

The Role and Impact of Development Banks

A Review of their Founding, Focus, and Influence

Aldo Musacchio[†], Sergio Lazzarini^{}, Pedro Makhoul[†], and Emily Simmons[†]*

Revised March 2017

Keywords: Development banks, industrial policy, market failures, political economy

JEL codes: O16, O25, H1, L3

[†]Brandeis International Business School

^{}Inspere Institute of Education and Research*

Table of Contents

1

ACKNOWLEDGEMENTS	5
INTRODUCTION	6
BRIEF SUMMARY OF THE THEORY OF DEVELOPMENT BANKS	7
<i>Industrial Policy View</i>	<i>8</i>
<i>Social View.....</i>	<i>9</i>
<i>Political View</i>	<i>10</i>
<i>Table 1. Summary of Major Views on the Roles of Development Banks.....</i>	<i>11</i>
THE COMMON HISTORY OF DEVELOPMENT BANKS.....	12
<i>Major Shifts in Target Sectors</i>	<i>13</i>
<i>Structural Changes and Expansion of Banks' Toolkits.....</i>	<i>15</i>
<i>Table 2. A Brief History of Selected Development Banks</i>	<i>17</i>
BANK CAMEOS.....	19
<i>Table 3. Program & Services Comparison by Bank.....</i>	<i>19</i>
<i>The Chilean Economic Development Agency.....</i>	<i>21</i>
<i>The Business Development Bank of Canada</i>	<i>22</i>
<i>The KfW</i>	<i>23</i>
<i>The Korean Development Bank</i>	<i>24</i>
<i>The Brazilian National Bank for Economic and Social Development.....</i>	<i>25</i>
<i>China Development Bank Corporation</i>	<i>26</i>
MARKET FAILURES AND THE TOOLS TO ADDRESS THEM.....	29
<i>Information Asymmetry and Credit Rationing</i>	<i>29</i>
<i>Information Externalities and Latent Capabilities.....</i>	<i>35</i>
<i>Coordination Problems</i>	<i>38</i>
<i>Social-Environmental Impact</i>	<i>39</i>
<i>Technical Assistance.....</i>	<i>41</i>
<i>Strategic Trade</i>	<i>43</i>
<i>Table 4. Market Failures and Corresponding Bank Tools.....</i>	<i>46</i>
BANK PRIORITIES AND PERFORMANCE	47

<i>Table 5. Financial Performance Ratios and Statistics by Bank</i>	48
<i>Size of Banks</i>	49
<i>Intensity of Loans</i>	49
<i>Table 6. Portfolio Composition by Bank</i>	50
<i>Financial Performance</i>	51
<i>Table 7. Interest Income, Interest Expense, and Net Interest Margins in Development Banks</i>	53
<i>Capital Structure Differences</i>	54
<i>Table 8. Sources of Funding</i>	55
<i>EVIDENCE OF IMPACT: Effect of BANK TOOLS ON MARKET FAILURE AND DEVELOPMENT</i>	56
<i>Corfo: Supplier Development Programs and Firm Performance</i>	57
<i>BDC: Contrasting View on Effects of Credit Provision on Investments</i>	58
<i>KfW: Yemen Water Program</i>	59
<i>BNDES: Studies Examining the Effect of Loans and Equity</i>	60
CONCERNS ABOUT THE ACTIONS OF DEVELOPMENT BANKS	64
POLICY RECOMMENDATIONS	67
<i>Appendix: Brief History of the Studied Development Banks</i>	71
<i>Corporation for the Promotion of Production (Corfo)</i>	71
<i>Korea Development Bank</i>	76
<i>BNDES</i>	79
REFERENCES	84

Glossary

BDC	Business Development Bank of Canada
BNDES	Brazilian National Bank for Economic and Social Development <i>“Banco Nacional de Desenvolvimento Econômico e Social”</i>
CDB	China Development Bank Corporation
Corfo	Corporation for Promotion of Production, also referred to as The Chilean Economic Development Agency
FGI	Investments Guarantee Fund (BNDES)
GDP	Gross domestic product
IP	Intellectual property
KDB	The Korean Development Bank
KfW	Bank for Reconstruction or <i>“Kreditanstalt für Wiederaufbau”</i> Group
NBFI	Non-banking financial institution
NIM	Net interest margins
PE	Private equity
PPP	Public-private partnership
PSI	Investment Support Program (BNDES)
R&D	Research and Development
ROA	Return on assets
ROE	Return on equity
SEC	United States Securities and Exchange Commission
SOE	State-owned enterprise
SME	Small and medium-sized enterprises
VC	Venture capital

ACKNOWLEDGEMENTS

This paper was written with funding from Research Group of the World Bank. The authors would like to thank the comments of Ceyla Pazarbasioglu, Mark A. Dutz, William Maloney, Eva Gutierrez, seminar participants at a World Bank, and staffers at BNDES, BDC, and CDB. Research assistance was ably provided by Claudia Bruschi, Veronica Olivera Sapienza, Na Zhang, Katia Samanamud, Lea Strub, and Guan-Ho Nam. All errors remain responsibility of the authors.

INTRODUCTION

Development banks are seen as an important tool to solve market imperfections that would leave either profitable projects or projects that generate positive externalities without financing (Bruck 1998, Yeyati, Micco and Panizza 2004). In economies with significant capital constraints, these banks serve to alleviate capital scarcity and promote entrepreneurial action to boost new or existing industries (Armendáriz de Aghion 1999, Cameron 1961). They also lend to companies that would not undertake projects if not for the availability of long-term, subsidized funding from a development bank (Rodrik 2004, Yeyati, Micco and Panizza 2004). These positive effects notwithstanding, development banks—and state-owned banks more generally—are often criticized for supporting politically connected industrialists (Ades and Di Tella 1997, Faccio 2006, Hainz and Hakenes 2008, La Porta, Lopez de Silanes and Shleifer 2002) or crowding out private sources of capital that would otherwise help promote new investment (Antunes, Cavalcanti and Villamil 2012, Lazzarini, Musacchio, Bandeira-de-Mello and Marcon 2015).

Surprisingly, despite this controversy, empirical research on development banks is scant. Most of what we know about these banks is based on descriptive or theoretical work, rather than on empirical studies of the tools that they use and the effects of their actions (Amsden 1989, Armendáriz de Aghion 1999, Aronovich and Fernandes 2006, Bruck 1998). Yet, development banks remain important players in many countries, developed and developing alike. Musacchio and Lazzarini (2014) identified 286 development banks throughout the world, chiefly concentrated in South and East Asia (29.7%) and Africa (24.5%), followed by Latin America and the Caribbean (17.8%). In this study we are particularly interested in the so-called *state-owned* development banks, which are owned by particular domestic governments (different from multilateral institutions such as the World Bank) and usually have a mandate to promote local industrial development.

More specifically, our objective is to discuss distinct market failures addressed by state-owned banks and how these market failures map onto different policy tools that have been used by the banks. For instance, some development banks use direct lending to reduce information asymmetry and rationing in credit markets, while other banks use credit guarantees (without direct lending) for the very same purpose. Our empirical analysis is based on the comparative assessment of six state-owned development banks in different regions of the world: Chile's Corporation for Promotion of Production (Corfo); the Brazilian Economic and Social Development Bank

(BNDES); the Business Development Bank of Canada (BDC); Germany's KfW; the Korean Development Bank (KDB); and the China Development Bank (CDB). Based on this comparative assessment and evidence of the impact of their programs, we then generate policy recommendations to help improve the industry- and firm-level performance implications of state-owned development banks.

BRIEF SUMMARY OF THE THEORY OF DEVELOPMENT BANKS

Development banks are financial institutions typically offering subsidized, long-term financing for industrial development. Although there are many multilateral development banks focusing on distinct areas and countries, our emphasis here will be the so-called “state-owned” development banks, controlled by a local government. The tools employed by each bank vary, but in general include medium- to long-term credit, subsidized interest rates, credit guarantees, equity, and technical assistance. While it is widely understood that development banks target industrial production, intense discussion exists around the methodologies employed by each bank and the motivation behind them (Lazzarini, Musacchio, Bandeira-de-Mello and Marcon 2015). From the vast body of literature encompassing this discussion we identify three main views on the purpose and role of development banks: the industrial policy view, the social view, and the political view (Musacchio and Lazzarini 2014, Yeyati, Micco and Panizza 2004).

In brief, the industrial policy view holds that development banks were formed in response to failures of the capital markets to provide the financing necessary for entrepreneurial activity and industrialization (Armendáriz de Aghion 1999, Gerschenkron 1962). The social view holds that the government intervenes in the capital markets to address specific social issues (i.e., unemployment, lack of housing, energy dependency, etc.) (Shapiro and Willig 1990, Shirley 1989). The political view depicts development banks largely as instruments serving politicians' personal objectives or as conduits for rewarding politically involved industrialists (Ades and Di Tella 1997, Shleifer and Vishny 1994). Each view presents a different perspective on the role of government (through the bank) in addressing market failures. Similarly each view lends itself to a different set of expectations regarding which financial instruments are best able to achieve the specific objectives and the effects that would be seen in the subsequent impact metrics.

Industrial Policy View

The industrial policy view, as the name might suggest, is built on the assumption that industrialization—and entrepreneurial activity more generally—will lead to economic growth in a country and subsequent improvements in overall welfare. In this view, capital market constraints are seen as the prohibitive factor to entrepreneurship, often directly, but also indirectly as financing for the infrastructure necessary to support industrialization may also be seriously deficient.

The direst constraint here is a lack of long-term lending not only for large industrial and infrastructure projects (Gerschenkron 1962), but also for the new ventures needed to bear the costs of discovery of new technologies and productive processes (Hausmann and Rodrik 2003). Additionally, information asymmetries and the inherent riskiness of such projects result in high interest rates deterring otherwise willing investors. High information asymmetry is most severe in the case of small investors seeking capital from the private sector. Medium- to long-term loans null the duration constraint on financing, while government funding for development banks provides lower-than-market interest rates essentially subsidizing the cost of the infrastructure or industrial projects. Development banks have also deployed equity financing in support of both state-owned enterprises (SOEs) and private firms; however this has been seen to be an effective use of state capital only in the case of credit-constrained firms (Inoue, Lazzarini and Musacchio 2013). To leverage the capabilities of the private sector, banks often have specialized structures to identify potential projects and even in some cases offer technical assistance (Armendáriz de Aghion 1999). In addition to patient capital, development banks may also offer guarantees, which serve to unlock additional capital from the private sector for development projects (Riding and Haines Jr. 2001, Zecchini and Ventura 2009).

Government intervention, under the industrial policy view, is largely seen as positive. The direct benefit then lies in enabling the country's industrial sector to unleash latent capabilities and thereby increase productivity and competitiveness (Rodrik 2004). The main insight of this view is that these *latent capabilities* are either too risky to be developed through the private financial system or too difficult to recognize. Indirect benefits of government involvement through development banks and the subsequent industrialization include creation of new streams of employment (through funding labor-intensive infrastructure projects), infrastructure projects with positive externalities (such as creation of new roads or water sources), and extending capital markets to support entrepreneurial activity. Proponents of the industrial policy view also cite

increased investment in innovation and discovery as a key benefit of development banks. As entrepreneurs develop new capabilities, they generate *learning externalities* that subsequent firms could imitate or upon which they could build. The presence of those externalities, some argue, will likely lead to underinvestment in new private capabilities (Amsden 1989, Hausmann and Rodrik 2003). Additionally, development banks can promote *coordination* to develop projects that require the orchestration of many actors and/or sectors (Murphy, Shleifer and Vishny 1989). Typically, this is the case of large, complex infrastructure projects or projects that require building local supply chains.

A controversial issue that is defended by some proponents of industrial policy is the so-called role of banks in supporting *strategic trade*. Throughout the world, banks have created “national champions” with heavy use of subsidies and even market protection (Fogel, Morck and Yeung 2011). In a context of global competition, firms that are heavily subsidized tend to distort markets and create negative externalities for competitors that lack those subsidies. Although these distortions are increasingly condemned by the World Trade Organization (Buiges and Sekkat 2009), government support for export activities and international expansion remains widespread. Development banks have also been used to support the strategic expansion of global firms, especially in contexts in which competition is heavily affected by nonmarket policies.

Social View

In this view, the development bank will try to leverage its competitive financing to ensure that firms recognize their roles in contributing to social issues, adopting sufficient constraints on activities contributing to the worsening of these issues and implementing initiatives to reduce or reverse the negative impact. In this regard, like any other state-owned policy bank, a development bank may actually finance projects with negative net present value but which offer significant positive externalities on the social side (Shapiro and Willig 1990, Yeyati, Micco and Panizza 2004).

Long-term, subsidized debt financing is an important tool of the development bank in promoting this focus on social issues. In particular, the duration and subsidies incentivize socially beneficial projects with either too long a time horizon or capital costs too high to insure the hurdle rates of investors are met. Equity financing, in turn, may be deployed to finance the establishment and growth of firms with a primary objective of addressing relevant social issues; this may include funding a new venture in an underdeveloped region or financing the expansion of firms with

significant job creation potential. There is some evidence that development banks do care about creating new employment, regardless of the productive structure of the new jobs (De Negri, Maffioli, Rodriguez and Vázquez 2011). Both through debt-financing terms and equity, development banks may make funds available to a firm contingent on prioritization of various social objectives.

Political View

The political view presents a more negative perspective on industrial policy as a whole. Under the political view, the investment criteria for development banks are shifted from alleviating gaps in the capital market or directing financing towards social aims to funding the preferred projects of politicians. These projects may lack the objectives laid out in the industrial policy and social views. The result is misallocation of funding which leads to distortions in the financial and labor markets. There are two hypotheses as to how this misallocation occurs: the soft-budget constraint hypothesis and the rent-seeking hypothesis.

The soft-budget constraint hypothesis is fairly straightforward and surmises that under the political view, development banks are used to “bail out” failing firms (Kornai 1979). In contrast to the industrial policy view that presents government subsidies as productive for investment and development, here the subsidy, guarantees, and/or long-duration lending serve to direct funds to inefficient market players rather than efficient firms. This subverts capital that could be used more productively and weakens incentives for firms to reach the industrial and/or social objectives laid out under the other two views (Shleifer and Vishny 1998).

The rent-seeking hypothesis presents a slightly more nuanced form of misallocation. Under the policy view the subsidies and long-term lending, which under both the industrial policy view and the social view enable development banks to facilitate optimal productive investment, are instead subverted to projects that are not inhibited by gaps in the capital markets. The funded projects could access capital from investors in the private markets, but through “cronyism,” a behavior that rewards political supporters with easier access to government resources or inversely enables high-powered industrialists to benefit from strategic political leveraging, industrialists are able to access the more competitive terms of the development banks’ loans (Ades and Di Tella 1997, Claessens, Feijen and Laeven 2008).

In the presence of rent seeking, a primary recommendation from the literature is to establish clear targets for the policy objectives, monitor the performance of investments, and cease support

if firms fail to meet the objectives (Amsden 1989, Lazzarini 2015, Rodrik 2004). Absent of these controls, development banks may end up providing capital to low-productivity firms or firms that do not need subsidized capital in the first place (Cull, Li, Sun and Xu 2013, Lazzarini, Musacchio, Bandeira-de-Mello and Marcon 2015). In other words, while banks can reduce market failure, they may also create *government* failure, that is, policies that end up reducing welfare and efficiency (Coase 1960, Krueger 1990).

The following table summarizes the distinguishing features of each view and the key market failures addressed. The second half of the table identifies the primary use of each financial instrument in the banks' toolkits.

Table 1. Summary of Major Views on the Roles of Development Banks

	Industrial Policy	Social	Political
Summary of Theory	Development banks are intended to finance entrepreneurship, industrialization, and the infrastructure necessary for the economy to efficiently adjust to industrialization and maximize productivity gains.	Development banks are intended to insure that social concerns are appropriately prioritized against profit maximization and that resources are allocated for projects addressing socio-environmental factors when unattractive for purely profit purposes.	Development banks are used by politicians primarily to achieve personal objectives and to advance political agendas.
Market Failures Addressed or Government Failures Created	<ul style="list-style-type: none"> • Reducing information asymmetry and credit rationing • Promoting latent capabilities and projects that can generate potential information externalities. • Reducing coordination problems by promoting complementary investments with large spillover effects. • Contributing with technical expertise to reduce "discovery costs." • Strategic trade: subsidizing firms in costly international markets. 	Socio-environmental impact: <ul style="list-style-type: none"> • Investment in regions or customer segments that are not profitable for the private sector. • Supporting socially oriented initiatives (including high employment). • Investment in environment-friendly projects. 	Government failures: <ul style="list-style-type: none"> • Misallocation of credit (e.g. subsidized capital to large firms that do not need support in the first place). • "Soft budget constraints": supporting unproductive or failing firms. • "Rent-seeking": provision of subsidies to firms that do not need subsidized capital.
Bank Tools & Effect on Market Failure			
Subsidies	Support competitiveness of domestic firms	Support projects with positive social-environmental externalities but low profitability	Prop-up inefficient firms and/or divert funding away from more inefficient firms
Long-term capital	Enable investment in projects with term horizons beyond what the capital market can supply	Overcome credit rationing preventing investment in longer-duration projects	Divert funding from efficient firms to those preferred by the political leaders

	Industrial Policy	Social	Political
Guarantees	Extend the capacity of capital markets through risk-bearing	Foster innovation by reducing information asymmetries and bearing discovery costs	“Bail out” firms that should otherwise fail; increase information asymmetries
Equity	Promote efficiency in firms; extend “patient” capital; fund state-owner enterprises focused on key industries; create “national champions”	Overcome information asymmetries faced by companies developing socio-economic solutions; setting socio-environmental objectives for invested firms; risk-sharing	Waste government funding on suboptimal investments
Technical Assistance	Promote industry development through coordination of key players; strategic trade; supporting development of latent capabilities	Strengthen the competitiveness of social enterprises; provide expertise to firms adopting new solutions	Direct resources towards firms favored by politicians and away from others that may have stronger latent capabilities
Research & Development	Developing advancements in operational efficiency	Cover discovery costs of education, healthcare, and environmental projects	Support research in an industry that is politically necessary or popular

Having reviewed the three prevailing views on the role of development banks, we turn next to the history of six major development banks from Brazil, Canada, Chile, China, Germany and Korea. The selected banks provide us with a varied sample of senior and more junior banks, developed and underdeveloped economies, and geographical coverage. We examine parallels and key differences in their histories before assessing their structures and financial performance in order to ultimately extract key policy recommendations for other development banks.

THE COMMON HISTORY OF DEVELOPMENT BANKS

Our survey of development banks and their histories has revealed a distinct commonality in their origins, patterns of growth, and shifts in target sectors. The devastation left behind from World War II and the subsequent U.S. Marshall Plan, which laid out a framework for directing foreign aid at rebuilding dilapidated economies, were critical drivers in the establishment of the development banks of Canada (1944), Brazil (1948), and Germany (1952). Chile’s development bank, the Corporation for Promotion of Production (Corfo), pre-dated these banks by several years and was established in 1939 in response to the effects of the Great Depression on Chile’s economy (Nazer, Camus and Muñoz 2009). The early focus was determined by a major earthquake that claimed a reported 24,000 lives, but the growth of the bank was aided and influenced by the post-WWII multilateral initiatives (Min-Ji 2015, Min 2004).

In much the same vein as banks established immediately following WWII, the KDB was established in the wake of the Korean War. The civil war ultimately ended in the division of the country between the present-day Republic of Korea (better known as “South Korea”) and the Democratic People’s Republic of Korea (“North Korea”) (CIA 2016). The bank was established in South Korea as a strategic tool for rebuilding the economy. Though the Korean War was distinctly different from the World Wars, the effects were not unique: demolished infrastructure, a ravished industrial sector, and a struggling economy.

While a similar experience, such as a war or devastating natural disaster, seems a logical impetus for establishment, the history of the development bank of China suggests that it may be a shared *objective* more than a shared history that connects the banks. The China Development Bank Corporation (CDB) was established in 1994 absent of a devastating war or natural disaster. Rather, it was established in order to support the structural transformation of the economy’s production base and, similar to the other banks, focused on fulfilling a market gap in medium- and long-term credit provision, particularly for public infrastructure and basic goods.

Major Shifts in Target Sectors

With the exception of the CDB, the development banks were initially focused on reconstruction; the CDB was instead focused on urbanization, or the construction of previously undeveloped regions (Sanderson and Forsyth 2013). For the Business Development Bank of Canada (BDC) reconstruction was largely involved with transitioning industrial sites back from production of wartime supplies to peacetime production (BDC 2016). For Germany, reconstruction was more literal in that it necessitated investment in public infrastructure, including housing and the energy supply system (Grünbacher 2011). For Brazil, investments included refurbishing the national railway system and building hydroelectric production plants (BNDES 2002). China similarly chose to invest heavily in infrastructure projects at the outset of lending, funding construction of the Three Gorges Dam, the Beijing-Kowloon Railway, and Shanghai Pudong International Airport (IDFC 2015).

The predominance of central economic planning during and post-WWII was visible in the commonality of top-down plans for economic recovery. This, combined with the prevalence of import-substitution policies, drove investment in industries that supplied basic goods (such as agriculture and energy) or that were believed to be key drivers of economic growth. In Chile,

Germany, and Brazil, the high-growth drivers were chemical compounds and/or mining. The steel industry, in particular, was a primary recipient of funding in Brazil and Germany.

Interestingly, the Canadian development bank was less focused on the industrial output or the recovery of specific sectors and more focused on providing employment for returning soldiers. This objective was distinct from the others and resulted in a unique focus on facilitating entrepreneurship, though an indirect result was the familiar investment in manufacturing capabilities. It may have been this divergent focus that led the BDC to extend lending to non-industrial sectors well before other development banks followed suit.

By the late 1980s and early 1990s, the domestic and global environment had changed for development banks, and governments began a major switch in development policy—away from planning and more focused on market liberalization. As the commercial banks in these economies grew, more sources of capital became available for industrial production. When the capacity of private banks grew such that they became able to compete with the development banks, the market gap that spurred the creation of the banks was diminished. This drove a natural expansion in both the sectors served by the development banks and the tools they used to spur growth. Additionally, the deepening of the capital markets was accompanied by a shift in policy from the earlier import-substitution orientation to expansion of global trade and adoption of export-led growth policies. The development banks of Germany and China also began to invest in international projects that were deemed in the “national interest,” politically and/or economically

Another subtle, but significant shift occurred during this period as development banks turned from industry-level planning to a more firm-centric approach. As globalization became an increasingly important force, countries with heavy investment in state-owned enterprises (SOEs) began to privatize them, and development banks played a central role in facilitating this privatization. Subsequently, the banks began to invest more heavily in private companies. This reorientation was observed in Chile in the 1970s and 80s and Brazil in the 1980s and 90s. With the fall of the Berlin Wall, the Kreditanstalt für Wiederaufbau Group (KfW), the development bank of the Federal Republic of Germany was integral to the economic convergence of East and West Germany.

Technological progress dramatically changed the face of production forcing countries to look for new sources of economic growth. We observe a widespread shift from early infrastructure financing to industrial projects, and then on to small and medium enterprises (SMEs). In this

dimension, Canada's BDC seems to have been well ahead of the curve, focusing on fostering entrepreneurship much earlier. The most recent period in development banks' history could aptly be called the "innovation" period, in which the focus has turned to innovation (as high-growth sectors have been high-tech industries, as well as biotech, healthcare, and telecommunications) and sustainability (primarily featuring renewable energy sources).

Structural Changes and Expansion of Banks' Toolkits

The shift in the sectors targeted by development banks was accompanied by major changes in the funding structure of the banks, tools used, and the services offered. While the extent of structural changes and offerings has varied across the banks, expansion in broad terms has been a common theme across the board (much like the transition to a focus on private firms and innovation).

The structures chosen for funding the banks have been dynamic, as the decrease in funding from bilateral partners post-war/post-disaster recovery necessitated development of other funding sources. The creation of the Bretton Woods institutions (including the World Bank and the International Monetary Fund), post-World War II, provided new multilateral sources of financing. However, multilateral funds were insufficient to ensure the sustainability of any bank, so many sought to further diversify their domestic sources of funding. This resulted in new instruments and sometimes a change in the structure and/or ownership of the bank. The development banks began to issue bonds, and when domestic bonds were insufficient they expanded to issues of foreign currency bonds. The development banks of Canada, Germany, Brazil, and China, all underwent formal changes in their names, objectives, and structure. The CDB was incorporated and became the China Development Bank Corporation, and the KDB was almost privatized (but was instead re-merged with the Korea Finance Corporation and the KDB Financial Group in 2014) (KDB 2014). The CDB introduced special purpose vehicles, while private equity investments morphed from ownership in SOEs to investment in private firms through syndicates.

Each of the development banks examined started by initially offering medium to long-term notes. As private banks began to fill in the financing gap for industrial sectors, the development banks identified other vulnerabilities and impedances to critical industries and began to offer credit guarantees to key industry players. Investments in equity, which began largely with the creation of SOEs, continued through the transition from SOEs to supporting SMEs; venture capital has been utilized more recently in efforts to promote innovation.

Expansion was not limited to changes in financial instruments, but also included the extension of non-financial offerings such as consulting, management, and technical advisory services. Canada may have been one of the first to do this with its early focus on entrepreneurship. While consulting services were not uncommon in the early years of the development banks, the service became more formalized as time went on and many of the development banks created new division specifically dedicated to providing consulting and advisory services. Initially, consultants were either industry specialists able to provide critical insights on infrastructure projects or advisors on implement the economy-wide reform plans. As the policy orientation shifted to export-led growth, and the sectorial focus moved to private firms in high-growth sectors, the consulting operations reflected this shift as well. Consulting services offered by development banks today may cover development of growth strategies, improvements to generate operational efficiency, and even HR strategy.

Table 2. A Brief History of Selected Development Banks

	Chile	Canada	Germany	Brazil	Korea	China
Yr. Est.	1939	1944	1948	1952	1954	1994
Current Mission	To “improve the competitiveness and the productive diversification of the country by encouraging investment, innovation and entrepreneurship, strengthening in addition the human capital and technological capabilities to achieve a sustainable and territorially balanced development”	To “help create and develop strong Canadian businesses through financing, consulting services and securitization, with a focus on small and medium-sized enterprises”	“Supports change and encourages forward-looking ideas – in Germany, Europe and throughout the world”	To “foster sustainable and competitive development in the Brazilian economy, generating employment while reducing social and regional inequalities”	To “contribute to the development of Korea’s Financial industry and economy”	To “assist in the development of a robust economy and a healthy, prosperous community“
Est. By	Chilean Congress (by mandate of President Cerda)	Canadian Parliament	West German government with influence of Allies	Brazilian Government, under Joint Brazil-US Mixed Commission (CMBEU)	Korean Legislative Body	Chinese Government, under State Council
Impetus for Est.	Spillover Effects of Great Depression (1930s) Earthquake of Jan. 1939	Post-WWII Reconstruction: - Employment for veterans - Transition of industrial firms	Post-WWII Reconstruction: - Physical capital - Infrastructure	Est. through influence of U.S. wartime aid	Post-war reconstruction following the Korean War	Policy tool to facilitate structural transformation & urbanization
Ownership	Under the Ministry of Finance	100% Fed-Govt Owned	80% Fed-Govt Owned, 20% State-Govt Owned	100% Fed-Govt Owned	100% Fed-Govt Owned	<ul style="list-style-type: none"> • Ministry of Finance • Central Huijin Investment Ltd. • Wutongshu Investment • National Council for Social Security Fund
Early Focus	Corporation for Promotion of Production (CORFO) 1939-1973	Industrial Development Bank 1944-1975	German Development Bank (KfW)	Brazilian Economic Development Bank (BNDE)	Korean Development Bank 1950s-70s	China Development Bank 1994-1998
Target Sectors	Import Substitution Policy <ul style="list-style-type: none"> • Mining • Utilities (Electricity) • Agriculture • Industrial Production • Trade 	Industrial entrepreneurship as a solution to lack of jobs: <ul style="list-style-type: none"> • Machine shops • Sawmills • Flour mills • Textile factories • Bakeries • Auto part manufacturers • Metal casting 	<ul style="list-style-type: none"> • Reconstruction • Basic goods: housing, energy, agriculture • Industrial (steel & mining) • Shift to SME financing (1950s) • Broader European stabilization (1960s) 	Import Substitution Policy <ul style="list-style-type: none"> • Focus on public infrastructure (railway and hydroelectric) • Steel industry (1960s) • Consumer goods • Technology • Increasing funding towards private firms Export-led growth (1970s)	Export-Led Growth <ul style="list-style-type: none"> • Infrastructure: Electricity • Mining: coal • Manufacturing: steel, shipbuilding, machinery • Heavy chemicals (1970s) • Industry-specific subsidiaries: housing, fishing, asset mgnt 	<ul style="list-style-type: none"> • Domestic infrastructure • Project of “high national priority”: Beijing-Kowloon Railway, Three Gorges Dam, Shanghai Pudong International Airport • Basic and emerging industries

Phase 2	Refocus under Military Regime (Pinochet) 1973-89	Federal Business Development Bank 1975-1995	Refocus, Refinance, Reconstruct 1970s-1990s	Privatization & Social Development 1980s-1990s	Rationalization & Globalization 1980s - 1990s	Rapid Growth 1998-2008
Target Sectors	Export-Led Growth: <ul style="list-style-type: none"> • Privatization of SEOs • Sold profitable SEOs • Opening of markets • Addressed market gaps rather than directing market resources 	<ul style="list-style-type: none"> • Stabilizing Force for Businesses • Maintained focus on entrepreneurship 	<ul style="list-style-type: none"> • Renewed focus on domestic production (1970s) • Housing following reunification w/ East Germany (1990s) 	<ul style="list-style-type: none"> • Privatization of SOEs • Renewed focus on capital goods and basic materials • Energy • Agribusiness • Social development comes to forefront 	<ul style="list-style-type: none"> • Heavy industries (80s): automobiles and electronics • High-tech industries: telecom and IT (90s) • Focus on financial market stability (90s) • Investment bank role 	<ul style="list-style-type: none"> • Urbanization • Coordinated regional development • Upgrading of industrial structure • SMEs targeting • Affordable housing • International cooperation
Phase 3	“Productivity, Innovation, & Growth” 1990s to present	Business Development Bank of Canada 1995-present	KfW Group 2000s	Brazilian Economic & Social Development Bank (BNDES) 2000s	New Century 2000s to present	China Development Bank Corporation 2008 to present
Target Sectors	<ul style="list-style-type: none"> • Supporting SMEs and Entrepreneurship • Incentivizing innovation and technological advancement 	<ul style="list-style-type: none"> • Focus on SMEs • Expanded services to non-industrial firms • Focus on “complementary” financing 	<ul style="list-style-type: none"> • Counter-cyclical policy stabilization • Sustainability focus • Expansion of commercial and promotional activities 	<ul style="list-style-type: none"> • Refocus on industrialization (2000s) • Innovation • Socio-environmental development • Regional development 	<ul style="list-style-type: none"> • Focus on SMEs • High-growth industries: renewable energy and IT/telecomm 	<ul style="list-style-type: none"> • Maintains focus on infrastructure, both domestic and international • Includes focus on entrepreneurship and innovation • Facilitates FDI • Leading in “green finance” • Shantytown transformation and poverty relief

Sources: ADFIAP 2016; Almeida, Lima-de-Oliveira, and Schneider 2014; Amsden 1989; Bank of Korea 1973; BDC 2014, 2016a, 2016b; BNDES 2002, 2016, 1987; CDB 2014, 2015; CIA 2016; Clark 1985; Corfo 2016;(Corfo 2016, Díaz 2010, Nazer, Camus and Muñoz 2009) Fergusson 1948; Frank Jr. and Suk Kim 1975; IDFC 2015; KDB 2014; KfW 2014a, 2014b, 2016; Kim 2013; Meighen and Hervieux-Payette 2010 Min 2004; Min-Ji 2015; Nazer, Camus, and Muñoz 2009; Sanderson and Forsythe 2013; Siedenbiedel and von Petersdorf 2012. CDB column developed with feedback from the bank’s staff.

BANK CAMEOS

We turn now to examining what each of the banks is pursuing as its main objectives in the twenty-first century. To get a broad idea of what these development banks do we segment their programs along two spectrums, the first being engagement with the private sector versus public sector, and to the second showing the extent of focus on domestic versus international projects. To support the public and private sector, both abroad and at home, the banks use a set of tools summarized in Table 3 and consisting primarily of different types of loans, credit guarantees, equity investments, grants, and technical assistance.

When examining Table 3, three patterns emerge. First, Corfo and the BDC focus on supporting the private sector, using a combination of loans, grants, and equity to promote SMEs. The BDC operates exclusively in the domestic sector. Second, the KfW and the KDB, while also demonstrating a strong focus on SMEs and innovation, expand their focus to include a variety of international programs as well. Third, the CDB and the BNDES focus on providing loans and equity investments for large corporations—private and public—to both aid their growth at home and support their internationalization. Financing here may be provided to a large private firm for mergers and acquisitions abroad or that of a developmental loan to a foreign government, which is tied to procurement policies that benefit the domestic national champions.

Table 3. Program & Services Comparison by Bank

	Corfo	BDC	KfW*	KDB	BNDES	CDB	
Domestic							
Private							
Loans to large companies	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	■ = Yes □ = No
Loans to SMEs	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Loans to individuals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Credit guarantees	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Leasing and securitization	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Equity for large companies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Equity for SMEs	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Venture capital	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Grants	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Technical assistance/consulting	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Public							
Infrastructure	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Social development	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
International							
Private							
Loans	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Public							
Loans	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Grants	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Source: Based on authors' research of each bank's offerings.

*KfW only grants loans with public funds to large companies for environmental projects. Loans for this subject area are made through KfW IPEX bank at market rates and using its own funds.

The mission statements of the banks converge around the importance of their roles in strengthening their respective domestic economies, but they diverge in the sectors and industries identified as key to achieving the overarching goal of economic strengthening. Infrastructure and industrial production are the primary focus for the CDB, the KfW, and the Brazilian National Bank for Economic and Social Development (BNDES), while the KDB, the Corfo, and the BDC are relatively more focused on entrepreneurship and building knowledge-based economies. We turn next to examining in greater detail the initiatives that comprise these perspectives, how they contribute to the financial performance of the banks, and where they are reflected in the capital structures of the banks.

Taking the lens of programs and activities, we can segment our sample by organizational breadth. The CDB, the KfW, and the BNDES—the banks that focus on infrastructure and industrial development—operate extensively in both international markets and in their domestic markets. Foreign investment can involve strategic trade or cross-border financing, project finance, and/or economic development initiatives. These programs are typically funded through loans, both direct and indirect, and sometimes through partnerships and/or syndicates. Support is not exclusive to finance, however; the banks play a key role in providing technical assistance and consultancy on infrastructure projects in particular. Yet even in this group there are stark differences among banks. For instance, 60% of the loans issued by the BNDES have been targeted to large firms (in the specific case of the bank, firms with annual revenues larger than 300 million reais or around 90 million U.S. dollars). Those large firms can be from different sectors, not necessarily sectors with potential positive externalities to the economy as a whole. The KfW, in contrast, tends to focus funding for large firms on environmental projects.

On the far opposite end of the spectrum are the BDC and Corfo, which focus almost exclusively on their domestic markets. The KDB operates internationally, but domestic operations comprise the majority of its portfolio. Domestic operations among all three firms seek to channel funding and support to SMES, in general, but have an additional focus on high-growth, innovation-dependent industries. The offerings among this group of banks include loans, equity, advisory services, and credit guarantees, though the offerings vary by bank. For example, Corfo operates primarily, though not exclusively, through credit guarantees.

Here it is important to note that while equity financing seems more prominent in developing entrepreneurship and offsetting firms with high discovery cost projects, it is not absent

from the toolkit of the BNDES or the CDB. In fact, it is also employed in the industrial projects, as observed in the creation of various state-owned enterprises in the primary goods markets or the financing of the international expansion of commodity companies. Often these projects are funded through a combination of loans and equity.

Let us now turn to look in more detail at the business model of each of the banks. We start with the smallest of the panel, the Corfo and the BDC, which are both focused exclusively on supporting private firms in their domestic markets. The rest of the banks in our study engage in both domestic and international operations.

The Chilean Economic Development Agency

The oldest of the banks in our study is also the bank for which we had access to the least amount of financial data. We surmise this to be due to the bank's position as an arm of the Ministry of Finance, which exempts Corfo from having to prepare standard financial statements and brings opaqueness to the profitability and portfolio concentration of the bank. Corfo, which as we recall, was originally founded to support infrastructure projects and was a primary driver in the development of SOEs, is now focused on supporting the growth of the "knowledge-based" economy in Chile. A thriving entrepreneurial environment and an ecosystem supportive of small and medium enterprises is largely held to be the underpinning of such a knowledge-based economy.

This focus has led to products designed to fill market gaps in the financing available for entrepreneurs and SMEs and to provide the soft skills necessary for the growth and productivity of these firms. Corfo offers indirect loans and guarantees to support small businesses. Direct lending is made to micro and small companies for working capital and investment in productive capabilities. Indirect financing is also provided through contributions to equity funds that invest in the various stages of enterprise development (venture fund, growth and transition funds, etc.).

Grants are also a key piece of the Corfo toolkit. Grants are available to entrepreneurs and small firms in order to address research and product development costs. Similarly, grants are made to early-stage investment funds to stimulate the capital markets for new venture funding. Corfo also provides grants for consulting, viability studies, and to support export-oriented firms. Further working to fill market gaps in the labor supply side, Corfo offers business training for future project coordinators, fund managers, and other skilled workers.

In addition to supporting SMEs in various stages of growth and development, Corfo also offers support for firms in cultural sectors (film, television, and tourism), mining, and agricultural. While during the previous administration of Sebastian Piñera, Corfo aborted any type of sector or industry targeting, our research indicates there may be limited return to this under Bachelet but the extent of this is still unclear. Ultimately, the programs offered focus around the development of the knowledge-based economy. Small and medium mining companies, for example, are eligible for long-term loans and capital injections. An innovative program launched by Corfo is the “Start-Up Chile” program, which offers grant funding, coworking space, and professional support to start-ups. The program seeks to “accelerate” start-ups, whether in early-stage development or ready to scale-up (Corfo 2014). Agricultural projects are also deemed priority projects, and funding is available for medium and large firms in the process of adopting new technology.

Social concerns are not absent from the portfolio of Corfo either. Indirect loans are available for Chilean citizens (or permanent residents) pursuing a graduate degree. Grants are provided to firms in regions affected by natural disasters. Through these initiatives, Corfo seeks to support all stages of the entrepreneurial and business cycle currently underserved or inadequately served by the capital markets and private sector.

The Business Development Bank of Canada

The BDC, in terms of focus area, is quite similar to Corfo. Like Corfo, the BDC also places priority on promoting an environment conducive to entrepreneurship, yet the BDC is even more explicit in displaying preference for SMEs. Products are designed specifically to support start-ups and SMEs, addressing market gaps in financing, training, and information. Additionally, some products are specifically dedicated to firms in industries that are less financially attractive but which offer positive externalities.

All BDC lending is done indirectly to make insure that BDC maintains a complementary role to that of the traditional banking system. While loans are available specifically for start-ups and SMEs, the general classification of the loans is based upon the intended use of the loan: working capital, investment in equipment, or acquisition of a firm. Additionally, both technical and financial support is provided to finance and leasing firms to access the securitization market; often, this includes a matching of funds raised by the BDC.

This use of “funds-matching” is replicated on the equity investment side as well. Under the subsidiary, BDC Capital, the BDC supports the venture capital sector of Canada. It most

commonly invests as part of a syndicate, with a cap on BDC investment at 49% of a fund. An additional benefit of working with the BDC is the unfettered access to the BDC team of experts.

While at first glance the BDC may appear to have an underproductive level of staff in comparison to the other banks (net income over number of employees – see Table 5 in the next section), this is actually due to the BDC's large and intricately structured consulting program. The consulting services are organized around operational areas, such as human resources, operational efficiency, and technology, but also extend to broader capacities such as strategic planning to general management coaching. The consulting arm of the bank does not generate positive returns, which makes the net interest margins (NIMs) of BDC even more impressive.¹ Complementing the consulting arm is a research center that conducts studies and produces publication on trends and developments relevant to start-ups and SMEs. Finally, the BDC also offers an awards program focused on highlighting inspiring entrepreneurs and their start-ups.

The KfW

The KfW ranks second in nominal size, but its operations differ significantly from those of the BDC and Corfo. Though the KfW shares the emphasis of the BDC and Corfo on SMEs, the KfW is not exclusively focused on the domestic market. A heavy focus on stimulating German production is certainly present, but Germany's role in the European market, specifically, and the global market more broadly, makes international engagement a natural, if not unavoidable component of operations for the KfW.

On the domestic front, the KfW focuses heavily on SMEs. Funding for large firms is available, but is only observed in relation to environmental projects. The KfW offers indirect loans to firms of all sizes. Products for start-ups include subsidized interest rates, while products for larger firms may include grace periods for repayment. Loans are not limited to German firms, however, and are available to foreign firms headquartered in Germany, firms located outside of Germany that are either subsidiaries of German firms or have a majority Germany ownership. Loan products support venture capital, research and development, and investment in underdeveloped regions within Germany.

¹ NIMs are the difference between the rates at which banks borrow and the rate at which they lend (they are the margin they make from intermediating).

In addition to supporting private firms, the KfW also offers products for municipalities, SOEs, public-private partnerships (PPPs), and charities. These loans serve a variety of needs including urban revitalization, social program development, and investment in infrastructure. On the social side, the KfW is developing a strong focus on products addressing environmental sustainability, and much of the public lending is conducted under the auspice of supporting greater energy efficiency. Additionally, a variety of loan products are also available for firms seeking “green certification,” including products for remodeling homes to be “aging friendly” and more energy efficient.

Domestic lending is also used to support education. A wide variety of products, including direct and indirect loans, along with grants for specific areas, are available to German citizens to further their education. Products are focused primarily on post-secondary education and professional development.

Equity financing is another key tool used by the KfW for stimulating the domestic economy. Equity investments are focused on SMEs and made indirectly through private equity firms. That is, KfW does not directly pick the firms for investment, but relies on specialized firms to choose the entrepreneurs to be supported. Direct investment is occasionally made in social enterprises through a partnership fund-matching model.

Finally, the KfW also offers a vast portfolio of products to foreign governments in support of either socially impact initiatives or of markets integral to the profitability of German firms. Financial products include development, promotional, or standard loans, a combination of grant and loans, or straight grant funding. Rather than offering predefined products, the KfW customizes the financing instrument to each specific case. Some programs receive subsidies from the Federal Government, some come directly from KfW funding, and some are funded through external capital markets and simply intermediated by the KfW.

The Korean Development Bank

The KDB presents a different model from the previous banks with programs and products that demonstrate that the bank operates much more as an investment bank than a policy bank. In fact its vision is to become the leading “commercial and investment bank” in Korea. The KDB was nearly privatized in 2009, but plans for privatization were dismissed when the bank was consolidated with the Korea Financial Corporation and the KDB Financial Group of the Korea government. The merger led to the extensive intermediary role that the KDB plays today.

Whereas Corfo sought to develop a “knowledge-based economy” in Chile, the KDB seeks to strengthen a “creative economy” in Korea. The products of the KDB serve private Korean firms, both domestically and internationally. Loans are available for individuals, SMEs, and large companies, with a prevailing interest in supporting 17 high-growth industries identified by the government as the “New Growth Engine.” Seven of the industries are related to environmental sustainability issues; four focus on technological innovation and/or telecommunications; the rest cover innovation in healthcare, education, and food supply. KDB products may be broadly categorized as supporting innovation, financial stability, growth strategies, or strategic trade/foreign direct investment.

The focus on innovation is highlighted by the variety of loans and equity products available to start-ups, SMEs, and larger firms with high research or initial costs. Particular interest is given to issues regarding intellectual property (IP), whether filing for patents, purchasing an IP or IP-related product, or commercializing an IP.

The focus on stability is indicated by a number of indirect equity investments and security offerings designed for alleviating temporary cash flow problems. A debt-to-equity swap program is offered to strengthen companies with a profitable business model but weak financial structure. Indirect loans and equity investments are available for firms struggling with low profitability from legacy products or services.

Supporting growth is an overwhelming focus of the KDB. Loan products are customized to the size of the firm and spread beyond the 17 primary industries, but discounts are largely limited to those strategic industries. Firms in these priority industries may also qualify for equity investments (made through partner fund management companies). Additionally, a large programmatic emphasis is placed on facilitating the growth of SMEs and harnessing their job creation potential. Numerous consulting services complement the lending and investment products and are sometimes combined with the financial offerings in a package deal. Mergers and acquisitions seems to be a primary use of the KDB’s consulting services.

Beyond these roles, the KDB also operates extensively as a financial intermediary. In this aspect, the bank offers debt-to-equity swaps, auction support, custody services, and corporate banking services.

The Brazilian National Bank for Economic and Social Development

The history of the BNDES is similar to that of the KfW, both focusing heavily on infrastructure and development of industrial production capabilities. Today, the BNDES offers a wider portfolio of products supporting industrial production and infrastructure projects, but orients these offerings around regional development, fostering innovation, and supporting the integration of Brazilian firms in global supply chains. The BNDES is comprised of three main subsidiaries: BNDES Limited, which supports firms involved in international exports; FINAME, through which much of the support for capital expenditures is conducted; and BNDESPar, which is the equity financing arm of the BNDES.

The bank is primarily concentrated on the domestic market, but international lending is conducted in support of strategic trade and social initiatives. Most of the bank's activities involve direct lending or indirect lending through commercial banks. As noted before, most loans target large firms; in contrast to other banks, there is generally no particular restriction or monitoring on whether firms should generate technological or environmental externalities. Both direct and indirect funds are available for firms in industrial production, trade, services, or agriculture for the purposes of investing in expansion, research and development, modernization, or acquisition of fixed assets (such as equipment, land, etc.). Indirect funds are available for small and medium firms, while microcredit is available through direct lending to micro-entrepreneurs.

Start-ups and SMEs are eligible to apply for credit guarantees, yet the program has been relatively small so far. Leasing is also available for firms in need of new machinery or equipment.

The BNDES also offers angel equity, venture capital funding, and private equity. Angel funding is directed towards SMEs; private equity, on the other hand, is directed towards innovation, supply chain improvements, and access to capital markets (bond issuances). The bulk of BNDES's equity activity, however, encompasses investments in large firms through its equity arm, BNDESPAR. Through this channel, the bank has maintained long-term investments in large Brazilian firms and even state-owned enterprises.

Grants, in turn, are used to support social initiatives. These include projects on environmental issues, in particular the prevention of Amazon deforestation, as well as social issues such as housing, justice, sports, employment, health, and education. General urban services are also eligible for grants. Finally, research grants are also offered in support of these initiatives.

China Development Bank Corporation

The CDB is the largest bank, in nominal terms, in our sample. The portfolio of the CDB rivals that of the KfW in terms of international engagement. The bank provides a variety of loan products and consulting services across the public and private sectors, both domestically and internationally. However, the CDB offers equity financing mostly to large firms, rather than SMEs, and does not offer any grants.

Direct lending is primarily used for SOEs and provincial governments, particularly to finance projects in sectors that range from railways, mining, airports, industrial zones, water conservancy, poverty relief, electricity, highways, petroleum and petrochemicals, to general infrastructure, green credit and education. In the last decade, CDB has also expanded its programs of direct lending to finance the transformation of shanty towns, albeit only a small share of the total. Leasing is also offered to support the development of heavy industries domestically, such as shipping and aircraft manufacturing. Equity products are also available for funding equipment manufacturing, along with regional and environmental projects. CDB Capital, a subsidiary of the CDB, directs funds to urban development projects, investment in industrial production, funds management, and overseas investments.

Consistent with the objective of supporting strategic trade, the CDB heavily leverages strategic investment for international projects. Direct loans are provided to large Chinese firms involved in either social projects or in large trade deals of high value for China. In at least one case, the CDB lent funds directly to two Russian oil companies due to a trade deal negotiated between the two firms and a Chinese counterpart. In other cases, the CDB has lent funds to partner countries for infrastructure, mining, energy, and other construction-related projects. In instances of lending to foreign governments, the foreign government is then expected to hire a Chinese firm to complete the project, as long as they win and meet the criteria of local procurement bidding. In some cases, the CDB has formed a syndicate in order to invest in a foreign project; the syndicate may include the foreign government, multilaterals or bilateral agencies, and/or foreign firms. The projects are consistently related to either infrastructure or manufacturing, two dimensions in which China has developed a particular strength and can lend expertise along with the funding. In this way China is able to secure demand for its natural resources and for the services of domestic firms beyond the domestic market constraints. In an interesting twist to the traditional loans for export, the CDB has refined a model in which it will lend funds to a large Chinese firm for the explicit purpose of investing in or financing a specific international project. Direct ventures are also a

major piece of the toolkit, and the CDB has gained much attention in the recent period for the launch of the China-Africa Development Fund.

CDB is funded mostly through bond issues. It began to issue bonds in 1998 and by 2000 it was funding all of its operations through these issues. These bonds have maturities that go from three months to 50 years, both with fixed and floating rates (pegged to one-year, time deposit rates or SHIBOR).

MARKET FAILURES AND THE TOOLS TO ADDRESS THEM

In this section we analyze the role of the banks in addressing six general market failures: information asymmetry and credit rationing; information externalities and latent capabilities; coordination problems; socio-environmental impact; technical assistance; and strategic trade. We provide a brief overview of each market failure before examining how our sample banks are addressing these market failures and which tools they are using to do so. Table 4 shows the tools used by each bank and how they map onto each market failure.

Information Asymmetry and Credit Rationing

Information asymmetry and credit rationing make it difficult for entrepreneurs to borrow and fund their operations. When expected returns are difficult to assess or dichotomies exist in the parties' understanding of an industry, firm, or perhaps a particular product or service, information asymmetries are at play. This is frequently observed in new industries or in high-tech spheres. While credit rationing may be due to a physical limitation on the amount of capital available, it is more often tied to information asymmetries. Where information asymmetries exist, the private market is typically reluctant to extend credit to projects which they cannot assess adequately or for which the risk profile is beyond the bank's risk appetite. Development banks may step in here and extend *loans, either directly or indirectly*, to enable firms to access the capital necessary for growth. As regards loans terms, we observe frequent use of long-term loans to address the short-term duration preference of the private banks. Subsidized rates are occasionally observed, but not always necessary for the context.

Corfo and the KfW issue only *indirect* loans in response to issues of credit rationing. Using indirect loans, Corfo and the KfW address the inhibitive effect of credit rationing on micro and small firms, both start-ups and established. Corfo issues the loans through non-banking financial institutions (NBFIs), while KfW issues the capital through private banks, preserving the relationship of the target client with their primary bank. The shorter duration of loans offered by private sector banks can be a challenge for small and medium firms in accessing to capital. Corfo and the KfW address this challenge by offering long-term financing, along with other preferable terms including varying repayment periods, funding levels, and mezzanine financing (Corfo), in which the amount of the loan may be converted to equity at a later date.

The BDC also seeks to address the challenge of private banks' preference for short-term lending, but it favors the use of direct loans over indirect loans. Whereas other development banks channel indirect loans through private banks or NBFIs, which then administer and monitor the loans, the BDC manages and monitors the loans alongside the private banks and believes this strategy provides better support to client firms.² While the repayment terms of the loans may be more favorable, the high risk of the funded projects is reflected in higher interest rates than would be offered by the private market. This serves the double purpose of matching the risk to the expected return of the project while also ensuring that the BDC does not encroach upon clients that could be served by the private sector (Cl  roux 2016).

Though some banks focus primarily on large SOEs, they are not absent of programs to support SMEs. The CDB also offers direct loans customized to the needs of SMEs and extends indirect loans to rural farmers and microbusinesses through loans to village banks. Similarly, BNDES has direct loan programs that provide lines of credit for SMEs and low credit-risk companies in any industry, as well as direct loan programs with subsidized interest rates and negotiable maturities for micro-entrepreneurs.

Loan duration issues can also pose a challenge to obtaining investment capital needed for new growth industries, as well as for infrastructure and heavy industry projects. The BDC addressed this challenge as it related to the hotel industry of Canada only a few years ago (Cl  roux 2016); private banks were uncomfortable providing loans for the development of hotels, because they felt the returns were either too far out or the risk too high. The BDC, however, stepped in to fill this market gap. It lent to hotel development projects while the industry was in its infancy. As the private sector banks became better acquainted with the nature of the hotel industry (reducing information asymmetries), they became more willing to lend to these projects. Today the BDC has moved out of financing hotel development projects as the private sector can now meet market demands.

Corfo, the BDC, and the KfW focus almost exclusively on alleviating credit constraints as they relate to entrepreneurs and SMEs. The KDB, the BNDES, and the CDB, however, target their programs primarily—though not exclusively—to large-scale, often industrial, projects. The KDB

² Though it has its own sales and development team, the BDC receives the majority of its clients through referrals from the private banks. When the risk or duration of the firm or its sector is too high, the private banks may also invite the BDC to partner with them in extending the loan.

reflects a strong orientation towards the private sector, while the BNDES and the CDB, on the other hand, primarily support SOEs and public projects. It must be noted that much criticism is levied at whether development banks' funding of SOEs and public projects is either necessary or beneficial. For example, the bulk of BNDES' loans go to large firms, when in general these do not face relevant credit constraints. The BNDES has also provided capital to SOEs, such as Petrobras and Eletrobras, which by definition are in the public sector already and receive injections of capital directly from the state, notwithstanding loans or support from the BNDES.

The KDB, the BNDES, and the CDB offer loan programs directed at addressing working capital needs and supporting investment in facilities or fixed assets. Both the KDB and the BNDES, for example, offer direct loans to address credit rationing affecting the aviation and shipping industries. The CDB also provides direct loans to enable access to funding for regional development programs, which in turn support investment in rural infrastructure, leading industry players in key sectors, healthcare programs, and education programs.

The KDB, interestingly, does not limit funding to Korean firms only, but also makes them available to foreign firms within specific industries. While the KfW and the BNDES also provide international loans, these are intended to address strategic trade and are extended only to domestic firms (or firms with majority ownership by a citizen). The KDB is the only bank in our sample to extend international loans in response to credit rationing and information asymmetries.³

Information asymmetries and credit rationing can also present a challenge for financing the research and development (R&D) critical to incite innovation and the investment in fixed assets necessary for productivity gains. The KDB, the BNDES, and the CDB use loan programs to address these barriers to increasing economic competitiveness. The KDB offers direct loans to firms for investment in facilities and R&D, including mergers and acquisitions related to facilities and R&D. With a unique focus on establishing the "creative economy" of Korea, the KDB uses direct loans and favorable terms to address information asymmetries that would limit development and commercialization of intellectual property (IP), in particular.

While development banks may provide credit to firms to overcome credit rationing, it is not necessary for development banks to act as credit providers in order to mitigate the information asymmetry problem. Rather than performing the role of a direct lender to companies, the

³ Through syndication services, the KDB also offers international loans to clients in the Asian market.

development banks can provide *credit guarantees* to entrepreneurs, thereby complementing the private capital market instead of replacing it and avoiding a heavy resource-transferring structure. International evidence suggests that there are several very efficient credit guarantee programs offered by public banks (Riding and Haines Jr. 2001). Much room remains, however, for more detailed studies comparing the effects of the two different approaches development banks can have—lending and guarantees—on the fiscal and real economy.

Out of our sample, only Corfo, the KfW, and the BNDES offer guarantees. Corfo offers direct and indirect credit guarantees to facilitate financing for SMEs. The bank provides indirect guarantees to micro, small, and medium enterprises through loans to financing companies or cooperatives that then extend the credit guarantees to the microenterprises and SMEs. Direct credit guarantees are also offered to facilitate access to foreign currency funding for micro, small, and medium enterprises engaged in exporting. The KfW offers credit guarantees for start-ups, which it defines as firms in operation for less than five years.

The BNDES offers multiple guarantee programs. In 2009, a new law in Brazil established several different credit guarantee programs, including the Investments Guarantee Fund (FGI), which has since become one of BNDES' key SME support programs (Lanz and Perurfo 2013). The FGI provides guarantees for 20% to 80% of the credit provided to companies, particularly SMEs, by public or private banks. In 2014, the FGI supported around 1 billion Brazilian Reais of disbursements to entrepreneurs through individual credit operations that averaged BRL200,000.

Credit guarantees of up to BRL10 million are available to SMEs for the purchase of capital goods and investments. The BNDES also provides both sureties and guarantees for Brazilian firms or firms whose controlling party, directly or indirectly, is comprised of Brazilian residents. The guarantees are limited to 33% of operational costs and carry a fee of 1% of the loan value plus a spread. Credit guarantees are also extended through credit right investment funds, a mechanism which serves to unlock additional capital for firms.

Despite the extensive guarantee programs offered by the BNDES, the Brazilian infrastructure industry still lacks sufficient support and could benefit from expanded credit guarantee programs. The Law 12.712 of 2012 enabled local government participation (as shareholder) in funds to guarantee risks associated with infrastructure projects. Acknowledging the potential losses of these projects to be significantly higher than in the case of lending to SMEs, the law also instructed that the infrastructure guarantee funds should have a higher percentage of

guarantees to credit received than SME guarantee funds. In 2015, as the fiscal crisis in Brazil worsened, local governments restricted the amount of resources allocated to credit guarantee funds. In the end, the Brazilian program of credit guarantees remains scant.

Factoring and leasing and *securitization* are tools closely related to guarantees and which are employed by several of the banks in our sample to address information asymmetries and credit rationing. Leasing (or factoring and leasing) appears to be a preferred tool of the banks addressing infrastructure and industrial needs, including the KDB, the BNDES, and the CDB. The KDB provides leasing programs to support firms in the aviation and shipping industries, while the BNDES offers leasing services for new machinery and equipment manufactured in Brazil. Through a 2008 acquisition, the CDB formed another subsidiary, the CDB Leasing Company, which provides factoring and leasing services to support the aircraft, shipping, engineering, machinery, commercial vehicles, and affordable housing industries.

Through another subsidiary, the CDB Securities Company, the CDB underwrites debt for government and infrastructure projects (such as construction of the state railways). The CDB formed CDB Securities Company through an acquisition made in 2010. Interestingly, the BDC, which falls on the opposite end of the spectrum in terms of orientation, also used securitization to address credit rationing. Through the “Funding Platform for Independent Lenders” the BDC insures that small and medium financing and leasing companies have sufficient capital to access the securities market and to serve SMEs.

Venture capital and equity investing also provide an array of tools for addressing this market failure. We find this to be a popular option across the spectrum, with all banks except for the BDC using some form, whether *seed capital funding*, *venture capital*, *private equity*, or *mezzanine financing*. Almost all of the programs are indirect, with investment made through an external fund, but a couple of notable exceptions exist in which direct investment is made.

Corfo invests indirectly through externally managed venture capital and private equity funds. The funds focus on supporting SMEs, with one fund providing a credit line for early-stage technology-focused SMEs, while another, Start-Up Chile, provides general funding for SMEs from early-stage funding to growth, and still others support further development and venture capital investment. The firms receiving these funds range in size from US\$20,000 to US\$15.5 million (shareholders’ equity). Sequential equity investments are carried out conditional on performance target (such as revenue growth). In addition, some of the loan programs offered by

Corfo include mezzanine financing, which allows the initial loan amount to be converted to an equity share in the firm on or after a specified date.

The KfW indirectly invests in venture capital for SMEs by providing long-term loans to private equity firms, which then facilitate the investments. The KDB follows a similar strategy of investing through venture capital funds. Indirect investments in growth-stage SMEs are made through venture capital funds to enable investment in facilities and R&D. More broadly and perhaps somewhat distinct from what we observe in the other development banks in our study, the KDB also provides direct private equity investments irrespective of industry or size. While little information is available to further our insights on the reason for this product, we surmise this may be a reflection of the KDB's stretch into commercial banking.

The BNDES and CDB again diverge from the earlier banks in focusing on supporting larger firms. BNDES's equity investments are managed through its subsidiary BNDESPAR. Funding is available for companies issuing an initial public offering (IPO) or follow-on offering. Additional indirect equity investments are made through other investment and mutual funds and focus on stimulating entrepreneurship and high-growth companies. Yet, again, the bulk of BNDESPAR's equity is concentrated on large firms, including SOEs. The CDB offers indirect equity investments to support the capital needs of domestic firms through contributions to asset management companies who then invest in the Chinese firms.

The last financial tool for address credit rationing is *grant funding*. We note that only Corfo offers grant funding in response to this market failure. Corfo offers grant funding to support irrigation system planning and the growth and sustainability of artisanal fisheries, as well as baseline studies and monitoring reports. The latter grant programs may include both financing and consulting services in support of implementing the findings of the studies. Corfo also provides grants that subsidize 50-65% of the costs of agricultural insurance for farmers without discrimination as to the size of the farm/agricultural operation.

Financial tools are not the only approach to addressing information asymmetries, and we observed the use of *technical assistance* and *non-monetary awards* by the entrepreneurial and innovation focused banks: Corfo, BDC, and the KDB. In order to reduce information asymmetry, Corfo maintains a list of certified companies who have expertise in performing market valuation and intellectual property assessment. Similarly, the KDB offers valuation of IP/technology. Technical assistance is offered in complement to a loan or other program. The BDC addresses

information asymmetries through non-monetary awards that increase recognition and support for entrepreneurs and those who mentor them. Current awards include the BDC Mentorship Award, the Entrepreneur Resiliency Award, and the BDC Entrepreneurship Champion. The bank previously awarded the “BDC Young Entrepreneur Award,” but discontinued this as of 2016.

Information Externalities and Latent Capabilities

Information externalities are the public returns generated from the production and dispersion of information and knowledge. Publishing new information, however, requires funding for research and a platform through which the information can be made readily accessible to those who can benefit from it the most. Development banks may issue grants, for example, to fund research on how to increase efficiency in product development. This is then published and made accessible to firms, across the world, which can benefit from the findings. Conversely, development banks address latent capabilities by funding the discovery costs required for a firm to improve its own efficiency and generate a competitive advantage. In this sense, public funds are used to develop a competitive advantage from which the firm alone reaps the financial benefits. Development banks are interested in supporting this, however, because the capabilities demonstrated by the supported firm can result in spillover effects that lead to a more productive and competitive industry as whole.

From our sample of banks, we observe wide use of equity investments to foment latent capability and information externalities. Loans and credit guarantees seem to be used more heavily by the banks that are focused on infrastructure, SOEs, and large private firms. Grants and technical assistance are also used, though in more limited capacities. Technological innovation seems to be an area of particular interest across the board.

Corfo and the BDC both provide seed capital for start-ups focused on technological innovation, Corfo through private asset management funds and the BDC through limited partnership in the GO Capital Fund, which is focused specifically on the development of science and technology firms in Quebec. The BDC multiplies the capital made available through this fund by matching the investments of GO Capital Fund with direct investments in the recipient firm. GO Capital partners with universities, public sector, and private sector players to support the development and commercialization of new technology.

Venture capital funds are key tools used by both the BDC and the KDB to promote innovation and support the entrepreneurial ecosystem. The BDC has venture capital funds

supporting the expansion of the following three sectors: (1) industrial, clean and energy tech; (2) healthcare; and (3) information technology. Through its Fund of Funds, the BDC provides indirect equity financing to support the development of the venture capital and private equity markets of Canada. The KDB's venture capital fund supports development of firms in the 6T industries: information technology (IT), biotech, nanotechnology, space technology, environmental technology, and culture technology. This fund provides direct investment along with a broad range of other financial services, access to industry expertise, and a business network in Korea and abroad. The BNDES also attempts to foment innovation through equity investments with a particular focus on agriculture, IT, nanotechnology, and biotechnology. Investments are indirect, and the program remains quite small. Through its subsidiary, CDB Capital Company, the CDB offers indirect equity investment through its Equipment Manufacturing Fund, the platform for industry specific investments in high-end manufacturing and high-tech industry.

While the entrepreneur-focused banks use equity investments most heavily, the banks on the other end of the spectrum take greater advantage of lending programs to support generation of information externalities and development of latent capabilities. We note that the BDC and KDB programs are targeted to start-ups and SMEs, while the offerings of the KfW, the BNDES, and the CDB focus less on size and more on facilitating research and development with the objective of increasing the competitiveness of domestic firms. Programs here include both direct and indirect loans.

The BDC offers direct loans for starting a business, investing in new equipment, or investing in commercial property, including purchase of land or buildings and construction, renovation, and expansion of existing premises. The KDB provides direct loans to SMEs with the potential to grow into leading competitive firms in the aforementioned 6T industries. Direct loans are available to firms with proven, high-potential technology (based on a grade of "excellent" received by the Tech Credit Bureau) but low financial security and therefore limited capacity to invest, as well as for the purchase of IPs. Firms commercializing IPs can apply for direct loans, credit guarantees, and equity investments.

The KDB offers indirect loans to SMEs with already proven technologies in the key industries. A particularly note-worthy aspect of this program is that clients may apply in any branch of KDB's intermediary financial institutions. To facilitate this, the KDB has a credit risk-sharing program, in which the KDB shares the risk of default with the intermediary institutions to foment

the extension of credit to benefit-producing, higher risk companies. The BNDES offers direct loans to firms in the telecommunication industry of Brazil to promote technological innovation. Medium and large firms are eligible for loans through BNDESPAR for high-risk projects related to advanced technologies.

The KfW provides indirect loans to private firms engaged in market-oriented research and development with a long-term horizon, which private banks would be unable to support. The loans from KfW are subordinated, which improves the recipient firms' ability to access funding from other sources. These indirect, subordinated loans are also available to firms working on improving their products, processes, or services. In similar fashion, the BNDES seeks to cultivate complementary capabilities in Brazilian firms through direct loans to firms for projects demonstrating synergy with the firm's current operations and market strategy.

In addition to the equity and lending programs, Corfo and the BNDES also employ grant programs to facilitate latent capabilities and information externalities. Grants from Corfo are available to firms conducting R&D, and tax breaks are offered to subsidize general studies on R&D. Research grants are also available for studies related to increasing business efficiency and operational productivity. The growth of strategic sectors, such as technology, is fomented through research grants for sector-specific studies as well as through grants directly to firms operating in these sectors. The high emphasis placed on technological innovation is observed in the provision of grants to firms for investment in technology and for the construction of technology centers for the generation of public goods. Medium and large firms are also eligible for grant funding to support the adoption of new technologies. To address the limited funding available to those in the media industry, Corfo provides grants to local TV stations, cinematographic production companies, and local audiovisual distributors. To address skill gaps in the labor market Corfo offers grants for vocational and workforce training. These grants support productivity improvements and increase the quality and quantity of skilled workers.

The BNDES also employs grants to address this market failure. Operational grants are available for a variety of industries, with one example being a grant program that supports adoption and development of innovative technology in the telecommunications sector. Research grants are available to support studies in the areas of telecommunications, in particular, as well as other key strategic areas within technology as identified by BNDES. Grant funding is provided to research institutions or private firms.

Coordination Problems

Problems of coordination occur when development of local industry requires complementary, orchestrated private investment. For example, development of the mining industry in a country may be prohibited due to poor supporting infrastructure such as roadways and ports. Earlier, we noted BNDES's extensive lending programs to support investment in infrastructure projects. While the loan programs primarily address market constraints affecting access to capital, coordination of investments is a secondary objective whose importance cannot be overlooked. Similarly, the CDB is directly addressing regional coordination through loan programs that facilitate regional development and promote coordination through projects such as "One Belt, One Road" (CDB 2014).

Development banks can also alleviate this market failure by fomenting concentration of market players around the same location and facilitating the creation of the supply chains necessary to support this new industry. With globalization came recognition of the efficiency produced by global and regional value chains. Where these value chains are absent or weak, limited physical coordination, as well as limited information sharing, contributes to the market failure. Grants for conducting industry relevant evaluations and technical assistance for establishing networks of entrepreneurs within a particular industry are the tools frequently observed in response to coordination problems.

In order to build flourishing ecosystems, Corfo provides grants to groups of farmers to form technology transfer groups and associations that enable collaboration in solving production problems and achieving management and production efficiency. Additional grant programs are available to establish, maintain, update, and evaluate a network of mentors supporting Corfo's portfolio companies. Corfo also offers grants to sponsors of seed capital programs that are contingent upon the performance of the funded start-ups in order to incentivize commitment from sponsors and careful mentorship of the start-ups. Also working through equity rather than grants, the BDC leverages venture capital financing and technical assistance to take a leading role in aligning the various partners into a thriving ecosystem. The BDC promotes a collaborative and intentional community supporting tech entrepreneurs in Canada through its Strategic Investments and Partnerships Program.

Corfo also provides grant programs that enable indirect suppliers to become direct suppliers in key industries, thereby supporting increased efficiency in the value supply chain, as well as

promoting collaboration and the sharing of information among market players. Corfo provides grants for monitoring and evaluation of its programs (or supported programs), for conducting educational workshops, to enable dissemination of informative publications, and to support innovation platforms.

With creation of a “knowledge-based” economy at the forefront of its objectives, the KDB offers IP brokerage services which complement the financing and valuation services it offers and improves coordination in the IP sector. While a loan or financial product may address credit rationing, the KDB offers technical assistance alongside these to promote coordination. Technical assistance is available for SMEs in relation to mergers and acquisitions (M&A), as well as for foreign firms engaging in cross-border M&A activity and entering the Korean market.

Social-Environmental Impact

The social-environmental impact generated by potential projects is considered a public good. When the private financial returns generated from the same projects are limited or null, then the private sector may be hesitant to pursue them. Because the social returns are high, however, development banks may step in to provide the funding or bear the risk of developing such projects. This is frequently seen in environmental projects such as the creation of alternative energy sources. Due to the high cost of developing renewable energy sources versus the low cost of using non-renewable energy sources, the incentives for investment in developing alternative energy sources is low. Development banks may offer subsidized financing, venture capital, or grants to address this and other scenarios like it.

The objective of programs addressing social-environmental impact varies widely and includes programs supporting education, worker mobility, cultural preservation, disaster relief, environmental protection, and more. The primary tools used are loans and grants, though equity programs are offered in some cases.

Corfo, the KfW, and the CDB offer loan programs to promote education and advance the value of skilled workers in the labor force. Corfo provides indirect loans to permanent residents to pursue a graduate degree either in Chile or abroad. KfW offers indirect loans to support students attending college or university as well as those pursuing technical or vocational programs, and direct loans to students pursuing degrees at a German university. Direct loans are irrespective of income and assets (as well as of parents) and provide monthly disbursements along with favorable terms, including a fixed maximum interest rate and repayment in 25 years. The CDB supports

students through direct loans, and coordinates universities and local governments to manage Student Loan Management Centers.

We find the KDB, the KfW, and the CDB to be the most active of our sample in addressing job creation, worker mobility, and general welfare. The KDB provides an equity infusion for companies contributing to the robustness of their local economy and/or job creation, as well as for firms seeking to invest in safety equipment. The KfW provides grants to support social projects that generate employment or support the areas of urban service, health, education, and sports. It also provides venture capital investment to small and medium social enterprises whose approaches have demonstrated success. The KfW typically limits its investment to 50% or less of an equity stake in the recipient firm. The CDB offers direct loans for infrastructure projects that improve mobility for the general population, such as construction of railways, highways, and subway systems. Theatrical groups, news broadcasting agencies, publication houses, and firms engaged in the tourism industry are also eligible to receive direct loans support from direct loans.

The KfW also offers indirect loans to individuals for use in building or buying their own homes. Local authorities, municipal enterprises, and community associations are also eligible for indirect loans for investment in housing projects, acquisition of land (for future construction projects), and investment in social infrastructure.

The BNDES, the CDB, and the KfW are involved in directly addressing environmental concerns. The BNDES supports environmental projects through grants only. Research grants enable studies on the social-environmental development of Latin America and Brazil, which then inform public policy. Grants are also used for prevention and monitoring of deforestation in the Amazon region, thereby increasing sustainability of the region. The KfW provides grants to local authorities to incentivize investment in increased energy efficiency in neighborhoods. Grants are also available in conjunction with implementation loans to enable supervisory support for construction and renovation efforts as well as for the “aging-friendly” projects.

The KfW also uses a variety of loan programs to address environmental concerns. Direct loans are used to stimulate investment in improved energy efficiency of both residential and commercial real estate. Loans are available to firms in order to adapt their headquarters to energy efficiency standards outlined by the KfW. These loans boast subsidized interest rates and are not exclusive to firms of a certain size. Similarly indirect loans are available to firms to enable investment in renovating their buildings, processes, industrial operations, and even energy storage

to be more energy efficient. Indirect loans are available for individuals to support new construction projects in line with energy efficiency standards and renovation of older buildings and homes to be more energy efficient or “aging friendly.” Municipalities, local authorities, and municipal enterprises are also eligible to apply for direct and indirect funding for construction or renovation of non-residential buildings. These loans support investment in more aging-friendly heating, cooling, water, and sewage systems. Grants are available to local authorities to incentivize investment in increased energy efficiency in neighborhoods. Finally, grants are available in conjunction with implementation loans to enable supervisory support for construction and renovation efforts as well as for the aging-friendly projects. Loans are available to small producers of alternative energy or renewables. Funds are specifically dedicated to supporting construction of wind parks offshore.

Grants are not in the toolkit of the CDB, which offers only direct loans for environmental projects to promote revitalization of rivers and lakes, promotion of recycling companies, and solutions for addressing air pollution and sewage and water treatment.

While environmental measures are not the primary objective of the BDC it should be noted some of the bank’s projects indirectly target positive environmental/social impact. In particular, two of the BDC’s venture capital funds—the Industrial, Clean and Energy Technology Venture Fund and the Healthcare Venture Fund—support the development of clean energy solutions, clean tech innovation, and advancement in the healthcare services of Canada.

Corfo, the KfW, and the CDB also offer financial programs directed at the economic development of impoverished regions and/or international development. Corfo provides grant funding to support investment in underdeveloped regions or regions affected by natural disasters. These grants facilitate economic development through funding high-impact products and services. The CDB offers international loans for projects that seek to improve general welfare in areas of extreme poverty. The KfW offers loans to foreign governments for social and environmental projects, while grants are available only for environmental projects.

Technical Assistance

Technical assistance can overcome a lack of local capabilities to develop complex or highly technical projects. The skills internalized by local practitioners through the provision of technical assistance can afterwards be transferred to additional practitioners. The BDC has heavily focused on the provision of consulting services to the market. Technical assistance appears to have enabled

their firms to realize much greater returns than the provision of credit alone (Statistics Canada 2013). It not only increases firms' ability to repay loans, but also improves efficiency and productivity of the firms. Development banks are interested in pursuing this, once again, because it contributes to the increased competitiveness of domestic firms. We observe, however, varying levels of engagement in this dimension.

As mentioned earlier, the BDC boasts a large, well-established consulting division. While stand-alone consulting services are available to firms, the BDC often uses the technical expertise of its staff to complement its lending and investment operations. In direct lending, this technical expertise is most prominently deployed alongside investments in growth projects and/or adoption of new technology. In these areas, the BDC consultants are able to optimize the improvements and according to Statistics Canada generate a much higher return for the firms that take advantage of this service as opposed to simply taking out a loan (2013).

Demonstrating how the BDC views the contributory role of its consulting services, consider the following anecdotal example of a client firm that requested a loan to expand and move its business into a new building (Cl  roux 2016). The BDC account manager met with the client, reviewed the site, and identified an opportunity to more efficiently organize the current location so that production levels increased without need for a new building. In the end, and perhaps paradoxically, the advice resulted in the client no longer needing a loan.

In terms of equity investments, the BDC also leverages technical assistance through its so called, "Diversified Portfolio." The bank describes this product as a team of highly experienced professionals with deep sector knowledge, who are able to assist entrepreneurs through mentorship, advice, and sometimes investment.

The consulting services offered by the BDC cover analysis, strategy development, and assistance in management strategy, in the following areas in particular: managing a business, human resources, integrated sales and marketing, international growth, operational efficiency, certification preparation, and technology. The BDC also funds research on various topics deemed relevant for entrepreneurs.

Though one might surmise that technical assistance would be a primary tool for banks promoting entrepreneurial activity and innovation, we fail to see high levels of use by the KfW and Corfo, though the KDB does extensively utilize technical assistance. Corfo provides grants to companies to enable access to technical assistance, training and consulting services and offers

technical expertise in its selection of intermediaries to oversee management and monitoring of projects. The KfW has extremely limited offerings in regards to technical assistance, offering it only through its international development focused subsidiary, the KfW DEG Group. Technical assistance programs support both the public and private sectors.

On the public side, both the KDB and the CDB provide technical support for SOEs and other public entities to ensure the effectiveness and profitability of large government programs. The CDB also supports local governments and ministries with the development of strategic initiatives, particularly in relation to strengthening key national industries.

On the private sector side, the CDB provides technical assistance related to urban renewal projects and the growth of micro and small businesses. The KDB offers teams of experts to support domestic firms, including multiple teams of corporate restructuring experts; these have been instrumental in the successful turnaround of major Korean firms including Kia and Daewoo. The KDB offers technical assistance specific to IP commercialization, technological and economic feasibility studies, mediation of financial assistance, and formulation of management strategies. In an investment-banking role, the KDB offers technical assistance on structuring of project finance deals both domestically and in the Asia Pacific region.

We note that the BNDES does not have as many offerings focused on provision of technical assistance. However, the BNDES produces studies on strategies for productivity gains in specific sectors, examining, for example, the benefits of capturing economies of scale in a particular industry through increased consolidation. The BNDES may then, in coordination with domestic firms, pursue implementation of the findings of the study.

Strategic Trade

Strategic trade is an important role for development banks when international markets are distorted by selective support engendered by foreign governments. Development banks may provide favorable lending terms for firms to expand internationally or move into exports. Through this support they enable firms to overcome negative payoff scenarios and generate trade surpluses for the domestic economy. Another variation of strategic trade support is seen in the provision of loans to foreign governments to hire national firms. Under the banner of international development, a development bank may provide credit to a foreign government for investment in roads, for instance. These loans, however, will be contingent on the foreign government hiring

firms from the development bank's country to complete the project. In this way, the demand for domestic firms is promoted and sustained.

We note that most of the banks in our sample depend on loans, guarantees, equity investments, and technical assistance to promote strategic trade initiatives. Corfo, however, uses only grants, and these it yields to support groups of SMEs in developing their export potential. Corfo's grants facilitate access to sources of information, connection with all relevant actors, and the development of an export platform to increase competitiveness.

The BDC uses both debt and equity financing to support expansion of Canadian firms into the export markets. Both the BDC and the KfW make loans available for growth projects, with technical assistance offered both in combination with these funds and on a stand-alone basis. Many of the KfW's programs are implemented by its subsidiaries: KfW DEG Bank and KfW IPEX Bank, which focus on international development efforts and import-exports respectively. The KfW DEG Bank provides both long-term loans and technical assistance to private enterprises investing in developing economies. The KfW IPEX Bank supports exporters in various sectors including aviation, in which the KfW has provided support to Airbus. IPEX Bank loans are issued at market rates. The KfW also provides international loans to foreign governments so that these governments can hire German companies to implement key projects, typically related to infrastructure.

The KDB uses loan programs, credit guarantees, and technical assistance to support the increased Korean firms in exporting, much like the KfW and the BDC, but also in importing. Loans and credit guarantees are available to importers of capital goods and/or agricultural products. For exports, the KDB offers loans and advises on financing strategies. For Korean firms seeking access to new markets, the KDB also provides cross border M&A services.

The BNDES also promotes strategic trade through supporting firms in exporting, but it does so by heavily subsidizing these loans. BNDES loans support exporters in the pre-shipping phase by providing the capital needed for production of goods; they support exporters in the post-shipping phase through three financing options. These include: financing for commercialization, direct loans for the purchase of national products or services (the recipient entities here could be public or private), and provision of credit lines in foreign financial institutions for domestic exporters. A government-backed fund also serves to protect exporters against political and extraordinary risks that could compromise the economic value related to the exportation process.

Yet this type of support has been controversial in Brazil, because the interest rates in export contracts have been well below the domestic interest rate in Brazil.

On the domestic front, the CDB offers direct loans to enable Chinese firms to acquire foreign assets or companies. The bank also offers indirect lending, through its subsidiary CDB Capital Company, to domestic firms seeking to expand internationally. Chinese firms already engaged in exporting are also eligible for certain loan programs from the CDB. On the international front, the CDB extends loans to foreign governments to support infrastructure projects. When these loans are issued, the recipient government is often obliged to hire a Chinese firm (or firms) to manage the construction process or conduct the project. Loans are also extended to regionally focused funds, such as the China-Africa Development Fund, to facilitate strong partnerships and continuing goodwill between trade partners.

The CDB has a unique process by which it invests indirectly in foreign firms. Through the CDB Capital Company, and sometimes directly as the CDB, the bank makes loans to Chinese equity firms who buy foreign companies through a delisting/privatization process.

Table 4. Market Failures and Corresponding Bank Tools

	Corfo	BDC	KfW	KDB	BNDES	CDB
Reducing asymmetric information/ credit rationing	<ul style="list-style-type: none"> - Indirect lending - Credit guarantees - Seed capital (indirect) - Venture capital (indirect) - Private equity (indirect) - Research grants - Grants to complement activities of partners - Grants to support other projects in the economy - TAC: IP valuation 	<ul style="list-style-type: none"> - Direct lending - Securitization - Non-monetary award 	<ul style="list-style-type: none"> - Indirect lending - Credit guarantees - Venture capital (indirect) 	<ul style="list-style-type: none"> - Direct lending - Leasing - International loans - Venture capital (indirect) - Private equity (direct) - Technical assistance - TAC: IP valuation 	<ul style="list-style-type: none"> - Direct lending - Indirect lending - Credit guarantees - Factoring and leasing - Venture capital (direct) - Private equity (direct) 	<ul style="list-style-type: none"> - Direct lending - Indirect lending- - Securitization - Factoring and leasing - Venture capital (indirect) - Private equity (indirect)
Dealing with information externalities/ latent capabilities	<ul style="list-style-type: none"> - Seed capital (indirect) - Research grants - Grants to complement activities of partners - Grants to support other projects in the economy 	<ul style="list-style-type: none"> - Direct lending - Seed capital (indirect) - Venture capital (indirect) 	<ul style="list-style-type: none"> - Indirect lending 	<ul style="list-style-type: none"> - Direct lending - Indirect lending - Credit guarantees - Venture capital (direct) - Private equity (indirect) - Technical assistance - IP & tech valuation 	<ul style="list-style-type: none"> - Direct lending - Equity (indirect) - Research grants - Grants to support other projects in the economy 	<ul style="list-style-type: none"> - Direct lending - Indirect lending - Venture capital (indirect)
Promoting coordination	<ul style="list-style-type: none"> - Grants to complement activities of partners - Grants to support other projects in the economy 	<ul style="list-style-type: none"> - Venture capital (indirect) - Technical Assistance 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> - Technical Assistance - IP brokerage services 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> - Technical assistance - Direct lending - Syndicated loans
Pursuing socio-environmental impact	<ul style="list-style-type: none"> - Indirect lending - Research grants - Grants to complement activities of partners - Grants to support other projects in the economy 	<ul style="list-style-type: none"> - Venture capital 	<ul style="list-style-type: none"> - Direct lending - Indirect lending - International loans - Venture capital (direct) - Grants to foreign governments 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> - Research grants - Grants to support other projects in the economy 	<ul style="list-style-type: none"> - Direct lending - Indirect lending - International loans
Contributing with technical expertise/ knowledge	<ul style="list-style-type: none"> - Grants to complement activities of partners - Technical assistance 	<ul style="list-style-type: none"> - Direct lending - Venture capital (indirect) - Technical assistance 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> - Technical Assistance 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> - Technical involvement in large government projects - Technical assistance
Strategic trade	<ul style="list-style-type: none"> - Grants to complement activities of partners 	<ul style="list-style-type: none"> - Loans for exporters - Technical assistance 	<ul style="list-style-type: none"> - Indirect lending - Loans for exporters - International lending - Technical assistance 	<ul style="list-style-type: none"> - Loans for exporters - Loans for importers - Credit guarantees - Technical Assistance 	<ul style="list-style-type: none"> - Loans for exporters - Credit guarantees 	<ul style="list-style-type: none"> - Direct lending - Loans for exporters - International loans

Note: Technical assistance in all cases noted here is provided along with a loan or participation in any other program.

TAC is used to refer to technical assistance provided in a very distinct and limited dimension such as IP valuation.

BANK PRIORITIES AND PERFORMANCE

We turn now to examine the financial performance and structure of our selected banks. From the data we observe several stark differences that may prove valuable for our analysis of strategy and policymaking, but we will start by looking at the size of the banks and their relative loan intensity. It is important to note as we move into our analysis that while the differences in bank size and loan intensity may have some effect on the choice of capital structure employed and financial performance, the causality of these on the structure and financial performance are beyond the scope of this paper and non-essential to our purposes. We are less interested in evaluating the most effective policy tool and more interested in identifying new tools and creative financial solutions for addressing market failures and managing risks. Data is based upon financial reports for fiscal year 2014; all figures are reported in U.S. dollars. Financial statements from Corfo are not publicly available, so Chile's development bank is excluded from this analysis.

Table 5. Financial Performance Ratios and Statistics by Bank

(Fiscal year 2014, in millions of USD unless indicated)

	BDC (Canada)	KfW (Germany)	KDB (Korea)	BNDES (Brazil)	CDB (China)
<u>Main Indicators</u>					
Total Assets	16,869	593,817	251,710	330,253	1,685,954
Earning Assets	16,127	589,742	221,482	311,400	1,648,641
Outstanding loans	15,300	534,568	130,523	246,361	1,297,866
Equity	3,784	26,225	27,018	11,572	111,156
Net income	373	1,838	611	3,235	16,049
Annual disbursements*	3,904	5,576	11,530	70,716	129,655
Staff	2,000	5,518	3,398	2,881	8,723
<u>Ratios</u>					
Size of Banks					
Total Assets to GDP	0.9%	15.4%	17.8%	14.1%	16.3%
Outstanding loans to GDP	0.9%	13.8%	9.3%	10.5%	12.6%
Total Assets / tot priv credit	0.6%	19.3%	12.9%	20.4%	11.5%
Outstanding loans/ priv credit	0.5%	17.4%	6.7%	15.2%	8.8%
Loan Intensity					
Outstanding loans/Assets	90.7%	90.0%	51.9%	74.6%	77.0%
Annual disbursements/GDP (2014)	0.2%	0.1%	0.8%	3.0%	1.3%
2014 disbursements/Assets	23.1%	0.9%	4.6%	21.4%	7.7%
Avg. growth rate of loans (5 years)	10.6%	3.9%	15.0%	17.9%	16.6%
Financial Performance					
Net income/employee (USD '000s)	186	333	180	1,123	1,840
ROE (%)	9.9%	7.0%	2.3%	28.0%	14.4%
ROA (%)	2.2%	0.3%	0.2%	1.0%	1.0%
Net Interest Margin	4.9%	0.5%	1.3%	2.2%	2.0%
Capital Structure					
Leverage (Assets/Equity)	4.5	22.6	9.3	28.5	15.2

Size of Banks

We use information on total assets, portfolio composition, outstanding loans, equity level, net income, 2014 disbursements, and number of staff to assess the size of each bank relative to one another (see Table 5). In nominal terms the China Development Bank is by far the largest development bank with total assets a hundred times that of our smallest bank, the BDC (Canada). The CDB and the BDC carry the distinction of the largest and smallest bank, respectively. The three other banks fall roughly in the middle of these two, but vary in order based on the metric selected. Germany's KfW ranks as the second largest by total assets, outstanding loans, and staff size; however, it comes in third in terms of nominal equity—the Korean Development Bank takes second—and in terms of net income it is surpassed by the BNDES. The KfW ranks next to last in terms of 2014 annual disbursements, exceeding only the BDC.

When we measure size as assets-to-GDP we can see that all of the banks, with the exception of the BDC, have assets that represent approximately 15% of GDP. The BDC is the smallest bank in our sample, with assets representing less than one percent of GDP. Using this metric, the KDB is the largest bank, with assets equivalent to roughly 18% of the Korean economy. The second largest bank is the CDB with assets representing close to 17% of GDP, followed by the KfW with 15.36% and the BNDES with 14.08%. These weights demonstrate the significant impact development banks are posed to have on their domestic economies and global financial markets more broadly.

Intensity of Loans

All of the banks, except Corfo, use loans intensively as a policy tool, though the specific shares of outstanding loans-to-assets range from 52% (KDB) to 91% (BDC). The BNDES falls in the lower three quintiles in all the aforementioned nominal size metrics, but moves to the front when we consider loan intensity (see Table 6). The BNDES has the second highest level of disbursements in nominal terms, and the highest in terms of annual disbursements-to-GDP and in five-year average growth rate in disbursements. Both the BNDES and the BDC had disbursement levels in 2014 that were greater than 20%. The high level of disbursement is reflective of an aggressive push by the BNDES to extend large industrial loans to Brazilian firms. Relative to the panel, the BDC has had a low 5-year average growth rate in loans disbursed. However, this seems to have reversed as the 2014 disbursements exceeded the five-year average growth rate.

Table 6. Portfolio Composition by Bank
(As a percentage of assets, fiscal year 2014)

	BDC (Canada)	KfW (Germany)	KDB (Korea)	BNDES (Brazil)	CDB (China)
Loans	90.70%	90.02%	51.85%	74.60%	76.98%
Equity	2.56%	4.42%	7.75%	5.13%	6.59%
Others	6.75%	5.56%	40.40%	20.27%	16.43%

Source: Bankscope. (2016) *Bureau van Dijk* [Online]. Available at: BankScope Subscription Service.

Interestingly enough, the KfW and the BDC have the highest shares of loans in their portfolios, yet they also reflect the lowest nominal levels of new disbursements in 2014. This is not surprising for the BDC, given its relatively small size to begin with, but it is a bit more surprising for the KfW. With shares of loans around the 90% mark, the low levels of new disbursements may be a result of caps on the share of loans in the portfolio. Both banks also have the lowest growth rates in new loan disbursements. Conversely, the KDB has the lowest share of loans, coming in at roughly 52%, but its disbursements are actually second to lowest and its growth rate in new loans comes in third. This reinforces our earlier interpretation that the KDB must be following an entirely different strategy than the other banks; the KDB is in fact pursuing a model closer to investment banking, than that of a policy bank.

While the BDC and the KfW have similar shares of loans, the percentage of total assets comprised by 2014 disbursements presents a stark contrast. New disbursements (as of 2014) as a percentage of total assets are highest in the BDC at 23.1%, while the KfW has the lowest share at less than one percent. It is possible that the BDC had a greater number of loans maturing, and that KfW's outstanding loans may have a longer maturity. Alternatively, it could be that an earlier spike in lending may have occurred in the BDC and is now visible in the turnover.

When we look at the size of loan disbursements in 2014 normalized against the size of the economy we see an interesting pattern. While most banks issue new loans totaling less than 1% of GDP, the BNDES seems an outlier with new loans representing 3% of GDP. It is important to note here that 2014 is not an outlier year for BNDES, as loan disbursements had been growing at the fastest pace in the history of the Brazilian bank (17.9% in the last five years), partly due to the active industrial policy of President Dilma Rousseff. In contrast, though most banks have growth rates between 10.5-18% (except the KfW), their total disbursements per year tend to be below 1%

of GDP. Given this trend, the BNDES and the CDB appear to be the most active development banks relative to the size of their economy.

Financial Performance

A very imperfect measure of productivity—or of overstaffing—in development banks is net income over employees (in thousands of USD). Table 5 demonstrates that, the CDB and the BNDES have the highest profits per employee, with \$1,839 and \$1,123 in net income per employee, respectively. In comparison the KDB and the BDC generate around \$180 of profit per employee, while the KfW earns only \$333.

There are two explanations for the relative success of the CDB and the BNDES in generating profits. According to Sanderson and Forsythe (2013), the CDB developed a system early on to ensure its loans would get repaid. These authors argue that the CDB financed large infrastructure projects with loans for which they advised local and regional governments to repay by selling land. As Musacchio and Lazzarini (2014) explain, BNDES has very low non-performing loans, and it tends to lend to large companies that are not credit constrained (because they could obtain financing elsewhere) and that have the sufficient capacity to repay the loans at market rates. In the 1980s, the BNDES became a “hospital for ailing firms,” bailing out Brazilian companies left and right, and accumulating losses in their loan divisions (Najberg 1989). Due to this experience, the BNDES under its former President, Luciano Coutinho, was very careful to show a profit while also aggressively pursuing industrial policy to propel large Brazilian firms to gain greater market shares at home and abroad (Almeida 2009).

Using return on equity (ROE) as a metric of financial performance, we observe the highest rate of return at 28% belongs to the BNDES. It is almost double that of the next highest performer, the CDB (14.4%). The differential in the ROEs on our selected banks is quite high, ranging from a low of 2.3% (KDB) to 28.8% (BNDES). We see that with the exception of the KDB, all the banks achieve an ROE above 5%, while three of our banks achieve roughly 10% or higher. In the specific case of the BNDES, it is important to note that part of these positive results are due to an implicit “arbitrage” deal orchestrated by the bank. The government has capitalized the bank through government debt provided at a subsidized rate (TJLP), and then the bank was able to achieve market returns on the resulting investments. Furthermore, the subsidies incorporated in the loans are not included in the financial figures of the bank.

The previous comparison provides a rough benchmark for development banks' profitability, but we wish to understand whether the profitability of each bank comes primarily from the composition of the portfolio or the capital structure. To do this, we examine the components of ROE, in particular return on assets and leverage ratios, in further detail.

Looking first at ROAs, we find that in contrast to its ROE, the ROA of the BNDES is not dramatically higher than the rest. In fact, the BNDES and the CDB both have an ROA of 1%, which falls in the middle of the sample range of 0.2%-2.2%. The Dupont Formula holds that ROE is comprised of ROA times the leverage ratio; following this formula, a low ROA accompanying a high ROE should be indicative of a highly leveraged firm. In comparing the BNDES and the CDB then, we would expect that the leverage ratios should account for the differences in ROE. The data supports this assumption, revealing that the BNDES has a leverage ratio nearly twice that of the CDB and is in fact the highest leverage ratio in our sample at 28.5. The CDB's leverage ratio is 15.2.

We observe a similar scenario at the other end of the spectrum. The KfW and the KDB have the lowest ROAs at 0.3% and 0.2% respectively, yet the KfW has an ROE three times that of the KDB (7.0% versus 2.3%). Again, this difference is reflected in the leverage ratios: the KfW's leverage ratio of 22.6 is 2.4 times the KDB's leverage ratio of 9.3.

The BDC, surprisingly, boasts the highest ROA at 2%. The bank also has the lowest leverage ratio of the sample at 4.5, leading us to believe that the relatively high returns are closely tied to the composition of the assets held by the BDC. Given the BDC also has the highest ratio of outstanding loans to assets, we suspect that the higher ROA may be attributed to better performing loans at more profitable interest rate margins.

To further our profitability analysis, we calculate the net interest margins, taking as a proxy the net interest income (interest earned – interest expenses) over earning assets. With a rate close to 5%, the BDC boasts the highest net interest margin. Despite having the highest cost of borrowing, the BNDES achieves the second highest net interest margin at 2.15%. The KfW, however, can barely claim a profit with a net interest margin of 0.51%. Given loans comprise approximately 90% of the portfolios of both the KfW and the BDC (Table 7), this difference in net interest margins is particularly curious.

Table 7. Interest Income, Interest Expense, and Net Interest Margins in Development

	Banks				
	BNDES (Brazil)	BDC (Canada)*	CDB (China)	KfW (Germany)	KDB (Korea)
For the fiscal year of 2014					
Int. income on loans/Outstanding loans	6.79%	5.86%	5.87%	7.84%	4.59%
Interest Income/Earning assets	8.03%	5.53%	5.64%	2.29%	3.86%
Interest expense on deposits/Deposits	n.a.	n.a.	1.12%	4.25%	2.25%
Int. expense/Interest-bearing liabilities	6.48%	0.77%	3.91%	1.87%	2.89%
Net interest income/Earning assets	2.15%	4.89%	1.99%	0.51%	1.29%

*Data from 2011

Based on the financial statements of each bank, we construct two rough estimates of the average interest rates charged by each bank in order to get a rough understanding of how these compare to market rates. For the first estimate, we take interest income on loans over outstanding loans, and for the second one we take interest income over earning assets. For most of the banks in our sample, the two rates were comparable, with a difference ranging from 23 to 124 bps. The KfW proved an exception with interest over outstanding loans coming in at 7.84% and interest over interest-bearing assets coming in at only 2.29%. Taking these figures as a proxy for the average interest rates, we are then able to compare these to 10-year bond yields, which we have selected as the benchmark long-term interest rates in the respective markets.

We find that the average interest rates charged by the development banks are largely in line with the rates in the domestic markets. In Brazil, we observe the average rate charged by the BNDES is significantly below long-term market rates, reflecting heavy government subsidization. While in the other selected countries we note that the development banks' interest rates are slightly above the bond yields. We surmise that this differential could be attributed to particularities surrounding the sectors in which the banks have invested. The targeted sectors may face limited access to capital or pose a higher risk to investors due to greater uncertainty, either of which justifies the observed higher interest rates.

It should be noted that the observation of the role of BNDES subsidizing interest rates is consistent with the academic studies of this bank. However, it seems that while, on average, the bank subsidizes interest rates by six percentage points (at least between 2002 and 2009), the loans it extends are not going to companies that have severe financial constraints or that face difficulties

obtaining financing from the market (Lazzarini, Musacchio, Bandeira-de-Mello and Marcon 2015).

Capital Structure Differences

In Table 8, we lay out the major components of each bank's funding structure. This enables us to analyze the financial performance of the banks in greater depth. Immediately, we observe wide variance in the deposits of the banks. Deposits comprise nearly a quarter of CDB funding and 15% of funds for the KDB. The BNDES and the KfW, on the other hand, maintain low levels of deposits (2-6%), while deposits are completely absent from the BDC's funding structure.

Next we look at funding from borrowings. One of the most dramatic revelations is the high percentage of short-term borrowing that comprises the funding for the BDC. While the other banks indicate long-term lending comprising 44-85% of total assets, the BDC has only 4% in long-term loans and 72% in short-term. The BDC's high level of short-term borrowings are particularly interesting given its' high net interest margins and return on assets. It appears that the BDC may be taking advantage of low short-term borrowing rates in Canada following the Global Financial Crisis, in order to improve profitability. Pierre Cl  roux, Vice President of Research and Chief Economist at the Business Development Bank of Canada, explained that "relying on short-term loans is not a problem for BDC because the maturity of liabilities is matched by the maturity of the loans they give."⁴ Still, this stark deviation from the norm is a key point as we attempt to understand the correlation of the high ROA with the lowest debt-to-equity ratio of our sample. Not only does issued capital account for more of the funding than in any of the other banks, retained earnings, too, are significantly higher than the rest.

⁴ Based on June 17, 2016, interview by the authors with Pierre Cl  roux, Vice President, Research and Chief Economist at Business Development Bank of Canada.

Table 8. Sources of Funding

(As a percentage of assets, fiscal year 2014)

	BDC (Canada)	KfW (Germany)	KDB (Korea)	BNDES (Brazil)	CDB (China)
Short-term funding	71.83%	6.94%	13.67%	5.53%	5.38%
Deposits	0.00%	5.73%	15.06%	1.92%	24.20%
Long-term notes/Bonds	3.96%	76.12%	43.63%	85.00%	61.59%
Retained earnings, net	11.07%	2.05%	2.74%	-0.64%	1.70%
Issued Capital	10.93%	4.40%	5.49%	8.19%	6.31%
Other	2.21%	4.75%	19.42%	0.00%	0.82%

Source: Bankscope. (2016) *Bureau van Dijk* [Online]. Available at: BankScope Subscription Service.

Note: 54% of BNDES's funding is directly financed by the Brazilian National Treasury.

EVIDENCE OF IMPACT: EFFECT OF BANK TOOLS ON MARKET FAILURE AND DEVELOPMENT

In this section we review the available evidence on the impact of state-owned development banks. We have a very precise notion of “impact.” We are particularly interested in studies that not only assess the effect of a given policy tool (on productivity, investment, performance, etc.) but also try to evaluate the *counterfactual* scenario, that is, what would have happened to the targeted sector without support from the development bank. With a counterfactual study, it is then possible to compute the *additionality* of the program, that is, how it increased the desired outcomes in the targeted sector beyond that of the alternative scenario in which there was no program. This type of analysis is now commonplace in development studies (see for a general discussion (Duflo, Glennerster and Kremer 2007)).

The assessment of counterfactual outcomes is particularly important because firms self-select into development programs, while banks define the sectors and pick the firms they support. Suppose, for instance, that we find a positive correlation between sector- or firm-level investment and borrowing from development banks. This correlation is likely to be spurious. A firm, for instance, may first decide that it is beneficial for it to invest; then the firm may try to benefit from the cheap credit available through a state-owned development bank. The strategic perspective and corporate financial planning displayed in this process highlights a certain amount of self-selection inherent in the process. Suppose further, however, that the development bank, which has selected the sector of this firm—as a particularly high-growth sector—then scrutinizes the firms that applied for a loan or other program and selects only the best firms. This selection process reveals systemic bias in that the bank has identified a sector with a high rate of successful growth and is able to choose the highest performers out of all the applicants. Subsequent performance gains or additional investment by the firm or in the sector may actually be caused not by the capital inflow received from the bank loan or program but by sheer superior capabilities inherent in the recipient firm.

To create a counterfactual scenario, researchers ideally would randomly select the firms that receive support from a given bank; this method is referred to as a *randomized controlled trial* (RCT). Random assignment to different conditions (e.g. with and without lending) limits skew in the results from unobservable factors affecting outcomes. Alternatively, researchers could artificially create a control group of firms not receiving support. A common practice has been the

use of *matching* techniques (e.g. (Heckman, Ichimura and Todd 1997) in which researchers attempt to select control firms based on a host of observable characteristics (such as size and sector) that closely resemble the set of firms supported by the bank.

As it turns out, our search of public sources for information revealed that very few state-owned development banks have conducted or been the subject of impact assessment studies using counterfactual scenarios. We could not find any particular study using randomization; most studies simply compared targeted and non-targeted firms, usually using matching techniques. In what follows, we describe some of those studies and summarize the lessons drawn from them. In a nutshell, studies are too scant to allow us to offer strong conclusions. At most, the studies indicate that achieving real impact appears to be very difficult in the context of development banks. The existing evidence, for instance, does not provide consistent support for programs targeting large firms that are able to fund their operations with other sources of capital. The effectiveness of these programs appears to vary depending on the bank's ability to critically identify market failures and manage the implementation of the project.

Corfo: Supplier Development Programs and Firm Performance

Arráiz, Henríquez and Stucchi (2013) evaluate the impact of the *Chilean Supplier Development Program*, aimed at improving and stabilizing the commercial linkages between small and medium-sized suppliers and their large-firm customers, over the period 2003–2008. In terms of the policy tools discussed before, this grant program contributes to improved coordination within the supply chain through supporting development and implementation of strategic work plans for SMEs. The authors use administrative records of the program and accounting information from the Chilean tax administration agency to construct a panel of firms comprised of the entire population of tax-compliant Chilean firms from 1998 to 2008. To evaluate the program, the authors compare the performance of firms that received support from the program (treated group) with firms that did not receive support (control group) but are very similar to the treated group in a large set of characteristics. In order to create this synthetic control group, the authors use a Propensity Score Matching (PSM) technique.

Findings suggest that the Chilean Supplier Development Program has achieved its objective of improving and stabilizing the commercial linkages between small and medium-sized suppliers and their large-firm customers. After participation, suppliers are more likely to survive in business—that is they report positive sales—than similar firms who did not participate in the

program, and both suppliers and sponsor firms benefit from larger sales. Although the program was not explicitly designed to promote exports, but rather to comply with international production standards as outlined in trade agreements, the results show that it has helped sponsor firms become exporters. In addition to its explicit and implicit objectives, the program has contributed to the generation of employment opportunities by supplier firms and an increase in the salaries these firms pay to their employees.

BDC: Contrasting View on Effects of Credit Provision on Investments

The BDC is one of the few development banks that have undertaken systematic impact evaluation studies following state-of-the-art methodologies. The BDC conducts annual surveys of its customers to understand what value is being generated from the lending and consulting services. In addition, the bank partnered with Statistics Canada (Statistics Canada 2013) for an impact assessment study of the programs offered from 2001 to 2010.

Statistics Canada examined the influence of BDC's programs on the performance of its clients using a matching method. First, Statistics Canada compiled panel data on BDC clients (the treated group) and non-clients (the control group), which included performance metrics and other firm and industry variables from the Business Register, corporate income tax files, payroll deduction files, and the Export Register. Second, the team from Statistics Canada conducted a nearest-neighbor matching with clients and non-clients using age, employment, assets, debt ratios, profit margin, revenues, industry and location as independent variables. After matching, the sample compiled had 18,161 clients of BDC financing (out of 45,953 original client observations) and 5,107 clients of BDC's consulting services (out of 14,376 original records). Then, Statistics Canada tracked the performance of the treated and control pairs over time and compared the performance in terms of five indicators: sales growth, employment growth, productivity growth, profit growth, and survival rates after receiving funding or consulting services from BDC.

The main finding of this study was that clients from BDC, relative to non-clients, had higher growth in sales, employment, productivity, and operating profits after they received financial aid and consulting from the bank. For instance, employment growth in client companies was 1% to 4% higher per year than for non-clients and 8% to 14% higher for client companies that *also* received consulting services with their financing package. The results for productivity growth were similar with financing clients realizing 1% to 2% higher productivity growth than non-clients and 4% to 13% higher for those who received consulting services as well. Therefore, it seems that

the success of BDC in creating additionality is that a dedicated account manager at BDC follows up with the client to obtain financial reports, visiting the client site if necessary. If repayment of the loan seems uncertain, the BDC sends in a specialized team to advise on turnaround operations, cost-saving measures, and productivity improvement strategies. Yet consulting services alone are not correlated with significant subsequent improvements in productivity (vs. non-clients). This is, we believe, because the primary market failure the BDC is alleviating is the incapacity of private and public commercial banks to take on high-risk or long-term projects.

KfW: Yemen Water Program

Yemen is a poor country experiencing rapid demographic growth and facing severe problems with sufficient water supply. To fulfill its water needs the country relies on rainfall, floodwater diversion, and groundwater extraction. The KfW, in partnership with the Dutch Government and the World Bank, helped to finance a US\$340 million water management program. In order to evaluate the impact of this program, the World Bank and the KfW conducted two poverty and social impact studies. Although this is an example of an intervention of a development bank in a foreign country, instead of its home market, the results are instructive for an impact analysis of these banks.

Between 2007 and 2009 the KfW ran three “rapid appraisal” impact evaluation studies through its internal evaluation unit (Entwicklungsbank Evaluation Unit). The study was “quasi-experimental,” using the mountainous area of Amran and the coastal area of Zabid as treatment towns and Raydah (mountainous) and Al Jarrahi (coastal) as control towns. Unfortunately, these studies failed to conduct a proper baseline measurement of water usage and social indicators. Klasen, Lechtenfeld, Meier, and Rieckmann (2011) then attempted to measure impact through a survey of 2,421 households with more than 18,000 individuals and complemented by additional data from the statistics office, hospitals, and water quality tests.

The study found that piped water projects lacked the capacity necessary to supply water year-round to all households. This meant that water storage tanks (and water purchased from water trucks) were still commonly used, even in treatment towns. Health outcomes were not as positive as expected because in treatment towns about one-third of the water tanks are polluted. In coastal towns water tanks were less polluted, because water tanks were filled up more often than in mountainous towns. In summary, the KfW program to improve the water supply in parts of Yemen did not achieve the desired impact because the intervention was insufficient to change current

practices and, moreover, produced no significant changes in many of the health outcomes measured.

BNDES: Studies Examining the Effect of Loans and Equity

Multiple studies of the impact of BNDES programs in Brazil have been conducted using a variety of methodologies. Below we summarize the studies with methodologies relevant for the present discussion.

Using aggregated data from 1999 to 2009, Pereira, Simões, and Carvalho (2011) concluded that BNDES' subsidized credit lines not only positively affected the investments in Brazil, but also had a positive fiscal result—that is, the additional revenue generated by the increase in investments was greater than the financial cost of the subsidies. The authors also stated that the above-mentioned result justifies the more recent government policy of issuing public debt to capitalize the BNDES. This policy was expanded in 2008 in response to the financial crisis and has remained active in the recent years. Yet the study was simply based on aggregated data, without any attempt to build reliable counterfactuals.

Other studies that have tried to build counterfactuals present less favorable conclusions regarding the effect of BNDES' credit supply on investments. In a 2013 study using data from listed firms in Brazil from 1995 to 2009, Inoue, Lazzarini, and Musacchio use fixed effect panel estimation combined with PSM to assess the effect of firm-level investments by BNDESPAR, the equity arm of the bank. They find a positive effect of BNDESPAR on performance and investment. Nevertheless, such an effect is only observed in independent firms (that is, firms that are not part of a big conglomerate) and firms with profitable projects but which were simultaneously experiencing severe credit constraints. Furthermore, the stated effect disappears completely after 2003. They suggest that after this period Brazil had a rapid development of its local capital market, therefore reducing the need of firms to resort to state-sponsored equity.

In a later study examining publically listed companies between 2002 and 2009, Lazzarini, Musacchio, Bandeira-de-Mello, and Marcon (2015) study again a panel of listed Brazilian firms and collect data on loans and equity by BNDES. They use a host of techniques including fixed effect panel regression and differences-in-differences matching estimation. They find a null effect of BNDES' capital over beneficiary firms' firm-level performance and investment rates. They find only that loans tend to reduce firm-level financing costs, which is hardly surprising given the subsidies embodied in BNDES' credit. Therefore, results suggest that, at least for this set of large

listed firms, credit is simply acting as a substitute for other sources of funding: firms could possibly fund their projects with non-subsidized, private sources. Bonomo, Brito, and Martins (2015) reach a similar conclusion using a broader data set.

Looking specifically at the effects of the *Investment Support Program* (PSI), which aims at financing investments in machinery and transportation vehicles with highly subsidized interest rates, Machado, Grimaldi, Albuquerque, and Santos (2014) calculated the additional investment generated by this program based on a large sample of firms in 2009 and 2010. They create a control group of firms (non-recipients) using PSM. Using data from 2009 and 2010, the authors estimated that each Brazilian Real given out as a loan generated an additional 1.18 Brazilian Reais of investment in 2009, and 0.58 Brazilian Reais in 2010. The authors argue that a possible explanation for the high return observed in 2009 versus 2010 is that in 2009 companies faced severe credit rationing as a consequence of the global financial crisis and BNDES funding provided the capital needed, while in 2010 the companies used subsidized credit from the BNDES simply to replace other, more expensive sources of financing.

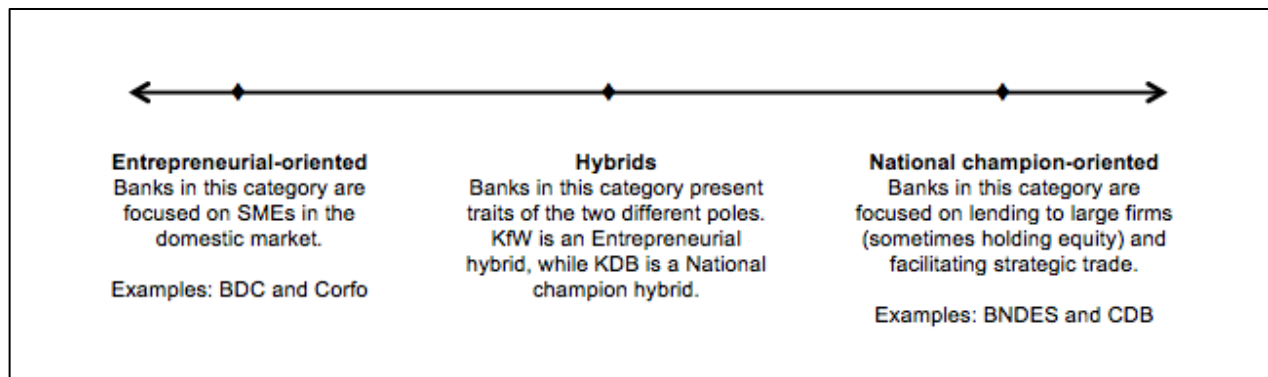
Taken together, the above-mentioned studies indicate the possibility of misallocation of resources generated by excessive public support, since firms with few credit restrictions may take advantage of subsidized credit without producing additional investments (see (Antunes, Cavalcanti and Villamil 2012, Cull, Li, Sun and Xu 2013)).

GENERAL STRATEGIES OF DEVELOPMENT BANKS

Building on the previous analysis of the development banks' operations and individual focuses, we define a spectrum of strategies and place the banks in our sample on the spectrum. On one end of the spectrum of orientation are bank that are *Entrepreneurial-oriented* and on the other end, those that are *National champion-oriented*. Entrepreneurial-oriented banks are, in general, focused on serving domestic companies and, more precisely, SMEs. A bank of this orientation works to complement the role of the private capital market by giving loans, credit guarantees, or grants to SMEs and as well as working with equity and venture capital firms. National champion-oriented banks, in contrast to the entrepreneurial-oriented bank, are more focused on lending to big firms and frequently do so without regard to market failures. These banks also do a lot of lending related to strategic trade in order to support either globalization of domestic firms or

exportation of goods and services. Additionally, they sometimes participate in large equity syndicates.

Figure 1. General Orientation of Development Banks



Based on our research, we were able to classify the banks into three distinct groups—two of them representing opposing ends of the spectrum—based on their programs and similarities in objectives. They are grouped as follows:

Entrepreneurial-oriented: The BDC and Corfo are clearly entrepreneurial-oriented banks. Both of them are extremely focused on SMEs and start-ups, and they only serve the domestic market, though they differ in the type of support given. Corfo is heavily concentrated on grants, while the BDC does more lending. They also differ on how they channel the resources. Corfo neither lends nor makes equity investments *directly*, while the BDC makes direct loans to companies and does directly invest in equity through a wholly owned subsidiary. Both, though especially the BDC, have training, consulting, or networking programs to complement the financial programs provided to recipient companies.

National champion-oriented: The BNDES and the CDB fall on the opposite side of the spectrum from the BDC and Corfo, as national champion-oriented banks. In contrast to the latter group, the BNDES and the CDB are more focused on lending to very large firms or conglomerates. Additionally, both banks have very large programs to support international growth (the CDB is more active in this area) and expansion of exports. The banks mostly focus on loans, but also have equity and credit guarantee programs. Though SMEs are served by these banks, but they are clearly not the priority.

Hybrids: The KfW and the KDB are banks that do not exactly fit in either of the above-mentioned categories, and so they are classified as “hybrids.” It is important to note that they are

both more inclined to the entrepreneurial-oriented side, especially the KfW. Given the stronger orientation of the KfW to the entrepreneurial side, we categorize the KfW as an *entrepreneurial hybrid* and the KDB, a *national champion hybrid*. These banks present characteristics for both the national champion and entrepreneurial categories. We say that they are more inclined to the entrepreneurial side because the focus or mission of the banks is to support SMEs. In the case of the KDB, the focus is on supporting firms in industries at the technological frontier. Notwithstanding, both banks provide capital for public infrastructure, SOEs, and some large firms. Also, they are not completely concentrated on the domestic market, but also serve foreign governments (KfW) and foreign companies (KDB).

The orientation of a bank along this spectrum informs an analysis of the programmatic focus and the tools most suited to addressing market failures. We found the banks on the entrepreneurial side were most interested in enabling and supporting research grants, innovation, information sharing, and a supportive network for SMEs. Banks on the national champion-oriented side sought to facilitate productivity gains in industrial sectors, increase labor mobility and skills, and address market failures limiting firm-level growth. Almost all banks were interested in providing some level of support for strategic trade and in supporting development of the private banking system and domestic capital markets.

How can we explain this diversity? At least based on our sample of banks, it appears that more developed economies tend to move towards the model of entrepreneurial-oriented banks, while banks in emerging economies tend to pursue the national champion model. A possible hypothesis is that emerging countries often face severe constraints in terms of scant long-term financing and infrastructure. A more active action of state-owned banks may be necessary given the lack of private capital markets and private entrepreneurship. In this sense, we might observe a “life cycle” of development banks (Torres and Zeidan 2016) whereby they can be more active in the national champion side of the spectrum at earlier stages of country-level development, and then gradually move to the entrepreneurial side as market and infrastructure voids are progressively mitigated. Yet, as we discuss next, the very presence of large, national champion-oriented development banks can pose threats to efficiency and market development.

CONCERNS ABOUT THE ACTIONS OF DEVELOPMENT BANKS

Bureaucratic Inertia

The first concern is a consequence of the *inertia* of public bureaucracy (Krueger 1990): once established, large banks can have a life of their own, regardless of their role and impact. These banks are supposed to have an autonomous technocracy to evaluate what tools are the best to address market failures. This usually means salaries, pensions, and benefits in development banks are above the mean for governmental organizations and state-owned enterprises. Thus, staff in these organizations has no incentive in downsizing these banks or dismantling them once the market failures they were addressing are alleviated (e.g., once financial markets are deep enough to provide long-term financing for projects).

Wrong KPIs

Development banks usually have key performance indicators (KPIs) that are not linked to their main objectives. For instance, most of these banks use as KPI either total loan disbursements per year or the stock of loans at the end of the year. If the objective is to solve market failures, banks should have KPIs *linked* to the alleviation of market failure. Thus, total disbursements or the stock of loans should actually *fall* as local financial markets develop.

Need of Impact Studies and Sunset Clauses

Development banks, in general, have not acted as impact investors. Our previous section indicated that there are few robust, conclusive studies showing the actual impact of development banks. How can their presence be justified in the absence of evidence that their activities are making a real impact in the economy? When a large development bank is in place, defendants of industrial policy might argue that state action is necessary regardless of market failure considerations, as long as they have a “mission” to innovate or develop new industries (Mazzucato and Penna 2015). In practice, however, their action should have clear targets (e.g., dealing with specific market failures) and sunset clauses (i.e., a procedure for dismantling the bank once its mission has been accomplished or as financial markets and other institutions arise to solve the market failures development banks were supposed to alleviate).

Development Banks Crowding Out Private Financial Intermediaries

Another concern is that banks will stifle the emergence of private banks with a focus on medium to long-term financing of private companies. National champion-oriented development banks tend to cater to large firms that would be able to borrow elsewhere using private and

oftentimes foreign sources of capital. By targeting these firms, banks may therefore create a severe problem of *credit misallocation*, that is, they will channel subsidized funds to firms that are not necessarily financially constrained (Cavalcanti and Antunes 2012, Cull, Li, Sun and Xu 2015). In our previous section, we reviewed studies that find that this has happened in BNDES in recent years.

By focusing on large, established firms, development banks may also cherry-pick the subset of firms in the economy with higher capacity to repay their loans—precisely the set of firms that could be funded by private financial intermediaries. Being left with higher-risk clients, private banks may thus become more reluctant to provide firms with loan-term loans. In other words, the mere presence of national champion-oriented development banks may *crowd out* the development of a private credit market. Banks more positioned in the entrepreneurial side of the spectrum, in contrast, tend to focus more on credit constrained firms and adopt mechanisms that are more complementary to the private credit market. We discussed, for instance, how credit guarantees can be used to stimulate entrepreneurs to get funding from private banks.

Political Capture and Credit Misallocation

In some cases, development banks may not only target large firms but also firms with bad projects. Thus, Bailey, Huang and Yang (2012) and Khwaja and Mian (2005) examining state-owned banks in China and Pakistan, respectively, find that these banks tend to give loans to underperforming firms. There are two potential channels that can cause this negative selection, all coming from the political view of banks, discussed before. First, large firms may nurture *political connections* to lobby for subsidized credit and then get massive loans (Ades and Di Tella 1997). A host of studies, for instance, have found support for this channel in the case of BNDES. Lazzarini et al. (2012) and Sztutman and Aldrichi (2015) find that Brazilian firms donating to winning political candidates get a higher portion of BNDES loans. In another study, Carvalho (2014) finds that BNDES has disbursed more loans to firms in regions governed by politicians aligned with the federal government. A second channel involves the possibility that development banks will be used as mechanisms to *bail out* companies. Cheap loans and equity can be used to rescue failing firms and therefore create counterincentives for managers to pursue efficient projects in the long-term.

Fiscal Cost of Development Banks

Finally, there may be macro-level, budgetary consequences when governments perpetuate large development banks. To fund those banks, governments tend to use existing earmarked revenues, raise taxes, or issue new debt. At a fundamental level, the social benefits of providing firms with extra credit, equity or other tools to solve market failures need to supplant the costs to fund and operate the state-owned development bank. If governments fail to show the impact of banks in the real economy, then all the costs involved to support this state-owned apparatus can be hardly justified. Governments may end up taxing the economy or increasing public debt to a point where the operations of the development bank may actually reduce welfare or create severe downstream fiscal problems.

POLICY RECOMMENDATIONS

We conclude with a set of policy recommendations for state-owned development banks and their governments to improve the effectiveness of programs addressing key market failures. This list of recommendations is not meant to be the last word on this matter; our own review showed that rigorous studies on development banks have been scant. Rather, our goal is to outline key areas for further research and potential action by development banks to improve their impact in the local economy.

Improve accountability for program effectiveness. We have shown that few state-owned development banks publish impact assessment studies conducted by either their own staff or independent researchers. Banks should make data on loans, equity investments, and other programs publicly available to enable evaluation of their programs by multiple research groups. Banks should encourage and support use of distinct methodologies for evaluation and examination of different types of outcomes. Programs that do not show consistent, strong impact (e.g. positive effect on investment, productivity, or social-environment outcomes more generally) should be aborted.

Closely monitor the performance of targeted companies and/or partner with the private sector. State-owned banks in developed economies tend to follow a more entrepreneurial orientation by trying to revamp latent capabilities through close partnership with private sector capital. In emerging or developing economies, lack of a sufficiently developed private capital market may require more direct intervention such as direct lending or equity investment in local firms. Governments in developing economies, however, should be wary of the risk of perpetuating support to national champions if they do not improve their KPIs and introduce sunset clauses (i.e., once the objective has been achieved the program or bank should be dismantled). Banks should define clear performance targets and clear exit strategies for when firms develop the scale and capabilities to compete in the marketplace without government support, while also encouraging the development of private capital markets. If development banks select the best firms and provide them with cheap capital, then private banks and funds may be left with riskier firms, therefore reducing the attractiveness in providing new private credit.

Accompany loans and investments with technical assistance or consulting. In developed economies, development banks have in-house capabilities to provide both financing and technical assistance to the beneficiary firms. The case of the BDC in Canada should be encouraging. By having a large consulting team this bank is able to provide more robust support and enable recipient firms to accomplish their goals. This kind of support not only improves the success of their lending programs and reduces non-performing loans, but also facilitates more careful monitoring of recipient firms.

Ensure that capital from development banks does not crowd out private capital markets. If development banks select the best firms and provide them with cheap capital, then private banks and funds may be left with riskier firms, therefore reducing the attractiveness to provide new, private credit. This is particularly a source of concern in the case of national champion-oriented development banks that target large companies. Such banks could consider a gradual transition towards a hybrid or entrepreneurial orientation by working in tandem with providers of private capital. That is, a good intervention should crowd in the private sector, by for instance developing credit guarantee programs or matching funds for private equity or venture capital funds. The KfW, for instance, invests in equity through private equity funds and provides capital to large firms only when it relates to environmentally oriented projects. The KDB also supports publicly traded companies by investing in professionally managed funds in partnership with private investors. In Chile, Corfo's *Startup Chile* program has provided a major push for the development of local venture capital funds, because the development institution has taken on the risk at the outset and provides a seal of approval for a large group of start-ups that then grow with investments from the private sector. BNDES has been trying to promote the development of a corporate bond market in Brazil by buying parts of the debenture issues of a company as long as the private sector buys the rest of the issue.

Use direct lending or direct equity investment with discretion and preferably when there are real credit constraints. Instead of directly lending or investing in firms, more entrepreneurship-oriented banks are adopting alternative tools to solve information asymmetries and problems of credit rationing. For instance, Corfo provides guarantees for

entrepreneurs to borrow from private banks. This strategy not only avoids crowding out (as discussed before) but also reduces the need of a costly technocratic apparatus to process and manage loans. An important side benefit of these policies, in emerging markets, is that it can aid the development of private credit markets, which are usually controlled by a highly concentrated banking system and usually face rationing. Credit guarantee programs, however, mandate the creation of guarantee funds to protect development banks against potential default. Development banks are, therefore, advised not to execute this strategy without complementary policies to stimulate both entrepreneurship and the development of private capital markets that can alleviate credit constraints for private firms.

Limit investment to projects with significant positive externalities. In this sense, support to large firms—or, more generally, firms that can fund their operations with other sources of capital—should only be done in cases where projects are expected to generate positive impact. This is the case, for instance, of firms that invest in clean technologies, infrastructure projects with uncertain sources of revenues (e.g. roads in remote locations), or risky R&D projects with potential to generate knowledge spillovers to other firms in the economy. Development banks could also generate considerable impact by acting as a credit-enhancer in pre-operational stages—that is, before the project starts generating revenue—by facilitating guarantees. It is in this precise stage that the problems caused by asymmetries of information are most acute, making the credit approval process harder.

Act as an impact investor. Impact investors seek firms with potential not only for profitability (or capacity to repay their debt), but also for generating positive externalities through proven metrics of impact (Brest and Born 2013). The field gained substantial traction after the publication of an influential report by J. P. Morgan (2010), claiming that impact investments represent a new “asset class.” Furthermore, new arrangements involving pay-for-impact have emerged. For instance, the so-called *social impact bonds*, created in the U.K. in 2009, are contracts in which the government gives a financial bonus to investors conditional on the social impact that they generate (Social Finance 2013). It is straightforward to believe that development banks could follow a similar strategy. They could, for instance, tie subsidies to the assessed impact of the project or continue equity

investments only in cases where targeted firms yield positive externalities. In other words, development banks could also help boost the trend of impact investing by acting in cooperation with impact-oriented private equity firms, family offices, and nonprofits supporting projects with expected positive impact.

Given these recommendations, it is important to think what kind of features that are needed for development banks to actually transform them into more effective instruments to solve market failure. First, it is clear governments need to create more flexibility to dismantle programs and banks. That is, they need to introduce KPIs that are linked to their objectives and sunset clauses that are linked to those KPIs. If one of the important market failures a bank is attacking is capital market failures, then as those markets develop we should see development banks withdrawing their support and phasing out programs, even dismantling sections of the bank. For example, BNDES was smaller as a percentage of GDP when private credit to GDP in Brazil was less than 20% (in the 1950s and 1960s) than today when private credit to GDP is closer to 60%.

Finally, successful interventions need to crowd in the private sector. Therefore, instead of developing large technocracies that are in the business of evaluating and disbursing loans, as the development banks should aim their policies to develop financial markets domestically. They should also have teams of professionals who are good at selecting private equity and venture capital partners and who can design credit guarantee programs so that the private sector can do the lending. Although institutional voids and capital scarcity may prompt some developing countries to create or maintain state-owned banks that act more along the lines of supporting large firms with direct funding, they should at least establish clear impact targets for their disbursements and a clear path towards a more entrepreneurial orientation in such a way that they will progressively partner with the private sector to do some of the lending, and then focus more on creating conditions to improve the odds of success of the projects they support.

APPENDIX: BRIEF HISTORY OF THE STUDIED DEVELOPMENT BANKS

Corporation for the Promotion of Production (Corfo)

The Chilean government established the Corporation for the Promotion of Production (Corfo) on April 29, 1939 in response to the effects of the Great Depression and a devastating earthquake that struck the country in January 1939 (Corfo 2016, Díaz 2010, Nazer, Camus and Muñoz 2009). The bank was to be funded through a mix of tax-generated revenues and external financing, primarily from the Export-Import Bank of the United States (EXIM Bank). The Chilean government supported a protectionist stance, and so the import-substitution approach towards economic growth resulted in an early focus on mining, electricity, agriculture, industrial production, and trade/transportation. Strategies for growth were laid out in “Immediate Action Plans” developed for each of the five sectors.

In order to execute these plans, Corfo established state-owned enterprises. The National Electricity Company (ENDESA) was formed in 1943 to manage the plan for the country’s electrical system. Corfo provided financing and technical assistance for the establishment of Chile’s steelworks, “Pacific Steel Company,” established in 1946. A state foundry for copper, gold, and silver was constructed to buy from the Norte Chico mine and export, while a Hotel Consortium was formed to finance the construction of hotels supporting the tourism industry. The bank also funded a national network of refrigerators to support food transportation across country; financed irrigation systems, agricultural automation, reforestation, and the fruit export industry; and supported research in livestock and vegetation.

The bank was initially composed of middle-class engineers, who made it possible for the bank to offer not only credit but also technical assistance on industry development. The central planning-driven policy had another substantial impact: the creation of the National Accounts System. In order to determine the stock of domestic resources and the most effective allocation of these for economic growth, Corfo’s Department of Planning and Studies embarked upon the meticulous work of measuring these resources and establishing a statistical database that eventually became the National Accounts System.

Central planning gradually began to lose its place of pre-eminence in policymaking, and divestment of many of the SOEs occurred between the 1960s and early 1970s. A controlling stake was maintained in specific industries, however, including natural resources, energy, and telecommunications. The military coup of 1973, which placed General Augusto Pinochet in power,

ushered in a new era in which free markets were seen as key to economic growth. The subsequent market reforms led to liberalization of the markets, reprioritization of foreign investments, and restructuring and privatization of many SOEs. The focus of the bank was permanently shifted away from directing market resources towards identifying and funding market gaps that the private sector could not efficiently address. SOE privatization climaxed in 1985 with the introduction of an aggressive program aimed at privatizing the largest of the SOEs.

In the 1990s, globalization necessitated investment in the competitiveness of private, domestic firms. Corfo was decentralized, and new Regional Committees for Promotion of Production were created to support small and medium enterprises. The present structure of Corfo reflects the dramatic shift from supporting specific key industries to promoting competitiveness and innovation of Chilean firms. Today Corfo comprises five departments: Investment and Finance, Competitive Development, Innovation, Development of Technological Capabilities, and Entrepreneurship.

Canadian Development bank

Originally named the Industrial Development Bank, the present-day Business Development Bank of Canada (BDC) was established on September 30, 1944 by the Canadian Parliament to direct reconstruction efforts following World War II (Corfo 2016). Although policymakers voiced criticism of the proposal to establish the BDC, there were seemingly no objections made by other financial institutions. The BDC was originally formed as a branch of the Bank of Canada (the Central Bank), but today boasts much more autonomy.

The primary objectives of the BDC were to facilitate the transition of industrial producers from wartime production to production for peacetime market demands and to facilitate employment for returning soldiers (Díaz 2010, Nazer, Camus and Muñoz 2009). These objectives resulted in a uniquely entrepreneurial-focused bank. While other development banks were focused on physical capital and infrastructure, the BDC was extending credit to a wide variety of small, manufacturing businesses. In contrast to Chile's Corfo, which established numerous SOEs in order to direct national resource allocation, the BDC sought to facilitate economic growth by addressing the market gap in medium and long-term financing.

Its first loans were to finance machine shops, chemical plants, sawmills, ceramic plants, textile and garment factories, flour mills, bakeries, auto parts manufacturers, and metal-casting companies. In 1961, its mandate was expanded beyond industrial businesses to provide financing

for any business that could not find funding under reasonable conditions. This expansion resulted in funding larger enterprises such as commercial airlines. The BDC initially filled a market void for medium to long-term financing, but in the 1960s changes in the financial sector allowed chartered banks to compete directly with the DBC. As a consequence, the BDC refocused its services on the provision of credit to small and medium manufacturing and commercial enterprises, where there was less competition from the chartered banks.

In 1970, the Federal Government commissioned an assessment of the BDC's operations. The BDC had expanded into new activities, such as advisory services; and the country faced new challenges in terms of high unemployment and inflation. In order to more effectively address these challenges, the Industrial Development Bank was restructured into the Federal Business Development Bank in 1975. The restructuring established the bank as a crown corporation: fully independent from the Bank of Canada, but still under the authority of Parliament and the direct supervision of the Ministry of Industry, Trade, and Commerce. The restructuring also introduced a new role for the Bank: lender of last resort. Its services also expanded to include a management services division, venture capital, along with counseling, training, and planning assistance for small businesses. The institution has remained profitable since 1977 and paid \$300 million in dividends back to the government since that time.

Globalization, with evolving financial services, a growing demand for venture capital, and a shift to a knowledge-based economy, brought a second-round of restructuring to the Bank in 1994/5. The Federal Business Development Bank was renamed the Business Development Bank of Canada and given a new mandate as a "complementary financial services provider."

The Bank ceased to be a "lender of last resort" and instead offered financial services that were intended to eliminate market gaps for entrepreneurs (Industry Canada 2001). At present, the BDC has seven divisions focused on clientele, products and services, human resources, organization, communications, partnerships and financial responsibility.

While the BDC supports some large enterprises, the majority are SMEs.⁵ The BDC offers secured and unsecured loans, subordinate financing, direct and indirect venture capital investment, and business consulting services. Since 1995, the BDC has provided \$33 million in financing to more than 60,000 Canadian businesses. The BDC must earn a return on equity equal to or higher

⁵ A small enterprise is defined as an enterprise with 100 employees or less, and a medium, between 100 and 500 employees.

than the Government's average long-term cost of capital. In 2008, the BDC ceased to issue bonds, and instead relies upon funding from the Ministry of Finance.

KfW

Germany's development bank—the *Kreditanstalt für Wiederaufbau* or “credit institution for reconstruction”⁶ (KfW)—was founded on November 18, 1948, to facilitate the rebuilding of Germany following World War II (Grünbacher 2011). The Allied victors were torn over the structure of the bank, with the British pushing for a central independent reconstruction agency and the Americans advocating for a decentralized banking system. The creation of a central loan corporation, 80% owned by the Federal Government and 20% belonging to the German states, proved a suitable compromise (KfW 2014).

The bank initially served as conduit for aid from the Allies to rebuild physical capital and infrastructure, with particular focus on reconstruction of housing facilities, the energy supply system, and industrial compounds. The Marshall Plan⁷ (which came out of the United States) provided initial funding for the KfW of about one billion Deutsch Mark (DM) (approximately EUR 511,000⁸). German suppliers paid the KfW for the supplies, and the bank then used these so-called “counterpart-funds” for additional investments. From these funds the bank received DM 1.9 billion (approximately EUR 971,000) which it could lend to the West German economy

The main instrument of the KfW was low-interest rate loans focused heavily on supporting the steel industry, electricity production, mining, and agriculture. When the Marshall Plan expired in 1953, the European Recovery Program (ERP) Special Fund was created. The ERP Special Fund still plays an essential role in the economic growth plan today. As the crisis in food supplies and housing leveled off in the second half of the 1950s, KfW moved to support small and medium enterprises (SMEs) and projects focused on environmental sustainability. The prevailing economic growth model also shifted away from an import-led production theory to long-term export-led growth.

In the 1960s, the Federal Government embarked upon a plan to finance international aid projects in low and middle-income countries; this grew to be a sizeable portion of the firm's

⁶ Translation of German names of institutions are made freely by the author within this text.

⁷ The general objectives of the Marshall Plan included enhancement of the Western European economic recovery through the supply of food, raw materials, and goods.

⁸ Exchange rate set at EUR 1 for DM 1.95583 (based on data from BundesBank).

business. Political imperatives over the course of the Cold War contributed to increasing pressure on lending for foreign projects supporting key domestic industries. In 1970 around seventy-five percent of the promotional funds were allocated to international projects. Over the course of the two oil crises (1972-1974 and 1978-1980), an increasing focus on supporting domestic production led to a reorientation of the bank. Specific programs were designed to promote SMEs, particularly as the political orientation shifted towards supporting domestic producers indicating goods “Made in West Germany.”

The globalization of the 1980s led the KfW to refinance and diversify its portfolio to include a wider array of currencies and instruments. The KfW was one of the first German companies to register with the United States Securities and Exchange Commission (SEC) in order to participate in the American capital market and to be rated by the U.S. credit rating agencies, earning an AAA-rating (KfW 2014).⁹ In order to raise funds from international credit markets, a subsidiary was created called KfW International Finance.

German reunification in 1990 presented the KfW with the challenge of converging the economic indicators of two starkly contrasted economies: the former German Democratic Republic (GDR), known as East Germany, with the continuing Federal Republic of Germany (FRG), where the KfW was based. The KfW introduced special support programs, including a massive housing refurbishment program for the former GDR, to try to raise the living standards.

The 2000s marked a period of controversy for the KfW, as the European Commission initiated an investigation against the bank for possible violation of European competition law.¹⁰ The investigation prompted restructuring of the bank to separate promotional and commercial activities. The KfW IPEX-Bank GmbH was created in 2008 to manage financing of exports and international projects. Later on, the KfW acquired the Federal Government’s shares of the German Investment Corporation¹¹ along with about 30% of the German Industry Bank (IKB Deutsche Industriebank AG), and merged with the German equalization bank (DtA Deutsche Ausgleichsbank). The resulting KfW Group provided support for SMEs, municipal projects, and private and financial institutions on the domestic front, while also promoting a strong export industry, financing international projects, and investing in low and middle-income countries.

⁹ The KfW holds a AAA-rating by Fitch, Moody’s and Standard & Poor’s.

¹⁰ The charges were related to refinancing guarantees received from the German government.

¹¹ The *Deutsche Investitions und Entwicklungsgesellschaft* (DEG) became a wholly-owned subsidiary of the KfW.

In 2007, during the Global Financial Crisis (GFC), the KfW invoked criticism again, this time for poor risk management. The KfW, along with the Federal Government, propped up the IKB, which suffered losses in billions of euros due to speculation on mortgage-backed securities and over exposure to foreign currency.¹² When the KfW eventually sold its IKB shares to Lone Star in 2008, it was at a significant discount.

The contraction of the international markets post-GFC led the KfW to increase domestic financing to its highest volume in its history at EUR 66.6 billion (KfW 2016). The KfW “Special Program” was created to facilitate countercyclical policy responses during the GFC. Today, the KfW’s portfolio reflects heightened concerns around environmental impact and long-term sustainability, with about 40% of total financing in 2012 dedicated to climate protection and environmental projects. Infrastructure financing now focuses on ensuring a reliable supply of clean energy. Other priority areas for KfW include facilitating globalization and technical progress and addressing the effects of both domestic and international demographic changes on Germany (KfW 2014). International investments also reflect a growing concern for social welfare, with financing targeted towards health-care, climate change mitigation, and stability of financial systems.

Korea Development Bank

Established April 1, 1954, the Korea Development Bank (KDB) was not Korea’s first development bank. During the Japanese occupation of Korea (1910-1945), when the Korean financial market operated as a subsidiary of the Japanese financial market, the country had the Chosun Production Bank¹³ (1918)(Kim 2013, Min-Ji 2015, Min 2004). After liberation from Japan in 1945, the Korean financial market faced seclusion from world financial markets and an under-developed domestic capital market. Then the Korean War broke out in 1950, plunging the peninsula into a bloody civil war. Recognizing the devastation the war had already caused, the Korean government began in May of 1951 to draft plans to establish an industrial bank that would support post-war reconstruction.

The damages from the war were severe, roughly the sum of 1952 and 1953 GDP (Frank Jr. and Suk Kim 1975). The economy was fragile following the split between North Korea and South

¹² On the day of the Lehman Brothers bankruptcy a transfer of EUR 320 million was made as part of a regular currency swap.

¹³ Chosun derives from the name of the dynasty that ruled Korean peninsula from 14th century to early 20th century.

Korea, so there was little opposition to the creation of an industrial bank. The plan for the KDB was passed in November 1953, and the bank was established in 1954 with 939 employees and initial funding of 40 million Korean Won (KRW), 25% of which was from federal funds (Min 2004).

The 1950s were full of challenges: the supply of long-term capital from private financial institutions was inadequate and the domestic capital market was still under-developed. As was common following a devastating war, the KDB focused on infrastructure, such as electricity, the mining industry, and rebuilding the manufacturing industry. With the investments from the KDB, the mining and manufacturing sectors achieved consistently high growth even into the 1970s (Bank of Korea 1973).

Initially, the KDB was dependent on capital flows from the Bank of Korea, which was facing elevated risk of inflation in the post-war period. The government temporarily suspended the issuance of KDB bonds from 1961 to 1968 as it sought to stabilize the financial sector. The Bank Act was revised in 1962, resulting in a relaxation of the limits on investments and permitting emergency leases from the Central Bank. The revision also provided government guarantee for foreign aid, which the KDB began to receive in the 1960s. This came primarily from the United States and was used to support the Korean government's five-year economic development plans of the 1960s and 70s.

In contrast to the import-substitution strategies of the post-WWII development banks, the KDB focused on the growth of strategic exporting industries, such as the steel, shipbuilding, and machinery industries. The KDB concentrated funding heavily on the coal and steel industries, expecting them to drive widespread economic growth by an average of 20% annually. The KDB toolkit expanded from start-up and growth funding for industrial firms to include management service, equity investment, and guarantees for corporate bonds and foreign aid. Subsidiaries were created around specific industries and sectors: Korean Asset Management Corporation (1962); the Fisheries Cooperative Union (1963); and the Korean Housing Bank (1967). As the decade progressed, more portfolio firms began to falter, so the KDB responded by taking more control in corporate management.

In the 1970s, the government shifted the focus towards supporting the growth of the heavy chemical industries. With over a decade of experience, the KDB recognized diversification of funding as a key to long-term affordability; as a result, in 1974, the KDB started selling its bonds

in foreign currencies and created special funds such as the Tourism Development Fund and the National Investment Fund. It also expanded the financial support offered for key industries (steel, electricity, and chemicals) by using federal spot investments and debt-for-equity swaps, along with expanding guarantee services.

Stagflation and negative net exports in the 1980s resulted in the introduction of industrial adjustments and rationalization policies, while a weak USD, low oil prices, and low interest rates fostered strong growth, beginning in 1985, in the heavy industries. KDB supported the industrial rationalization by expanding its available funds¹⁴ and increasing investments in domestic production, particularly heavy industry, such as automobiles and electronics, which became the new basis of national growth. The KDB also increased foreign investments, started an investment trust business, and ventured into securitized assets.

The 1990s ushered in an era of widespread market liberalization and globalization. With this came intensified competition for Korean industrial producers from Chinese and other ASEAN counterparts. To increase Korea's competitiveness on the global front, the KDB shifted its focus from financing long-term construction projects to investing primarily in high-tech industries. Korean companies became market leaders in information technology (IT) and telecommunication industries. The role of the KDB expanded in 1990 to include the purchase and sale of public offering bonds and repurchase agreements.

When the Asian Financial Crisis struck in 1997, the KDB received foreign aid from international financial institutions, including the International Monetary Fund and the Asian Development Bank, increasing its capital to 10 trillion KRW. This period marked a significant shift in the KDB's role, as it now took on the responsibility of insuring stability in the financial markets. First, its structure changed to mimic that of an investment bank and it became actively involved in corporate debt restructuring. By the 2000s, the KDB was offering assistance with mergers and acquisitions, along with private equity investments.

When the Global Financial Crisis hit Korea in 2008, the KDB underwent its own restructuring that resulted in the KDB, Korea Finance Corporation, and KDB Financial Group. Despite the major changes, the KDB's legal capital increased by nearly 1.5 trillion KRW from 2008 to 2014. The bank began to offer personal lending and insurances services, as well as

¹⁴ KDB increased its legal capital to 1.5 trillion KRW

trusteeship management of the Development Bank of Mongolia in 2011, and was set to be privatized, but these services and the subsequent talk of privatization were ended when the bank remerged with the KFC and KDB Financial Group in 2015.

In the present century, the KDB has expanded support to include small and medium enterprises (SMEs) and innovative venture companies, and has also implemented various types of professional services such as consulting and retirement pension fund management. In 2012, KDB started “KDB techno banking” for financial support of small- & medium-sized companies (KDB 2015). The KDB has continued to focus on potential high-growth industries, including broadcasting, IT, and telecommunication industries, as well as renewable energy.

BNDES

The Brazilian Economic Development Bank (BNDE)¹⁵ was established on June 20, 1952 to address the country’s immediate needs for long-term financing of infrastructure and industrial projects (BNDES 2002, BNDES 2016). Industrialization in Brazil began in the 1940s in the midst of WWII but its expansion had been inhibited by a lack of investment capital available for large infrastructure and industrial projects. At the time, Brazil was following an import substitution framework, focused in particular on the perishable and semi-durable consumer goods.

During World War II, Brazil sided with the Allied Forces and received foreign aid from the United States for the development of its mining and steel industries. In 1950, a Joint Brazil-U.S. Mixed Commission (CMBEU) was created to analyze and recommend infrastructure projects that would help the development of the Brazilian economy.¹⁶ The BNDE was formed as a result of the work of the CMBEU and initiatives of Presidents Eurico Gaspar Dutra (1946-1951) and Getúlio Vargas (1951-1954) to facilitate funding for heavy industrial enterprises.

The BNDE’s initial financing cycle consisted mainly of public infrastructure projects managed by state-owned enterprises (SOEs), in particular renovation of the railway system and construction of hydroelectric power plants. Then in the late 1950s, the bank was seen as integral to achieving President Juscelino Kubitschek’s national development goals or “Plano de Metas,”

¹⁵ The bank later became BNDES when “social development” was added to the name.

¹⁶ The projects were supported by the World Bank, the American Export-Import Bank (Eximbank), and in part by the Brazilian government.

and the bank's focus changed from infrastructure to the steel industry. In the 1960s, BNDE was responsible for 70% to 80% of all capital investment in the steel industry (BNDES 2002), which was funding using negative interest rates. The prioritization of the steel industry continued through the military regime (1964-1985), until the mid-1970s.

Though the military regime maintained the focus on import substitution, the BNDE portfolio shifted from financing only public projects (either directly or indirectly through SOEs) to 70% of funds going towards private firms by the 1970s. On June 21, 1971, under Law 5662, the BNDE was itself converted into a state-owned enterprise, which resulted in greater flexibility in fundraising and investment activities and lessened political interference. In addition, three subsidiaries were established in 1974 to broaden offerings in the capital markets.

In the mid-1970s, military President Geisel laid out new priorities for the government in his Second National Development Program (II PND); these were (i) to diversify the energy matrix of Brazil (which increased in priority after the oil shock of 1979); (ii) to promote the development of the domestic raw materials industry; and (iii) to consolidate the machinery and equipment industries (BNDES 1987). This reorientation of economic policy led to significant changes in the focus and structure of the BNDE. The bank started to finance two heavyweight sectors: capital goods and basic materials (mining, steel, metallurgy, chemical and petrochemical, pulp and paper, cement and fertilizers).

In the early 1980s, many new directives were incorporated into the BNDE under the umbrella of "social development." This expansion of vision led to the renaming of the bank in 1982 to the BNDES ("s" added for social development). Also in this period, the BNDES began to divest its shares in the many state and private companies in which it was a majority shareholder, as many of these had begun to default on their loans. A notable shift also began in economic policy as export-led competition was encouraged.

The 1990s saw a new Brazilian democracy established. Under the administration of President Fernando Collor de Mello a National Privatization Program was initiated in 1991.¹⁷ In line with the political view of development banks roles, BNDES shifted its focus from promoting industrial sectors to supporting the government's privatization program. The BNDES provided financing as well as administrative and technical support, particularly for auctions.

¹⁷ Presidents Itamar Franco (1992-1994) and Fernando Henrique Cardoso (1995-2002) continued this program.

In 2003, with the election of the government of Luis Inácio da Silva (2003-2010), the profile of BNDES changed once again as the government returned to a focus on promoting industrial activity. While it continued to invest in infrastructure projects, the bank in 2008 began to invest in large individual companies and to engineer the consolidation of players in global production chains. In its selection of these large firms, the BNDES has been accused of creating a misallocation of credit by supporting firms that could borrow capital from private sources (Almeida, Lima-de-Oliveira and Schneider 2014).

Today, the mission of the BNDES is to foster sustainable and competitive development in the Brazilian economy, generating employment while reducing social and regional inequalities. Three subsidiaries comprise the present-day BNDES: FINAME, which finances the purchase of equipment and other basic inputs; BNDESPar, the equity arm of the bank¹⁸; and BNDES Limited, which finances international expansion of domestic firms. The value of BNDES' operations to GDP more than doubled between 1995 and 2015, moving from 5.6% to 14.3% and peaking in 2010 at 24.3% of GDP (see Table 5). In 2015 the BNDES represented 20.7% of total outstanding loans in Brazil.

The BNDES receives funds at a below-market rate, known as the “Taxa de Juros de Longo Prazo” or TJLP, from the National Treasury, Fundo de Amparo ao Trabalhador (FAT) and PIS-Pasep.¹⁹ The BNDES, in turn, is able to offer subsidized loans. International loans and capital market operations also contribute to BNDES funding. FAT funds as a share of BNDES total liabilities increased significantly in the decade preceding 2007; however, funding from the National Treasury overtook FAT funding and now accounts for almost 60% of BNDES funding. External financing from multilateral institutions and bonds accounted for over 20% of consolidated liabilities in 2002, but in 2015 fell to 6%. This change was the result of FAT resource depletion and the continued use of the bank as a countercyclical policy inductor in the crisis of 2008/2009.

The BNDES' financial performance has been relatively stable over the past decade (Table 5). The return on average equity (ROAE) rose to 18.0% in 2015, from 4.4% in 2012. However, the bank's leverage increased significantly after 2011. In 2002, the leverage ratio was

¹⁸ BNDESPar engages in capital market transactions ranging from venture capital to equity purchases in the secondary market.

¹⁹ In 2015, the TJLP remained more than 7 pp under the benchmark interest rate (Selic).

12.2 and in 2015, it reached 30.0 as National Treasury financial support was taken in the form of indebtedness, not as capital.

BNDES has undergone significant changes over time. Starting off as an important agent in supporting infrastructure projects, the BNDES also drove the development of the goods industry in the 1970s. The bank bailed out several companies in the crisis of the 1980s; financed and operationalized the privatization program of the 1990s; contributed greatly to the improved competitiveness of Brazilian exports in the early 2000s; and in recent years has revisited the financing of infrastructure through an expansion of its portfolio. Despite the vast changes in the structure and focus of the BNDES, its importance has only grown over the years. Today it represents a large portion of domestic credit, especially for long-term projects.

Development Bank of China

The Development Bank of China (“CDB”) was established in 1994 by the Chinese government under the jurisdiction of the State Council (CDB 2015). As one of three policy banks of China, the CDB was formed to finance domestic infrastructure, basic and emerging industries, and other high-priority national projects. Infrastructure projects were “mega-projects,” deemed high-priority and of strategic interest for the country; projects included the Three Gorges Dam, the Beijing-Kowloon Railway, and Shanghai Pudong International Airport (IDFC 2015).

The bank distinguished itself from other commercial banks by supporting the macroeconomic policies of the central government for the structural transition of the economy. However, the performance of the state-owned policy bank was poor in the first several years with high non-performing loans. In 1998, Chen Yuan, former Deputy Governor of China’s Central Bank, took office as the Governor of the CDB. Chen played a key role in turning around the performance of the bank. Under the leadership of Chen, the CDB successfully reduced its bad debt and adopted international financial standards and best practices. The reforms enabled the bank to achieve rapid growth and paved the way for the CDB to become one of the most important financial institutions of China, wielding significant influence both domestically and internationally.

The advantage of the CDB was that it provided medium- to long-term financing. Funds were used to support China's development strategy domestically and abroad.²⁰ Though uniquely formed as a matter of policy²¹, the CDB followed the path of many other development banks formed post-war or post-disaster in providing financing to support low-income housing and livelihood improvement. The bank also facilitated China's cross-border investments and global business cooperation. [1] [SEP]

The CDB was funded through the issuance of bonds, and reached a new milestone in 2008. On December 11, 2008, the State Council of China approved incorporation of the China Development Bank Corporation. By the end of 2014, the bank had issued a cumulative total of 11.4 trillion RMB in bonds, with 6.6 trillion RMB floating, which made the CDB the largest financial issuer in the Chinese debt capital market, followed by the Ministry of Treasury.

On March of 2015, the State Council officially defined CDB as a development finance institution. At present, the CDB has a staff of about 9000 employees and is comprised of four major subsidiaries: CDB Capital, CDB Securities, CDB Leasing, and the China-Africa Development Fund (CAD Fund). The CDB owns 37 primary branches and 3 secondary branches across China. It also has an offshore branch in Hong Kong and five representative offices in Cairo, Moscow, Rio de Janeiro, Caracas, and London.

The bank's registered capital is 421.2 billion RMB, and its current shareholders are the Ministry of Finance, Central Huijin Investment Ltd., Buttonwood Investment Holding Co. and the National Council for Social Security Fund, with ownership shares of 36.54%, 34.68%, 27.19% and 1.59% respectively (CDB 2015). By the end of 2015, CDB's total assets were 12.3 trillion RMB with a non-performing loan ratio of under 1% for a 43 consecutive quarter. International credit ranking agencies, Moody's, Standard & Poor's, and Fitch, all rate the CDB at the same level as China's sovereign credit. In the two decades since the CDB was created, the bank has become "the world's largest development finance institution, China's largest cross-border financier, largest medium- and long-term lender, and largest bond-issuing bank, and plays a critical role in both China's domestic boom and global cooperation (CDB 2016).

²⁰ As the largest development financial institution, the bank "aligns its business focus with national economic development strategy and allocates resources to break through bottlenecks in China's economic and social developing (CDB 2014)."

²¹ CDB funds were utilized to support the government's new urbanization program.

REFERENCES

- Ades, Alberto, and Rafael Di Tella, "National champions and corruption: some unpleasant interventionist arithmetic," *The Economic Journal*, 107 (1997), 1023-1042.
- Almeida, Mansueto, "Desafios da real política industrial brasileira no século XXI," (Texto para discussão 1452, IPEA, 2009).
- Almeida, Mansueto, R. Lima-de-Oliveira, and B. R. Schneider, *Política Industrial e Empresas Estatais no Brasil: BNDES e Petrobras* (IPEA, 2014).
- Amsden, Alice H., *Asia's next giant: South Korea and late industrialization* (New York: Oxford University Press, 1989).
- Antunes, António, Tiago Cavalcanti, and Anne Villamil, "The effects of credit subsidies on development," in *Working paper*, (2012).
- Armendáriz de Aghion, Beatriz, "Development banking," *Journal of Development Economics*, 58 (1999), 83-100.
- Aronovich, Selmo, and Andréa G. Fernandes, "A atuação do governo no mercado de capitais: experiências de IFDs em países desenvolvidos," *Revista do BNDES*, 13 (2006), 3-34.
- Arráiz, Irani, Francisca Henríquez, and Rodolfo Stucchi, "Supplied Development Programs and Firm Performance: Evidence from Chile," *Small Business Economics*, 41 (2013), 277-293.
- Bailey, Warren, Wei Huang, and Zhishu Yang, "Bank loans with Chinese characteristics: some evidence on inside debt in a state-controlled banking system," *Journal of Financial and Quantitative Analysis*, 46 (2012), 1795-1830.
- Bank of Korea, *Economic Statistics Yearbook* (Bank of Korea, 1973).
- BDC's History (<https://www.bdc.ca/en/about/who-we-are/pages/history.aspx>, Business Development Bank of Canada).
- BNDES, *Informações Básicas* (Rio de Janeiro: Brazilian Economic and Social Development Bank (BNDES), 1987).
- , *50 Anos: Histórias Setoriais* (São Paulo: DBA Artes Gráficas, 2002).
- About the BNDES: Hstory*
(http://www.bndes.gov.br/SiteBNDES/bndes/bndes_en/Institucional/The_BNDES/history.html, Brazilian Economic and Social Development Bank (BNDES)).

- Bonomo, M., R. D. Brito, and B. Martins, "The after crisis government-driven credit expansion in Brazil: A firm level analysis," *Journal of International Money and Finance*, 55 (2015), 111-134.
- Brest, B. P., and K. Born, "When Can Impact Investing Create Real Impact?," *Stanford Social Innovation Review*, (2013), 22-31.
- Bruck, Nicholas, "The role of development banks in the Twenty-First Century," *Journal of Emerging Markets*, 3 (1998), 39-67.
- Buiges, Pierre-André, and Khalid Sekkat, *Industrial policy in Europe, Japan and the USA: amounts, mechanisms and effectiveness* (Basingstoke: Palgrave Macmillan, 2009).
- Cameron, Rondo E., *France and the economic development of Europe* (Princeton: Princeton University Press, 1961).
- Carvalho, Daniel, "The Real Effects of Government - Owned Banks: Evidence from an Emerging Market," *The Journal of Finance*, 69 (2014), 577-609.
- Cavalcanti, Tiago, and Anne Villamil Antonio Antunes, "The Effect of Credit Subsidies on Development," (2012).
- About CDB (www.cdb.com.cn, China Development Bank).
- 2016 Overseas Intern Recruitment: China Development Bank (intern.cdb.com.cn/company.html, China Development Bank).
- South Korea (<https://www.cia.gov/library/publications/the-world-factbook/geos/ks.html>, The Central Intelligence Agency).
- Claessens, Stijin, Erik Feijen, and Luc Laeven, "Political connections and preferential access to finance: the role of campaign contributions," *Journal of Financial Economics*, 88 (2008), 554-580.
- Cléroux, Pierre, "Vice President, Research and Chief Economist at Business Development Bank of Canada," (2016).
- Coase, Ronald H., "The problem of social cost," *Journal of Law & Economics*, 3 (1960), 1-44.
- About Start-up Chile (<http://startupchile.org/about/>, The Chilean Economic Development Agency).
- Historia de CORFO (<http://www.corfo.cl/sobre-corfo/historia-de-corfo/historia-de-corfo>, CORFO).

- Cull, Robert J., Wei Li, Bo Sun, and Lixin Colin Xu, "Title," World Bank Working Paper 6352, 2013.
- Cull, Robert, Wei Li, Bo Sun, and Lixin Colin Xu, "Government connections and financial constraints: Evidence from a large representative sample of Chinese firms," *Journal of Corporate Finance*, 32 (2015), 271-294.
- De Negri, Joao Alberto, Alessandro Maffioli, Cesar M. Rodriguez, and Gonzalo Vázquez, "The impact of public credit programs on Brazilian firms," in *IDB Working Papers IDB-WP-293*, (2011).
- Díaz, A., "Sueños de futuro (La historia de Corfo)," (2010).
- Duflo, Esther, Rachel Glennerster, and Michael Kremer, "Using Randomization in Development Economics Research: A Toolkit", *Handbook of Development Economics*, 4 (2007), 3895-3962.
- Faccio, Mara, "Politically connected firms," *American Economic Review*, 96 (2006), 369-386.
- Fogel, Kathy, Randall Morck, and Bernard Yeung, "National champions and economic growth," in *Industrial policy for national champions*, Oliver Falck, Christian Gollier, and Ludger Woessmann, eds. (Cambridge: The MIT Press, 2011).
- Frank Jr., Charles R. , and Kwang Suk Kim, "Foreign Trade Regimes and Economic Development: South Korea," *Journal of Development Economics*, (1975), 6-24.
- Gerschenkron, Alexander, *Economic backwardness in historical perspective* (Cambridge: Harvard University Press, 1962).
- Grünbacher, Armin, "The Early Years of a German Institution: The Kreditanstalt für Wiederaufbau in the 1950s. ," *Business History*, 43 (2011), 68-86.
- Hainz, Christa, and Hendrik Hakenes, "The politician and the banker," in *Working paper, Max Planck Institute for Research on Collective Goods*, (2008).
- Hausmann, Ricardo, and Dani Rodrik, "Economic development as self-discovery," *Journal of Development Economics*, 72 (2003), 603-633.
- Heckman, James J. , Hidehiko Ichimura, and Petra E. Todd, "Matching as an Econometric Evaluation Estimator: Evidence from Evaluating a Job Training Programme," *The Review of Economic Studies*, 64 (1997), 605-654.
- Members: China Development Bank* (www.idfc.org/Members/cdb.aspx, International Development Finance Club).

- Supporting Small Business Innovation: Review of the Business Development Bank of Canada*
- Inoue, Carlos F. K. V., Sergio G. Lazzarini, and Aldo Musacchio, "Leviathan as a minority shareholder: firm-level performance implications of equity purchases by the government," *Academy of Management Journal*, 56 (2013), 1775-1801.
- KDB, "Annual Report," (Seoul: Korea Development Bank, 2014).
- About KDB Bank (www.kdb.co.kr/ih/wcms.do#none, Korea Development Bank).
- KfW, "KfW presents itself: Structure and Mission of KfW," (2014).
- , "Gesamtgeschäft," (2016).
- Khwaja, Asim Ijaz, and Atif Mian, "Do lenders favor politically connected firms? Rent provision in an emerging financial market," *The Quarterly Journal of Economics*, (2005), 1371-1411.
- Kim, E-Wha, "Political Economy in South Korea in the 1950: Korean Development Bank's Role in the Formation of Crony Capitalism," in *Department of International Relations*, (Seoul: Seoul National University: The Graduate School, 2013).
- Klasen, Stephan, Tobias Lechtenfeld, Kristina Meier, and Johannes Rieckman, "Impact Evaluation Report: Water Supply and Sanitation in Provincial Towns in Yemen," in *Poverty, Equity and Growth - Discussion Papers*, (University of Göttingen: Courant Research Centre, 2011).
- Kornai, Janos, "Resource-constrained versus demand-constrained systems," *Econometrica*, 47 (1979), 801-819.
- Krueger, Anne O, "Government Failures in Development," *The Journal of Economic Perspectives* (1986-1998), 4 (1990), 9.
- Krueger, Anne O., "Government failures in development," *Journal of Economic Perspectives*, 4 (1990), 9-23.
- La Porta, Rafael, Florencio Lopez de Silanes, and Andrei Shleifer, "Ownership of banks," *Journal of Finance*, 57 (2002), 265-302.
- Lanz, L. Q., and J. V. Perurfo, "Risco de crédito e estimativa de alavancagem de um fundo de aval," *Revista do BNDES*, 40 (2013), 195-230.
- Lazzarini, Sergio G, "Strategizing by the government: Can industrial policy create firm - level competitive advantage?," *Strategic Management Journal*, 36 (2015), 97-112.

- Lazzarini, Sergio G., Aldo Musacchio, Rodrigo Bandeira-de-Mello, and Rosilene Marcon, "What do development banks do? Evidence from Brazil, 2002-2009," in *Insper Working paper*, Available at SSRN: <http://ssrn.com/abstract=1969843>, (2012).
- , "What do state-owned development banks do? Evidence from Brazil, 2002-2009," *World Development*, 66 (2015), 237-253.
- Machado, Luciano, Daniel da S. Grimaldi, Breno E. Albuquerque, and Leonardo de O. Santos, "Additionality of Countercyclical Credit: Evaluating the Impact of BNDES' PSI on the Investment of Industrial Firms," in *Working Paper*, (Rio de Janeiro: Brazilian Economic and Social Development Bank (BNDES), 2014).
- Mazzucato, Mariana, and Caetano CR Penna, "Beyond market failures: The market creating and shaping roles of state investment banks," *Levy Economics Institute of Bard College Working Paper*, (2015).
- Min-Ji, Seo, "Korea Development Bank, from 1906 to the present," (Seoul: The Fact, 2015).
- Min, Park Jung, "Korea Development Bank: Giant Step in the History [loose translation]," in *Korea Securities*, (Seoul, Korea: Korea Securities Dailynews, 2004).
- Morgan, J.P., "Impact Investments: An Emerging Asset Class," (Rockefeller Foundation, 2010).
- Murphy, Kevin M., Andrei Shleifer, and Robert Vishny, "Industrialization and the Big Push," *Journal of Political Economy*, 97 (1989), 537-564.
- Musacchio, Aldo, and Sergio G. Lazzarini, *Reinventing State Capitalism: Leviathan in Business, Brazil and Beyond* (Cambridge: Harvard University Press, 2014).
- Najberg, Sheila, "Privatização de Recursos Públicos: Os Empréstimos do Sistema BNDES ao Setor Privado Nacional com Correção Monetária Parcial," in *Economics Department*, (Rio de Janeiro: PUC-RIO, 1989).
- Nazer, R., P. Camus, and I. Muñoz, *Historia de la Corporación de Fomento de la Producción - CORFO. Santiago de Chile: Patrimonio consultores*. (Santiago de Chile: Patrimonio consultores., 2009).
- Pereira, Thiago Rabelo, Adriano Simões, and André Carvalhal, "Mensurando o resultado fiscal das operações de empréstimo do Tesouro ao BNDES: custo ou ganho líquido esperado para a União?," in *Texto para discussão 1665*, (Rio De Janeiro: Instituto de Pesquisa Econômica Aplicada, 2011).

- Riding, Allan L., and George Haines Jr., "Loan guarantees: costs of default and benefits to small firms," *Journal of Business Venturing*, 16 (2001), 596-612.
- Rodrik, Dani, "Industrial policy for the twenty-first century," (London: CEPR Discussion Paper 4767, 2004).
- Shapiro, Carl, and Robert D. Willig, "Economic rationales for the scope of privatization," in *The political economy of public sector reform and privatization*, E. N. Suleiman, and J. Waterbury, eds. (London: Westview Press, 1990).
- Shirley, Mary M., *The Reform of State-Owned Enterprises: Lessons from World Bank Lending* (Washington D.C.: World Bank, 1989).
- Shleifer, Andrei, and Robert W. Vishny, "Politicians and firms," *The Quarterly Journal of Economics*, 109 (1994), 995-1025.
- , *The grabbing hand: government pathologies and their cures* (Cambridge: Harvard University Press, 1998).
- Social Finance, "A Technical Guide to Developing Social Impact Bonds," (London: Social Finance US, 2013).
- Statistics Canada, "Measuring BDC's Impact on Its Clients," From BDC's Economic Research and Analysis Team, ed. (Business Development Bank of Canada, 2013).
- Sztutman, Andre Medeiros, and Dante Aldrighi, "Political Connections and Access to Loans from the Brazilian Development Bank," Available at SSRN 2642960, (2015).
- Torres, Ernani, and Rodrigo Zeidan, "The life-cycle of national development banks: The experience of Brazil's BNDES," *The Quarterly Review of Economics and Finance*, 62 (2016), 97-104.
- Yeyati, Eduardo Levy, Alejandro Micco, and Ugo Panizza, "Should the government be in the banking business? The role of state-owned and development banks," in *RES Working Papers 4379, Inter-American Development Bank, Research Department*, (2004).
- Zecchini, Salvatore, and Marco Ventura, "The impact of public guarantees on credit to SMEs," *Small Business Economics*, 32 (2009), 191-206.