest loan recipients. This concentration of loans has been decreasing over the last years. In 2008, electricity generation captured 17 per cent of all loans; the five largest recipients together accounted for 44 per cent of all loans. By 2014, the top recipient, transport equipment, captured 3 per cent of all loans and the five largest recipients accounted for only 11 per cent of all loans. In Brazil, three industries, namely machinery and equipment (27 per cent), chemicals and petrochemicals (18 per cent) and food and beverages (16 per cent), account for roughly 60 per cent of all loans in the industrial sector. Transport equipment captured between 19 per cent and 26 per cent of industry loans between 2011 and 2014. Box 3 provides some examples of industrial financing by the Development Bank of Ethiopia.

Box 3 The experience of a development bank at low income levels: the case of Ethiopia

The history of the Development Bank of Ethiopia traces back to the early 20th century. After numerous reforms, the bank was re-established in 2003 as part of the 2003 Industrial Development Strategy (IDS). Since then it has become the financial arm of the State, allocating loans to projects in industries selected by the government. Indeed, one of the peculiarities of this bank is its project-based form of financing. In 2011, DBE was one of 15 banks operating in the country. The strong link between the government and the bank is evident: the bank finances the industries identified by the government, and the board of directors that runs the bank is composed of seven senior government officials. While DBE's annual reports do not provide data on loans disaggregated by industry, a list of the major projects financed by the bank is provided. Two examples from the manufacturing industry exemplify the bank's activities and its role in industrial policy-making.

The bank finances the expansion projects of various textile firms, a key industry in the government's industrial plans. The low wages of the Ethiopian workforce, especially when compared with the rising wages in Asian countries such as China, are attracting various renowned international firms to source inputs and intermediate goods from Ethiopia. The expansion projects of both international and domestic textile firms have been financed by the DBE. The bank does not only support the textile industry by financing projects to expand the production of garments, but also the inputs required for production. For instance, chemicals are needed to treat cotton. These are generally imported, which is the reason why DBE supports firms that are willing to produce these in Ethiopia.

Ethiopia has been growing rapidly over the last decades and its expanding industrial sector is attracting labour from rural areas. As a result of the housing boom, further sustained by the government-promoted housing programmes, construction has been among the fastest growing industries in the economy. DBE also plays a role in this important industry by financing expansion programmes of cement producing firms.

Sources: Gebreeyesus (2013), DBE (2013) and Lenhardt et al. (2015).

4. Instruments used by development banks to spur structural change

As mentioned in Section 2, development banks perform different roles, often depending on the stage of development of the respective country. Given the specific aim of this paper, this section focuses on the development role of development banks. This development role practically translates into a multiplicity of activities and instruments aimed at eliminating the obstacles of firms in developing and industrializing countries. This section distinguishes three objectives of development banks and discusses the means to achieve them.

4.1 Ease access to patient capital through long-term loans

Loans are the primary industrial policy instrument of development banks. As section 3.3 showed, loan disbursements can reach fairly high amounts. Development banks do not only facilitate access to credit, but also fill a gap in the financial market, namely the scarcity of patient capital. Table 6 presents the share of medium and long-term loans as a percentage of total loans.

Table 6 Medium and long-term loans as a percentage of total loans

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
MFB		63.4	77.7	69.7	40.6	42.5	79.0	80.1	77.4	80.6	74.2	64.8	60.3	74.5
BNDES	77.9	77.4	76.9	78.6	75.0	72.9	76.7	78.8	82.0	83.4	83.1	79.5	80.8	81.4
CDB										86.8	83.3	83.6	81.1	83.3
IDC									53.6	36.4	55.3	51.9	55.9	54.6
SIDBI							39.6		51.7	52.5	50.0	41.8	40.6	40.1
TSKB	65.7	74.8	96.4	98.9		98.4	97.6		96.7	91.3	95.8	95.6	93.1	88.0
VDB				47.2	45.1	46.1	47.9	45.9	48.1	50.6	43.1	41.7		

Sources: Annual reports and financial statements of development banks.

Note: Long-term loans are defined as loans whose maturity is more than one year. Hungary, China and Turkey: data refer to gross loans and advances. South Africa: impairment of loans and advances are excluded from computations. India: data refer to total assets. Viet Nam: data refer to long and medium-term investment loans. Loans with ODA funds are not divided between short, medium and long-term loans and are therefore not included. This means that these figures might underestimate the share of medium and long-term loans in total loans.

MFB, BNDES, CDB and TSKB stand out for their remarkably high share of long-term loans, with peaks of 99 per cent for the TSKB, 87 per cent for CDB, 83 per cent for BNDES and 81 per cent for MFB. In Hungary, the share of long-term loans was around 40 per cent in the mid-2000s. Since 2007, the share of long-term loans has increased, possibly reflecting the new emphasis of the New Hungary Enterprise Development Programme (see Box 4). By contrast, IDC, SIDBI and VDB have a more balanced portfolio, with roughly half of their loans being long-term and half being short-term loans.

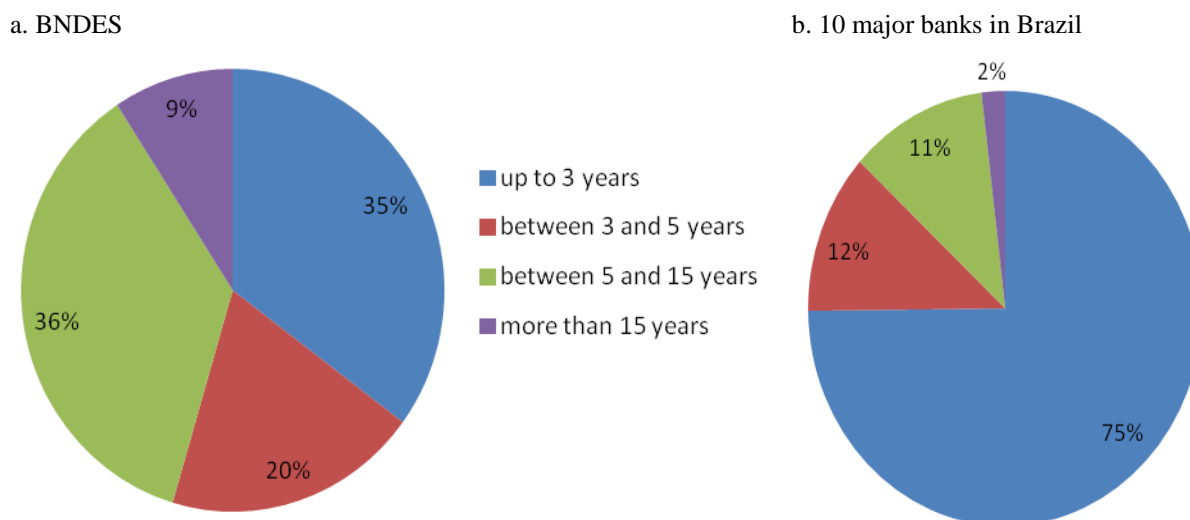
Box 4 The New Hungary Enterprise Development Programme

The New Hungary Enterprise Development Programme substituted the For a Successful Hungary programme, which in turn had unified a number of schemes that had been part of the Szechenyi Enterprise Development Programme, operational since the early 2000s. All of these programmes were essentially meant to spur SMEs' growth, which were often deemed ineligible for financing in the domestic financial system. The New Hungary Enterprise Development Programme provides repayable and non-repayable loans at preferential conditions – subsidized interest rates, long grace periods and long maturities. In 2007, the programme was extended to start-ups and enterprises with high-growth potential. Moreover, the amount of maximum credit was raised and the proportion of matching funds decreased. As a result, total and average loan disbursements have increased. The average maturity of these loans is between 5 and 10 years. In 2014, this programme represented 77 per cent of all MFB loans. The programme was reformed again in 2015 and became the MFB Enterprise Financing Programme 2020. In spite of this change, the programme maintains the rationale and characteristics of previous programmes.

Source: MFB.

It is worth exploring whether national financial systems are generally prone to giving long-term loans or whether development banks are truly filling a gap in domestic financial systems. Figure 6 shows the maturities of loans of Brazil's 10 major banks (excluding BNDES) and of BNDES.

Figure 6 Maturity of BNDES loans compared to those of 10 major banks in Brazil (2012)



Source: Portugal (2013).

In 2012, roughly 75 per cent of the long-term loans of the 10 largest banks in Brazil had a maturity of less than 3 years. Almost the opposite is true for BNDES: 25 per cent of its medium and long-term loans had a maturity of less than 3 years, and 75 per cent had a maturity of over 3 years. At the highest maturity level (more than 15 years), BNDES outperforms Brazil's 10 major banks, with 9.2 per cent against 1.9 per cent of these loans in the portfolio. In addition, the average maturity of loans of-

ferred to all banks in Brazil was 2.8 years in 2011 and increased to 3.7 years in 2014.⁶ Hence, BNDES provides a type of loan that other banks do not provide, i.e. filling a gap in the financial market. Box 5 provides more details on the long-term loans offered by BNDES.

Box 5 Long-term financing for capital goods acquisition in Brazil: FINAME

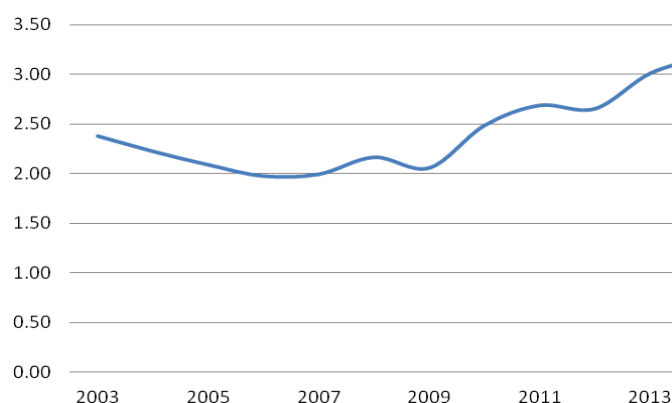
BNDES offers a huge variety of credit lines, categorized into products, programmes and funds. Among the credit lines for industrial financing, FINAME (*Financiamento de máquinas e equipamentos*) is a subsidiary of BNDES, created to provide medium-term loans for the acquisition of capital goods and equipment. The programme was launched in 1964, pioneering a wave of similar programmes in other industrializing countries such as the Republic of Korea and Mexico.

Today, FINAME supports buyers of capital goods or equipment and/or producers of commissioned goods or equipment. Three credit lines exist: i) acquisition and commercialization of capital goods; ii) production of capital goods; iii) acquisition and commercialization of buses, trucks and aircraft. Interest rates and other financial conditions vary according to the credit line. Generally, loans have a maximum 5-year maturity, except for loans for the production of capital goods (18 months). Interest rates vary and depend on the long-term interest rate set by the National Monetary Council. BNDES finances up to 90 per cent of the value of the investment, and the capital goods must comply with the 60 per cent local content requirement. In 2009, BNDES launched the Investment Maintenance Program (*Programa Sustentação do Investimento*, PSI), which was set to run until 2015. PSI is a strong counter-cyclical effort aimed at counter-balancing the effects of the global financial crisis by re-activating loans. PSI supplements FINAME and offers even more favourable terms: interest rates are lower, 100 per cent of the value of the investment can be financed with a maturity of up to 10 years.

Error! Reference source not found. shows data on FINAME loans as percentages of GDP. On average, FINAME loans account for 2.4 per cent of Brazil's GDP and one-third of total BNDES loans (see Table 4).

The impact of PSI is evident with an increase in loans since 2010. Today, FINAME is much larger than it used to be: in the mid-1970s, i.e. in the midst of Brazil's industrialization efforts and the peak of government development efforts, FINAME loans accounted for 1.5 per cent of Brazil's GDP.

Figure 7 FINAME loans as a percentage of GDP



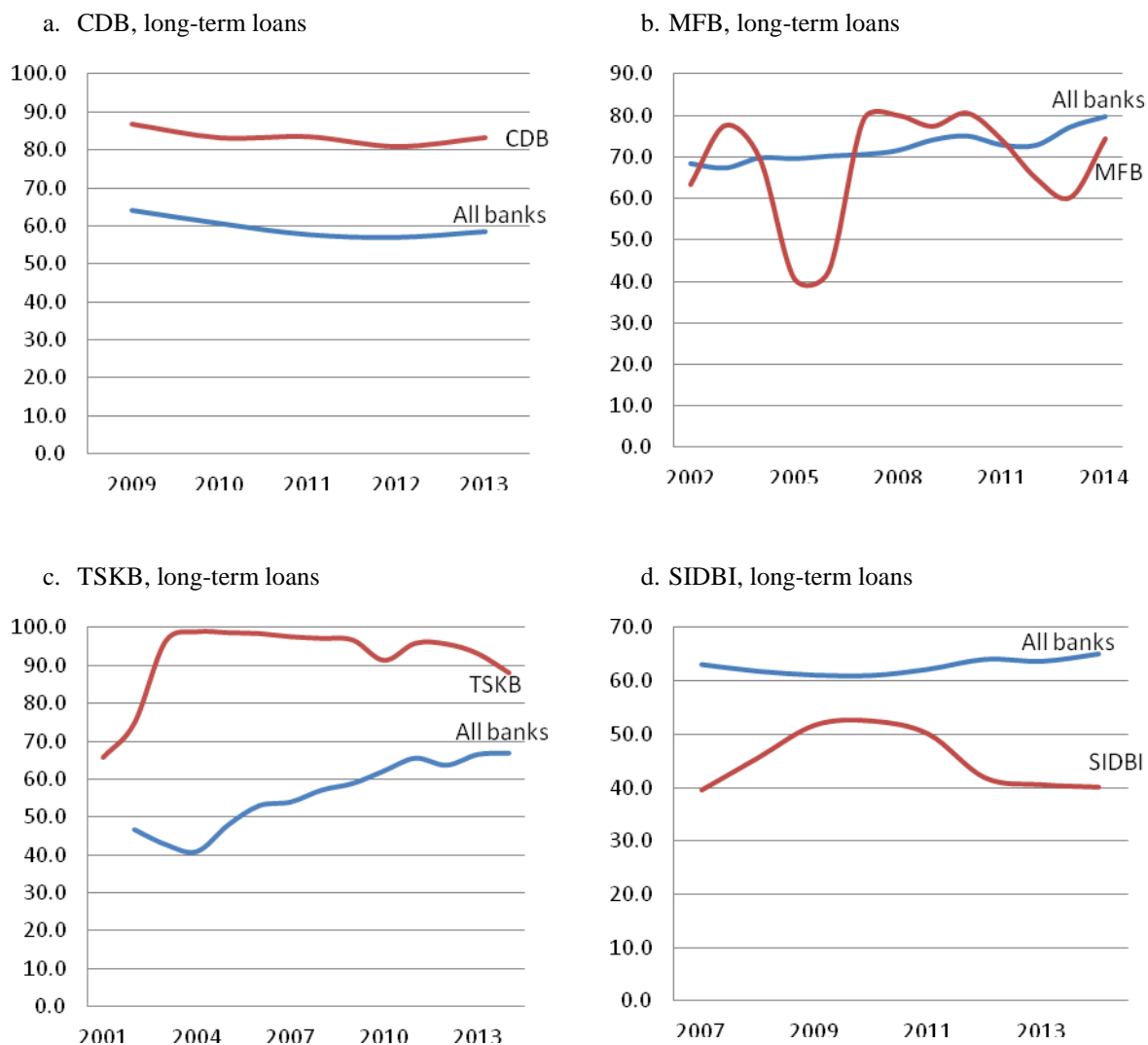
Source: FINAME.

Sources: BNDES webpage, FINAME, Ferraz et al. (2011) and Guadagno (2015).

⁶ Data from Brazil's Central Bank. Retrieved 13 November 2015 from <https://www3.bcb.gov.br/sgspub/consultarvalores/consultarValoresSeries.do?method=consultarValores>

Figure 8 a-d compares the share of medium and long-term loans over total loans for development banks and all banks in China, Hungary, Turkey and India.

Figure 8 Long-term loans as a share of total loans



Sources: Annual reports and financial statements of development banks. All banks: Hungary: Central Bank of Hungary.⁷ China: China Banking Regulatory Commission Annual reports. Turkey: Banking Regulation and Supervision Agency.⁸ India: Reserve Bank of India.⁹

Note: China: data for all banks refer to banking institutions, including PBOC. Turkey: data for all banks refer to the entire banking sector. Figures for TSKB for 2005 and 2008 are imputed and calculated as the averages of 2004 and 2006, and 2007 and 2009, respectively. India: data for all banks refer to major commercial banks. The 2008 figure for SIDBI is imputed and calculated as the average of 2007 and 2009.

⁷ Retrieved 19 November 2015, from <https://www.mnb.hu/en/statistics/statistical-data-and-information/statistical-time-series/x-monetary-and-other-balance-sheet-statistics>

⁸ Retrieved 18 November 2015, from <http://ebulten.bddk.org.tr/ABMVC/en>

⁹ Retrieved 18 November 2015, from <https://www.rbi.org.in/Scripts/AnnualPublications.aspx?head=Statistical%20Tables%20Relating%20to%20Banks%20in%20India>

In China, CDB provides roughly 20 per cent more long-term loans than the average of all banks, verifying that CDB fills a gap in China's financial system. In Turkey, TSKB grants more long-term loans than the average of all banks, even though the gap is visibly decreasing as the share of all banks has risen since the mid-2000s, reaching 67 per cent in 2014. This value is similar to those of China or India, where the share of long-term loans in the economy are between 60 per cent and 70 per cent. This indicates that while banks in Turkey provide more long-term loans, TSKB still grants roughly 20 per cent more long-term loans than the average Turkish bank, confirming that TSKB is accomplishing its function in the financial market.

In Hungary, the share of long-term loans by all banks increased from 68 per cent in 2002 to 80 per cent in 2014. By contrast, the share of long-term loans by MFB has been quite cyclical, decreasing sharply in 2005 and less pronounced in 2011. This reveals that the Hungarian development bank has not always been the main provider of patient capital in the Hungarian economy. In India, SIDBI is under-financing in the medium and long-term compared to the largest commercial banks in the country. In 2007, 63 per cent of loans of the major commercial banks had a maturity longer than one year. This share has slightly increased over the years, reaching 65 per cent in 2014. By contrast, the share of SIDBI's long-term loans was 40 per cent in 2007 and increased to 53 per cent by 2010, but began decreasing since. Hence, while SIDBI facilitates access to loans for Indian micro-enterprises and SMEs, access to medium and long-term loans might be more problematic.

In addition to providing patient capital, the interest rates of development bank loans are often subsidized. Interest rates can be fixed or floating; the latter are often set in reference to a base rate such as the LIBOR (the London Inter-bank Offered Rate, the rates at which large banks lend to each other). For example, the New Hungary Enterprise Development Programme (see Box 4) offers loans at variable interest rates of up to 3 month EURIBOR + 4 per cent. At the beginning of 2014, the 3 month EURIBOR was 0.284 per cent, meaning that the maximum interest rate for programme loans was 4.284 per cent, slightly below the Hungarian lending interest rate of 4.44 per cent.¹⁰ In South Africa, the Manufacturing Competitiveness Enhancement Programme (see Box 7) offers loans at fixed interest rates of 4 per cent, more than half the prime interest rate of 9.25 per cent at the end of 2014.

In China, where the Central Bank determines the benchmark interest rates, reforms to liberalize interest rates are currently underway. As part of these reforms, the loan prime rate (NPR) is computed as the average interest rate banks offer their best customers. In 2014, the NPR was 5.51 per cent (People's Bank of China, 2014). In the same year, the average interest rate applied to CDB loans was 5.84 per cent, 0.33 per cent higher than the NPR (CDB, 2014). This, however, is only an average value, as

¹⁰ Data on lending interest rates were derived from the WDI. EURIBOR rate data were taken from <http://www.euribor-rates.eu/euribor-rate-3-months.asp>, retrieved 25 November 2015.

the bank is allowed to set lower interest rates.¹¹ For example, in 2010, the average interest rate of CDB loans was 5.29 per cent (CDB, 2011). In the same year, CDB provided a USD 30 billion loan to the Brazilian telecom company *Tele Norte Leste Participacoes* to buy network equipment from Huawei at an interest rate of 4 per cent. At that time, Brazilian firms paid roughly 6 per cent on dollar debts (Sanderson and Forsythe, 2013).

In Brazil, interest rates on BNDES loans are based on the long-term interest rate (*Taxa de Juros de Longo Prazo*, TJLP), set by the National Monetary Council.¹² The TJLP is a subsidized rate: in 2014, it was only 5 per cent, considerably lower than the Selic (*Sistema Especial de Liquidação e Custodia*) rate of 11.75 per cent and the average lending interest rate of 32.01 per cent.¹³ Because of the recession that has recently hit Brazil, the interest rates of BNDES credit lines have increased. For example, the PSI (see Box 5) offers loans at an interest rate of between 6.5 per cent and 11 per cent, reducing the spread between BNDES interest rates and Selic rates, which today are at 14.25 per cent.

4.2 Spurring manufacturing firms' growth: vendor financing, equity investments, grants, trade finance and technical support

Firms in developing and industrializing countries face considerable constraints to growth. Growth would, however, create new job opportunities and wealth. Loans are one of the instruments that spur firms' growth. They can be provided to national firms, especially when they wish to expand their production capacity or modernize their equipment, or to customers of domestic firms, a practice known as *vendor financing*.

In China, CDB supports the "going out" strategy of Chinese firms that seek markets that allow them to maintain their high production scales. Low-income countries with huge markets such as those in Africa, need a variety of products and services, but local borrowing is expensive. At higher income levels, countries such as Brazil, Mexico, the Russian Federation or Indonesia, have vast markets. While Chinese products are often competitive in these markets, buyers might face high borrowing costs to access loans needed to buy these products. This is where CDB intervenes by offering buyers competitive (subsidized) loans that allow them to purchase Chinese products.

¹¹ According to the CDB website, CDB "sets interest rates in line with the unified stipulations made by the People's Bank of China. For long-time customers who have maintained sound credit standing, interest rates can be lowered appropriately within the range stipulated by the People's Bank of China". Retrieved 25 November 2015 from <http://www.cdb.com.cn/english/Column.asp?ColumnId=111>

¹² TJLP rates, retrieved 26 November 2015, from http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Custos_Financeiros/Taxa_de_Juros_de_Longo_Prazo_TJLP/index.html

¹³ The Selic rate is the Brazilian overnight rate, set by the Brazilian Central Bank. Data on Selic rates were retrieved 26 November 2015 from <http://www.bcb.gov.br/?INTEREST>. Data on lending interest rates were taken from WDI. WDI data differ from those of the Brazilian Central Bank, according to which the average lending interest rate was 23.96 per cent in 2014. Data from <https://www3.bcb.gov.br/sgspub/consultarvalores/consultarValoresSeries.do?method=consultarValores> (Retrieved 26 November 2015).

These deals are often energy or commodity-backed, i.e. loans are secured by revenues earned from the delivery of energy or other commodities of interest. These are referred to as *loans-for-oil*, a practice that was first used by Japan with China in the 1970s. In these deals, CDB provides a loan to a foreign firm or government, which commits to sell energy or commodities to a Chinese firm. The Chinese firm pays through a bank account at CDB, which directly withdraws all due payments relative to the loan. On the buyer's side, evidence shows that these loans are used to finance infrastructure investments or other purchases such as telecom equipment, but social programmes as well (Downs, 2011). To give an idea of the size of this phenomenon, according to recent estimates (Gallagher et al., 2012), Chinese banks lent USD 75 billion to Latin American countries, of which two-thirds can be classified as loans-for-oil.¹⁴

Loans are not the only available instrument. Some development banks, especially at higher income levels, offer *equity investments*, acting as private equity firms, thus creating an additional channel through which firms can capitalize. Firms that need financing to expand their capital but which are in too early a stage or whose project is too uncertain to predict cash flow to repay the loan, might prefer equity over credit. In addition, government stakes in private firms can be beneficial, especially if the firms have a latent growth potential and face serious obstacles in accessing capital. However, equity investments require a developed financial market that allows banks to exit the firm and profitably sell assets in the market. This explains why not all development banks have an equity portfolio.

Moreover, private equity is very different from development banking: at minimum, it requires a different (more commercial) mind-set, greater financial resources and more advanced evaluation and risk management skills. For these reasons, equity investments are generally kept separate from traditional development banks' activities. For example, BNDES has a wholly-owned subsidiary, BNDESPAR, dedicated to this, with some of the BNDES funds also managing private equity investments.¹⁵ CDB established the China Development Bank Capital, a wholly-owned subsidiary of CDB created in 2009, with an endowment of CNY 35 billion, and the China-Africa Development Fund (see Box 6).

¹⁴ CDB concluded 82 per cent of loans to governments and firms in Latin American countries (Gallagher et al., 2012).

¹⁵ According to Lazzarini et al. (2011), BNDES had direct equity in 31 firms in 2009, with 13 per cent direct ownership, on average.

Box 6 Supporting the “going-out” strategy of firms: the China-Africa Development Fund

The China-Africa Development Fund (CADF, also referred to as CADFund) is China’s largest Africa-focused investment vehicle. Established in 2007, it is 100 per cent owned by CDB, but operates independently. CDB provided the first-phase funding of USD 1 billion, which is planned to eventually reach USD 5 billion. The fund is intended to enhance engagement in Africa while creating additional demand for Chinese firms. Given its objectives, CADF qualifies as one of the key instruments of the Chinese government’s “going-out” strategy introduced in 1999, and represents an innovative way of conducting international cooperation.

The fund offers a bundle of services ranging from technical support to equity and quasi-equity investments. Technical support involves on-site facilitation services to assist Chinese firms struggling with deficient doing business conditions in Africa, operation and management consulting, M&A and IPO consultancy, but also advisory services to match firms, as African firms need a Chinese partner as a prerequisite to apply for CADF support. Chinese firms that operate or plan to start operations in African countries can benefit from CADF support. CADF frequently opens the door to CDB’s loans and vice versa. Investments mainly target infrastructure, agriculture, manufacturing, resource extraction and industrial parks.

CADF investments are generally large and CDB involvement can be very instrumental. For infrastructure projects, such as the USD 3 billion loan to the Ghanaian government, CADF makes use of the decennial experience of CDB in infrastructure and negotiates loans in order for Chinese firms to get most of the procurements stemming from the loan. CADF also invests in mining projects, such as the project to develop the Simandou iron ore mine in Guinea involving Chinalco, the Chinese leader in aluminium production, and Rio Tinto, the multi-billion Anglo-Australian miner. These projects not only expand business opportunities for Chinese firms abroad but also for those in China, as they ensure that firms in China secure a sufficient supply of energy and primary inputs for their own production and demand, especially for equipment and capital goods necessary for production in Africa. For example, in manufacturing investments such as the Ethiopian leather factory supported by CADF, machineries and inputs came from China. Outputs, such as animal skins, were exported to China, feeding other Chinese firms’ production. With investments in industrial zones in Nigeria, Mauritius, Egypt, Algeria, Zambia and Ethiopia, CADF creates double business opportunities, as some firms build infrastructure for industrial parks, and others establish the factories the park consists of. These examples give an idea of the tremendous spillover from investments such as these. It also shows how CADF fits into the government policy agenda: in the manufacturing sector, CADF helps Chinese firms cope with the rising labour costs in China by shifting low value-added activities to lower-cost African production sites.

Sources: CDB and CADF websites, and Sanderson and Forsythe (2013).

As shown in Table 1 , development banks in countries at higher income levels such as Hungary, Brazil and South Africa, also offer *non-repayable grants*. These grants allow financing early-stage or risky projects, such as innovative projects, and to support firms that do not qualify for credit lines, due, for example, to lack of collateral. Grants can also be used to stimulate investments in areas where governments would like firms to invest, but firms lack incentives to do so. For example, IDC offers

grants for projects that are of interest to the government (see Box 7), for firms in selected industries (textiles, footwear and leather) and for innovative projects that are in their development phase, i.e. the phase that starts after basic research and ends when a prototype is produced.

Trade finance is another instrument to spur firms' growth. Export credits, which are among the most important policy instruments used today by successful industrializers like the Republic of Korea, fall under this umbrella. According to WTO rules, among the countries included here, only India is allowed to use export subsidies.¹⁶ SIDBI, however, does not provide export credits, which might be explained by the small scale of the businesses it supports. Despite not being a member of the WTO, Ethiopia does not grant export credits either (only export credit guarantees). VDB, on the other hand, offers export credits, representing between 2.4 per cent and 9.9 per cent of its total loan portfolio. At higher income levels, BNDES provides loans for both exporters and importers, at conditions depending on the type of firm and goods being produced. Interest rates for goods identified by BNDES are subsidized, and in order to qualify for such support, certain products need to comply with domestic content requirements. PSI (Box 5) also offers loans to capital goods exporters. Interest rates range from 10 per cent to 11 per cent, depending on the size of the firm. Maturities are set at a maximum of 3 years and the value of the loan ranges between 50 per cent and 70 per cent of the value of the exported good. As already discussed, CDB uses alternative instruments to promote exports.

Box 6 provides an overview of types of technical support services development banks can provide. The range of technical services offered is extensive. Apart from business and financial consultancy services, development banks have in-house technical expertise to offer operational support, conduct feasibility studies to make long-term projections on the profitability of projects and to monitor real and financial industry trends. As already highlighted in Section 3.1, banks have significant numbers of engineers and technical experts on their staff. Technical support services can be categorized into pre- and post-investment services. The former entails the preparation of business plans and support to set up a business and identify the most suitable credit lines for that business. The second entails the resolution of problems entrepreneurs face in managing their firm, accounting assistance, support with quality accreditation, but also training courses in business management.

¹⁶ See Annex 7 of the Agreement on Subsidies and Countervailing Measures.

Box 7 The South African Manufacturing Competitiveness Enhancement Programme

Launched in 2012 to spur growth in a period of financial turmoil, the Manufacturing Competitiveness Enhancement Programme (MCEP) aims to ease access to credit for manufacturing firms, to increase their competitiveness, expand their business and create new job opportunities. Currently, it is the key programme for industrial financing under the Industrial Policy Action Plan (IPAP). The programme is worth ZAR 5.8 billion, to be allocated between 2012 and 2017.

Given the strong focus on job creation, basic and heavy industries—paper, petroleum, nuclear fuel, basic chemicals, iron and steel and basic metals—are only considered for financing if they can show that they can create jobs in downstream industries and benefits for the rest of the value chain, or if the industry is in financial trouble. Firms in automotive, clothing, textile, footwear and leather are also excluded as they are entitled to seek assistance via other dedicated programmes.

MCEP comprises two sub-components: the Production Incentive, administered by the Department of Trade and Industry (dti), consisting of cash grants, and the Industrial Financing and Loan Facility, administered by the IDC and consisting of loans and grants. The Industrial Financing and Loan Facility provides financial support in two forms:

- working capital loans up to a maximum of ZAR 50 million for a period of up to four years, at a preferential fixed interest rate of 4 per cent through the Pre- and Post-Dispatch Working Capital Facility;
- grants for projects identified by the dti and IDC's Strategic Business Units under the Industrial Policy Niche Projects Fund. Projects that would otherwise not be candidates for commercial or IDC funding receive these grants. These projects should focus on new areas with the potential for job creation, diversification of manufacturing output and contribution to exports.

In 2014, the funds channelled through this programme represented roughly 10 per cent of IDC funds. The programme, initially to run until 2017, was temporarily suspended in October 2015, due to the high number of applications received. Since April 2015, some observers have noticed a backlog in the processing of applications, primarily due to insufficient funds available to review applications. Because of the high number of applications, dti decided to lower the maximum cap available for financing, allowing more firms to benefit from support. At the same time, the lag between applications and disbursements has surged, also because successful applicants would often not exercise their right to the grant. These blocked funds could have been allocated to other, more urgent projects. Moreover, according to some, regulations relating to the programme changed too often. Situations like this lead to frustrations for all firms involved in the application process and, ultimately, undermine the relationship between the State, the development bank and local entrepreneurs and firms seeking support.

Sources: Allix (2014), Andreoni et al. (2014), dti (2014), Neuman (2014) and Ensor (2015).

4.3 Support MSMEs, stimulate new ventures and spur innovation

Micro, small and medium enterprises (MSMEs) are often the most credit-constrained firms in the economy. Still, MSMEs play an important role in the economy, especially in developing countries. First, MSMEs often represent the bulk of the private sector in these countries. Second, their role in job creation and regional development can be substantive. In this area, the policy challenge governments face is how to nurture micro and small enterprises so they can graduate into medium-sized enterprises, and how to help them expand production and benefit from economies of scale, which is crucial for manufacturing industries.

MSMEs generally have different characteristics and problems than larger firms. This requires development banks to target them with a specific set of instruments. As Table 1 showed, several development banks offer dedicated support to SMEs. The salient characteristics of these instruments are twofold. First, they are hybrid instruments: they balance debt and equity, allowing the bank to convert debt into equity after a certain period, or depending on certain conditions. Second, these instruments often do not require collateral. These two characteristics are particularly suited to MSMEs, which generally lack collateral, due to their age and size, and therefore constitute a very risky investment for banks. Examples of these alternative financial instruments are *mezzanine financing*, *convertibles* and *subordinated equity*. SIDBI, specialized in services to MSMEs, offers these alternative instruments, together with more traditional services such as loans and equity. These incentives are organized in schemes, as shown in Box 8.

Young firms are also among the most financially constrained firms in the economy. Due to their lack of assets, cash flow and history, banks find it particularly risky to invest in them. Especially when specialized in innovative or early-stage technologies, the profitability of their projects and chances of survival in the market are highly uncertain. Still, some of these firms have high growth potential and can ultimately create employment and help countries diversify their production structures. Venture or risk capital makes equity investments in early-stage enterprises with a high growth potential.

Few development banks are active in the venture capital business. Those that are apply a different logic than that common in venture capital. For example, in South Africa, IDC has a Risk Capital Facility, funded mainly from international donor funds (the European Investment Bank, in particular). This fund is not simply a venture fund but promotes the second objective of stimulating entrepreneurship among disadvantaged communities and compliance with other socially desirable requirements like the provision of HIV/Aids prevention and awareness programmes. In India, venture capital funds support MSMEs in traditional industries like textiles (see Box 8) or industries already established in the country (e.g. software and IT). While MSMEs in these industries might also be financially constrained, venture capital funds generally target firms in earlier-stage and riskier technologies.

Box 8 Instruments for micro, small and medium enterprises (MSMEs): The case of SIDBI

SIDBI specifically offers services for MSMEs. Apart from facilitating access to loans and syndication services to identify suitable SIDBI and government support schemes, the bank offers the following schemes:

- Growth Capital and Equity scheme, providing mezzanine financing, convertibles, subordinated debt and equity. Beneficiaries include existing clients of the bank or firms with 3 years of profitability and a 2-year satisfactory banking credit track record. This shows that although these instruments already attempt to reduce the risks associated with financing MSMEs, the bank has additional filters in place to select beneficiary firms.
- Receivable Finance Scheme, aiming at increasing MSMEs' liquidity by offering their customers financial resources to pay the bills of their purchases. This is a clear example of the different services MSMEs need.
- Flexible Assistance for Capital Expenditure scheme, providing financing to modernize or upgrade technologies or to make investments to diversify businesses. Loans under this scheme have long-term maturities between 7 and 10 years.

Given the importance of technology modernization and production expansion, industry-specific programmes for modernization in food processing, textiles and leather are also available. Often discontinued due to an exhaustion of funds, they have a fairly long history, dating back to the late 1990s. These schemes are often designed in a quite technical way, specifying the support available for different machineries. The rationale behind this is to encourage upgrading towards machinery that allows for high-speed production and high capacity, or to improve quality control or diversify production into new market segments. Some of these programmes (e.g. the Leather Industry Programme) also combine technology modernization incentives with incentives to improve productivity and product quality through the establishment of in-house R&D, testing and sample-making facilities.

SIDBI also operates venture capital funds through SIDBI Venture Capital Limited. Currently, it is investing in industry-specific funds (e.g. software and IT or textiles), or funds addressing a specific type of firm (e.g. social firms), or funds that generically target unlisted Indian MSMEs. Ministries, commercial banks, DFIs and international donors also contribute to these funds.

Sources: SIDBI website and SIDBI (2014-15).

Investments in R&D and innovative projects are socially desirable endeavours, but expensive for individual firms. Due to the uncertainty of their outcome and high risk profile, these projects might find it difficult to obtain the necessary financial resources to get started. While innovation is generally considered a first-world activity, emerging and developing economies are increasingly contributing to global R&D expenditure and innovation. The countries that invest most heavily in R&D have managed to catch up with industrialized countries. In these cases, innovation spurred productivity growth, created employment and allowed countries to diversify their production structures towards higher value added industries. As discussed in Section 2, development banks can play a role in this area by providing loans and other forms of support to investments in innovative projects.

For example, IDC ran a huge and successful programme, the Support Programme for Industrial Innovation (SPII). The programme consists of three sub-programmes, each tailored to a specific group of firms – micro and very small, medium to large and large enterprises. It provides non-repayable grants, covering between 50 per cent and 85 per cent of the costs incurred to develop the innovative product or process. The value of the grant ranges from ZAR 2 million for micro and small firms to ZAR 5 million for medium and large firms. Large firms also qualify for a conditionally repayable grant equal to a maximum of 50 per cent of the development costs incurred, for a maximum of ZAR 10 million per project, to be repaid in case of successful commercialization of the product.¹⁷ This indicates that the conditions for obtaining such grants differ depending on applicant type, reflecting the obstacles between smaller and larger firms in accessing loans.

Similarly, in Brazil, the programme *Inova Empresa* aims to stimulate innovation among Brazilian firms. Contrary to South Africa's SPII, *Inova Empresa* specifies the industries that can request financial support, with individual sub-programmes targeting broadly defined industries (e.g. aerospace, agriculture, energy, health, green industries, telecom and chemicals) and narrowly defined industry segments (oil and natural gas, biomass derived from sugarcane and innovations in the production chains of sugarcane and other compatible cultures). Many of these sub-programmes are co-managed by several public agencies: for example, in the case of aerospace, BNDES is joined by the Ministry of Defense, the Brazilian Space Agency and FINEP, the agency that finances basic research. All supported products, processes and objectives are clearly outlined in each sub-programme. The phases of the selection process, characteristics of eligible participants and types of support are elaborated as well. The role of BNDES in these programmes relates to credit allocation. In 2013-2014, *Inova Empresa* invested ZAR 32.9 billion, out of which 24 per cent was allocated to the energy industry, 17 per cent to oil and natural gas, 15 per cent to health, 13 per cent to agriculture and 12 per cent to aerospace.

Smaller banks such as SIDBI also offer some forms of support for innovation. The Revolving Fund for Technology Innovation offers subsidized loans for early-stage projects aimed at development, demonstration and commercialization of innovations in emerging technological areas. Assessing the potential success and profitability of such risky projects, which often have a high technological content, is a difficult task that requires technical knowledge and competencies on the part of the bank. Smaller banks might not necessarily possess such advanced knowledge. To this end, SIDBI cooperates with the Technology Information, Forecasting and Assessment Council (TIFAC), an organization under the auspices of the Department of Science and Technology of India's government, whose task is monitoring technological progress in promising emerging technologies. TIFAC evaluates the pro-

¹⁷ As in the case of the MCEP (see Box 7), the programme was interrupted due to budgetary constraints and has been open again since August 2015 for applications, but is managed directly by the dti.

jects submitted to the Fund from a technical perspective, while SIDBI assesses their financial viability.

5. Conclusions and policy implications

This paper focused on the role of industrial development banks as engines of structural change. Due to market failures in the financial market, manifesting in scarcity of capital and under-investment in socially profitable projects, firms in developing and emerging economies are often credit-constrained. In such contexts, the State can intervene by setting up national development banks, as was the case in today's industrialized economies such as Germany, Japan and the Republic of Korea. Development banks perform a variety of roles, investing when private investments are scarce and where private firms and banks are not willing to invest.

This study reveals that development banks, *inter alia*, fill a gap in the domestic financial market in which they operate by providing patient capital for long-term industrial projects and favourable conditions that make investments more attractive. Average maturities of loans from development banks are more often than not higher than the average maturities of major commercial banks or of the average bank in the country. Interest rates are also lower than those prevailing in the market. While this represents a cost for the State, the lending activities of the bank, favouring projects in infrastructure and other strategic industries such as ICT, energy and aerospace, establish the preconditions for further investments, opportunities for new jobs and productive diversification, thereby spurring structural change.

With time, development banks become huge organizations with large loan portfolios, numerous employees and regional and international branches. As the experience of older banks like BNDES shows, building such an organization takes time and involves trial and error processes and learning by governments and managers. As the organization becomes larger and more complex, managerial challenges increase, requiring professional managers and continuous investments in staff training.

Apart from considerable financial resources and managerial skills, development banks also need to invest in technical knowledge in order to be able to assess the potential of innovative projects, especially in emerging technological fields. Such ambitious projects often require a bundle of policy instruments: beyond loans, development banks offer other forms of financial support, and tailoring these to the needs of the respective firms and bundling financial services with technical support and advisory services. In this regard, development banks become one of the facilitators of industrial policy, joining the government and its ministries and other public agencies. The institutional setting of development banks is therefore a crucial link between the bank and the government and can maximize policy complementarities and policy coherence, thus intensifying the impact of industrial policies.

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