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Can national development banks help alleviate the shortage of patient investment capital in Africa? Evidence from bank-level panel data

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Can national development banks help alleviate the shortage of patient investment capital in Africa?

Evidence from bank-level panel data^{1, 2, 3}

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Abstract

National development banks remain an important part of modern financial systems in developed as well as developing countries. They play an important role in providing long-term financing and providing counter-cyclical financing during financial and economic crises. In this context, this paper aims to provide empirical evidence of the role of national development banks in Africa in providing medium-term and long-term credit and their performance in managing resources, using bank-level data from selected countries and the BankFocus database. The empirical results show that while national development banks do not lend more relative to commercial banks, they outperform the latter in focusing on medium-term and long-term loans, which is consistent with their mandate. The results further confirm that national development banks incur more risk, resulting in relatively higher non-performing loan ratios. As expected, national development banks are not more profitable than commercial banks in general; but they do perform better when they are located in countries with relatively more developed financial systems. The results are similar for public banks. The evidence suggests that strengthening the lending capacity of national development banks would significantly help alleviate the shortage of patient investment capital; i.e., medium-term and long-term credit in African economies. The paper discusses policy implications and proposes some avenues for further research.

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1. Introduction

National development banks remain an important part of modern financial systems in developed and developing countries, and their relevance has been reinvigorated in the aftermath of the 2008 global financial crisis (Epstein et al., 2009; Epstein & Dutt, 2018; Griffith-Jones & Ocampo, 2018a; World Bank, 2018), and more recently in the context of the economic crisis caused by the Covid-19 pandemic (McDonald et al., 2020). The crisis has prompted fresh debates on the role of national development banks, and public banks in general, as instruments for counter-cyclical financing and inclusive finance, and as tools for addressing various economic, social, and environmental challenges faced by countries in contemporary times (see Uğurlu and Epstein (2021) for the case of the United States).

In developing countries, the interest in national development banks is especially motivated by the need to finance industrialization and structural transformation which requires long-term and more risk-tolerant financing that commercial banks are either unwilling or ill-equipped to provide. In Africa, national development banks were part of the policy apparatus in the state-led growth models of the 1960s and 1970s. However, many of them failed or were privatized during the liberalization era of the 1980s and 1990s. But many survived and are still successful to varying degrees; and new ones have been created since the turn of the 21st century (Ndikumana, 2009).

The evidence in the empirical literature has showed that national development banks increase lending during recessions relative to normal times, while lending by commercial banks moves in the opposite direction (Brei & Schclarek, 2013, 2018). The evidence also shows that lending by national development banks is associated with speedy recovery from economic crises, a finding that holds in cross-country studies (Chen et al., 2016) as well as in single country studies, as in the case of Brazil (Coleman & Feler, 2015) and Turkey (Önder & Özyıldırım, 2013). Moreover, micro level evidence suggests that lending by national development banks is efficient in the sense that funding is channeled to productive uses in firms, sectors and industries (Lazzarini et al., 2015), and that it benefits credit-constrained small and medium enterprises as well as large firms that are otherwise not credit constrained (Oliveira, 2019).

A major gap in the existing literature is the lack of evidence on Africa as most of the studies are on developed countries, Latin America, and Asia. This is an important concern given that national development banks constitute an important part of the financial sector in Africa. This study aims to inspire further research that can contribute to filling this gap. Data from selected national development banks show that national development banks contribute to national development goals, notably by financing industry, supporting employment creation, and mitigating financing constraints faced by small and medium enterprises and other traditionally credit rationed sectors (for illustrations with selected banks see Ndikumana et al., (2021)). The study provides empirical evidence using data from BankFocus supplemented by data from national development banks to fill gaps in the BankFocus database. The econometric analysis

proceeds along the lines of existing studies on Latin America and other regions (Chen et al., 2016; Micco et al., 2007; Micco & Panizza, 2006).

The econometric analysis pursues three questions. The first is whether lending is influenced by bank characteristics; that is, whether the institution is a national development bank or a commercial bank. Specifically, the question is: do national development banks lend more or less than commercial banks given bank characteristics and specific conditions in the host economy? The second question is whether national development banks manage resources effectively in general and compared to commercial banks, specifically with regard to loan recovery as measured by non-performing loans. The third question is whether national development banks perform better or worse than commercial banks.

The results from econometric analysis indicate that while national development banks do not lend more relative to commercial banks, they do focus more on medium-term and long-term lending in line with their mandate. Moreover, medium-term and long-term lending is associated with lower non-performing loan ratios as well as higher return on assets. The results are similar for public banks.

The findings from this research shed light on the merit of national development banks through their role in complementing commercial banks in resource mobilization and financing private sector development. The objective of this line of research is to provide insights into the *raison d'être* of national development banks in African economies. In addition, this study aims to inspire further research that can help to distil lessons on the conditions that enable the efficient functioning of national development banks and public banks, including how to keep them financially viable, while contributing to alleviating market imperfections and serving as instruments for achieving national development goals.

Following this introduction, the next section presents a brief theoretical motivation of national development banks. This is followed by a review of the empirical literature in Section 3, and a presentation of the data sources and some stylized facts on national development banks in Africa in Section 4. Section 5 describes the methodology used in the econometric analysis and discusses the empirical results. Section 6 concludes with a summary of the findings, some policy implications, and suggested avenues for further research.

2. Theoretical perspectives: Why national development banks?

Before discussing why national development banks exist and their role in the economy, it is useful to clarify what a national development bank is. In the World Bank's 2017 survey, the term development bank refers to "any type of financial institution that a national government fully or partially owns or controls and has been given an explicit legal mandate to reach socioeconomic goals in a region, sector, or market segment" (World Bank, 2018).⁷ There are two fundamental elements of the definition of a national development bank. First, it is a financial institution established by a government and operated with substantial influence of the

⁷ See also (de Aghion, 1999).

government serving as majority shareholder. Second, the purpose of a national development bank is to channel long-term capital to support industrialization. The question raised by this definition is the necessity and justification of government intervention in a modern market-oriented financial system, which, in principle is supposed to operate efficiently in mobilizing and allocating resources in the economy. In other words, what do development banks provide to the financial system and the economy that cannot be provided by private commercial banks? Additionally, what can the government do better than free markets in ensuring that the resources are mobilized and allocated efficiently? These questions call for a theory of national development banks.

A number of theoretical perspectives have been proposed to motivate the existence of national development banks. These theories draw primarily on the existence of financial market failures arising from asymmetric information, moral hazard, missing or insufficient collateral, high transactions costs, and term structure mismatch between funds available in the system and the needs of investors and consumers (Stiglitz, 1993; Stiglitz & Weis, 1981). These issues of market failure affect both the demand side and the supply side of credit markets (Eslava & Freixas, 2018; Smallridge & de Ollouqui, 2011). On the supply side, credit markets are characterized by a shortage of long-term investment capital. On the demand side, the financial markets face moral hazard associated with the behavior of borrowers (Holmstrom & Tirole, 1997), and the lack of private operationalizable collateral.

Financial market failures arise from the fact that credit markets rely heavily on information, which is a public good (Stiglitz & Greenwald, 2014), implying that there will be sub-optimal production of this public good if left to the will of free markets. Because information generates social value (by optimizing credit allocation) that is greater than the costs of information generation, the government has a role to bridge this gap. National development banks can play this ‘intelligence role’ (Fernández-Arias et al., 2019), therefore improving the overall performance of the financial system in resource allocation.

Financial market imperfections also arise from differential levels of uncertainty across sectors where some are viewed by banks as more uncertain and riskier than others. The riskier sectors are often those that are less developed, but which are important for structural transformation, such as infrastructure, industry, technology and innovation. While investing in these sectors may be perceived by private banks as risky and generating low monetary returns, the gains to the economy and society as a whole may be large in the medium and long-term. In this case, national development banks can serve as a tool for industrial policy and economic transformation (Mazzucato, 2013).

Financial market imperfections are particularly illustrated in the shortage of long-term financing. From a theoretical perspective, this is due to two factors: risk aversion by banks vis-à-vis new enterprises, and the specialized skills and expertise required in assessing credit worthiness of new investments. Based on these two factors, it is possible to develop a model for the role of national development banks in a market-oriented banking system with two key elements (De Aghion, 1999). First, the decision by a bank to finance a new enterprise or sector

requires expertise to analyze the credit worthiness of projects, and monitor the implementation of projects and the management of indebted firms so as to achieve the required returns to service the loan. While this expertise is costly, the bank that has invested in generating it can only appropriate a fraction of the benefits from funded projects. This is because the specialized expertise can be transmitted to other banks, becoming a public good. As a result, there is no sufficient incentives for commercial banks to invest in developing specialized expertise required to ameliorate information in credit markets.

Secondly, the success of funded projects depends on adequate monitoring, which is also costly. In this respect, Eslava and Freixas (2018) emphasize three points. First, there are bad and good firms and projects, but the type of firm and project is not directly observable by banks. Second, screening is costly, and the benefits of screening are not excludable: other banks may benefit from the fruits of one bank's investment in screening. Third, banks are not able to appropriate the full benefits of projects that they finance.

As a result of these credit market imperfections, individual banks will underinvest in expertise and knowledge generation, and they will under-transmit newly acquired expertise. In equilibrium, total investment in expertise and knowledge falls below the socially optimal level, leading to sub-optimal levels of credit supply and project funding. National development banks can alleviate these effects of market imperfections by funding not only weak projects (risky sectors, small and medium enterprises, etc.), but also high-value projects that are rationed out due to market imperfections. Therefore, interventions by national development banks can improve upon the competitive financial market outcomes in terms of resource allocation.

One possible strategy that national development banks can use to mitigate the problem of underinvestment due to credit imperfect information is co-financing of projects and joint ownership of client firms. This reduces the risks faced by individual banks, while also providing a mechanism of disciplining the management of debtor firms. National development banks can serve this function by mobilizing private funders, leveraging their catalytic role as well as taking advantage of government guarantees associated with their nature as state-owned institutions. As a result, both the volume of lending and the sectoral distribution of credit would improve relative to the free market equilibrium, thanks to interventions by national development banks.

From a macroeconomic perspective, the role of national development banks has been justified on the basis of the inherent procyclical nature of financial markets, which historically exhibit booms and busts (Keynes, 1936; Minsky, 1977). Due to the combination of information imperfections, risk aversion and profit-seeking by banks, bank lending tends to increase during economic expansions, and decrease during economic downturns. This procyclical nature of bank lending exacerbates the direct impact of shocks to the real sector, magnifying the level of uncertainty and macroeconomic instability. National development banks can help mitigate this instability and minimize macroeconomic consequences of exogenous shocks by providing countercyclical lending. To be effective in that role, national development banks, referred to as 'sleeping beauty', need to be adequately capitalized and properly governed so that they are

ready to step in and shore up credit supply during bad times (Smallridge & de Olloqui, 2011). The Conference Board of Canada puts it more explicitly as follows: “Once a financial crisis hits, it is too late for governments to create institutional capacity to provide fallback credit support. The institutions must already exist, with a clear operating mandate, experienced professional staff, and the financial capacity to respond to the financial needs and ramp-up their operations when the private market fails” (Conference Board of Canada, 2010).⁸

Overall, the theoretical views on national development banks can be classified into four interlinked categories: the development view, the social view, the macroeconomic view, the political view, and the life-cycle view. Under the ‘development view’ (Gerschenkron, 1962), national development banks fill the need to fund sectors and industries that are not likely to be funded by private commercial banks, mainly for two reasons: as a matter of ‘preference’ because they find the sectors too risky; and as a matter of lack of capacity, because they lack the long-term capital needed by the industries. Under this view, national development banks are an instrument of economic transformation in the growth process (Mazzucato, 2013).

According to the ‘social view’, national development banks serve the need to finance investments that have positive externalities but without attractive financial returns, and thus not of interest for commercial banks (Atkinson & Stiglitz, 1980; Stiglitz, 1993). This is the case for investments geared to the provision of social services such as education, health, low-income housing and others. Under this view, national development banks serve as a policy instrument for poverty reduction and social development in general.

Under the ‘macroeconomic view’, national development banks provide counter-cyclical lending, in line with the notion of ‘sleeping beauty’ (Bonomo et al., 2014; Smallridge & de Olloqui, 2011). This view draws on the understanding that financial markets are inherently unstable and subject to booms and busts that can be destabilizing for the real economy. The countercyclical role of national development banks also arises from their social welfare mandate as assigned by the government. By this mandate, they are expected to increase lending during bad times, irrespective of the profitability of the funded activities.

The three views of the theory of national development banks described above advance a positive and productive role of these institutions whereby they contribute to achieving better economic and social outcomes relative to financial markets with only private commercial banks. There is, however, a contrarian view, the ‘political view’ that sees national development banks as efficiency reducing and even outright counterproductive. Under the political view, national development banks are an instrument of state intervention that can undermine financial development, thereby retarding economic growth (La Porta et al., 2002; World Bank, 2012).⁹

⁸ Quote cited in (Gutierrez et al., 2011).

⁹ The World Bank’s *Global Financial Development Report 2013 - Rethinking the Role of the State in Finance* (p. 116) includes excerpts of opposing views in academia about the role of national development banks. For example, Charles Calomiris argues that state-owned banks lack competitive incentives and expertise, and engage in politically motivated allocation of funds. He says: “State-controlled banks are a breeding ground for corruption of elected and appointed government officials, the financial regulatory authorities, and the courts. Not only do they stunt the growth of the economy, they also weaken the core political and bureaucratic

In particular, it is argued that under weak governance, national development banks may suffer from mission creep, mismanagement and inefficiency that lead to misallocation of financial resources. This view has gained substantial following in mainstream economics literature and it has offered a theoretical backing for privatization or outright dismantlement of national development banks. As the evidence reviewed in the next section will show, however, the empirical evidence on the political view is limited and not robust. In contrast, the empirical literature contains solid evidence on the positive role played by national development banks, and public banks in general, in increasing access to credit by firms, and in providing counter-cyclical lending, thus contributing to economic growth and employment creation.

The theories of national development described thus far imply that these institutions evolve out of an environment in an economy characterized by market imperfections, generating sub-optimal allocation of financial resources. Naturally, these imperfections are economy-specific and their nature and severity are expected to evolve with the sophistication of financial markets and the overall level of economic development. This implies that the need for market-augmenting interventions by the government would also evolve over time along the economic development path. This is the motivation for the ‘life cycle hypothesis’ of national development banks (Torres & Zeidan, 2016).

Under the life cycle hypothesis, national development banks “emerge in countries with some solid institutions but incomplete and inefficient financial markets; grow up alongside industrialization and the development of financial markets; and wither and die as countries fully develop” (Torres & Zeidan, 2016, pp. 98–99). Thus, national development banks are expected to develop in three phases. The first is the establishment phase where they put together the infrastructure to facilitate project identification and to provide direct credit to execute the projects. The second phase is the development phase where they roll out the direct credit provision program. In phase three – the ‘engine of growth’ phase, development banks evolve gradually from direct credit to indirect mechanisms of allocating financial resources to support industry. In the developed financial markets phase the volume of direct lending is minimal, focusing on indirect mechanisms, eventually becoming eclipsed thanks to increased capacity and efficiency of a mature market-based financial system. In reality, however, national development banks have remained an integral part of modern financial markets regardless of the degree of financial sophistication and economic development. In fact, the largest and most active national development banks today are found in advanced economies such as the German state-owned development bank, Kreditanstalt für Wiederaufbau (Credit Institute for Reconstruction, abbreviated as KfW) and emerging economies such as the Brazilian National Bank for Economic and Social Development (in Portuguese: Banco Nacional de Desenvolvimento Econômico e Social, abbreviated as BNDES) (Griffith-Jones & Ocampo,

institutions on which democracy and adherence to the rule of law depend. State-controlled banks are *loss-making machines*.” (emphasis in the original). In contrast, Franklin Allen argues that “despite being outperformed by their private counterparts in terms of long-term resource allocation, public banks may enjoy an advantage over private banks in times of crisis.”

2018b; Naqvi et al., 2018, 2018; World Bank, 2018). In other words, national development banks are here to stay.

3. Empirical evidence on the role of national development banks

The literature offers robust historical accounts of the important role that development banks and public banks in general have played in financing industrial development in advanced and emerging economies (Cameron, 1953; Diamond, 1957; Gerschenkron, 1962; Griffith-Jones & Ocampo, 2018b). Results from surveys of national development banks show that they continue to be a major player in developing, emerging, and advanced economies (De Luna-Martínez & Vicente, 2012; De Olloqui, 2013; Thorne & du Toit, 2009; World Bank, 2018).¹⁰

Besides the historical accounts, and to support them, there is a growing body of rigorous empirical evidence on the lending behavior of national development banks and their impact at the firm, sector, and economy-wide level. The evidence helps to test the various hypotheses and predictions of the theories reviewed in the previous section. We organize the evidence in two categories: aggregate or macro level evidence; and evidence at the bank and firm level.

Empirical evidence at the macro level

At the macro level, well-functioning national development banks are expected to stimulate domestic investment, which boosts output growth and employment. Most importantly, national development banks are supposed to help cushion the impact of negative shocks to the economy and speed up recovery after a crisis. This role of national banks, and public banks in general re-emerged in the aftermath of the 2008 global economic crisis (Epstein et al., 2009; Epstein & Dutt, 2018; Griffith-Jones & Ocampo, 2018a; World Bank, 2018), and more recently in the context of the economic crisis caused by the Covid-19 pandemic (McDonald et al., 2020; Uğurlu & Epstein, 2021). The IMF's Fiscal Affairs department noted: "Public banks—if financially sound and sufficiently well resourced—can be used to complement these efforts especially in cases where private banks are reluctant to lend, even with government guarantees, given risks or operational costs" (IMF, 2020).

Results from global surveys of national development banks indicate that national development banks generally increase their lending during downturns while commercial banks reduced lending. The 2012 Global Survey of Development Banks reported that lending by development banks in the 61 countries surveyed increased by 36% during the recession from 2007 to 2009, compared to only 10% for commercial banks (De Luna-Martínez & Vicente, 2012). The 2017 edition of the survey reported that 56 percent of development banks experienced loan growth higher than national averages over 2010-2015; and interestingly, of these, 70% were in

¹⁰ See (Kashuliza, 1992) for review of the performance of development banking in Tanzania with an illustration with the case of the Cooperative and Rural Development Bank (CRDB). Also see (Rezende, 2015) for a discussion of the case of BNDES in Brazil.

developing countries (World Bank, 2018). The increased lending by development banks could have contributed to cushioning the impact of the crisis.

The empirical literature has attempted to formally establish evidence on the countercyclical lending by development banks and the effects on the overall economy. This strand of the literature can be categorized in two camps: a negative-effect camp and a positive-effect camp. In the negative-effect camp, it is argued that state ownership of banks is associated with overall worse macroeconomic performance. The most referenced study in this camp is that of La Porta, Lopez-De-Silanes, and Shleifer (2002) which argues that state-ownership leads to slower financial development (i.e., reduced growth in bank credit) and slower economic growth. This study has been influential and it has inspired privatization of national development banks and government-owned banks in general (see World Bank 2012).

However, subsequent empirical investigations have cast doubts on the robustness of the evidence from the cross-country study by La Porta *et al* (2002). In their investigations using more rigorous econometric tests, Yeyati, Micco, and Panizza (2007) find that the Laporta *et al.* (2002) results vanish when the sample period is extended and when countries are classified by income. They point out that the La Porta *et al.* (2002) sample included socialist countries where government ownership of banks was the norm, which means that in these countries there is no benchmark against which to assess the relative performance of national development banks. Moreover, the La Porta *et al* (2002) results suffer from endogeneity, which they did not control for. Once these issues are properly taken care of, Yeyati *et al.* (2007) find no evidence of state-ownership of banks on financial development and growth. They conclude as follows (p. 245): “Although we found some support for the idea that public banks do not allocate credit optimally, we also showed that the results demonstrating that state ownership inhibits financial development and growth are far less robust than previously thought. We further reported new evidence indicating that public banks may play a useful role in reducing credit procyclicality.”

Other studies have documented positive benefits of national development banks especially during economic downturns. Using data on 56 countries including 2547 private banks and 108 government banks, Chen et al. (2016) find that government banks exhibited significantly higher loan growth than private banks during the 2008 global financial crisis, and that higher government bank lending was accompanied by increased output growth, employment and new business formation.

The positive impact of public lending is also observable at the regional level within countries. A study of the relationship between bank ownership and lending before and after the 2008 global financial crisis in Brazil at the locality and sectoral level finds that government banks increased lending by 28.5% relative to private banks in the 12 months following the collapse of the Lehman Brothers that triggered the crisis (Coleman & Feler, 2015). Moreover, localities with a greater share of government branches received about 15% more credit during and following the crisis.

Similar results are found in a study of lending by state-owned banks at the regional level in Turkey over 1992-2010 (Önder & Özyıldırım, 2013). The study finds that the share of government banks in credit supply is higher during crisis years, and during election years in all provinces.

Overall, the empirical analysis at the macro level, whether at national level or sub-national level, supports the view that national development banks and government-owned banks in general tend to lend countercyclically, and that this helps to minimize the negative impact of shocks during crises and to speed up post-crisis recovery.

Empirical evidence at the bank and firm level

There is a growing body of micro level empirical evidence that, along with the aggregate evidence, helps to test theoretical predictions of the impact of national development banks on the financial system and the economy. One important question pursued by this strand of the literature is whether lending by national development banks is efficient in the sense that funding is channeled to productive uses in firms, sectors and industries. One concern is that, because of their public nature, national development banks may be used to bail out bad firms and finance activities that have low economic value. Lazzarini *et al.* (2015) test this prediction in the case of Brazil by asking whether the national development bank BNDES bailed out bad banks, and whether companies funded by BNDES exhibited increased performance. Using data on 286 publicly listed companies on the Sao Paulo Stock Exchange over 2002-2009, they find that firms that received BNDES loans exhibited higher performance, and they find no evidence that BNDES loans were targeted to rescuing failing firms.

Evidence from some empirical studies suggests that, in addition to enhancing performance of borrowing firms, access to national development bank credit enhances the resilience of firms to adverse shocks to cash flow. A study by Oliveira (2019) finds that credit from BNDES credit has helped to mitigate credit market imperfections by providing lending to small and medium enterprises as well as large and unconstrained firms at a cost below market interest rates.

Studies at the micro level also provide evidence on countercyclical lending by national development banks. Using data from BankScope (maintained by Fitch and Bureau van Dijk) on 336 banks from 31 Latin American and Caribbean countries over 1995-2014, Brei and Schclarek (2018) examined changes in lending by national development banks and public commercial banks compared to domestic and foreign private commercial banks during banking and currency crises. They found that national development banks and public banks increased lending growth in crisis times by 3 times and 2.5 times, respectively, relative to normal times. In contrast, lending by private domestic and foreign banks during crisis times was 80 percent of the level observed in normal times.¹¹ These results extend those obtained in an earlier study

¹¹ The study defined crisis times to include episodes of banking crisis, currency crisis, and the 2008-12 period (the global financial crisis and its aftermath).

by the same authors using BankScope data on 50 countries from Europe and Latin America and Caribbean over 1994-2009 (Brei & Schclarek, 2013).

The observed differential behavior of national development banks relative to private commercial banks may arise from distinctive characteristics of national development banks. Most importantly, national development banks and public banks attach high value to economic and social development objectives, leading them to tolerate higher credit risk and willing to lend in unstable environments. Moreover, public banks face less liquidity problems given that their funds do not depend on customer deposits – and thus do not face the risk of a run on banks. These features of national development banks may explain their continued presence and relevance even in countries with developed financial systems.

4. Data and Stylized facts

4.1 Data sources

The data used in this study are obtained from four sources. The first is BankFocus, which contains bank-level data over the period 2013-2019. The second set of data is from individual national development banks extracted from banks' online databases or directly with permission from bank management in the cases of Banque Nationale de Développement (BNDE, Burundi), the Industrial Development Corporation (IDC, South Africa), the Uganda Development Bank (UDB).¹² The third and fourth sources are the World Bank's World Development Indicators and the Worldwide Governance Indicators which contain country level data.

The list of countries included in BankFocus along with the number of banks by type (national development banks, public banks, commercial banks) is provided in Table A1 in the appendix. Summary statistics for the regression variables are presented in Table A2 in the appendix.

4.2 Stylized facts¹³

Lending with a special mandate

National development banks have been part of the financial system in African countries for a long time.¹⁴ The mandate of national development banks in Africa was and remains even today to serve as an instrument of public policy, specifically a tool for building a domestic industrial base. This mandate is typically implemented through funding industries in specific sectors selected on the basis of natural endowment and comparative advantage (e.g., natural resource exploitation), or strategic goals of the moment, such as the promotion of local production to

¹² The authors very much appreciate the support by Senior Management of these three banks in granting access to the data.

¹³ Detailed stylized facts are presented in Ndikumana et al. (2021).

¹⁴ See UNDESA (2006) for proceedings of a multi-stakeholder consultation on the role of national development banks in Africa covering issues including: evolution of development banking; financing development and supporting regional economic integration; role of national development banks in sustainable development; financial sustainability; support for SMEs and microfinance; mobilization of resources; enhancing national development banks delivery for development; and corporate governance and regulation.

reduce the dependence on imported goods, or the promotion of agriculture and rural development.¹⁵ Thus, national development banks featured prominently in the toolbox of import-substitution industrialization and economic growth during the post-independence era.

In the case of the IDC in South Africa, for example, the initial sectoral focus in funding allocation was on petrochemicals and minerals which were seen as key drivers of employment and exports. The industrialization strategy also included beneficiation and value chain development as well as downstream industries, such as fabricated metals, agro-processing, clothing and textiles. While in the case of IDC, the focus was and remains clearly on the development of the manufacturing sector, other national development banks had missions to develop other sectors such as agriculture and rural development as in the case of Land Bank in South Africa and Cooperative and Rural Development Bank (CRDB) in Tanzania (Kashuliza, 1992).

National development banks are also called to play a role in promoting economic inclusion by funding new and credit constrained sector and entities. An example is support to small and medium enterprises. For instance, in 2015 the IDC reported that SMEs accounted for more than 70% of the number of its funding approvals and 18% of the value of its approvals over the past 20 years. The report added that “While transactions involving larger corporations were appealing from a funding perspective, it was recognized that the real job creation impact lay somewhere in between – that is, in an all-inclusive approach such as funding smaller and medium-sized enterprises” (IDC, 2005, p. 45).

Recently, the challenges associated with climate change and environmental degradation have emerged prominently in national, regional and global policy debates. National development banks can be an important tool of government strategies for promoting the green economy through direct lending as well as by playing a catalytic role in attracting participation by private banks and non-bank institutions. In the case of South Africa, the IDC plays a key role in financing projects under the government’s Renewable Energy Independent Power Producers Procurement Programme (REIPPPP), a program based on the Integrated Resource Plan (IRP 2010) for electricity generation in South Africa, which was promulgated in May 2011. In 2015, the IDC reported that it had provided funding of up to R6.6 billion, representing 9% of the country’s total investment in renewable energy (IDC, 2005, p. 37).

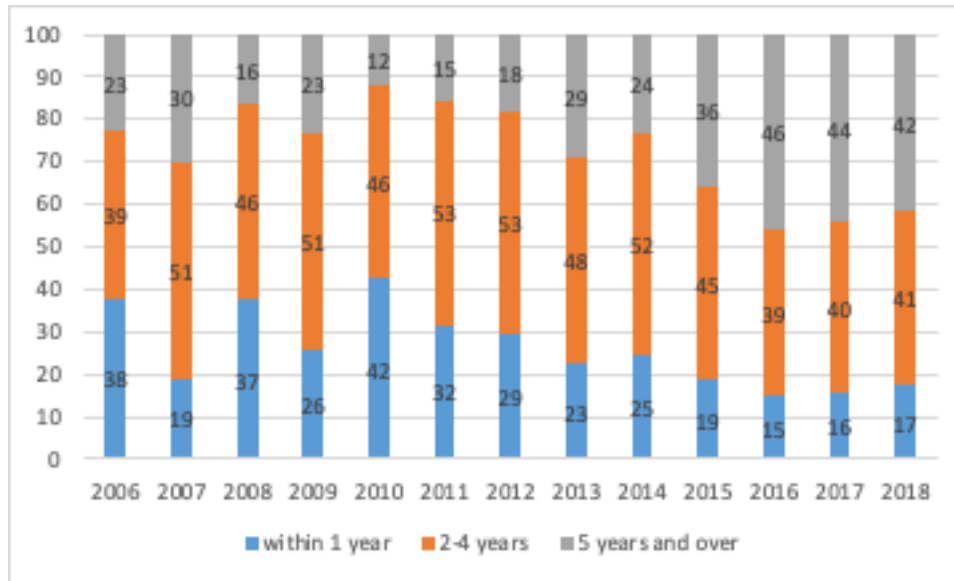
A common feature of credit market imperfections in African financial sectors is the concentration of lending on the short side of the term structure of credit. This constitutes a handicap to investment in industry and infrastructure which require long-term capital. Thus, a key part of the mandate of national development banks is to promote access to credit with long maturity.

Country level data illustrate the dominance of medium-term and long-term loans in the portfolio of national development banks, contrary to the predominance of short-term credit in

¹⁵ See the case of the Cooperative and Rural Development Bank in Tanzania (Kashuliza, 1992).

the portfolio of private banks. In the case of the Industrial Development Corporation (IDC), long-term loans represent a large share of total loans and that this share has been increasing over time (Figure 1). In 2018, long-term loans represented 42% of total loans, up from 12% in 2010. However, the situation varies significantly across countries and banks. For example, in the case of the National Development Bank (Banque Nationale de Développement, BNDE) in Burundi, short-term loans represented 53% of total loans in 2018, higher than the share in the case of commercial banks (Ndikumana et al., 2021).

Figure 1: Term structure of loans by IDC South Africa (percent of total loans)



Source: IDC database

Providing counter-cyclical financing

Like in other developing regions, there is some evidence that national development banks in African countries have played an important role in providing counter-cyclical and ‘distressed’ funding during bad times such as financial crises. Such funding tends to be targeted to the sectors that are most hit by a crisis. For example, in South Africa during the 2008 global financial crisis, private banks tightened credit criteria and reduced lending due to heightened risk in the context of economic downturn. In 2009, the IDC intervened by injecting R6.1 billion in loans to assist distressed businesses and protect jobs and production capacity in the private sector (IDC, 2005, p. 63). The loans were allocated to selected sectors, notably mining which was severely hit by the drop in commodity prices, and manufacturing industries including fabricated metals, machinery and motor vehicles and textile. It is in the context of engagement in distressed lending that the IDC took charge of managing the Clothing, Textile, Leather and Footwear Competitiveness Scheme established by the Department of Trade and Industry. Further research is needed to uncover more evidence on the role of national development banks in providing counter-cyclical financing in Africa.

Do national development banks utilize resources efficiently?

The data provides some insights into the efficiency of national development banks in resource management. One measure of efficiency is performance in the allocation and recovery of loans as indicated by low non-performing loan ratios. Evidence from bank data from BankFocus shows that NPL ratios are significantly higher for national development banks than commercial banks, with the exceptions of Angola, Burundi, Morocco, and Senegal where national

development banks perform better on this metric (Table 1). The fact that national development banks record higher NPL ratios is not surprising given that their mandate involves providing loans to segments of the economy that tend to be riskier and therefore rationed out by commercial banks. But sector or project specific risk is only one factor that drives the default risk. The other important factor is the efficiency of loan monitoring and collection by the bank. This calls for detailed analysis of determinants of bank performance in resource management.

Table 1: Non-performing loans for development banks vs. commercial banks (percentage of total loans and advances), average 2013-2019*

country	Development banks	Commercial banks	Country average
Angola	16.7	31.7	27.0
Botswana	53.5	4.6	6.4
Burundi	15.4	18.6	16.2
Congo, Rep.	28.5	9.3	10.3
Côte d'Ivoire	29.1	6.2	7.5
Egypt	12.5	5.1	5.6
Ethiopia	29.0	5.2	5.7
Ghana	24.3	17.9	16.6
Kenya**	203.2	9.2	9.3
Malawi	12.5	7.1	11.1
Mali	16.1	11.1	13.0
Mauritius	14.0	7.2	7.2
Morocco	5.1	8.3	8.1
Mozambique	11.5	8.4	8.4
Namibia	9.8	1.9	2.4
Nigeria	25.5	8.1	8.5
Rwanda	12.6	7.0	7.6
Senegal	9.2	18.6	18.3
Seychelles	9.3	5.2	5.9
South Africa	5.5	4.1	4.0
Swaziland	17.0	2.9	5.2
Tanzania	21.6	8.9	9.8
Tunisia***	96.2	13.7	13.2
Uganda	23.3	8.4	7.5
Zambia	27.6	7.1	8.9
Zimbabwe	16.2	7.5	8.6

Source: Authors' computation from BankFocus database.

Notes: * Averages are weighted by total loans.

** Kenya: non-performing loans are systematically higher than total loans for the Industrial and Commercial Development Corporation (ICDC).

*** Tunisia: Non-performing loans exceed total loans in 2016-2018 for Caisse de Prêts et de Soutien des Collectivités Locales (CPSCL).

Are national banks profitable?

Another measure of efficiency of resource utilization by banks is the rate of return on these resources. One would expect commercial banks to record higher returns on investments, given that they are by nature profit maximizing enterprises. In contrast, national development banks have a mandate that prioritizes social and economic development through lending to sectors and activities that, while deemed too risky by commercial banks, have high social returns in terms of contribution to economic growth and social development. The category of public banks is more complex because it includes public commercial banks and development banks. Public banks include financial institutions classified by BankFocus as national development banks or whose main shareholder is a public authority. In some cases, public commercial banks are dominant players in the sector and they can leverage the privilege of being a profit-making enterprise with a high market share, while also benefiting from being the priority lender to the public sector. Such institutions can in fact serve as an instrument of financial repression and indirect financing of fiscal deficits. An example is the Commercial Bank of Ethiopia, which controls over 70 percent of lending in the banking sector and serves as a vehicle for financing the central government and state-owned enterprises (Chauffour & Gobezie, 2019).

Overall, bank-level data from BankFocus does not support the prediction that private commercial banks are universally more profitable than national development banks and publicly owned commercial banks (Table 2). There is variation across institutions and across countries in comparative rates of returns between these categories of institutions. This calls for more in-depth examination of bank-level characteristics as well as country specific circumstances that drive the level and variation of rates of return in the banking sector in general and for development banks and public banks in particular.

Table 2: Rates of return on assets: national development banks and public banks vs. commercial banks, average over 2013-2019

country	National development banks	Commercial banks	Public banks non-commercial banks	All public banks	Public commercial banks
Algeria	0.1	1.8	0.1	1.1	1.2
Angola	3	1.4	3	3	
Botswana	-6.9	1.1	-1.6	-1.6	
Congo, Rep.	0.7	0.6	0.7	0.7	
Côte d'Ivoire	-0.1	0.4	-0.1	-0.1	
Egypt	1.8	2	1.8	1.5	1.1
Ethiopia	-2.6	2.8	-2.6	1.8	2.4
Ghana	1.5	2.5	1.5	1.5	
Kenya	2.4	1.3	2.4	2.8	3.5
Libya	-0.2	0.7	-0.2	-0.2	
Malawi	-1	2.5	-1	-1	
Mali	1.9	1.2	1.9	1.9	
Mauritius	6.2	0	6.2	6.2	
Morocco	0.8	0.7	0.9	0.8	0.5
Mozambique	3.2	-1.8	3.2	3.2	-16.3
Namibia	2.9	0.1	2.9	0.3	
Nigeria	2.6	1.2	1.6	1.6	
Rwanda	-0.2	1.2	-0.2	-0.2	
Senegal	0.6	0.4	0.6	0.6	
Seychelles	1.7	2.2	1.4	1.9	
South Africa	2.9	-1.8	2.7	2.7	2.8
Sudan	-1.2	2.2	-1.2	-1.2	
Swaziland	1.5	3	2.1	2.1	
Tanzania	-0.1	-0.2	-0.1	1	2.6
Togo	0.6	-0.3	0.6	0.6	
Tunisia	3.4	1	3	0.8	0.2
Uganda	3.1	1.1	3.1	3.1	
Zambia	2	1.8	2	2	
Zimbabwe	-1.3	1.5	0.9	0.9	

Source: Authors' computation from BankFocus database.

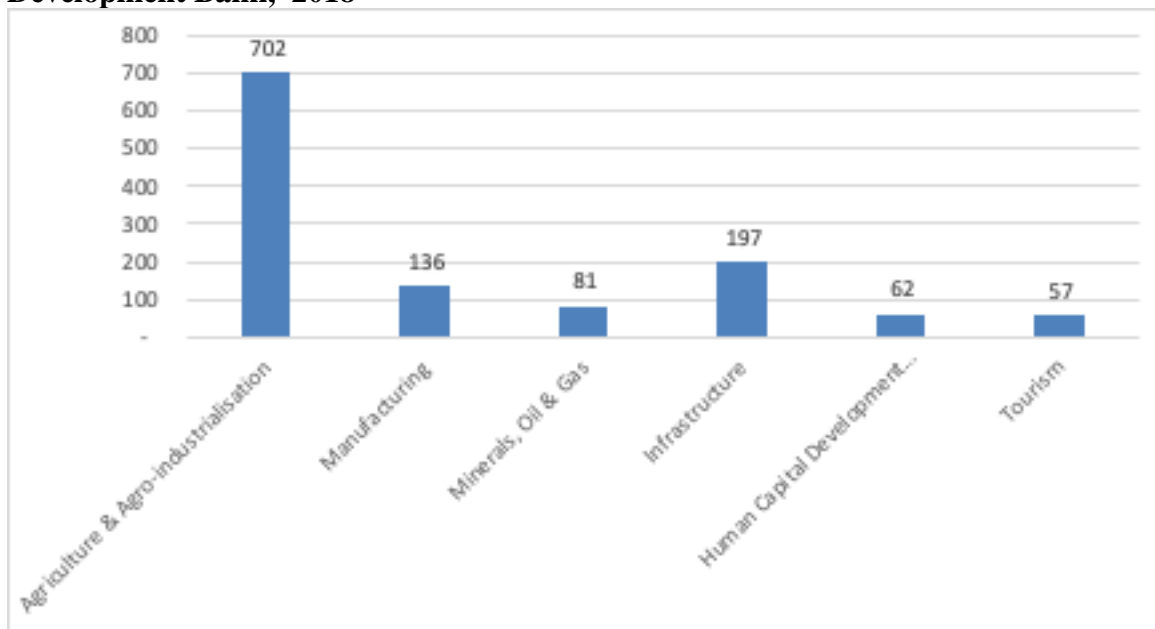
*Note: National development banks are banks classified as "Specialized governmental credit institutions" and public banks are institutions whose shareholder type is identified as "Public authority, state, government" in BankFocus database.

Social returns to loans by national development banks?

By their nature as public institutions, national development banks have a mandate to contribute to national development through financing of priority activities in line with national development objectives. One such objective is job creation. It is therefore appropriate to gauge the effectiveness of national development banks in resource allocation in terms of social returns measured by the number of jobs created directly and indirectly (jobs saved or created through spillover effects and forward and backward sectoral linkages) through lending.

The data from the Uganda Development Bank (UDB) shows striking differences in job creation outcomes across sectors. In particular, the agriculture sector dominates other sectors in terms of jobs created by activities funded by UDB loans, generating more than 5 times as many jobs as the manufacturing sector for each Ugandan shilling disbursed in loans. On average, a loan of one billion Ugandan shillings helped create 702 jobs in agriculture, compared to 136 jobs in the manufacturing sector (Figure 2). To further examine the returns to UDB's lending, we compare UDB's share in total loans to the share in total jobs created by sector (Table 3). The results clearly show that the goal of job creation would be better served by allocating more UDB resources to agriculture. Yet, in 2018, agriculture received 37% of total loans, compared to 52% for the manufacturing sector. This suggests that channeling a higher share of loans towards agriculture would substantially contribute to boosting the employment gains from economic growth in the country.

Figure 2: Number of jobs created per 1bn Ugandan shillings of loan by the Uganda Development Bank, 2018



Source: UDB database

Table 3: Job creation impact of loans by the Ugandan Development Bank in agriculture and manufacturing sectors

	2015	2016	2017	2018
<i>Share of UDB in total loans</i>				
Agriculture & Agro-industrialization	14.1	14.1	19.9	37.0
Manufacturing	17.7	42.3	39.1	52.3
<i>Jobs generated per 1mn loan</i>				
Agriculture & Agro-industrialization	1.8	1.9	0.9	0.7
Manufacturing	0.1	0.0	0.0	0.1
<i>Ratio of the share in jobs created to the share in loans</i>				
Agriculture employment share/loan share	6.1	5.8	4.1	2.0
Manufacturing employment share/loan share	0.3	0.1	0.2	0.4

Source: Authors' computations using data from UDB database

5. Econometric analysis

5.1 Motivation

The empirical analysis in this study contributes to the existing literature in two important ways. First, the African continent has, to a large extent, been left out of the scope of existing empirical studies on the role of development. Yet, national development banks remain an important part of financial systems in Africa and they have an important mandate to contribute to mobilizing and allocating financial resources to the private sector. Second, the analysis in this paper takes into account host country specific factors in explaining bank lending behavior, given the high heterogeneity across countries along various dimensions, notably the structure of the economy and the institutional environment. Thus, in addition to bank characteristics, the empirical model specifically incorporates indicators of the macroeconomic environment (economic growth and inflation), as well as the structure of the economy (endowment in oil and minerals). The empirical model also accounts for the institutional environment by incorporating indicators of governance, which play an important role in influencing credit risk, demand and supply of credit. Finally, the empirical model controls for the level of financial development to capture the efficiency in mobilization and allocation of financial resources across borrowers and sectors.

The empirical analysis pursues three questions. The first is whether lending is influenced by the characteristics of the bank, particularly whether it is a national development banks or a commercial bank. Specifically, the question is: do national development banks lend more or less than commercial banks given bank characteristics and host country conditions? The second question is whether national development banks manage resources effectively in general and compared to

commercial banks. The analysis specifically focuses on the efficiency in loan recovery as measured by non-performing loans. The third question is: do bank characteristic influence the bank's performance regarding return on assets? More specifically, do national development banks perform better or worse than commercial banks? The empirical analysis draws from and expand the existing work in the literature, notably Micco and Panizza (2006), Micco, Panizza, and Yanez (2007), and Chen et al. (2016).

5.2 Model specification

To answer the first research question stated above, we estimate an empirical model where the volume of bank's lending depends on the legal status of the bank or bank type (national development bank, public bank, or not), the bank's time-varying characteristics, and host country specific factors. For bank i in country j and in year t , the lending model is specified as follows:

$$Loan_{ijt} = \alpha_0 + \alpha_1 D_i + \alpha_2 F_j + \mathbf{Z}_{it} \Gamma + \mathbf{X}_{jt} \Phi + \varepsilon_{ijt} \quad (1)$$

Loan is alternatively the volume of total loans and the sum of medium-term loans and long-term loans. \mathbf{Z} is a vector of time-varying bank characteristics, \mathbf{X} is a vector of host country specific factors, D_i is a dummy that equals 1 if it's a national development bank and zero otherwise, F_j is a dummy that equals 1 if the country is relatively financially developed, and ε is a random error term. Countries classified as financially developed are: Cape Verde, Kenya, Mauritius, Morocco, Namibia, South Africa, and Tunisia. In alternative specifications the dummy for national development bank is replaced by a dummy for public banks, which includes national development banks as well as commercial banks that are majority-owned by the government.

The question about efficiency in resource management is explored by estimating a model with non-performing loans as the dependent variable. We explicitly examine whether the term structure of loans matters for the prevalence of non-performing loans, given that longer-term loans are deemed relatively riskier than short-term loans. This is especially important given that national development banks are expected to specialize in providing medium-term and long-term loans, which tend to be poorly supplied by commercial banks especially in a developing country context, while they are important for promoting investment, industrialization and economic transformation. The model is specified as follows:

$$NPL_{ijt} = \alpha_0 + \alpha_1 D_i + \alpha_2 F_j + \mathbf{Z}_{it} \Gamma + \mathbf{X}_{jt} \Phi + \delta TSLoans_{ijt} + \varepsilon_{ijt} \quad (2)$$

NPL stands for non-performing loans as a percentage of total loans, *TSLoans* denotes the term structure of loans represented alternatively by total loans, short-term loans, and the sum of medium-term and long-term loans.

To answer the third question, we estimate a model of bank performance, which like in equation (1), also depends on bank characteristics and host country specific factors. The model is specified as follows:

$$Return_{ijt} = \alpha_0 + \alpha_1 D_i + \alpha_2 F_j + \mathbf{Z}_{it} \Gamma + \mathbf{X}_{jt} \Phi + \delta TSLoans_{ijt} + \varepsilon_{ijt} \quad (3)$$

Return is measured by the return on assets (ROA); the other variables are defined as in equation (2).

5.3 Discussion of regression results

In Tables 4 and 5, we report results for bank lending for national development banks and public banks, respectively. distinguishing between total loans and medium- and long-term loans. These results help to answer the question of whether national development banks lend more than other banks given other individual characteristics and the host country context. In Tables 6 and 7, we report results for non-performing loans aimed at answering the question of whether national development banks and public banks incur higher credit risk and are efficient in loan recovery relative to other banks. Tables 8 and 9 present results on profitability as measured by the return enabling us to address the question about the profitability of national development banks relative to other banks.

Do national development banks lend more than other banks?

The first two columns of Table 4 present results for total loans by national development banks, whereas the last two columns show results for the sum of medium-term and long-term loans as dependent variables. In columns 1 and 3, dummies for bank type (national development bank) and financial development are included without interaction terms between the two. According to these results, it does not appear that national development banks lend more than other banks given bank and host country characteristics. The coefficients on the dummy for national development bank are statistically insignificant. However, the results suggest that national development banks located in countries with developed financial systems lend less than other banks controlling for other determinants of lending. In such countries, lending by national development banks is 25% lower than other banks. This could be due to the fact that on average national development banks have an overall smaller resource envelope than commercial banks.

However, the regression results are quite different for medium-term and long-term loans. Recall that the mandate of national development banks is primarily to focus on supplying medium-term and long-term lending, which tends to be rationed by commercial banks because it is riskier. The regression results are consistent with this expected specialization. The results including an interaction between the development bank and financial development dummies show that the share of medium-term and long-term loans in total loans is 22% higher for national development banks

relative to their counterparts. These results suggest that national development banks and public banks are indeed fulfilling their mandate of bridging the financing gap through medium-term and long-term lending. This implies that increasing the lending capacity of national development banks would help in alleviating the shortage of medium-term and long-term credit in African economies.

The results are similar for public banks (Table 5). While public banks appear to lend less compared to commercial banks (column 1), they lend more medium and long term. This effect becomes stronger when we include an interaction term between the public bank dummy and the financial development dummy.

The results in Tables 4 and 5 show that bank characteristics as well as the host country context matter for bank lending. In particular, bank size is positively correlated with total lending as well as medium-term and long-term lending, as illustrated by the positive and significant coefficients on total assets. The volume of lending is also positively influenced by the bank's financing capacity as measured by savings and time deposits as shown by the positive and significant coefficients on these indicators. Moreover, high liquid assets are associated with lower lending. This suggests that hoarding excess liquidity exacerbates the shortage of credit in African economies.

With regard to the host country context, the regression results in Tables 4 and 5 show that high inflation discourages lending as exhibited by the negative and significant coefficient on the lagged inflation rate. This is because inflation raises investment uncertainty while reducing real returns on investment. For total lending, there is a quadratic relationship between the volume of loans and per capita GDP, which is a proxy for the demand for credit as well as the borrowers' capacity to repay loans. The positive relationship materializes at higher levels of per capita GDP, suggesting that the relationship is stronger in middle-income countries than in low-income countries.

Are national development banks efficient in managing loans?

Given that national development banks have a mandate of supplying medium- and long-term loans while targeting sectors and activities that are regarded as risky but with high social returns, they are expected to face higher non-performing loans than commercial banks. The empirical results presented in Table 6 support this premise. The coefficient on the national development bank dummy is positive and significant. The results suggest that national development banks record between 11% and 52% higher non-performing loan ratios than commercial banks.

In line with the mandate of national development banks, we test the impact of the term structure of loans. The results show that overall higher lending is in fact associated with lower non-performing loan ratios (columns 1 and 2 in Table 6). In addition, there is no evidence that a high share of medium-term and long-term loans in total loans increases the risk of the loan portfolio as exhibited by the insignificant coefficient on medium and long-term loans (column 4). In contrast, a higher share of short-term loans in total loans is associated with a higher non-performing loan

ratio (column 3). This suggests that short-term lending is in fact riskier than medium-term and long-term lending. It seems therefore that rationing of medium-term and long-term loans by commercial banks is not justified by the evidence on the risk implications in terms of non-performing loans.

With regard to the role of bank characteristics, the regression results show that larger banks record less non-performing loans as exhibited by the negative and significant coefficient on total assets. As for the country context, higher GDP growth is associated with lower non-performing loan ratios in the banking sector. This suggests that higher GDP growth indicates higher average returns to investment as well as rising incomes, which enhance debt payment capacity for borrowers. These growth effects imply higher solvency and consequently lower non-performing loan ratios. In addition, the results show no significant effect of institutional quality as measured by the government effectiveness index.

In Table 7, the results show a similar pattern for public banks. On average public banks record higher non-performing loan ratios than their private counterparts. The coefficients on the public bank dummy suggest between 4.4% and 27.2% higher ratios for public banks relative to private banks, which is about half the estimated effects for national development banks shown in Table 6. This suggests that public commercial banks incur less non-performing loans than national development banks. Moreover, the term structure of loans also matters, with short-term loans associated with higher non-performing loans while a high share of medium and long-term loans in total loans has no impact on the prevalence of non-performing loans.

Are national development banks profitable?

National development banks are, by mandate, not profit-maximizing enterprises. The results in Table 8 indeed show that being a national development bank is not associated with higher returns on assets as illustrated by the fact that the coefficient on the national development bank dummy is statistically insignificant. But this also means that national development banks are not necessarily less profitable than commercial banks. However, the results show that national development banks located in countries with developed financial systems record 3.5 – 4 times higher return on assets ratios than their commercial counterparts. This could be due to the fact that in addition to access to relatively more stable sources of funding (rather than depending on customer deposits), national development banks located in financially developed economies have access to better technology and higher managerial know-how that enable them to manage resources and conduct their businesses more efficiently. Another factor could be that in financially developed economies, which are also more developed overall, national development banks receive a better mix of bankable projects. Furthermore, banks in these countries may enjoy a better institutional environment, including more operational autonomy from the government, which gives them more space to channel resources to productive investments and manage them efficiently. Detailed case studies would be useful to investigate this result.

A higher volume of lending is associated with higher profitability as exhibited by the positive and significant coefficient on the net lending to assets ratio (columns 1 and 2). However, the term structure of loans matters significantly. Specifically, short-term lending is associated with a lower return on assets. One unit increase in the share of short-term loans in total loans leads to 33% decrease in return on assets. In contrast, medium-term and long-term lending generates higher returns on assets. One unit increase in the share of medium-term and long-term loans leads to a 30% increase in the return on assets ratio. For national development banks, the results suggest that fulfilling their mandate of promoting access to longer-term credit is in fact a good business strategy, as it results in higher rates of return on assets.

In terms of the role of bank characteristics, bank size is found to be positively correlated with profitability as exhibited by the positive and significant coefficient on total assets. One unit increase in bank size is associated with 52% to 69% increase in return to assets. Interest income boosts profitability as shown by the large positive and significant coefficient on the interest income to assets ratio. In addition, the prevalence of non-performing loans hinders profitability as shown by the negative and significant coefficient on the non-performing loan ratio.

The regression results are similar for public banks as shown in Table 9. Public banks are not a priori more or less profitable than other banks, as shown by the insignificant coefficient on the public bank dummy. However, public banks located in financially developed economies are 2 to 3.8 times more profitable than private financial institutions. Moreover, the concentration of lending on the short-term diminishes profitability, while focusing on medium-term and long-term lending increases it. One unit increase in the share of short-term loans reduces the return on assets by 27%, whereas one unit increase in the share of medium-term and long-term loans increases the return on assets by 29%.

The results for public banks are also similar to those for national development banks with regard to the role of bank characteristics. In particular, larger public banks are more profitable, interest income is a key source of profitability, and non-performing loans depress the return on assets.

6. Conclusions, policy implications and suggestions for further research

This study sought to investigate the role of national development banks in African economies. Using econometric analysis based on data from BankFocus supplemented by data from individual national development banks, the study found evidence that sheds light on the role of national development banks and public banks in African economies. The regression results indicate that while national development banks do not lend more relative to commercial banks, they outperform the latter in supplying medium-term and long-term loans, which is consistent with their mandate. The results further confirm that national development banks incur more risk, resulting in relatively higher non-performing loan ratios. As expected, national development banks are not more profitable than commercial banks in general; but they do perform better when they are located in

countries with relatively more developed financial systems. The empirical evidence also shows that lending and performance by national development banks are influenced by bank characteristics, such as size and lending capacity as measured by deposits, as well as host country environment such as GDP growth and inflation. The empirical results are broadly similar for public banks.

The key message from these findings is that national development banks generally allocate lending with a focus on medium-term and long-term credit. This implies that African governments can alleviate the shortage of credit by strengthening the lending capacity of national development banks and public banks. The evidence suggests that this strategy is not only good for the national economy, but it is also good business practice for national development banks as it is associated with a better credit portfolio (less non-performing loans) and higher profitability.

A number of caveats are in order to put these results in context. The first concerns the measurement of bank performance. In this study, because of data limitations, bank performance is assessed using non-performing loans and the rate of return on assets. Ideally, given the mandate of national banks, other indicators would be needed to have a full picture of their performance. In particular, it would be insightful to examine the contribution of national development banks to employment creation and funding for infrastructure, industry, and agriculture. Case studies would be the best approach to answer these questions. A second caveat is that the BankFocus database we used only covers seven years from 2013 to 2019. This data does not allow us to explore the role of national development banks in counter-cyclical lending as it does not include a recession period. A third limitation of the study is the lack of data on firms and consumers that are recipients of bank loans, making it impossible to analyze the targeting of loans as well as the impact of credit on the borrowers' side.

Despite these caveats and drawing on the findings herein, this study can serve as a basis for exploring important issues related to the role of African development banks in African economies. Below are some suggested avenues for further research.

How to measure the performance of national development banks?

A proper assessment of national development banks needs to be guided by each bank's specific statutory mandate. While mandates vary by institution, across countries, and over time, they typically revolve around providing medium-term and long-term lending to promote industrialization and economic growth. Case studies are the most appropriate avenue for in-depth analysis that can shed light on whether national development banks have fulfilled their mandate, what constraints they have encountered, and what strategies can be deployed to address those constraints in order to improve their performance.

How can national development banks catalyze private lending?

National development banks do not have the resource capacity required to meet growing needs in medium-term and long-term credit in African economies. Private lenders, in turn, tend to shy away from long-duration lending due to high risk aversion. To bridge financing gaps, national development banks can leverage their capital and privileged position as government-guaranteed institutions to catalyze private financing while minimizing the risk faced by private lenders. While this approach is standard practice in major regional and international development financing institutions, it remains largely unexploited in the case of national development banks. Research in this area can help to draw lessons from the experiences of regional and multinational development banks to explore the modalities that national development banks can use to incentivize co-financing partnerships with private lenders to better meet investment needs in the economy.

How to build an effective pipeline of bankable projects?

The shortage of credit is not only the outcome of a shortage of capital on the bank side, but it is also often exacerbated by the lack of a pipeline of bankable projects that can be rolled out as soon as resources become available. Building up such a pipeline requires national development banks to build the appropriate human capital and technological capacity to originate and screen projects, and to assist prospective borrowers in designing fundable projects. Research would be valuable to distill lessons from best practices in Africa and around the world on pipeline management to inspire innovations and reforms aimed at enhancing the role of national development banks in meeting development financing needs in the continent.

Does regulation matter for the performance of national development banks?

The existing literature offers little insights on the nature of regulation that applies to national development banks in Africa. One question worth investigating is how the regulation of national development banks varies across countries and how it compares with that of commercial banks. Another question is how regulation affects the performance of national development banks. Addressing those and related questions requires in-depth investigation through case studies.

What is the contribution of national development banks to the development of domestic financial systems?

While fulfilling their mandate of supporting economic development through medium-term and long-term lending, national development banks can also potentially contribute to financial development in various ways. Through efficient balance sheet management and synergies with other financial institutions, national development banks can contribute to maturity transformation notably by leveraging their comparative advantage in long-term lending. They can also contribute to deepening domestic financial systems through domestic bond markets. They can also contribute to financial inclusion, notably by directly and indirectly channeling resources to credit-rationed sectors, especially small and medium enterprises, as well as youth and women-owned enterprises. This can be accomplished, among others, through opening lines of credit to commercial banks and micro-finance institutions that have the capacity to operate retail lending.

Research along these themes through in-depth bank and country case studies would shed light on how national development banks can contribute to economic growth, industrialization, financial inclusion, and financial sector development in Africa.

Table 4: Regression results for bank lending: national development banks

Variables	Total loans (1)	Total loans (2)	MT< loans (3)	MT< loans (4)
<i>Bank type and financial development</i>				
NDB	-0.048 (0.21)	0.020 (0.64)	0.108 (0.23)	0.222** (0.04)
Financial Dev. dummy	-0.022 (0.49)	0.005 (0.86)	0.125** (0.02)	0.128** (0.02)
Fin. Dev. x NDB dummy		-0.252*** (0.01)		0.021 (0.85)
<i>Bank characteristics</i>				
Total assets	0.036*** (0.00)	0.035*** (0.00)	0.047*** (0.00)	0.047*** (0.00)
Savings deposits/assets	-0.001 (0.14)	-0.001 (0.14)	0.007*** (0.00)	0.007*** (0.00)
Time deposits/assets	0.002*** (0.00)	0.002*** (0.00)	-0.002 (0.22)	-0.002 (0.19)
Liquid assets/assets	-0.018*** (0.00)	-0.018*** (0.00)	-0.013*** (0.00)	-0.013*** (0.00)
<i>Host country environment</i>				
Inflation	-0.020*** (0.00)	-0.020*** (0.00)	-0.018*** (0.00)	-0.018*** (0.00)
GDP per capita	-0.656*** (0.00)	-0.652*** (0.00)	-0.331 (0.53)	-0.310 (0.56)
GDP per capita square	0.040*** (0.00)	0.040*** (0.00)	0.024 (0.49)	0.022 (0.52)
Control of corruption	0.050*** (0.01)	0.051*** (0.01)	0.084** (0.04)	0.084** (0.04)
Mineral rich dummy	0.061*** (0.00)	0.064*** (0.00)	0.091** (0.03)	0.107** (0.01)
Oil dummy	0.069* (0.10)	0.080* (0.06)	0.086 (0.31)	0.104 (0.22)
NDB x Mineral rich		0.038 (0.63)		-0.193 (0.17)
NDB x Oil rich		-0.072 (0.47)		-0.275 (0.35)
Constant	6.682*** (0.00)	6.671*** (0.00)	4.755** (0.03)	4.664** (0.03)
Observations	2,252	2,252	1,175	1,175
R-squared	0.444	0.447	0.225	0.227

Robust p-values in parentheses; *** p<0.01, ** p<0.05, * p<0.1

The dependent variable is alternatively net loans as a percentage of assets (1st and 2nd columns) and the sum of medium- and long-term loans as a percentage of total loans (MT< loans, 3rd and 4th columns). Variables are in logarithm as appropriate (e.g., except for inflation and dummies)

Table 5: Regression results for bank lending: Public banks

Variables	Total loans (1)	Total loans (2)	MT< loans (3)	MT< loans (4)
<i>Bank type and financial development</i>				
Public bank	-0.081*** (0.01)	-0.022 (0.63)	0.150** (0.02)	0.272*** (0.00)
Financial Dev. dummy	-0.023 (0.47)	0.004 (0.90)	0.140*** (0.01)	0.151** (0.01)
Fin. Dev. x Public bank		-0.159** (0.03)		0.024 (0.80)
<i>Bank characteristics</i>				
Total assets	0.036*** (0.00)	0.036*** (0.00)	0.050*** (0.00)	0.048*** (0.00)
Savings deposits/assets	-0.001 (0.15)	-0.001 (0.14)	0.006*** (0.00)	0.006*** (0.00)
Time deposits/assets	0.002*** (0.00)	0.002*** (0.00)	-0.001 (0.28)	-0.001 (0.28)
Liquid assets/assets	-0.018*** (0.00)	-0.018*** (0.00)	-0.013*** (0.00)	-0.013*** (0.00)
<i>Host country environment</i>				
Inflation	-0.020*** (0.00)	-0.020*** (0.00)	-0.018*** (0.00)	-0.018*** (0.00)
GDP per capita	-0.644*** (0.00)	-0.622*** (0.00)	-0.308 (0.56)	-0.228 (0.67)
GDP per capita square	0.040*** (0.00)	0.038*** (0.00)	0.021 (0.53)	0.016 (0.64)
Control of corruption	0.052*** (0.01)	0.053*** (0.01)	0.087** (0.04)	0.088** (0.03)
Mineral rich dummy	0.064*** (0.00)	0.066*** (0.00)	0.091** (0.03)	0.116** (0.01)
Oil dummy	0.073* (0.07)	0.092** (0.03)	0.091 (0.28)	0.122 (0.16)
Public bank x Mineral rich		0.022 (0.74)		-0.195* (0.06)
Public bank x Oil rich		-0.101 (0.21)		-0.267 (0.23)
Constant	6.628*** (0.00)	6.548*** (0.00)	4.660** (0.03)	4.350** (0.04)
Observations	2,252	2,252	1,175	1,175
R-squared	0.446	0.447	0.228	0.230

Robust p-values in parentheses; *** p<0.01, ** p<0.05, * p<0.1

The dependent variable is alternatively net loans as a percentage of assets (1st and 2nd columns) and the sum of medium- and long-term loans as a percentage of total loans (MT< loans, 3rd and 4th columns). Variables are in logarithm as appropriate (e.g., except for inflation and dummies)

Table 6: Regression results for non-performing loans: case of national development banks

Variables	(1)	(2)	(3)	(4)
<i>Bank type and financial development</i>				
NDB dummy	0.111*** (0.005)	0.194*** (0.002)	0.305*** (0.000)	0.520*** (0.001)
Financial development dummy	0.034 (0.173)	0.008 (0.691)	-0.014 (0.517)	-0.025 (0.336)
NDB x Financial development		0.208 (0.120)	0.323** (0.021)	0.249* (0.058)
<i>Term structure of loans and bank characteristics</i>				
Net loans / assets	-0.181*** (0.000)	-0.175*** (0.000)		
Short-term loans (%)			0.024** (0.021)	
Medium & long-term loans (%)				-0.002 (0.894)
Total assets	-0.014*** (0.000)	-0.013*** (0.000)	-0.023*** (0.000)	-0.019*** (0.000)
Demand deposits / assets	-0.001*** (0.003)	-0.001*** (0.001)	-0.001*** (0.007)	-0.001*** (0.000)
Savings deposits / assets	-0.001 (0.139)	-0.001* (0.077)	0.000 (0.801)	
Liquid assets / assets	-0.003*** (0.000)	-0.003*** (0.000)		
<i>Host country environment</i>				
GDP growth	-0.007* (0.074)	-0.008** (0.021)	-0.004* (0.081)	-0.010** (0.040)
Government effectiveness	-0.020*** (0.000)	-0.012 (0.440)	0.003 (0.872)	-0.013 (0.541)
New businesses	-0.008 (0.580)	-0.016*** (0.000)		-0.012*** (0.001)
Mineral rich dummy	-0.018 (0.126)	-0.008 (0.425)	-0.023** (0.049)	-0.019 (0.252)
NDB x Mineral dummy		-0.257** (0.030)	-0.346*** (0.004)	-0.527*** (0.003)
Oil rich dummy	0.032 (0.141)		0.038 (0.162)	0.028 (0.381)
NDB x Oil dummy			-0.236** (0.017)	-0.449*** (0.007)
Constant	1.278*** (0.000)	1.242*** (0.000)	0.217*** (0.001)	0.491*** (0.000)
Observations	1,198	1,198	1,012	876
R-squared	0.177	0.208	0.202	0.249

Robust p-values in parentheses; *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is the ratio of non-performing loans to total loans and advances. Variables are in logarithms except for dummies and variables that take negative values (e.g., GDP growth). The indicator for governance and institutional quality (government effectiveness) is transformed so that a higher value represents higher quality.

Table 7: Regression results for non-performing loans: case of public banks

Variables	(1)	(2)	(3)	(4)
<i>Bank type and financial development</i>				
Public bank dummy	0.044* (0.074)	0.086** (0.035)	0.211*** (0.000)	0.272*** (0.004)
Financial development dummy	0.029 (0.239)	0.005 (0.797)	-0.006 (0.782)	-0.009 (0.727)
Public bank x Fin. dev. dummy		0.144 (0.135)	0.318** (0.015)	0.325** (0.010)
<i>Term structure of loans and bank characteristics</i>				
Net loans / assets	-0.184*** (0.000)	-0.181*** (0.000)		
Short-term loans (%)			0.035*** (0.003)	
Medium & long-term loans (%)				-0.003 (0.861)
Total assets	-0.013*** (0.000)	-0.013*** (0.000)	-0.023*** (0.000)	-0.022*** (0.000)
Demand deposits / assets	-0.002*** (0.000)	-0.002*** (0.000)	-0.001*** (0.001)	-0.002*** (0.000)
Savings deposits / assets	-0.001*** (0.008)	-0.001*** (0.006)	-0.001 (0.160)	
Liquid assets / assets	-0.003*** (0.000)	-0.003*** (0.000)		
<i>Host country environment</i>				
GDP growth	-0.007* (0.078)	-0.008** (0.034)	-0.003 (0.160)	-0.009* (0.052)
Government effectiveness	-0.021*** (0.000)	-0.010 (0.565)	-0.004 (0.835)	-0.028 (0.163)
New businesses	-0.008 (0.584)	-0.018*** (0.000)		-0.010*** (0.008)
Mineral rich dummy	-0.019 (0.108)	-0.008 (0.444)	-0.024** (0.046)	-0.022 (0.184)
Public bank x Mineral dummy		-0.160* (0.061)	-0.274*** (0.006)	-0.335*** (0.006)
Oil rich dummy	0.020 (0.345)		0.033 (0.234)	0.018 (0.579)
Public bank x Oil dummy			-0.225*** (0.006)	-0.335** (0.014)
Constant	1.321*** (0.000)	1.298*** (0.000)	0.213*** (0.003)	0.550*** (0.000)
Observations	1,198	1,198	1,012	876
R-squared	0.165	0.184	0.176	0.206

Robust p-values in parentheses; *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is the ratio of non-performing loans to total loans and advances. Variables are in logarithms except for dummies and variables that take negative values (e.g., GDP growth). The indicator for governance and institutional quality (government effectiveness) is transformed so that a higher value represents higher quality.

Table 8: Regression results for profitability: case of national development banks

Variables	(1)	(2)	(3)	(4)
<i>Bank type and financial development</i>				
National development bank dummy	-0.047 (0.89)	0.265 (0.49)	0.518 (0.34)	0.712 (0.19)
Financial development dummy	-0.284 (0.14)	-0.486** (0.01)	-0.571** (0.02)	-0.757*** (0.00)
NDB x Fin. dev. dummy		3.514*** (0.00)	3.958*** (0.00)	3.965*** (0.00)
<i>Term structure of loans and bank characteristics</i>				
Net loans / assets	1.542*** (0.00)	1.581*** (0.00)		
Short-term loans (%)			-0.333** (0.03)	
Medium & long-term loans (%)				0.305* (0.08)
Total assets	0.528*** (0.00)	0.525*** (0.00)	0.654*** (0.00)	0.690*** (0.00)
Interest income / loans	1.475*** (0.00)	1.506*** (0.00)	1.095*** (0.00)	0.885*** (0.00)
Liquid assets / assets	0.018*** (0.01)	0.017*** (0.01)	0.000 (0.96)	0.007 (0.19)
Savings deposits / assets	0.011*** (0.01)	0.011** (0.01)	0.023*** (0.00)	0.017** (0.01)
Time deposits / assets	-0.026*** (0.00)	-0.026*** (0.00)	-0.019*** (0.00)	-0.017*** (0.01)
Non-performing loans (% total)	0.078 (0.65)	-0.217 (0.23)	-2.480* (0.05)	-2.416** (0.04)
<i>Host country environment</i>				
GDP per capita	-2.740** (0.01)	-2.228** (0.04)	2.932 (0.15)	1.812 (0.33)
GDP per capita squared	0.201*** (0.00)	0.168** (0.02)	-0.166 (0.21)	-0.095 (0.44)
Government effectiveness	-0.329 (0.21)	-0.322 (0.21)	-0.396 (0.24)	-0.383 (0.25)
Oil rich dummy	-1.459*** (0.00)	-1.530*** (0.00)	-2.884*** (0.00)	-3.291*** (0.00)
NDB x Oil rich dummy		0.439 (0.61)	2.485 (0.27)	2.844 (0.25)
Minerals rich dummy	-0.632*** (0.00)	-0.483*** (0.00)	-0.679*** (0.00)	-0.756*** (0.00)
NDB x Minerals rich dummy		-3.008*** (0.00)	-2.880*** (0.00)	-2.861*** (0.00)
Constant	-1.610 (0.71)	-3.713 (0.38)	-14.866** (0.05)	-12.679* (0.07)
Observations	2,125	2,125	1,300	1,290
R-squared	0.114	0.135	0.192	0.209

Robust p-values in parentheses; *** p<0.01, ** p<0.05, * p<0.1

The dependent variable is return on assets (ROA). Variables are in logarithms except for dummies and variables that take negative values (e.g., ROA). The indicator for governance and institutional quality (government effectiveness) is transformed so that a higher value represents higher quality.

Table 9: Regression results for profitability: case of public banks

Variables		(1)	(2)	(3)
<i>Bank type</i>				
Public bank dummy	0.086 (0.71)	0.266 (0.39)	0.318 (0.49)	0.454 (0.31)
Financial development dummy	-0.278 (0.15)	-0.490** (0.02)	-0.650** (0.02)	-0.867*** (0.00)
Public bank x Fin. dev. dummy		2.137*** (0.00)	3.519*** (0.00)	3.814*** (0.00)
<i>Term structure of loans and bank characteristics</i>				
Net loans / assets	1.549*** (0.00)	1.584*** (0.00)		
Short-term loans (%)			-0.273* (0.08)	
Medium & long-term loans (%)				0.293* (0.09)
Total assets	0.529*** (0.00)	0.523*** (0.00)	0.671*** (0.00)	0.708*** (0.00)
Interest income / loans	1.475*** (0.00)	1.509*** (0.00)	1.065*** (0.00)	0.853*** (0.00)
Liquid assets / assets	0.018*** (0.01)	0.019*** (0.00)	0.001 (0.91)	0.007 (0.19)
Savings deposits / assets	0.012*** (0.01)	0.013*** (0.00)	0.027*** (0.00)	0.020*** (0.00)
Time deposits / assets	-0.026*** (0.00)	-0.024*** (0.00)	-0.015** (0.03)	-0.013** (0.04)
Non-performing loans (% total)	0.067 (0.69)	-0.104 (0.54)	-2.385* (0.07)	-2.331* (0.05)
<i>Host country environment</i>				
GDP per capita	-2.751** (0.01)	-2.557** (0.02)	2.888 (0.16)	1.889 (0.32)
GDP per capita squared	0.201*** (0.00)	0.189*** (0.01)	-0.162 (0.23)	-0.100 (0.42)
Government effectiveness	-0.334 (0.20)	-0.321 (0.22)	-0.419 (0.22)	-0.391 (0.25)
Oil rich dummy	-1.466*** (0.00)	-1.488*** (0.00)	-2.994*** (0.00)	-3.405*** (0.00)
NDB x Oil rich dummy		-0.290 (0.63)	1.890 (0.25)	2.351 (0.20)
Minerals rich dummy	-0.636*** (0.00)	-0.541*** (0.00)	-0.778*** (0.00)	-0.823*** (0.00)
NDB x Minerals rich dummy		-1.413** (0.03)	-1.372* (0.08)	-1.726** (0.02)
Constant	-1.600 (0.72)	-2.643 (0.54)	-15.038** (0.05)	-12.993* (0.07)
Observations	2,125	2,125	1,300	1,290
R-squared	0.114	0.123	0.184	0.205

Robust p-values in parentheses; *** p<0.01, ** p<0.05, * p<0.1

The dependent variable is return on assets (ROA). Variables are in logarithms except for dummies and variables that take negative values (e.g., ROA). The indicator for governance and institutional quality (government effectiveness) is transformed so that a higher value represents higher quality.

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Table A1: Number of banks in the BankFocus dataset by type

Country	Commercial banks			
	NDBs	Public banks	Private	All commercial banks
Algeria	1	7	10	16
Angola	1	1	20	20
Benin	0	0	8	8
Botswana	1	3	10	10
Burkina Faso	0	0	12	12
Burundi	1	1	5	5
Cameroon	0	0	11	11
Cape Verde	0	0	7	7
Central African Rep.	0	0	2	2
Chad	0	0	5	5
Congo	1	1	2	2
Côte d'Ivoire	1	1	19	19
Congo, Dem. Rep.	0	0	12	12
Djibouti	0	0	5	5
Egypt	4	10	20	24
Equatorial Guinea	0	0	2	2
Ethiopia	1	2	13	14
Gabon	0	0	6	6
Gambia	0	0	3	3
Ghana	2	2	24	24
Guinea	0	0	8	8
Guinea Bissau	0	0	1	1
Kenya	2	3	32	33
Lesotho	0	1	3	4
Liberia	0	0	3	3
Libya	2	3	11	11
Madagascar	0	0	6	6
Malawi	1	1	6	6
Mali	2	2	10	10
Mauritania	0	0	10	10
Mauritius	2	2	18	18
Morocco	2	4	11	12
Mozambique	1	1	14	14
Namibia	2	3	6	7
Niger	0	0	7	7

Nigeria	3	4	23	23
Rwanda	1	1	10	10
Sao Tome & Principe	0	0	1	1
Senegal	1	1	21	21
Seychelles	1	3	2	3
Sierra leone	0	0	7	7
Somalia	0	0	1	1
South Africa	3	5	16	16
South Sudan	0	0	4	4
Sudan	2	2	1	1
Swaziland	1	3	3	3
Tanzania	3	4	30	31
Togo	1	1	7	7
Tunisia	1	6	12	16
Uganda	2	2	18	18
Zambia	1	1	15	15
Zimbabwe	2	5	9	9
Total	49	86	522	543

Source: BankFocus

Table A2: Summary statistics for regression variables

Variables	Observations	Mean	Std. dev.	Min	Max
<i>Dependent variables</i>					
Net loans/assets	4,716	47.9	21.4	0	99.5
Short-term loans/assets	2,270	52.3	26.3	0	101.0
Medium and long term loans/assets	6,104	17.8	28.1	-1.0	100
NPL/loans	3,252	0.8	20.1	0	791.6
ROA	4,839	1.3	5.3	-117.5	45.6
<i>Bank specific indicators</i>					
Total assets (million \$)	4,852	3017.5	12156.8	0.003	252664.9
Demand deposits/assets	3,570	32.0	19.1	0	92.5
Savings deposits/assets	2,800	13.0	14.1	0	93.6
Time deposits/assets	3,279	20.6	15.6	0	85.2
Liquid assets/assets	4,834	31.8	20.5	0	99.9
<i>Country level indicators</i>					
Inflation (%)	5,934	7.7	13.6	-3.2	379.8
GDP per capita (US \$)	6,081	2942.2	2789.5	208.1	16764.4
GDP growth	6,076	3.8	3.8	-36.4	26.7
Control of corruption	6,104	2.9	0.6	1.7	4.5
Government effectiveness	6,104	3.0	0.6	1.0	4.6
New businesses	3,219	39568	80171	20	376727

Source: BankFocus; World Bank: World Development Indicators; Worldwide Governance Indicators.

NPL = non-performing loans; ROA = return on assets