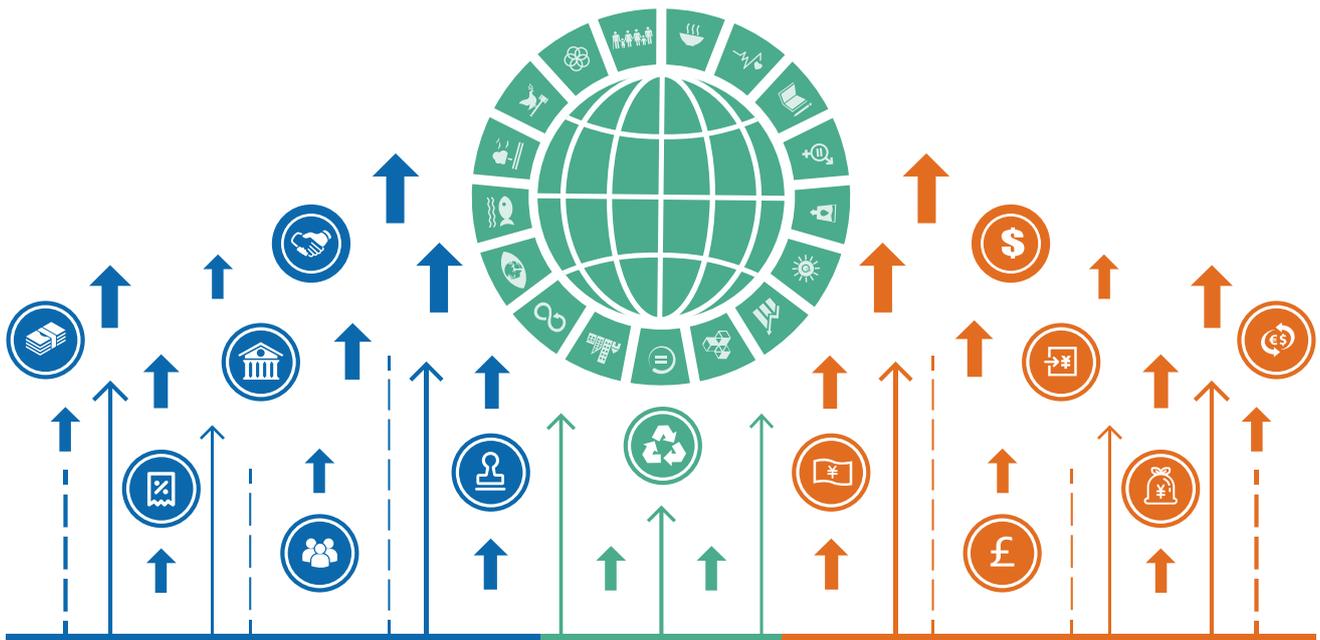




Funding Sources of National Development Banks

Jiajun XU, Kedi WANG, and Xinshun RU



The New Structural Economics Development Financing Research Paper Series aims to build the first comprehensive database of worldwide development financing institutions (DFIs) and foster original research on the rationales, operations, performance, and impact of DFIs to improve understanding of these important institutions and achieve better development outcomes.

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Abbreviations

CDB	China Development Bank
CBRC	China Banking Regulatory Commission
DFI	Development Financing Institution
FILP	Fiscal Investment Loan Program
GNI	Gross National Income
HIC	High-Income Country
IBK	Industrial Bank of Korea
INSE	Institute of New Structural Economics
KfW	Kreditanstalt für Wiederaufbau
LIC	Low-Income Country
LMIC	Lower-Middle-Income Country
MIC	Middle-Income Country
MDB	Multilateral Development Bank
NDB	National Development Bank
NSE	New Structural Economics
ODA	Official Development Assistance
PBC	People's Bank of China
PSL	Pledged Supplementary Lending
PT SMI	PT Sarana Multi Infrastruktur
ROK	Republic of Korea
SME	Small and Medium-sized Enterprises
UMIC	Upper-Middle-Income Country
WB	World Bank

Executive Summary

In the aftermath of the global financial crisis and the outbreak of the new coronavirus pandemic, the importance of national development banks (NDBs) has received increasing recognition, and the world is witnessing their renaissance. They can potentially play a counter-cyclical role in times of crises, bridge the infrastructure financing gap, advance economic structural transformation, and achieve sustainable development. However, the renaissance of development financing institutions (DFIs) worldwide stands in sharp contrast with the lack of academic research on the role, operation, and efficacy of DFIs. The lack of data has constrained the research on DFIs. Detailed data about their operation and performance is very limited.

To fill this gap, the Institute of New Structural Economics at Peking University aims to establish the first database of DFIs worldwide. In addition to using the existing official firsthand data, we plan to conduct questionnaire surveys on different themes to improve the database in the near future. We hope to establish the database in a rigorous and systematic manner, which will help advance the original research on development finance and learn from the historical failures of some DFIs to unleash their full potential.

The present report is the third NSE Development Financing Research Report, which presents the typology and stylized facts of funding sources available to NDBs.

This report is not a research report but a database report, which aims to achieve conceptual clarity of each variable and rigorous quality control of the data collection process to reveal stylized facts of NDBs' funding sources. This cornerstone effort will lay the foundation for in-depth academic and policy research in the future. Building on the key characteristics of funding sources for NDBs worldwide, the present report finally proposes 10 research questions for further investigation and encourages scholars who may be interested in this area to conduct further research.

In this report, we define funding sources of NDBs as all types of funding obtained for NDBs to engage in developing financing operations and sustaining their operations. NDBs are financial institutions established or owned by a central government to serve its national strategy or fulfill public policy. Unlike commercial banks, NDBs are not aimed at maximizing profits. Projects undertaken by NDBs are usually characterized by long maturity, large scale, high risk, and positive externality. Commercial financial institutions or capital markets are often reluctant to provide financial support for these projects. Hence, NDBs simply cannot mobilize sufficient funding on their own. Therefore, government support is indispensable for mobilizing funding for NDBs. Unlike official aid agencies that rely primarily on governments for direct fiscal transfers, NDBs, as financial institutions, deploy financial means

and make full use of the leverage effect of sovereign creditworthiness to turn market funds into long-term, large-sum funds to serve development objectives. The funding of NDBs is characterized distinctively by mobilizing funding from both public agencies and market actors and by deploying both administrative measures and market-based means.

Based on firsthand data from the database, we present the stylized facts of the funding sources for NDBs worldwide. The key findings are as follows.

First, NDBs are usually funded either by public agencies or market actors. Regardless of who provides funding, the government plays an important role in the funding mobilization process. Governments play an indispensable role in mobilizing funding for NDBs through either administrative measures or market-based means.

Second, bond issuance is one of the most important funding mechanisms by which NDBs securitize sovereign creditworthiness to raise funds from capital markets. Governments, either through explicit or implicit guarantees, support NDBs to issue long-term bonds at relatively low prices.

Third, internal financing and equity financing from governments play more important roles in NDBs than in commercial banks.

Fourth, governments support the funding of NDBs mainly through share capital, borrowing and deposits from governments, the establishment of trust funds, government subsidies, tax incentives, service fees, and various other means.

Fifth, on-lending and official development assistance (ODA) from NDBs in high-income countries (HICs) and multilateral development banks (MDBs) play relatively more important roles in funding NDBs in developing countries.

Last but not least, although NDBs that take household deposits may be prone to liquidity risks and maturity mismatch, nearly 30 percent of NDBs resort to take household deposits because they may have limited alternative funding sources.

Building on the key characteristics of funding sources for NDBs worldwide, we propose the following 10 research questions for future exploration and encourage scholars who may be interested in this area to conduct further research.

(1) What is the most appropriate financing structure for NDBs at different stages of development? How do NDBs at different stages of development find the right mix of funding sources from public agencies versus market actors and achieve the right balance between administrative means and market-based means?

(2) If the goal of finance is to serve the real economy, what are the systemic differences in the size and risk profiles of the real economy supported by NDBs with different mandates, and how do these differences in the real economy affect the financing sources and mechanisms of NDBs?

(3) How does the financing structure of NDBs affect the maturity of loans, risk appetite, and choice of financial instruments on the asset side?

(4) Under what conditions can bond-issuing NDBs effectively contribute to the development of domestic capital markets?

(5) Why do some NDBs issue bonds, whereas others are not given the similar level of domestic capital market development?

(6) What determines the price, maturity, liquidity, and location (either domestic or international capital markets) of bond issuances by NDBs?

(7) What is the most appropriate risk-sharing mechanism when a government commissions a fund with an NDB?

(8) To what extent do on-lending and ODA from international and foreign public agencies discourage NDBs from mobilizing funds in their own countries or catalyze them to do so?

(9) Under what circumstances would on-lending denominated in hard currencies from MDBs and foreign NDBs lead to a balance of payment crisis in the host country?

(10) What are the effects of taking household deposits on an NDB's ability to fulfill its development-oriented mandate?

I. Introduction

The Institute of New Structural Economics at Peking University is the first to systematically collect data on the funding sources of NDBs worldwide. We propose typologies of NDBs' funding sources, present basic empirical evidence regarding these funding sources, and identify the stylized facts to lay the groundwork for solid academic and policy research in the future.

In the aftermath of the global financial crisis and the outbreak of the recent coronavirus pandemic, the importance of NDBs in playing a counter-cyclical role in times of crises, bridging the infrastructure financing gap, advancing economic structural transformation, and achieving sustainable development has received increasing recognition. The world is witnessing their renaissance. Access to large, long-term, and stable funding sources is a prerequisite for achieving NDBs' objectives. However, so far a lack of data has prevented researchers from providing answers to the following

questions: What are the main types of funding sources available to NDBs, and what are the stylized facts of such funding sources? To fill this gap, the Institute of New Structural Economics at Peking University is the first to systematically collect data on the funding sources of NDBs worldwide. We propose typologies of NDBs' funding sources, present basic empirical evidence regarding these funding sources, and identify the stylized facts to lay the groundwork for solid academic and policy research in the future.

This report proceeds as follows. In Section II, we introduce data sources, the data collection methodology, and our quality control methods. In Section III, we propose the working definitions and basic types of funding sources. In Section IV, we present the sample selection and reveal the diversity of NDBs. In Section V, we analyze the characteristics of the financing structure of NDBs and compare it with that of commercial banks. In Section VI, we present the basic characteristics and stylized facts of the main funding sources of NDBs, i.e., who provides funding for NDBs. Finally, in Section VII, we summarize key findings and propose future research directions.

II. Data Sources, Data Collection Methodology, and Quality Control Methods

In this section, we describe data sources, data collection methodology, and quality control methods undertaken in our research. The aim is to ensure academic rigor throughout the data collection process and make the verification process as traceable as possible. This will lay the foundation for future original academic research.

We aim to ensure academic rigor throughout the data collection process and make the verification process as traceable as possible.

■ 2.1 Data Sources

To collect data on NDBs' funding sources, we have relied primarily on the following data sources, including official primary sources and existing databases. Official primary sources include NDBs' official websites, annual reports, financial statements, charters, and other legal documents. To manually collect firsthand data from official primary sources, we have established a team of research assistants who are fluent in English, French, Portuguese, Spanish,

Russian, Arabic, and other languages and who have backgrounds in finance and accounting. Furthermore, we have matched the list of NDBs with the banks in the existing databases, including Bankfocus, so that we can make full use of the existing data sources.

We prudently matched the list of NDBs with existing databases such as Bankfocus, based on exact matches followed by fuzzy matches. An exact match is a comparison of a unique piece of information (e.g., website) on the list of NDBs and its counterpart in the Bankfocus database. The two must be identical to qualify as a successful match. A fuzzy match refers to the matching between the two databases for a piece of non-unique information (e.g., a name). To increase the accuracy of fuzzy matches, we included additional information for verification, namely, the organization's country or headquarters. If the URL was the same, then the match was considered successful; if the match was unsuccessful, then we searched for the name; and if the name was similar, then we included additional information, such as the country or headquarters where the NDB is located. When the above information was consistent, then the match was successful. The results show the effectiveness of this approach by reaching a

matching rate of 56 percent (the present report includes 375 NDBs, among which 210 have been matched with Bankfocus). The banks that were not successfully matched were primarily NDBs that were smaller in scale without disclosing their annual reports or financial statements, or were institutions with problematic operations and a lack of information disclosure in the host country.

■ 2.2 Data Collection Methodology

Our data collection team consisted of a principal investigator, research directors, a project manager, research assistants, and the research assistants' team leaders. This report's manual data collection comprised the following steps:

1. Developing the data collection codebook. For each manually collected data point, we developed an indicator codebook, a data collection template, illustrative examples, and technical notes. The codebook provided a clear and precise definition of each variable and indicated the data sources and the collection method. The data collection template specified the content and the format that research assistants had to fill out. The illustrative examples used specific cases to show the data collection method and procedure as well as the collection result's presentation. The technical notes elaborated on core concepts and the requirements of filling out the template. Before developing the data collection manual for each data point, we held an in-depth discussion concerning the definitions and connotations of the indicators. We then selected representative cases for pretesting, which combined deductive and inductive approaches.

2. Training research assistants and pretesting data collection exercises. Before the formal data collection, we held a data collection training session for research assistants. This training covered the types of funding sources, the definitions and connotations

of each variable, the collection methodology, the quality control methods, and the work plan. After the training, the research assistants conducted pretesting on, for example, 10 percent of the total number of NDBs. Those 10 percent were representative in terms of locations and development stages of their host countries and had complete public information. Immediately after pretesting, we held a feedback meeting to respond to questions the research assistants raised, to share experiences, and to sum up the common mistakes in the course of data collection to further improve the data collection codebook. This step helped ensure the data collection codebook fully took into account the NDBs' heterogeneity to improve the quality of data collection.

3. Collecting data and conducting process tracing. During data collection, the research assistant must accurately record supporting evidence and report data sources using the format template to ensure each data point was verifiable, and the research directors monitored the research assistants' data collection process in real time so that they could respond promptly to any questions the research assistants raised.

4. Performing quality control of the data collection results. After the research assistants completed the data collection template, we summarized the data collected and performed four quality control steps, to be elaborated below.

■ 2.3 Data Quality Control Methods

To ensure the accuracy and reliability of the data collection process, we conducted four steps of data quality checks. In the first step, the project manager, who was responsible for monitoring the research assistants' data collection progress, checked whether the record of data sources and data formats was up to standard and ensured every data point had rigorously cited original data sources for verification. In the second step, the

research assistant team leaders were responsible for verifying the accuracy of each data point collected by research assistants, and for double-checking whether “no information” on certain variables concluded by research assistants was true. The research directors performed the third step; they checked and evaluated the first two steps

for pending data collection results and spot-checked the first two steps to ensure there were no problems with the data points. In the fourth step, the principal investigator comprehensively evaluated the results of the first, second, and third steps of the review process, then gave a final judgment on the pending cases.

III. Working Definitions and Basic Types of Funding Sources of NDBs

In this section, we first provide a working definition of funding sources for NDBs to define the scope of our data collection and analysis. Second, based on first-hand data collection and cases study, we propose a typology of NDBs’ funding to help us grasp how each specific funding source is positioned along the two analytical dimensions: funding sources (public agencies or market actors) and funding mobilization mechanisms (administrative measures or market-based means). This typology helps to reveal core features of the funding

of NDBs, as financial intermediaries between the government and the market.

In this report, we define funding sources of NDBs as all types of funding obtained for NDBs to engage in developing financing operations and sustaining their operations.

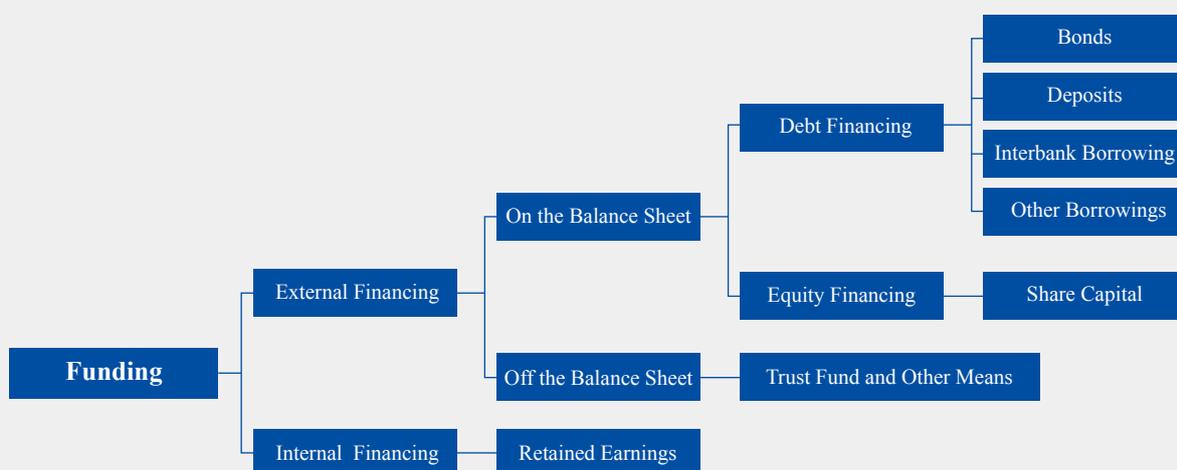


Figure 3.1 Analytical Dimensions of NDBs’ Funding

3.1 Working Definition of Funding Sources

In this report, we define funding sources of NDBs as all types of funding obtained for NDBs to engage in developing financing operations and sustaining their operations. We can categorize the funding sources according to the following dimensions: (1) internal financing from an NDB’s own net income versus external financing; (2) external financing, which includes both

funds recorded on the balance sheet and unrecorded off-balance sheet funds (e.g., funds administered on behalf of the government); and (3) On-balance-sheet financing can be further divided into equity financing and debt financing. (see Figure 3.1).

In terms of funding sources and methods, NDBs primarily mobilize funding from the following five sources: (1) issuance of debt securities in domestic or international capital markets; (2) share capital, borrowing, deposits, commission fees, grants, and

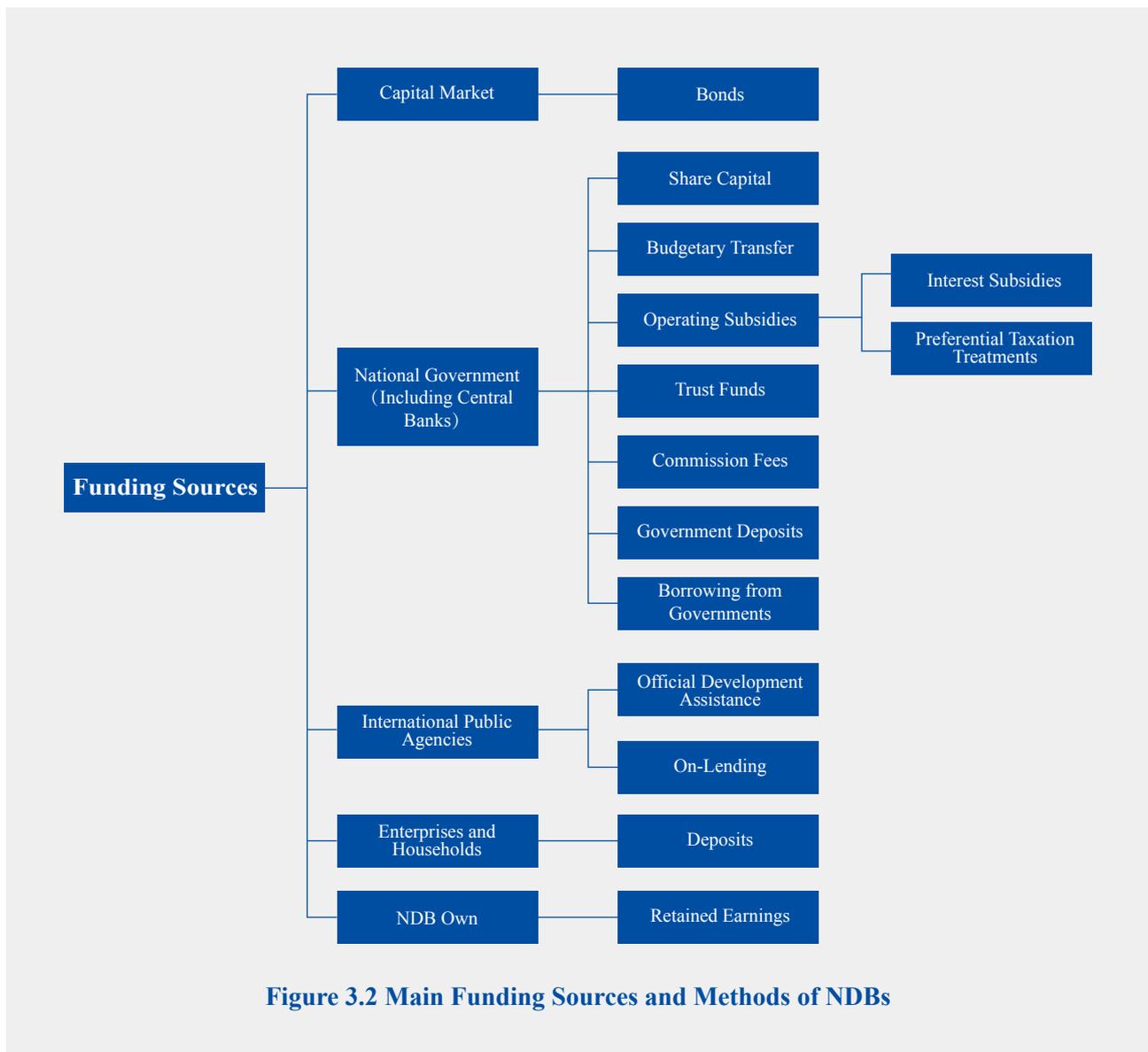


Figure 3.2 Main Funding Sources and Methods of NDBs

subsidies from national governments (including central banks); (3) deposits from households and enterprises; (4) on-lending and ODA from international financial institutions such as the MDBs, foreign development banks, and aid agencies; and (5) retained earnings from NDBs' own income. See Figure 3.2 for NDBs' main funding sources and methods.

■ 3.2 Main Typology of NDBs' Funding

NDBs are financial institutions created or owned by governments to advance national strategies or fulfill public policy objectives. Unlike commercial banks, NDBs do not aim to maximize profits. The projects that NDBs undertake are generally characterized by long project cycles, large capital requirements, high risks, and positive externalities. As a result, profit-driven financial institutions or capital markets are unwilling to provide financial support for NDBs, so NDBs are often unable to mobilize sufficient funding by relying solely on their own efforts. Therefore, government support for fundraising is indispensable for NDBs. The main differences between the funding sources of NDBs and commercial banks are as follows:

NDBs are often unable to mobilize sufficient funding by relying solely on their own efforts. Therefore, government support for fundraising is indispensable for NDBs.

(1) The most important funding source for commercial banks is to deposits from household and customers, while NDBs mainly finance medium-and long-term projects on their asset side, so household deposits are not an ideal source of funding, and we will discuss the fact and consequences of taking household deposits by NDBs in detail in Section 6.4

(2) The most important source of funding for NDBs is rely on the sovereign creditworthiness to issue bonds, whereas bonds are not the main funding source for commercial banks, though they may also issue bonds.

(3) Generally, governments and foreign public institutions do not regularly render financial support for commercial banks; however, their financial support from governments and foreign public institutions is critical to NDBs.

(4) There are some systemic differences between NDBs and commercial banks in terms of their reliance on internal financing and equity financing. Compared with commercial banks, NDBs rely more on internal financing and equity financing which will be discussed in detail in Section 5.

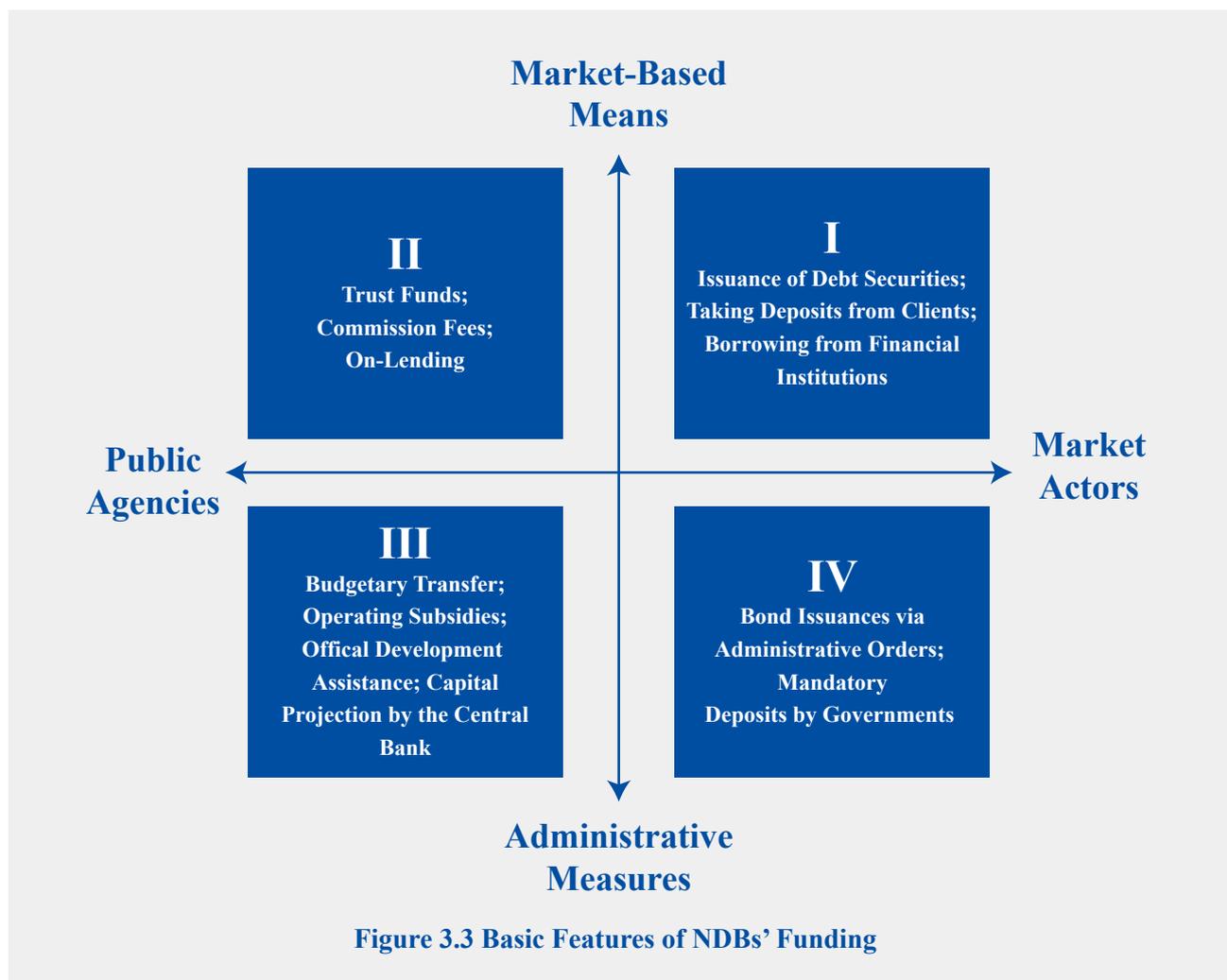
The combination of sources from public agencies and market actors and the integration of administrative measures and market-based means are distinctive features of NDB funding mobilization.

Unlike aid agencies that rely mainly on direct budgetary transfers from governments, NDBs can rely on government support to use market-based means to make the full use of the leverage effect of sovereign creditworthiness, thus transforming market funds into large long-term funds to advance development goals. The combination of sources from public agencies and market actors and the integration of administrative measures and market-based means are distinctive features of NDB funding mobilization. We summarize the core features of NDB funding sources in Figure 3.3.

The horizontal axis represents the funding source (i.e., *what directly provides funding to NDBs*). There are two main sources: public agencies and market actors. The leftmost end of the horizontal axis represents the extent to which NDBs depend on public agencies, such

as taking budgetary transfers or special funds from the government (including central banks). These public agencies include the governments of host countries, central banks, foreign aid agencies and DFIs, as well as MDBs. The closer to the right end of the horizontal axis, the higher the degree of reliance on market actors providing funding sources for NDBs. Market actors include household or business providers of deposits, financial institutions, and capital market investors. The vertical axis represents the financing mechanisms (i.e., *how NDBs mobilize funding sources*). There are two main ways to mobilize funding sources: administrative measures and market-based means. Because of the development-oriented mandate of state-owned NDBs on their asset side (that is, to fill the market gap),

government support is indispensable, regardless of whether the funds come from public agencies or market actors. However, the degree and means of government support may differ. Toward the top of the vertical axis, government intervention in financing NDBs is indirect, in line with market principles, where market players decide the scale or price of funding for NDBs. For example, governments can provide implicit or explicit guarantees for the bonds issued by NDBs. Toward the bottom of the vertical axis, the government intervention in funding NDBs is direct. In other words, governments take administrative measures to decide the scale or price of funding available to NDBs. For example, the government provides budgetary transfers to NDBs.



IV. Diversity of NDBs

In this section, we classify NDBs according to the development stage of their countries, official mandate, and bank size. This classification shows the diversity of NDBs.

Based on the *New Structural Economics Development Financing Inaugural Report* (Xu et al., 2019), the second *New Structural Economics Development Financing Report* (Xu et al., 2020) further improves the criteria for the identification of DFIs. These criteria include five dimensions: (1) they should have a separate legal entity and stand-alone financial statements and personnel; (2) they should use financial instruments that seek to reflow funds instead of provide grants only; (3) their funding sources cannot rely solely on regular budgetary allocations; (4) their development mandate should be oriented proactively toward serving public policy objectives, and their articles of agreement should stipulate clearly that their mandate is to achieve development or implement public policies since establishment; and (5) they receive government steering. In addition to these five criteria, NDBs must meet two further identification conditions: (1) they provide loans, distinguishing them from DFIs, which mainly offer equity investments, guarantees, or insurance; and (2) they are established or owned by the central government, thus distinguishing them from MDBs and subnational development banks. Based on the above criteria, we have identified 375 worldwide NDBs for this report.

Table 4.1 shows that there is vast diversity among NDBs across three analytical dimensions: development stage of their home countries, bank size, and official mandate. Diversity of each dimension will be presented in this section.

There is vast diversity among NDBs across three analytical dimensions: development stage of their home countries, bank size, and official mandate.

■ 4.1 Development Stage

Based on the World Bank (WB)'s gross national income (GNI) per capita, we classify countries into four income groups: low income countries (LICs), lower-middle-income countries (LMICs), upper-middle-income countries (UMICs), and high-income countries (HICs). However, according to the average number of NDBs owned by each country (including those in which NDBs have not yet been established) in each income group, we find the relative weight of NDBs is greater in middle-income countries (MICs) than in LICs and HICs¹. Xu et al. (2019) first identified this stylized fact and explained that the number of NDBs exhibits an inverted U-shape at different development stages.

¹ The average number of NDBs in different income groups is 0.8, 2.3, 2.2 and 2.0 respectively, from low to high levels of development.

Table 4.1 Diversity of NDBs

Classification		Number of Observations	Percentage
Total Samples		375	100%
Development stage	HICs	122	32.5%
	UMICs	120	32.0%
	LMICs	111	29.6%
	LICs	22	5.87%
Bank size	Mega	18	4.8%
	Big	44	11.7%
	Medium	103	27.5%
	Small	192	51.2%
	Unknown	18	4.8%
Official mandate	General mandate	198	52.8%
	Trade	41	10.9%
	Agriculture and rural development	34	9.1%
	SMEs and entrepreneurship	67	17.9%
	Housing	21	5.6%
	Infrastructure	6	1.6%
	Local government	8	2.13%

Note: In Table 4.1, “percentage” refers to the percentage of an NDB category in the full samples. The "general mandate " refers to the fact that an NDB's operations are not limited to a specific sector or client. For a description of the remaining categories, see Section 4.2.

Table 4.1 shows NDBs are mainly concentrated in HICs (32.5 percent), UMICs (32.0 percent), and LMICs (29.6 percent), but they are underrepresented in LICs (5.87 percent).

■ 4.2 Official Mandate

An NDB's official mandate refers to the focus of its operation as defined in its articles of agreement. According to their mandates, we classify 375 NDBs into two categories: general-mandate or multisector NDBs, in which business is not limited to a specific sector or segment. Representative cases are AFD, KfW, BNDES, and CDB. Another category is single-mandate NDBs, whose business is focused on addressing a specific market failure. Table 4.1 shows 52.8 percent of NDBs have an official mandate in support of a general mandate or multi-sector (thereafter referred to as "general mandate"). Single-mandate NDBs mainly support small and medium-sized enterprises (SMEs) and entrepreneurship, trade, and agriculture and rural development, which account for 17.9 percent, 10.9 percent, and 9.1 percent, respectively.

NDBs with single mandate are further classified as follows: agricultural and rural development, where NDBs are dedicated to solving agricultural and rural problems such as low rural income, and large agricultural price fluctuations (e.g., Agricultural Development Bank of Ghana); SME financing or start-up incubation (e.g., Business Development Bank of Canada); financing for housing (e.g., National Housing Bank in India); financing for infrastructure, where the state establishes NDBs to specifically address the financing gap in infrastructure (e.g., PT Sarana Multi Infrastruktur in Indonesia); financing for local governments, where NDBs provide financing for the local government, which has limited funding and sources to cover expenses for infrastructure and social security such as education and health care, to fulfill their public policy objectives (e.g., Kommunalbanken Norway); and trade promotion, where NDBs aim to mitigate risks encountered by import and

export enterprises during international trade, represented by national import and export banks.

■ 4.3 Bank Size

In this section, we classify NDBs in terms of both absolute bank size and relative bank size.

4.3.1 Absolute Size

Following the WB's 2017 survey on NDBs (de Luna Martinez 2018), we use total assets as an indicator to classify NDBs into four size categories: mega (more than \$100 billion), large (between \$10 billion and \$99.9 billion), medium (between \$1 billion and \$9.9 billion), and small (less than \$1 billion).² Table 4.1 shows over half of NDBs (51.2 percent) are small-sized, whereas 27.5 percent, 11.7 percent, and 4.8 percent are categorized as medium-sized, big-sized, and mega, respectively.

Taking into account the representativeness of the NDBs' geographical region and official mandate, Table 4.2 presents selected cases in each category of absolute bank size.

4.3.2 Relative Size

Although Table 4.1 shows that a vast majority of NDBs are small-sized in terms of absolute size, this does not necessarily mean they are small in relative size. Therefore, we use the percentage of an NDB's total assets in the host country's GDP as an indicator to measure its relative size³. Table 4.3 presents the descriptive statistics of NDBs' relative size.

² The symbol, \$, refers to the US dollar throughout this report.

³ Since total assets data for some NDBs are not available, the sample size in Table 4.3 is less than the full sample size. In addition, the reason of using GDP as the denominator here is twofold: 1. The sample in this report covers a large number of countries, and the macro-level financial data, such as the total assets of the banking system, are much more patchy than GDP; 2. Using the total assets of the banking system as the denominator delivers similar patterns.

Table 4.2 Representative Cases of NDBs in Each Size Category

NDB Name	Country	Average Total Asset during Five Years (2015-2019) (billion USD)	Classification of Absolute Size
China Development Bank	China	2204.7	Mega
KfW	Germany	554.6	
Cassa Depositi e Prestiti	Italy	472.0	
Korea Development Bank	South Korea	240.2	
The Brazilian Development Bank	Brazil	233.2	
Kommunalbanken Norway	Norway	50.99	Large
French Development Agency	France	45.79	
The Vietnam Development Bank	Vietnam	14.09	
Bank of Industry and Mine	Iran	12.97	
Finnvera	Finland	11.69	
Development Bank of the Philippines	The Philippines	11.54	Medium
Industrial Development Corporation	South Africa	9.89	
Banco De Reservas De La Republica Dominicana	Dominica	9.78	
Dutch Entrepreneurial Development Bank	Netherlands	9.69	
National Housing Bank	India	9.17	
Croatian Bank for Reconstruction and Development	Croatia	4.03	
Hungarian Export-Import Bank	Hungary	3.29	Small
Bangladesh Development Bank	Bengal	0.65	
Development Bank of Namibia	Namibia	0.57	
Finnfund	Finland	0.54	
Agricultural Development Bank of Zimbabwe	Zimbabwe	0.54	
Nigerian Export-Import Bank	Nigeria	0.33	
Agricultural and Rural Development Bank of Cambodia	Cambodia	0.13	

Table 4.3 Relative Size of NDBs

Category of Relative Size	Sample Size	Average	Standard Deviation	Maximum	Minimum
Mega	15	10%	6%	23%	2%
Big	34	7%	7%	29%	0.1%
Medium	66	2%	3%	13%	0.1%
Small	59	2%	3%	15%	0.01%

The average total assets of NDBs in the four categories of absolute size are \$384.36 billion, \$33.53 billion, \$3.95 billion, and \$320 million, respectively. By contrast, Table 4.3 shows the average relative sizes of these four categories are 10 percent, 7 percent, 2 percent, and 2 percent, respectively. This indicates some NDBs are small in absolute size, but they are not necessarily small in relative size. For example, the ratio of the average total assets of mega-sized NDBs to those of big NDBs is about 11.5 to 1, whereas the ratio of relative size is only about 1.4 to 1. Because of the limited space of this report, we have chosen the absolute size of NDBs in the subsequent analysis.

■ 4.4 Samples of This Report vs. Samples of World Bank Reports

Table 4.4 compares the distribution of samples according to development stage, bank size, and general mandate between this report and WB's survey reports conducted in 2012 and 2017.

Table 4.4 shows the present report aims to identify all NDBs worldwide, hence the number of its observations is much more comprehensive than that of WB's questionnaire surveys conducted in 2012 and 2017. The number of samples in WB's 2012 and 2017 reports is 21.6% and 14.7% of the number of samples in this report.

The WB report was based on a questionnaire to collect information on the membership of major development banks. This report represents the first attempt to collect the data of NDBs worldwide. In addition to including members of major DFI associations that meet the qualification criteria for DFIs, we have also systematically identified DFI-like institutions by examining the official bank classification country by country and consulted with practitioners to identify all NDBs worldwide.

The present report aims to identify all NDBs worldwide, hence the number of its observations is much more comprehensive than that of WB's questionnaire surveys conducted in 2012 and 2017.

Regarding the sample distribution, this report and WB's reports are similar in the following aspects: in terms of development stage, a vast majority of NDBs are located in MICs; in terms of bank size, a vast majority of NDBs are small-sized and medium-sized; and in terms of official mandate, a vast majority of NDBs aim to raise funds for general development, and SMEs and entrepreneurship.

In addition to the abovementioned commonalities, this report also differs from WB's reports in terms of sample distribution as this report aims to analyze the

total samples of NDBs worldwide. This helps explain the difference in the subsequent analysis on the stylized facts of NDBs' funding. For example, the difference in the ratio of bond issuance between this report and WB's reports might be attributed to the fact that this report

includes not only banks that disclose transparent bond issuance information but also banks whose bond issuance and sovereign guarantee information is difficult to obtain through public channels. We will elaborate on these differences further in Section 6.1.

Table 4.4 Samples of This Report vs. Samples of World Bank Reports

Classification		Number of Observations in the WB's 2012 Report	Number of Observations in the WB's 2017 Report	Number of Observations in this Report
Total Samples		81	55	375
Development stage	HICs	16, 19.8%	14, 25.5%	122, 32.8%
	UMICs	36, 44.4%	25, 45.5%	120, 32.5%
	LMICs	23, 28.4%	13, 23.6%	111, 29.6%
	LICs	4, 4.9%	2, 3.6%	22, 5.9%
Bank size	Mega	3, 3.7%	2, 3.6%	18, 4.8%
	Big	15, 18.5%	12, 21.8%	44, 11.7%
	Medium	19, 23.5%	17, 30.9%	103, 27.5%
	Small	36, 44.4%	18, 32.7%	192, 51.2%
Official mandate	General mandate	57, 70.4%	36, 65.5%	197, 52.5%
	Trade	7, 8.6%	7, 12.7%	41, 10.9%
	Agriculture and rural development	6, 7.4%	3, 5.5%	35, 9.3%
	SMEs and entrepreneurship	9, 11.1%	5, 9.0%	67, 17.9%
	Housing	1, 1.2%	1, 1.8%	21, 5.6%
	Infrastructure	0, 0.0%	2, 3.6%	6, 1.6%
	Local government	0, 0.0%	0, 0.0%	8, 2.1%

Note: In this table, "percentage" refers to the percentage of the number of observations in each category in total sample size in different reports. For example, 19.8 percent refers to the percentage of HIC samples in the total sample size of the WB's 2012 report. A few banks are not included in the total samples because their information on total assets is missing. For example, the number of observation about the bank size in the WB's 2012 report is 73, which is smaller than the total sample size of 81. In addition, a few banks in the WB's questionnaire-based reports are not included in the total sample, because they do not meet the qualification criteria for NDBs as proposed in this report. For example, DFCC Bank of Sri Lanka, which was in the WB's 2012 report, was commercialized in 2015. Therefore, this bank is no longer qualified as an NDB.

V. Stylized Facts on the Financing Structures of NDBs

■ 5.1 Internal vs. External Financing Structures

In this section, we elaborate on the empirical evidence on the level of internal financing as well as the weight of internal financing in the total funding of NDBs. We first explore whether there are significant differences in the level of internal financing by NDBs in terms of different development stages, bank sizes, and official mandates. Second, we compare the level of NDBs' internal financing with that of commercial banks. Finally, we analyze the weight of internal financing in NDBs' funding sources by using the percentage of internal financing in total assets.

Internal financing refers to the funding sources generated by an enterprise through its own operations and retained within the enterprise. Compared with external financing such as debt financing or equity financing, internal financing helps enterprises reduce funding costs and allows a certain degree of autonomy. However, internal financing is mainly a source from an enterprise's net income; hence, the scale of internal

financing is often relatively small compared with that of external financing.

In the analysis of internal financing, we can discuss it from two perspectives: First, how much of the bank's annual net income is allocated for internal use? Second, how much of the bank's current assets are accumulated by its income generated by its own operations? Therefore, we use the ratio of retained income/net income (flow) and retained earnings/total assets (stock) to carry out the analysis respectively.

In this report, we use retained income⁴ as a percentage of net income on average during the 2015–2019 period as the indicator of the level of internal financing. Retained income refers to the net income (after interest and taxes) remaining after dividends are deducted. The rationale for using this indicator is that we aim to examine the extent to which bank shareholders are willing to forgo dividends to support bank operations. We matched NDBs with banks in the Bankfocus database to obtain the financial data. Table 5.1 presents the descriptive statistics. It shows that the level of internal financing is relatively high regardless of different types of NDBs.

⁴ Retained income = net income – appropriation of legal surplus reserves - dividends, etc., so retained net income is a flow concept. The Nth year's retained earnings = The (N-1)th year's retained earnings + the Nth year's retained income, so retained earnings is a stock concept. We use retained income instead of retained earnings here due to the following two considerations: 1. What we try to measure here is how much of the bank's annual net income is allocated for internal use, so we focus on the discussion of flow rather than stock; 2. The retained net profit is more available in the database.

Table 5.1 Internal Financing of Different Types of NDBs

Classification		Number of Observations	Mean	Median	Standard Deviation	Min	Max
Total Samples		195	96%	100%	13%	32%	100%
Development stage	HICs	60	95%	100%	13%	34%	100%
	UMICs	73	96%	100%	15%	32%	100%
	LMICs	55	97%	100%	11%	40%	100%
	LICs	7	99%	100%	3%	92%	100%
Bank size	Mega	16	97%	100%	7%	75%	100%
	Big	37	95%	100%	12%	55%	100%
	Medium	70	96%	100%	15%	32%	100%
	Small	71	96%	100%	12%	34%	100%
Official mandate	General mandate	114	97%	100%	13%	32%	100%
	Trade	25	94%	100%	13%	56%	100%
	Agriculture and rural development	15	99%	100%	4%	85%	100%
	SMEs and entrepreneurship	25	92%	100%	16%	34%	100%
	Housing	10	96%	100%	11%	63%	100%
	Infrastructure	2	100%	100%	0%	100%	100%
	Local government	4	100%	100%	0%	100%	100%
Taking of household deposits	Take	73	96%	100%	10%	50%	100%
	Do not take	122	96%	100%	14%	32%	100%

We then further compare the differences in the level of internal financing between NDBs and commercial banks. Results are presented in Table 5.2. It shows the mean and median percentages of NDBs' internal financing reach 96 percent and 100 percent respectively. Furthermore, the level of NDBs' internal financing is far higher than that of commercial banks, which are 70 percent and 77 percent respectively.

Compared with commercial banks, NDBs are more likely to retain net income internally.

Further, as shown in Table 5.3, T-test indicates the level of internal financing is higher for NDBs than for commercial banks, which is statistically significant at the

Table 5.2 Comparison of the Level of Internal Financing Between NDBs and Commercial Banks

Type	Number of Observations	Mean	Median	Standard Deviation	Min	Max
NDB	195	96%	100%	13%	32%	100%
Commercial bank	6,993	70%	77%	30%	0%	100%

Table 5.3 T-Test of the Level of Internal Financing of NDBs and Commercial Banks

	NDB	Commercial Bank
Mean	96%	70%
Observation	195	6,993
Difference	26%***	
	(27.54)	

Note: The use of three asterisks (***) indicates statistical significance at the 1 percent level.

1 percent level. This means compared with commercial banks, NDBs are more likely to retain net income internally. In absolute terms, almost all the net income of NDBs is retained as internal financing. A first-cut analysis indicates such a difference may be attributed directly to the fact that the ownership structure of commercial banks is relatively dispersed compared to that of NDBs, hence demanding a high level of dividends. However, a deeper reason may be that commercial banks' shareholders are usually profit-driven and demand a high level of dividends, whereas governments, as NDBs' main shareholders, place greater emphasis on public policy objectives. Another fundamental reason might be that it is more challenging for NDBs than for commercial banks to mobilize external financing from market actors because NDBs primarily finance high-risk, long-term, and large-scale projects. As shareholders of NDBs,

governments are more willing to forgo dividends to enable NDBs to better fulfill their development-oriented mandates.

Furthermore, to evaluate the weight of internal financing in total funding of NDBs, we use the indicator of retained earnings as the percentage of total assets⁵. Table 5.4 presents the descriptive statistics of retained earnings as the percentage of total assets among different types of NDBs.

Internal financing accounts for only a small proportion of total funding and varies across different types of NDBs.

⁵ In order to measure the weight of internal financing in the NDBs' total funding, we use the stock variable here to calculate the proportion, that is, retained earnings rather than retained net income as the numerator. In the denominator, since data on off-balance sheet financing is not available, we take a second-best approach by using total assets to describe the total funding.

Table 5.4 Descriptive Statistics of Retained Earnings as Percentage of Total Assets

		Number of Observations	Mean	Median	Standard Deviation	Min	Max
Total Samples		189	4.60%	1.90%	10.47%	-21.30%	64.98%
Development stage	HICs	57	5.90%	2.40%	12.04%	-19.96%	64.98%
	UMICs	71	4.98%	1.88%	10.06%	-17.53%	41.06%
	LMICs	54	2.70%	1.43%	9.51%	-21.30%	31.29%
	LICs	7	3.87%	2.54%	8.59%	-9.88%	17.98%
Bank size	Mega	20	3.26%	2.11%	5.43%	-4.34%	15.25%
	Big	34	2.15%	1.26%	4.04%	-8.32%	13.82%
	Medium	70	4.24%	1.90%	11.14%	-19.96%	64.98%
	Small	69	5.90%	3.49%	11.87%	-21.30%	41.06%
Official mandate	General mandate	110	4.70%	2.11%	10.34%	-21.30%	64.98%
	Trade	24	2.00%	1.43%	8.82%	-20.37%	20.34%
	Agriculture and rural development	15	4.04%	2.41%	7.58%	-4.47%	27.45%
	SMEs and entrepreneurship	24	5.89%	2.04%	11.38%	-16.67%	29.32%
	Housing	11	7.74%	1.18%	17.68%	-13.32%	41.06%
	Infrastructure	2	3.79%	3.79%	1.33%	2.85%	4.73%
	Local government	3	0.94%	0.08%	2.72%	-1.25%	3.98%
Taking of household deposits	Take	71	2.17%	1.18%	8.30%	-21.30%	29.32%
	Do not take	118	6.00%	2.52%	11.42%	-20.37%	64.98%

Table 5.4 indicates internal financing accounts for only a small proportion of total funding and varies across different types of NDBs. The ratio runs as low as -21.3 percent⁶ and as high as 64.98 percent. Regarding development stages, NDBs from HICs and UMICs have a higher ratio of retained earnings to total assets

than those from LIMCs and LICs. In terms of bank size, internal financing plays a smaller role in mega and big NDBs than in medium and small-sized ones. One reason might be that large NDBs have more external funding sources available (such as bond issuances) than small NDBs. In terms of official mandates, NDBs with

⁶ If retained earnings are negative, then this means the NDB experiences losses.

Table 5.5 Ratio of NDBs' Total Liabilities to Total Assets

Classification		Number of Observations	Mean	Median	Standard Deviation	Min	Max
Total Samples		196	71%	80%	25%	1%	98%
Development stage	HICs	59	64%	80%	31%	1%	98%
	UMICs	74	76%	80%	19%	17%	98%
	LMICs	56	71%	80%	23%	3%	96%
	LICs	7	75%	88%	23%	31%	97%
Bank size	Mega	16	80%	89%	25%	13%	98%
	Big	36	79%	91%	7%	6%	98%
	Medium	71	71%	81%	24%	1%	97%
	Small	73	61%	66%	26%	3%	96%
Official mandate	General mandate	115	71%	80%	26%	1%	98%
	Trade	24	78%	84%	20%	23%	95%
	Agriculture and rural development	15	80%	84%	19%	17%	98%
	SMEs and entrepreneurship	25	67%	75%	27%	1%	94%
	Housing	11	66%	64%	25%	24%	95%
	Infrastructure	2	52%	52%	15%	37%	68%
	Local government	4	82%	96%	26%	37%	98%
Taking of household deposits	Take	73	81%	88%	17%	4%	98%
	Do not take	123	66%	76%	27%	1%	98%

the mandates of SMEs and entrepreneurship as well as housing financing rely more on internal financing than those with other mandates. Finally, NDBs that do not take household deposits depend more on internal financing than those that do, possibly because household savings deposits provide an alternative source of funding.

■ 5.2 Equity Financing vs. Debt Financing

In this section, we explore the differences in the financing structure of equity financing versus debt financing for different types of NDBs. We use the indicator of the ratio

of total liabilities to total assets to measure the extent to which NDBs rely on debt financing. Table 5.5 presents statistical results.

Table 5.5 shows the proportion of debt financing is significantly higher for mega and large-scale NDBs than for small and medium-sized NDBs. Moreover, NDBs located in HICs are more likely than those in LMICs to choose equity financing. The average debt financing level of NDBs with the mandate to finance SMEs and start-ups is lower than the average for the total sample. This could be due to the risk characteristics of their specific business (i.e., the business side of supporting SMEs and funding

start-ups is often characterized by short-cycle, high-risk, and high-return aspects). In this regard, equity financing matches the characteristics of start-up businesses on the asset side better than debt financing. Moreover, NDBs with a housing and infrastructure objective are more likely to take equity financing. However, we need further analysis to explore concrete explanations.

Table 5.6 shows commercial banks are more inclined than NDBs to undertake debt financing. One reason for this could be that NDBs' asset-side business has long-term, high-risk characteristics. These characteristics make it more difficult for NDBs to receive support from

Table 5.6 Comparison of Debt Financing (Ratio of Total Liabilities to Total Assets) Between NDBs and Commercial Banks

Bank Type	Number of Samples	Mean	Median	Standard Deviation	Min	Max
NDB	196	71%	81%	25%	1%	98%
Commercial bank	7,264	87%	89%	11%	0%	100%

Table 5.7 Comparison of Debt Financing Ratios of Household Deposit-Taking NDBs to Commercial Banks

	Proportion of NDBs' Debt Financing Through Households' Savings Deposits	Proportion of Commercial Bank Debt Financing
Mean	81%	87%
Observation	73	7,264
Difference		-6%***
		(-2.96)

Note: The use of three asterisks (***) indicates statistical significance at the 1 percent level.

debt financing; thus, NDBs rely more heavily on equity financing from the government.

Compared to commercial banks, NDBs rely more on equity financing and internal financing.

Furthermore, Table 5.7 demonstrates that commercial banks are still more likely to use debt financing than NDBs that take household deposits, although the debt financing level is higher for NDBs that take household deposits than for NDBs that do not (as shown in Table 5.5). This might be explained by the fact that although

NDBs accepting household deposits have an additional debt financing source on the liability side, they are still engaged in development finance, whereby the mission of promoting development makes them more dependent on government support for equity financing.

In summation, compared to commercial banks, NDBs rely more on equity financing and internal financing. There might be such factors as the mandate to address market failures, the long maturity of loans provided by NDBs, and the high uncertainty of projects financed by NDBs. To better match the characteristics of the asset side, NDBs also tend to prioritize long-term, patient equity financing and internal financing on the funding source side.

VI. Empirical Patterns on Main Funding Sources of NDBs

▪ 6.1 NDBs as “Bond Banks”

In this section, we present the stylized facts of bond-issuing NDBs and analyze the role of the government in NDBs’ efforts to mobilize financing from capital markets. Finally, we use a case study on China Development Bank (CDB) to illustrate the important role of NDBs in incubating the domestic bond market.

Although we tried to collect quantitative data, such as the percentage of bonds issued by NDBs in total financing and the cost and maturity of bond financing, our efforts turned out to be futile because of relatively limited data availability and low comparability across NDBs. Therefore, a detailed analysis of the abovementioned information is beyond the scope of this report. Going forward, we will aim to collect and analyze relevant data.

6.1.1 Bond Issuance

1. Characteristics of bond-issuing NDBs and their countries

Table 6.1 shows the bond issuance by NDBs. Overall, 45.33 percent of NDBs financed themselves through issuing bonds. According to the data from the WB’s 2012 survey, 89 percent of the NDBs confirmed raising funds from other financial institutions and capital markets. Most institutions need government approval to do so. This is particularly the case if the bond issuance requires a government guarantee (de Luna-Martínez et al., 2012). Moreover, 75 percent of the institutions in the WB’s 2017 survey managed to raise funds through bond issuance in their domestic capital markets, and 85 percent could raise funds in international capital markets (de Luna-Martínez et al., 2017).⁷

In this report, we collect the characteristics of NDBs and their home countries to analyze the diversity of bond-issuing NDBs.

(1) The country’s development stage. This report classifies countries into HICs, UMICs, LMICs, and LICs. A total of 122 NDBs are in HICs, of which 46.72 percent issue bonds; 120 NDBs are in UMICs, of which 55.83 percent issue bonds; 111 NDBs are in LMICs, of which

⁷ The fact that the percentage of bonds issued by NDBs in this report is lower than that in WB reports might be attributed to two factors. First, the percentage of small NDBs in the total samples of this report is larger (51.2 percent, compared to 38 percent in the WB reports), and small NDBs are less likely to issue bonds. Second, compared with the WB’s survey data, the original data sources used in this report include annual reports, financial reports, and official website information disclosed by NDBs, which means some NDBs might have issued bonds or received government guarantees without disclosing relevant information. This report’s statistical results might underestimate the number of NDBs that have issued bonds and received government guarantees.

37.84 percent issue bonds; and 22 NDBs are in LICs, of which 18.18 percent issue bonds. The comparison shows NDBs in HICs are generally more likely to finance their operations through bond issuance.

NDBs in HICs are generally more likely to finance their operations through bond issuance.

(2) Bank size. The sample in this report includes 18 megabanks, of which 100 percent issue bonds; 44 large banks, of which 79.55 percent issue bonds; 103 medium-sized banks, of which 56.31 percent issue bonds; and 192 small banks, of which 27.60 percent issue bonds. In general, the larger the NDB is, the more likely it is to issue bonds.

The larger the NDB is, the more likely it is to issue bonds.

(3) Official mandate. This report divides the NDB's mandate into the general mandate and single mandate including trade, agriculture and rural development, SMEs and entrepreneurship, housing, infrastructure, and local government. For 198 NDBs with general mandates, 49.49 percent issue bonds; 41 NDBs promote trade, with 53.66 percent issuing bonds; 34 NDBs support agriculture and rural development, of which 29.41 percent issue bonds; 67 NDBs support SMEs and entrepreneurship, of which 25.37 percent issue bonds; 21 NDBs support housing, of which 71.43 percent issue bonds; 6 NDBs have a mandate to build infrastructure, of which 33.33 percent issue bonds; and 8 NDBs support local government financing, of which 75 percent issue bonds. In sum, the probability of bond issuance varies significantly across NDBs with different mandates. The rationale behind this

phenomenon is worth further study. With other factors controlled, NDBs will have more difficulty securing financial support from capital markets when they need to deploy loans with higher risks, tougher cash flow recovery, and longer loan maturity to address certain market failures.

The probability of bond issuance varies significantly across NDBs with different mandates.

(4) Degree of capital market deepening. This report uses the “corporate bond issuance as a percentage of GDP” indicator from the WB's Global Financial Development Database to measure the degree of bond market deepening in the countries where NDBs are located.⁸ In this report, we classify the ratio of corporate bond issuance to GDP into three tertiles. Those in the upper tertile are defined as countries with a high degree of capital market deepening; those between the upper and lower tertiles are defined as countries with medium capital market deepening; and those in the lower tertile are defined as countries with low capital market deepening.

The deeper the country's bond market, the more likely the NDB will finance its operations through bond issuance.

In the sample, there are 125 NDBs with high capital market depth, of which 57.60 percent issue bonds; 77 NDBs with moderate capital market depth, of which 54.55 percent issue bonds; and 173 NDBs with low capital market depth, of which 32.36 percent issue bonds. The comparison shows that the deeper the country's bond market, the more likely the NDB will finance its operations through bond issuance.

⁸ It should be noted that in the WB's Global Financial Development Database, the data on this indicator are missing for a large number of countries, mainly because those countries may not have a corporate bond market. Hence, the missing value is replaced with zero in this report.

Table 6.1 Statistics of Bond Issuance of NDBs

Classification		Number of Observations	NDBs That Issue Bonds	
			Number	Percentage
Total Samples		375	170	45.33%
Development stage	HICs	122	57	46.72%
	UMICs	120	67	55.83%
	LMICs	111	42	37.84%
	LICs	22	4	18.18%
Bank size	Mega	18	18	100.00%
	Large	44	35	79.55%
	Medium	103	58	56.31%
	Small	192	53	27.60%
	Unknown	18	6	33.33%
Official mandate	General mandate	198	98	49.49%
	Trade	41	22	53.66%
	Agriculture and rural development	34	10	29.41%
	SMEs and entrepreneurship	67	17	25.37%
	Housing	21	15	71.43%
	Infrastructure	6	2	33.33%
	Local government	8	6	75.00%
Capital market deepening	High	125	72	57.60%
	Medium	77	42	54.55%
	Low	173	56	32.36%

Note: In the table above, “percentage” refers to the number of NDBs that issue bonds divided by the corresponding total number of observations in each subcategory.

6.1.2 Location of Bond Issuance

NDBs issue bonds in either their domestic capital markets or international capital markets. The results show that among NDBs issuing bonds that have information on locations of bond issuance, 69 issue bonds in the domestic market; 51 issue bonds in foreign markets, and

44 issue bonds in both domestic and foreign markets.

NDBs issue bonds in either their domestic capital markets or international capital markets.

Box 1: KfW Financed Through International Capital Markets

KfW is one of the most typical DFIs that mobilize financing in international capital markets. KfW is refinanced primarily through bonds issued on international capital markets, which makes the bank one of the largest and most active bond issuers in Europe. Bonds issued by KfW are far more than other European DFIs. These bonds are popular on international capital markets because they are diverse in type, inclusive in currency, and highly international. In 2019 alone, KfW issued 157 bonds in 12 currencies, with a total volume of EUR 80.6 billion to international institutional investors.⁹ The currency mix of KfW's bonds is quite diverse and includes the euro, the US dollar, the Australian dollar, and the Japanese yen. The bank also offers a diverse set of products with different maturities and yields-to-maturity for a variety of client groups. KfW's bonds are divided into four categories: benchmark program bonds, green bonds, other public bonds, and private placement bonds. Figure 6.1 shows the composition of the bank's 2019 bond issuances¹⁰.

(1) Benchmark program bonds are the most important part of its fundraising mechanism strategy. These are

KfW's most conventional bonds, which are mainly issued in euros and US dollars. Benchmark bonds represent a large issuance share, accounting for about half of the bank's total bond issuance. However, the share of this bond type declined in 2019 because of an increased issuance of green bonds. Benchmark bonds are available in three, five, and seven years of maturity.

(2) Green bonds are intended to offer investors the possibility to invest in climate protection, and they serve as an incentive to invest in environmental protection initiatives. In 2019, KfW issued 10 green bonds in seven currencies, of an equivalent value of EUR 8.1 billion. This represents a significant increase compared to the previous year (EUR 1.6 billion in 2018). By the end of 2019, KfW issued a total portfolio of approximately EUR 22.6 billion, making KfW the largest issuer of green bonds in Germany by far and one of the largest green bond issuers in the world. As of June 30, 2020, 48 percent of KfW's green bonds were issued in euros, while 28 percent were issued in US dollars.

⁹ Source: "KfW 2019 Annual Report," KfW, accessed August 22, 2020, https://www.kfw.de/PDF/Download-Center/Finanzpublikationen/PDF-Dokumente-Berichte-etc/3_Finanzberichte/Financial-Report_2019_EN_barrierefrei.pdf, 69.

¹⁰ Source: "Investor Presentation, KfW, accessed August 22, 2020, <https://www.kfw.de/KfW-Group/Investor-Relations/Investor-Relations-Responsive-Startseite.html>, 26, 30, and 31.

(3) KfW offers other public bonds. Besides benchmark bonds, there are bonds targeted mainly to smaller bond markets, such as the British sterling pound, Australian dollar, Canadian dollar, Norwegian krone, Japanese yen, and Swedish krona. These bond types are issued in complementary currencies (to the euro and US dollar) in different capital markets. These types of bonds' clients are

generally institutional and retail investors as well as local investors.

(4) Private placement bonds are customized products tailored to each investor's needs and are usually flexible. KfW's private placement bonds' investors are widely diverse across currencies and structures, mostly in the form of medium-term bonds.

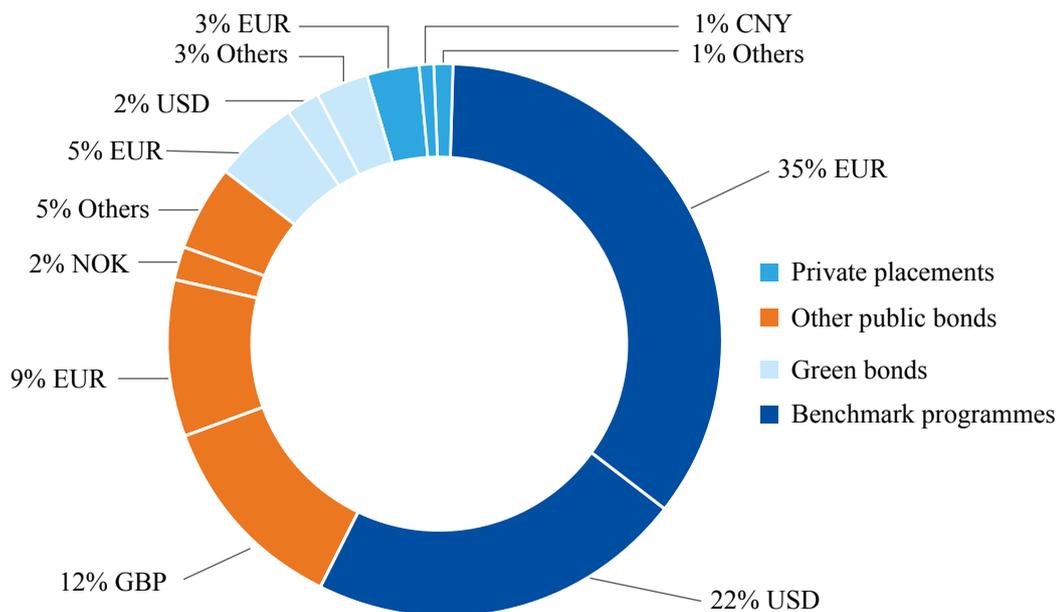


Figure 6.1 Composition of KfW's Bond Issuance

6.1.3 The Role of the Government in Supporting NDBs to Issue Bonds

Because NDBs are usually required to provide long-term funding for public projects, they require access to adequate amounts of low-cost, long-term funding. However, short-term funding, such as deposits from households, cannot fully meet NDBs' funding needs. Conversely, the maturity of bonds is more flexible; long-term bonds may have maturities of several decades or

longer, and these can meet the NDBs' long-term financing needs and mitigate the risk of maturity mismatch. The projects supported by NDBs are generally characterized by long lead times, large capital requirements, and high risks, yet they have positive developmental impact. Because commercial financial institutions or capital markets are unwilling to provide financial support for the abovementioned projects under market economy conditions, NDBs are often unable to effectively issue bonds on their own. Thus, the government plays a crucial

role in NDBs' bond issuance by providing sovereign creditworthiness support through various means. In this way, the bonds issued by NDBs are comparable to "government bonds" or "quasi-government bonds," consequently increasing their competitiveness in capital markets and reducing borrowing costs. Therefore, the synergy between funding sources from market actors and credit guarantees from governments (the "market" plus "government" model) ensures that NDB can mobilize sufficient funding.

The government plays a crucial role in NDBs' bond issuance by providing sovereign creditworthiness support through various means. In this way, the bonds issued by NDBs are comparable to "government bonds" or "quasi-government bonds", consequently increasing their competitiveness in capital markets and reducing borrowing costs.

Table 6.2 reports the statistics of explicit government guarantees to bonds issued by NDBs based on public information. Generally, 40 percent of NDBs issue bonds explicitly guaranteed by the government, of which 28.24 percent are fully guaranteed and 11.76 percent partially guaranteed. According to the WB's 2012 survey report, 64 percent of NDBs received government support in the form of bond guarantees. But the WB reports failed to classify government guarantees. As the present report focuses on explicit guarantees, the results of this report are slightly lower than those of WB reports. Then we analyze the data showing that different types of national development banks enjoy explicit government guarantees. Regarding development stage, nearly 60 percent of HIC governments provide guarantees to bonds issued by NDBs, whereas less than 30 percent of LMIC or UMIC governments provide guarantees to NDB-issued bonds. Regarding bank size, NDBs guaranteed by government are larger sized. Regarding mandate, NDBs dedicated to financing local governments have easier

access to government guarantees. Regarding the degree of capital market deepening, government guarantees do not vary significantly among countries with different degrees of capital market deepening.

KfW Germany is one of the most representative cases in which the government provides explicit guarantees. KfW's funding mechanism is market-based (i.e., the market determines the price and quantity of funds). In this funding process, the German government's role is to provide guarantees. KfW was legally established in 1948 and began operations in 1949. At that time, KfW had a share capital of 1 million German marks, half of which the governments of the Economic Joint Occupation Zone (later the Federal Republic of Germany) and the German states provided. From 1958 onward, KfW's domestic focus shifted from primary industries to manufacturing, trade, and commerce. In terms of funding, the bank borrowed from capital markets for the first time in 1949 (Grünbacher, 2004). On September 15, 1949, KfW made its first bond issuance in the German domestic market.

KfW Germany is one of the most representative cases in which the government provides explicit guarantees.

At that time, KfW's board of directors discussed the issuance of two bond types: mortgage bonds with a 3.5 percent interest rate and general bonds with a 5.5 percent interest rate. To attract potential purchasers, the 3.5 percent mortgage bond was tax exempt, and the 5.5 percent bond was tax deductible. Furthermore, the government guaranteed the interest on these two bonds, which enabled their transformation into government bonds. Despite all the concessions, the subscriptions to these bonds were ultimately unsatisfactory. Only 8 million marks of housing bonds could be placed until the end of 1949. KfW's first bond issuance fell short of expectations, because the German capital market was not sufficiently mature (Chen, 2016). KfW started to refinance its debt through international capital markets in

Table 6.2 Statistics of Government Guarantees to Bonds Issued by NDBs

Classification		NDBs That Issue Bonds	Full Guarantee		Partial Guarantee		Full & Partial Guarantee	
			Number	Percentage	Number	Percentage	Number	Percentage
Total Samples		170	48	28.24%	20	11.76%	68	40.00%
Development stage	HICs	57	26	45.61%	8	14.04%	40	59.65%
	UMICs	67	13	19.40%	7	10.45%	33	29.85%
	LMICs	42	7	16.67%	5	11.90%	19	28.57%
	LICs	4	2	50.00%	0	0.00%	2	50.00%
Bank size	Mega	18	4	22.22%	9	50.00%	13	72.22%
	Large	35	17	48.57%	3	8.57%	26	57.14%
	Medium	58	16	27.59%	9	15.52%	35	43.10%
	Small	53	9	16.98%	3	5.66%	18	22.64%
	Unknown	6	2	33.33%	0	0.00%	2	33.33%
Official mandate	General mandate	98	31	31.63%	12	12.24%	58	43.88%
	Trade	22	5	22.73%	4	18.18%	14	40.91%
	Agriculture and rural development	10	1	10.00%	0	0.00%	2	10.00%
	SMEs and entrepreneurship	17	2	11.76%	3	17.65%	10	29.41%
	Housing	15	5	33.33%	1	6.67%	6	40.00%
	Infrastructure	2	0	0.00%	0	0.00%	0	0.00%
	Local government	6	4	66.67%	0	0.00%	4	66.67%
Capital market deepening	High	42	15	35.71%	3	7.14%	27	42.86%
	Medium	43	9	20.93%	9	20.93%	27	41.86%
	Low	29	11	37.93%	3	10.34%	18	48.28%

Note: In the table above, “percentage” refers to the number of NDBs receiving guarantees divided by the total number of samples.

1985 (Chen, 2016). Since then, bond markets have become increasingly important for KfW. For example, bond issuance constituted 99 percent of KfW’s total funding sources in 2019.¹¹ Table 6.3 summarizes the evolution of KfW’s main operations and funding sources.

Table 6.3 Changes in KfW’s Main Operations and Funding Sources

Date	Main Business	Main Financing Source
1950s	Energy industry, West German housing reconstruction	European Recovery Plan funding
1960s	Manufacturing, overseas development business, export credit business	European Recovery Plan funding
1970s	SMEs, manufacturing, overseas development business, export credit operations	European Recovery Plan funding, overseas capital markets
1980s	SMEs, manufacturing, overseas development business, export credit operations	Overseas capital markets
1990s	SMEs, manufacturing, overseas development business, export credit operations, East German housing reconstruction	Overseas capital markets
2000–present	SMEs, manufacturing, overseas development business, export credit operations, housing renovation and development	Overseas capital markets

Source: Chen, “KfW’s Overseas Investment and Financing Experience and Insights,” *Overseas Investment and Export Credit*, no. 6 (2016): 25–31.

KfW is able to issue bonds through explicit and direct guarantees by the Federal Republic of Germany. The KfW Act explicitly states the following: “*The Federal Republic guarantees all obligations of KfW in respect of loans extended to and debt securities issued by KfW, fixed forward transactions or options entered into by KfW and other credits extended to KfW as well as credits extended to third parties inasmuch as they are expressly*

guaranteed by KfW.” Thanks to German state support, international rating agencies have rated KfW’s bonds as high as German government bonds. *Global Finance* magazine recognized the KfW as “the world’s safest bank” for the eleventh time since 2009. Such a high rating keeps KfW’s bonds attractive on the market. For investors, KfW bonds are considered safe and worth holding as long-term investments.

¹¹ Source: “Investor Presentation,” KfW, accessed August 22, 2020, <https://www.kfw.de/KfW-Group/Investor-Relations/Investor-Relations-Responsive-Startseite.html>, 22.

CDB is also a DFI primarily financed through bond issuance. However, unlike KfW which received explicit guarantees by national legislation, CDB did not benefit from explicit guarantees by the Chinese government. The Capital Adequacy Management Measures for Commercial Banks, issued by the China Banking Regulatory Commission (CBRC)¹² in 2004, stipulates that policy bank bonds enjoy a zero-risk weight when commercial banks purchase these policy bank bonds. This regulation incentivizes commercial banks to buy CDB bonds because these are considered low-risk, long-term assets. However, as CDB embarked on the commercialization reform in 2008, the demand for CDB bonds in the Chinese interbank market has declined sharply in the face of the potential loss of sovereign creditworthiness support for the CDB (Ba, 2010; Chen, 2018). To deepen the reform of CDB and to bolster development finance in China, the CBRC launched the CDB's Debt and Creditworthiness Regulation Policy in June 2015. This new policy specified that CDB bonds purchased by financial institutions are treated as claims on policy banks, with a zero-risk weight. Since its enactment, CDB's Debt and Creditworthiness Regulation Policy has been implemented smoothly. In addition, the CBRC clarified that CDB's debt and creditworthiness policy is long term and stable with no maturity date, which reflects the principle of continued state credit support to CDB. At the same time, this creditworthiness policy applies to CDB's RMB and foreign currency financial bonds. The market demand for CDB bonds significantly fluctuated during the bank's

commercialization reform, and this variation provides evidence that bonds issued by DFIs are based on the support of sovereign creditworthiness. Therefore, DFIs cannot abandon government support and rely entirely on market-based fundraising strategies.

Moreover, because many NDBs are fully owned by governments or governments are their majority shareholders, the markets expect that governments will provide support when necessary. This implies an "implicit guarantee," which allows NDBs to raise funds smoothly through bond issuance on the capital markets.

6.1.4 Bond Issuance and Bond Market Development by NDBs: The Case of CDB

As analyzed earlier, relying on sovereign creditworthiness to issue bonds is an important source of large-scale, long-term, and low-cost financing for NDBs. However, the paradox is that in the early stages of development, capital markets are underdeveloped, and sovereign creditworthiness is low or has not been rated (especially in LICs). In the early stages of development, how can NDBs incubate their capital markets by relying on sovereign creditworthiness to issue bonds, thereby ensuring a stable funding source? Through the case study of CDB in market-based bond issuance, we provide evidence on the joint development of NDBs and bond markets.

¹² In 2018, the CBRC and China Insurance Regulatory Commission were consolidated to form China Banking and Insurance Regulatory Commission.

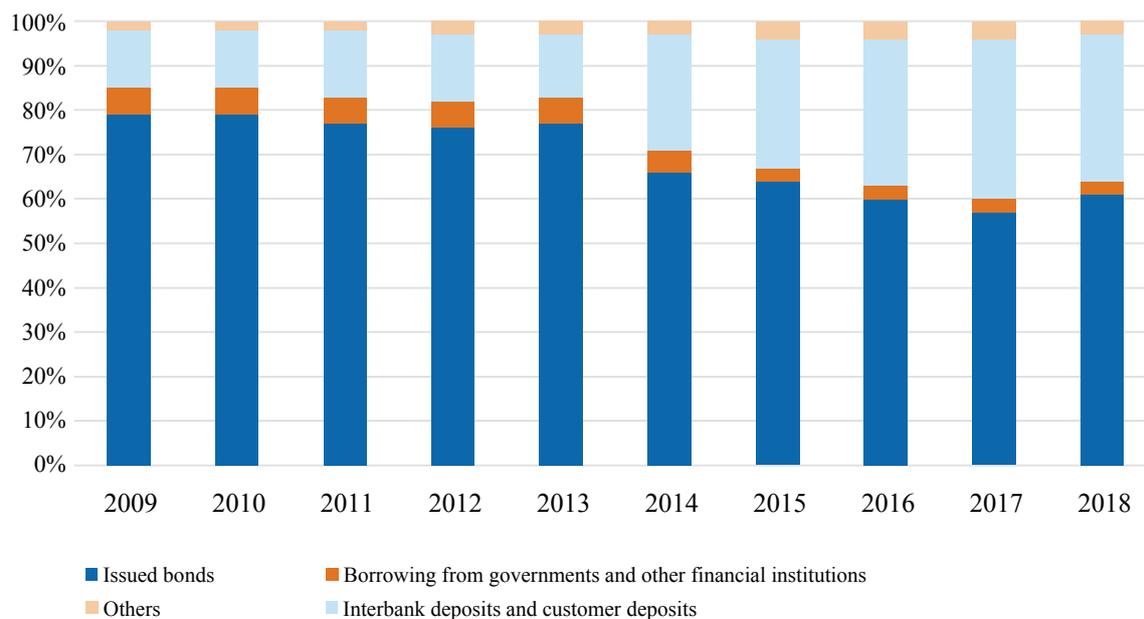
Box 2: CDB's Incubation of China's Interbank Bond Market

1. CDB as a “bond bank”

Since its establishment in 1994, CDB has grown gradually to become the world's largest DFI. As an NDB, its goal is to meet financing needs to promote economic and social development of China. In particular, CDB focuses on providing financial support for various policies and development projects, often with low financial returns, long completion cycles, and urgent financing needs in line with China's national development needs. To achieve these goals, CDB mainly relies on the issuance of bonds in the interbank bond market to raise funds. In this sense, from the perspective of funding sources, CDB can be considered a “bond bank.”

At its current stage, CDB still uses bonds as its primary fundraising mechanism. According to CDB's annual report, the bank relies on four main funding sources: (1) issuing bonds in the interbank bond market; (2) borrowing from the government and other

financial institutions; (3) receiving deposits from counterparts and other financial institutions; and (4) obtaining other sources, such as corporate deposits. Figure 6.2 shows the issuance of bonds has always been the most important source of funding for CDB. In 2013 and earlier, CDB's bonds accounted for more than 70 percent of its overall funding sources. Although the proportion of bonds has declined since 2014, CDB currently uses this channel to raise about 60 percent of its total funding. Hence, CDB is known as a bond bank. By contrast, other channels, such as central bank's pledged supplementary lending and fiscal transfers, which include borrowing from the government and other financial institutions, supplement CDB's funding sources. Furthermore, the share of interbank and customer deposits has increased in recent years, having now reached about one-third of its total financing structure. However, in the short term, a large gap remains between the share of interbank deposits and that of debt financing.



Source: “China Development Bank Annual Report,” 2009–2018.

Figure 6.2 Structure of CDB's Funding Sources (in percentages)

2. CDB's market-oriented bond issuance and the incubation of China's interbank bond market

CDB did not issue bonds on a market basis immediately upon its establishment. During the first years after the bank was established (1994–1998), CDB's main fundraising mechanism was through the “administrative issuance of bonds.” That is, CDB's debt-financing mechanism mainly relied on directive purchase orders. CDB also relied on a supplementary funding source through China's central bank. Although the administrative issuance of bonds ensured the developing policy bank's initial operations, these bonds presented significant shortcomings, namely price distortion,¹³ poor liquidity,¹⁴ or the limitation of being “one of a kind.” Without a central bank directive plan, CDB bonds could not be sold; thus, the bank could not effectively meet its capital needs (CDB and Renmin University of China, 2007).

During this period, the People's Bank of China (PBC) was under considerable pressure of inflation. China's monetary policy began to shift from direct to indirect regulation to promote the reform of the Chinese financial and investment system. Achieving this transformation requires improving policy banks' funding and operation management mechanism as well as building a relatively mature bond market

with a specific scale. Similarly, commercial banks that were withdrawn recently from the stock market had to search for new investment opportunities and channels.¹⁵

Under joint efforts by the CDB, the central bank, and commercial banks, CDB started issuing bonds via the market-based means in 1998. This embarked on a journey where CDB's bond issuance and China's interbank bond market development are growing together. That is, while meeting its own capital needs, the CDB also incubated and nurtured the Chinese interbank bond market. This can be seen in three primary areas:

First, CDB is the earliest and most important participant in China's interbank bond market. In 1998, CDB began to experiment with the issuance of market-oriented bonds, which was practically simultaneous with the establishment of China's interbank bond market. CDB is the second bond issuer in China's interbank bond market, directly after the Ministry of Finance of the People's Republic of China. Figure 6.3 details the composition of bond issuers in China's interbank market. On the one hand, the structural changes in the interbank bond market are outstanding. With the increasing diversification of China's economy, all types of entities are involved

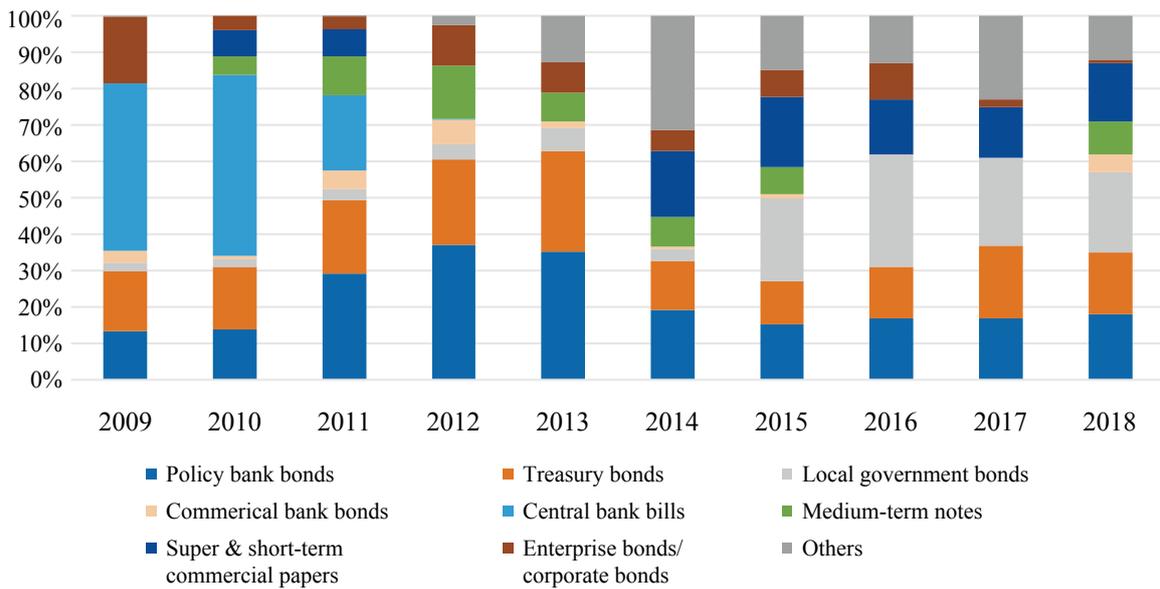
¹³ In 1994, three-year CDB financial bonds were issued at an interest rate of 12.5 percent, five-year bonds at 14 percent, and eight-year bonds at 14.5 percent—seemingly not a low coupon rate. However, the inflation rate at the time was more than 10 percent, and the yield on government bonds that were sold directly to the public could reach 22 percent (the coupon rate combined with the Ministry of Finance's hedging subsidies).

¹⁴ For commercial banks, the impossibility of trading and the absence of any liquidity made it difficult to relieve the liquidity risk for investors of financial debt distribution; this made the bond essentially a loan, despite being named a bond.

¹⁵ In 1997, to prevent the influx of credit funds into the stock market, the PBC issued the Notice on the Cessation of Securities Repurchase and Spot Trading by Commercial Banks in the Stock Exchange. After that, commercial banks withdrew from the Shanghai Stock Exchange and the Shenzhen Stock Exchange bond markets. In the first half of 1997, a large amount of funds from commercial banks flowed into the stock market through the repurchase of bonds in the stock exchange, causing the stock market to overheat. In June of the same year, on the basis of the China Foreign Exchange Trading Center, the State Council approved the establishment of a national interbank bond market, thus separating China's bond market from the stock market. In 2009, the China Securities Regulatory Commission and the CBRC jointly issued the Notice on Pilot Issues Concerning the Participation of Listed Commercial Banks in Bond Trading in Stock Exchanges, making it clear that 14 listed commercial banks, after CBRC approval, could apply to the stock exchange to engage in bond trading.

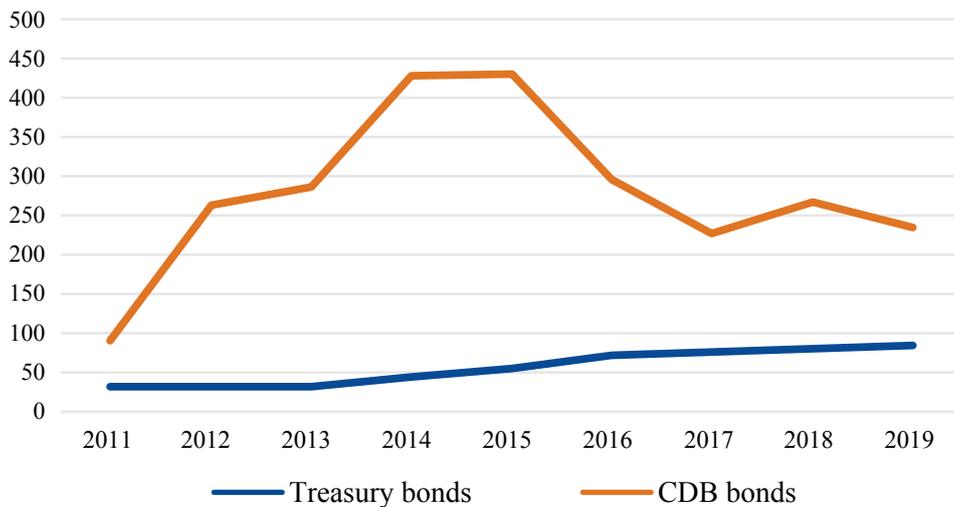
in the bond issuance process, which provides more diverse and more market-oriented options for government agencies and corporations to raise funds and obtain funding. On the other hand, policy banks (including CDB, Exim Bank of China, and Agricultural Development Bank of China) have

maintained a highly stable share in the interbank bond market. For many years, these have been the interbank market’s primary bond issuers. Thus, as exemplified by CDB’s case, policy banks will continue to be an important presence in the interbank bond market for a considerable period.



Source: China Central Depository & Clearing Co. Ltd. “Bond Market Statistical Analysis Report/Bond Market Overview,” 2009–2018.

Figure 6.3 Composition of Issuers in China’s Interbank Bond Market



Source: Ministry of Finance, “State Bond Issuance Plan, 2011–2020,” CDB Annual Report, 2011–2018.

Figure 6.4 Number of Issuances of CDB Bonds and Treasury Bonds

Second, CDB bonds have a substantial impact on market pricing and risk management. The gradual expansion of CDB's business areas, alongside rapid growth in the scale of bond issuance, and CDB's strong bond underwriting capability enabled the launch of various bond products. This specific policy bank bond system provided a highly effective financial tool for China to stabilize market interest rates. Compared with government bonds, which are more stable in terms of maturity and form, the issuance of CDB bonds is highly flexible, especially in terms of their issuance frequency. Figure 6.4 records the number of book-entry treasury bonds issued and the number of bonds issued by CDB from 2011 to 2020. As the table shows, the number of CDB bond issuances has become several times higher than the number of treasury bonds over the years. As a result, the coupon rate of CDB bonds have become the anchor rate. Therefore, issuing CDB bonds in the bond market is a convenient and feasible means of monetary policy adjustment. In short, CDB's explicit status as a DFI and certainty of sovereign creditworthiness backing have enabled CDB bonds to be characterized with low risk

and high stability. Therefore, we expect the high-frequency issuance of CDB bonds can help stabilize market expectations in the short term, reduce interest rate fluctuation, and act as an "interest rate anchor" in the Chinese market.

Moreover, the CDB is an active player in RMB interest rate exchange transactions. CDB is the leading lender (reverse repurchase party) of pledged bond repo transactions and provides funding to its counterparties (mainly banks). That is, CDB likewise plays a significant role in risk management for China's interbank bond market.

Third, CDB is a pioneer in interbank bond market innovation. Its bond issuances have taken various forms since its establishment: from the early floating-rate bonds, and option bonds, to recently the first credit asset-backed securities, and the first US dollar-issued bond, and to the original blanket key term benchmark bonds. All these are major CDB products and fundraising innovations that together have promoted and contributed to the development of the Chinese interbank bond market.

■ 6.2 Funds from Governments and Central Banks

In this section, we present the stylized facts of NDBs' funding sources from governments and central banks. We also analyze how the government, in addition to providing share capital, helps NDBs raise funds. While this report focuses on samples with available data below, it is worth noting that accounting standards do not usually require the disclosure of funds from

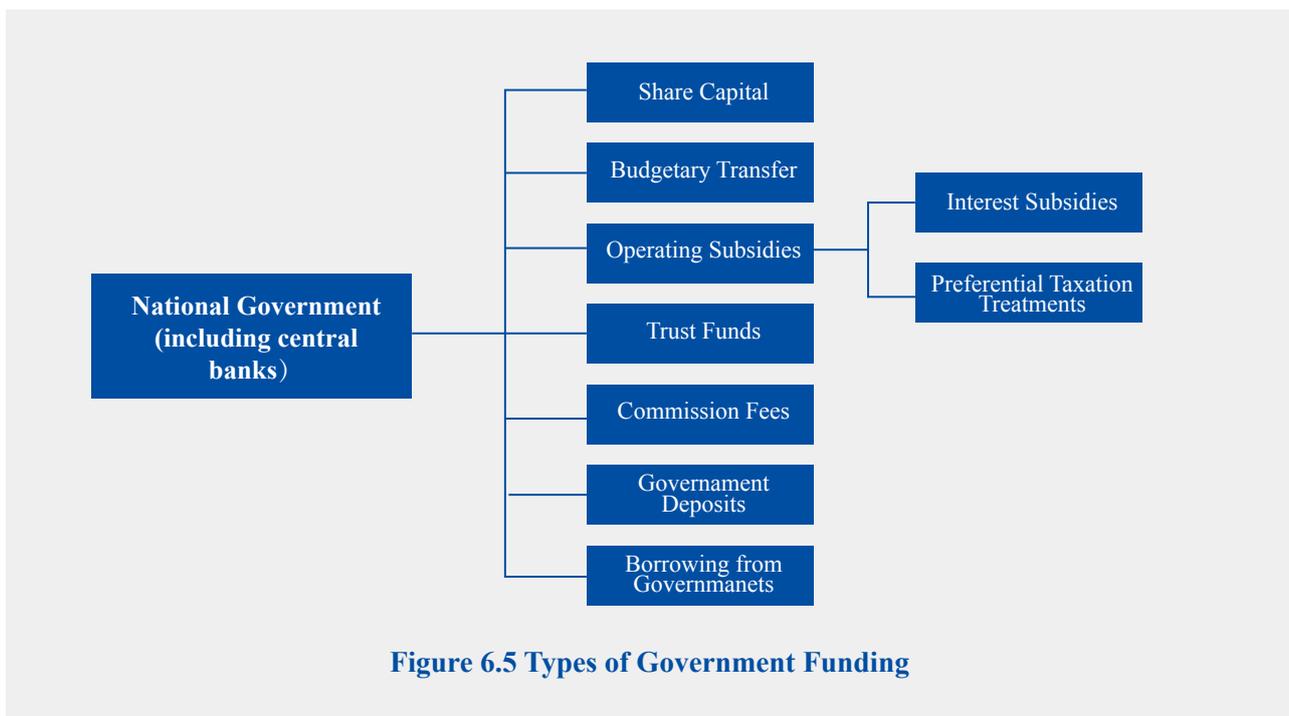
governments. Therefore, even if an NDB does not disclose the information of funding from governments, then this does not necessarily mean the NDB does not receive such funding in practice.

6.2.1 Typology of Government Funding

Because NDBs aim to serve national strategies and implement public policies rather than maximizing profits, profit-driven financial institutions are unwilling or unable to finance development projects with long implementation

cycles, high capital requirements, and low returns. As a result, the government usually provides NDBs with various means of financial support to enable them to fulfill their development-oriented goals. We classify government support to NDBs into the categories shown in Figure 6.5. The following sections of this report focuses on the collection of data on the establishment of funds, government subsidies, and service fees, and provide examples of the central bank's support to NDBs. In addition, government deposits or loans for NDBs are also one of the types of funding that NDBs receive from the government. For example, the Development Bank of Japan receives a significant portion of its annual funding from Fiscal Investment Loan Program (FILP) funds (Chen, 2017).

Because NDBs aim to serve national strategies and implement public policies rather than maximizing profits, profit-driven financial institutions are unwilling or unable to finance development projects with long implementation cycles, high capital requirements, and low returns. As a result, the government usually provides NDBs with various means of financial support to enable them to fulfill their development-oriented goals.



6.2.2 Establishment of Funds

1. Types of funds

There are two main types of government funding mechanisms through NDBs. The first type is through the establishment of trust funds commissioned by governments for certain purposes, whereby NDBs manage funds on behalf of governments. In this case,

NDBs are not responsible for the fund's profit or loss. The second type is that governments provide NDBs with funds earmarked for certain purposes in which NDBs bear credit risks. Table 6.4 summarizes the stylized facts of the two types of funds that NDBs receive from governments. Among 375 NDBs worldwide, 8.80 percent of the NDBs reported that they receive trust funds (Type 1 trust funds), and 7.47 percent reported they obtain

earmarked funds where they themselves bear risks (Type 2 risk-bearing funds).

In addition, we identify empirical patterns across NDBs along the analytical dimensions of development stage, bank size, and official mandate. It shows that NDBs from HICs are more likely to establish funds. Moreover,

megabanks are more likely to administer government-commissioned trust funds. Generally, NDBs with general mandates are more likely to undertake Type 1 trust funds; the reason might be that governments can earmark funds for specific purposes. Other single mandate-oriented NDBs tend to establish Type 2 risk-bearing funds.

Table 6.4 Funds from Governments

Classification		Number of Observations	Trust Funds		Risk-Bearing Funds	
			Number	Percentage	Number	Percentage
Total Samples		375	33	8.80%	28	7.47%
Development stage	HICs	122	13	10.66%	13	10.66%
	UMICs	120	9	7.50%	4	3.33%
	LMICs	111	10	9.01%	9	8.11%
	LICs	22	1	4.55%	2	9.09%
Bank size	Mega	18	6	33.33%	2	11.11%
	Big	44	4	9.09%	3	6.82%
	Medium	103	5	4.85%	4	3.88%
	Small	192	10	5.21%	9	4.69%
	Unknown	18	8	44.44%	10	55.56%
Official mandate	General mandate	198	27	13.64%	17	8.59%
	Trade	41	1	2.44%	3	7.32%
	Agriculture and rural development	34	0	0.00%	3	8.82%
	SMEs and entrepreneurship	67	5	7.46%	4	5.97%
	Housing	21	0	0.00%	1	4.76%
	Infrastructure	6	0	0.00%	0	0.00%
	Local government	8	0	0.00%	0	0.00%

Note: In the table above, “percentage” refers to the number of NDBs taking trust funds or risk-bearing funds as funding sources divided by the number of total samples or samples in each subcategory.

2. Areas supported by funds

Figure 6.6 shows the areas supported by government funds. About 40 percent of funds do not exclusively support a single area; rather, they support multiple areas concurrently. However, NDBs also set up funds earmarked for certain purposes, such as SMEs, agriculture, trade, and sustainable development.

Apart from establishing funds for multiple purposes, NDBs also earmark funds for a specific purpose such as agriculture and SMEs.

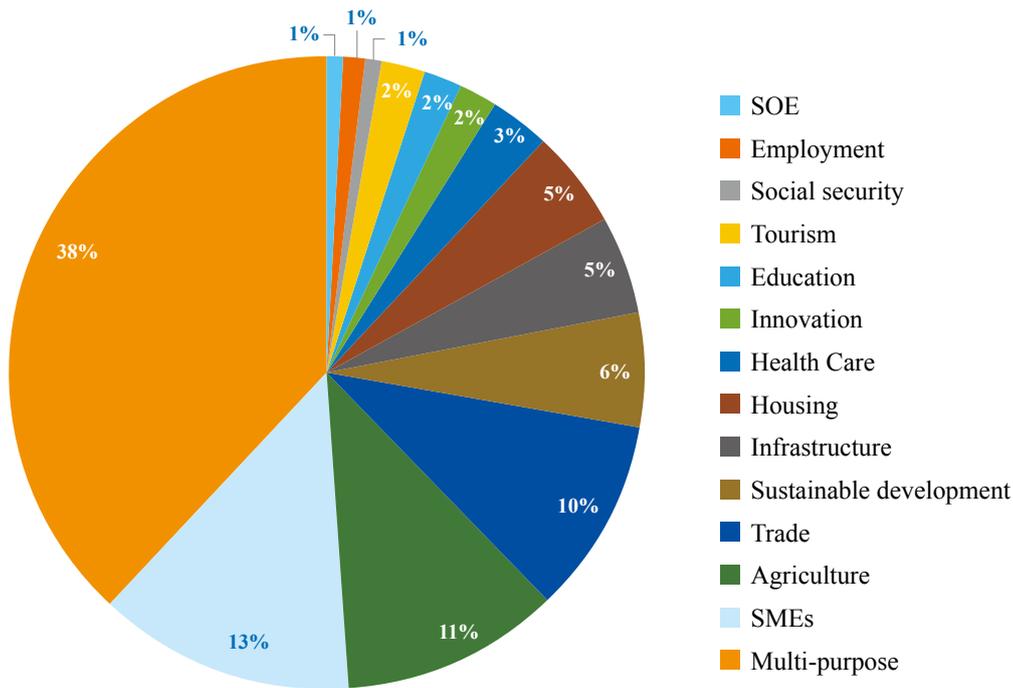


Figure 6.6 Areas Supported by Funds

6.2.3 Government Subsidies

1. General information on government subsidies

Government subsidies are an important type of government support for NDBs. The projects undertaken by NDBs are generally those to which market-based financial institutions are reluctant to provide credit

support; these projects generally have long maturity, high capital requirements, and low returns on assets. Almost all types of funding that NDBs receive are more or less backed by the government in one form or the other. Therefore, government subsidies in a broad sense can be defined as the various ways in which the government supports the financing of NDBs, including direct and

indirect subsidies. In this section, we mainly analyze the direct subsidies that the government renders to NDBs in the form of money.

Government subsidies are an important type of government support for NDBs.

Table 6.5 shows the stylized facts of NDBs receiving

government subsidies, in which 12.80 percent reported that they have received government subsidies. For those that receive subsidies from governments, NDBs from HICs, mega-NDBs, and NDBs promoting trade are more likely to receive government subsidies.

2. Interest subsidies

Interest subsidies are an important type of government subsidy, and the government usually provides NDBs

Table 6.5 Government Subsidies to NDBs

Classification		Number of Observations	Access to Government Subsidies	
			Number	Percentage
Total Samples		375	48	12.80%
Development stage	HICs	122	20	16.39%
	UMICs	120	18	15.00%
	LMICs	111	8	7.21%
	LICs	22	2	9.09%
Bank size	Mega	18	5	27.78%
	Big	44	5	11.36%
	Medium	103	12	11.65%
	Small	192	14	7.29%
	Unknown	18	12	66.67%
Official mandate	General mandate	198	31	15.66%
	Trade	41	10	24.39%
	Agriculture and rural development	34	2	5.88%
	SMEs and entrepreneurship	67	2	2.99%
	Housing	21	3	14.29%
	Infrastructure	6	0	0.00%
	Local government	8	0	0.00%

Note: In the table above, “percentage” refers to the number of NDBs receiving government subsidies divided by the number of total samples or samples in each subcategory.

with these to subsidize earmarked projects that have positive externalities but hardly break even in financial terms. Table 6.6 shows the main characteristics of the NDBs receiving interest subsidies. NDBs from HICs and UMICs are more likely to receive government interest subsidies. Furthermore, government subsidies are usually earmarked for certain purposes, and very few NDBs

receive government interest subsidies applied to all their loans.

Interest subsidies are an important type of government subsidy.

Table 6.6 Characteristics of NDBs Receiving Interest Subsidies

Bank	Development Stage	Country	Region	Scope
Public Investment Development Company	HICs	Lithuania	Europe	Partial
Finnvera	HICs	Finland	Europe	Undisclosed
Croatian Bank for Reconstruction and Development	HICs	Croatia	Europe	Partial
Czech Export Bank	HICs	Czech Republic	Europe	Partial
Czech-Moravian Guarantee and Development Bank	HICs	Czech Republic	Europe	Partial
MFB Hungarian Development Bank Private Limited Company	HICs	Hungary	Europe	Undisclosed
Hungarian Export-Import Bank Plc.	HICs	Hungary	Europe	Partial
Bank of the Cook Islands	HICs	Cook Islands	Oceania	Undisclosed
Bank for Development and Foreign Economic Affairs	UMICs	Russia	Europe	Partial
Indonesia Eximbank	UMICs	Indonesia	Asia	Full
Bank Pembangunan Malay Berhad	UMICs	Malaysia	Asia	Partial
Development Bank of Samoa	UMICs	Samoa	Oceania	Partial
Fiji Development Bank	UMICs	Fiji	Oceania	Partial
Agricultural Bank of Namibia	UMICs	Namibia	Africa	Partial
National Bank for Agriculture and Rural Development	LMICs	India	Asia	Partial
Agricultural Development Bank	LMICs	Ghana	Africa	Full

Source: Chen, "KfW's Overseas Investment and Financing Experience and Insights," Overseas Investment and Export Credit, no. 6 (2016): 25–31.

6.2.4 Service Fees

Governments pay NDBs service fees in return for professional services; service fees are another government funding source. Table 6.7 shows 7.47 percent of NDBs have received service fees from governments, and the table further reveals that NDBs from HICs, mega- and medium-sized NDBs, and NDBs promoting trade are more likely to receive service fees from governments.

6.2.5 Support from Central Banks

When the central bank provides financial support to the national development banks in its own country, it can provide funds for general purposes or support the national development banks to carry out development projects for specific purposes. Through the case study of China’s central bank (PBC) supporting CDB by increasing credit support for the renovation of shanty towns—a key project—we analyze how central banks support NDBs’ operations through quasi-fiscal policy support.

Table 6.7 NDBs’ Access to Service Fees

Classification		Number of Observations	Service Fees	
			Number	Percentage
Total Samples		375	28	7.47%
Development stage	HICs	122	15	12.30%
	UMICs	120	8	6.67%
	LMICs	111	4	3.60%
	LICs	22	1	4.55%
Bank size	Mega	18	2	11.11%
	Big	44	3	6.82%
	Medium	103	10	9.71%
	Small	192	7	3.65%
	Unknown	18	6	33.33%
Official mandate	General mandate	198	17	8.59%
	Trade	41	6	14.63%
	Agriculture and rural development	34	1	2.94%
	SMEs and entrepreneurship	67	4	5.97%
	Housing	21	0	0.00%
	Infrastructure	6	0	0.00%
	Local government	8	0	0.00%

Note: In the table above, “percentage” refers to the number of NDBs taking service fees as the funding source divided by the number of total samples or samples in each subcategory.

Box 3: PBC's Pledged Supplementary Lending (PSL)¹⁶

In April 2014, PBC initiated PSL to provide a long-term, stable, and appropriately priced funding source for development finance to support the renovation of shanty towns. The main function of PSL is to provide long-maturity and large-sum financing for financial institutions to support developing key areas and bolstering weak links in the national economy and the social cause. PSL is issued in the form of pledges. Eligible collaterals include high-grade bond assets and high-quality credit assets.

PSL refers to special loans approved by the State Council and issued by PBC in the form of pledges to financial institutions for the purpose of supporting key areas and strengthening weak links in the national economy and the social cause.

Objects of lending: The recipients are CDB, the Export-Import Bank of China, the Agricultural Development Bank of China, and other State Council-approved financial institutions.

Principles of lending: PSL is issued according to the principles of “specific purpose, earmarking a fund for [a] specified purpose only, breaking even and pursuing small profit, and ensuring safety.”

Purposes of loans: Financial institutions determine the specified purposes of PSL according to different business scopes.

- The fund earmarked for CDB is used to issue two loan types: loans for the renovation of shanty towns and loans for the construction of urban underground utility tunnels.

- The fund earmarked for the Export-Import Bank of China is used to issue four loan types: “capital recycling” (overseas RMB loans), loans for military products, loans for international production capacity cooperation and equipment manufacturing cooperation (including nuclear power and railway), and BRI loans.

- The fund earmarked for the Agricultural Development Bank of China is used to issue four types of loans: bridging loans for major national water conservancy projects (172 national-level major water conservancy projects), loans for water conservancy construction, loans for the renovation of shanty towns, and loans for rural road construction.

- The fund can also be used for other specific purposes approved by the State Council and determined and adjusted by PBC.

Maturity of loans: PSL has a one-year contract term that can be extended. PBC determines the amount and frequency of extension.

Interest rate of loans: PBC determines the PSL interest rate on the basis of economic growth, inflation level, and total supply and demand, and it adjusts this rate as appropriate. PBC determines the specific PSL interest rate as issued to financial institutions by increasing the base point on the foundation of the PSL interest rate, and PBC determines the amount and adjustment of increase.

¹⁶ Source: Compiled per PBC's website.

6.3 International Funding Sources

In this section, we outline the main features of on-lending and ODA from international sources: namely, international organizations and foreign public agencies.

Although we focus on a sample of available data, it should be noted that because accounting standards do not usually mandate the disclosure of funds from on-lending and ODA, the fact that an NDB does not disclose relevant information does not mean it does not receive international funds.

Table 6.8 NDBs Receiving On-Lending

Classification		Number of Samples	On-Lending	
			Number	Percentage
Full Samples		375	33	8.80%
Development stage	HICs	122	11	9.02%
	UMICs	120	8	6.67%
	LMICs	111	12	10.81%
	LICs	22	2	9.09%
Bank size	Mega	18	3	16.67%
	Big	44	2	4.55%
	Medium	103	11	10.68%
	Small	192	9	4.69%
	Unknown	18	8	44.44%
Official mandate	General mandate	198	19	9.60%
	Trade	41	5	12.20%
	Agriculture and rural development	34	2	5.88%
	SMEs and entrepreneurship	67	3	4.48%
	Housing	21	2	9.52%
	Infrastructure	6	0	0.00%
	Local government	8	2	25.00%

Note: In the table above, “percentage” refers to the number of NDBs receiving on-lending as funding sources divided by the number of total samples or samples in each subcategory.

6.3.1 On-Lending

On-lending generally refers to loans that NDBs receive from MDBs or NDBs from more developed countries to be distributed to end beneficiaries.

NDBs from LICs and LMICs are more likely to receive on-lending.

Table 6.8 shows the empirical patterns of the NDBs that received on-lending. Overall, 8.80 percent of NDBs have received on-lending. The table further reveals that NDBs from LICs and LMICs are more likely to receive on-lending. These banks often find it difficult to obtain adequate funding from domestic sources, and they are thus more inclined to access international funds.

At 25 percent, NDBs with the mandate of supporting local government are most likely to receive on-lending, conceivably because of the stronger externalities and weaker profitability of the types of projects they finance, together with their weak capacity and limited access for market-based funding.

2.Types of on-lending

This report classifies on-lending into three types. The first type includes projects in which the government or a government department (e.g., the Ministry of Finance) acts as the borrower and assumes repayment responsibility. The second type consists of projects in which an NDB acts as the borrower and assumes repayment responsibility, with the government or a government department (e.g., the Ministry of Finance) providing a guarantee. The third type includes projects

Table 6.9 Types of On-Lending

Type	Definition	Number	Percentage
First	Projects in which the government or a government department (e.g., the Ministry of Finance) acts as the borrower and assumes repayment responsibility	7	21.21%
Second	Projects in which NDBs act as the borrower and assume repayment responsibility, with the government or a government department (e.g., the Ministry of Finance) providing a guarantee	2	6.06%
Third	Projects in which NDBs act as the borrower and assume repayment responsibility, with the government or a government department (e.g., the Ministry of Finance) not providing a guarantee	7	21.21%
Unknown	-	17	51.52%
Total	-	33	100.00%

Source: Chen, “KfW’s Overseas Investment and Financing Experience and Insights,” Overseas Investment and Export Credit, no. 6 (2016): 25–31.

in which an NDB acts as the borrower and assumes repayment responsibility, where the government or a government department (e.g., the Ministry of Finance) do not providing a guarantee.

Table 6.9 presents the types of on-lending and the percentage of NDBs accepting on-lending. Except for projects in which the on-lending type cannot be

determined because of a lack of information, we find the first and third types each account for 21.21 percent of the total amount of on-lending, while the second type accounts for the least percentage.

3. Sources of on-lending

On-lending is provided by MDBs, such as World Bank Group, European Bank for Reconstruction and

Table 6.10 NDBs Providing On-Lending

Bank Name	Region	Country	Development Stage
International Development Finance Corporation	Americas	USA	HICs
Kommuninvest	Europe	Sweden	HICs
Netherlands Development Finance Company	Europe	Norway	HICs
French Development Agency	Europe	France	HICs
Société du Financement Local	Europe	France	HICs
Austrian Development Bank	Europe	Austria	HICs
The Export-Import Bank of Korea	Asia	South Korea	HICs
Development Bank of Japan, Inc.	Asia	Japan	HICs
Japan Finance Corporation	Asia	Japan	HICs
China Development Bank	Asia	China	UMICs
The Export-Import Bank of China	Asia	China	UMICs
Export-Import Bank of India	Asia	India	LMICs

Source: Chen, “KfW’s Overseas Investment and Financing Experience and Insights,” Overseas Investment and Export Credit, no. 6 (2016): 25–31.

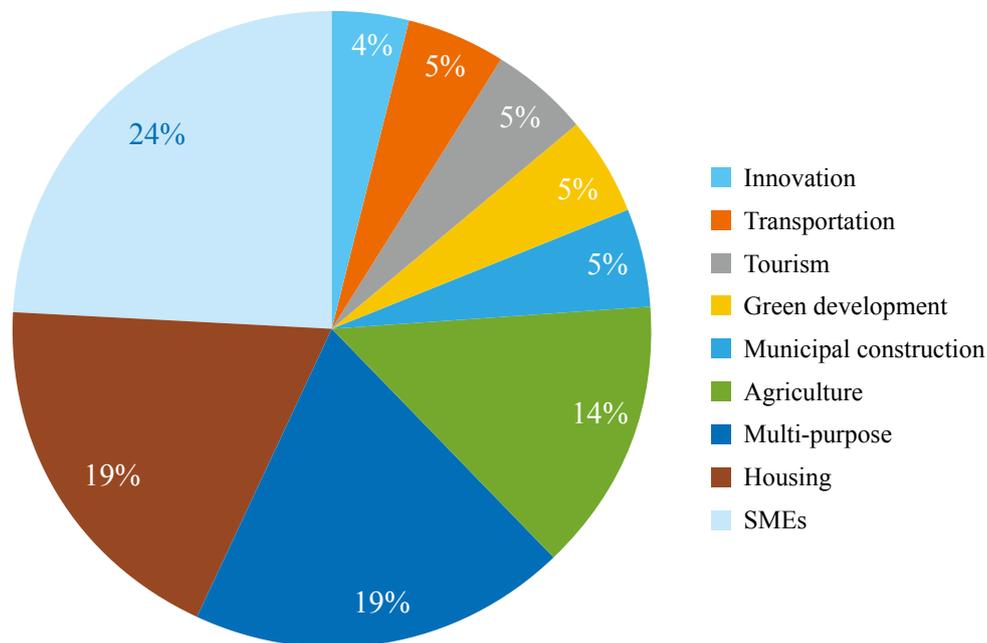


Figure 6.7 Purposes of On-Lending

Development, European Investment Bank, African Development Bank, and Asian Development Bank, as well as NDBs from UMICs and HICs. Table 6.10 lists NDBs providing other NDBs with on-lending. As the table shows, NDBs providing on-lending to other NDBs are mainly those from HICs and UMICs.

On-lending is often used to support projects with a larger number of borrowers and small lending amount such as housing, SMEs, and agriculture.

4. Purposes of on-lending

Figure 6.7 shows the purposes of on-lending. The chart indicates a vast majority of on-lending is used to support housing, SMEs, and agriculture. As these projects are often characterized with a large number of borrowers

and small lending volume, on-lending by NDBs in host countries can reduce the transaction cost for MDBs and NDBs from MICs and HICs.

6.3.2 ODA

1. NDBs receiving ODA

ODA refers to development assistance from international organizations or donor countries and consists of grants and concessional loans. Table 6.11 presents the stylized facts of NDBs that receive ODA. Overall, 5.87 percent of NDBs have received ODA. The table further shows that smaller NDBs from LICs are more likely to receive ODA than NDBs from more developed countries. Compared with NDBs with other mandates, NDBs supporting infrastructure and local government are more likely to receive ODA, accounting for 16.67% and 12.50% respectively.

Table 6.11 NDBs Receiving ODA

Classification		Number of Observations	ODA	
			Number	Percentage
Total Samples		375	22	5.87%
Development stage	HICs	122	0	0.00%
	UMICs	120	13	10.83%
	LMICs	111	7	6.31%
	LICs	22	2	9.09%
Bank size	Mega	18	0	0.00%
	Big	44	2	4.55%
	Medium	103	7	6.80%
	Small	192	11	5.73%
	Unknown	18	2	11.11%
Official mandate	General mandate	198	13	6.57%
	Trade	41	1	2.44%
	Agriculture and rural development	34	3	8.82%
	SMEs and entrepreneurship	67	2	2.99%
	Housing	21	1	4.76%
	Infrastructure	6	1	16.67%
	Local government	8	1	12.50%

Note: In the table above, “percentage” refers to the number of NDBs receiving ODA divided by the number of total samples or samples in each subcategory.

2. Sources of ODA

ODA accepted by NDBs mainly comes from international organizations and MDBs such as the European Union, WB, and African Development Bank, as well as DFIs from HICs and UMICs such as KfW.

3. Purposes of ODA

Figure 6.7 presents the purposes of ODA. Notably, supporting environmental protection is the primary purpose of ODA accounting for 34 percent of the total—much higher than other purposes.

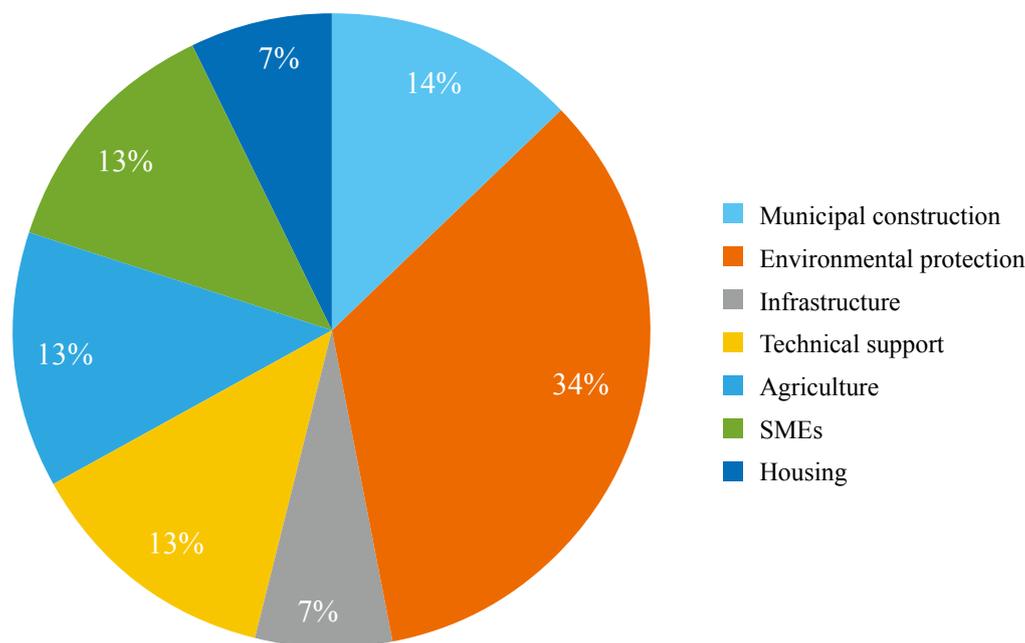


Figure 6.8 Purposes of ODA

Supporting environmental protection is the primary purpose of ODA accounting for 34 percent of the total—much higher than other purposes.

6.4 NDBs Receiving Deposits

6.4.1 NDBs That Accept Customer Deposits

Generally speaking, NDBs are allowed to take customer deposits from nonresident entities such as government departments and enterprises, among others. NDBs might provide deposit services to these institutions to facilitate operations and reduce information asymmetry. For example, an NDB issues loans to an enterprise. If

the loans are not all used up at once, then the enterprise may open a savings account and deposit the borrowed money there for subsequent use. Such a savings account allows the NDB to gain a clear understanding of how the loans are spent, thus reducing information asymmetry. The proportion of customer deposits is not necessarily low. For example, the Agricultural Development Bank of China's customer deposits account for around 20 percent of total liabilities (Agricultural Development Bank of China's 2019 Annual Report). Through Bankfocus, we collected 124 samples with customer deposits as a percentage of total liabilities; these deposits exhibit the following distribution characteristics.

Table 6.12 shows that the more developed an NDB's country is, the less likely it is to accept customer deposits. Compared to mega-NDBs, small NDBs are more likely to accept customer deposits. NDBs promoting agriculture and rural development, SMEs and entrepreneurship, housing, and general development are more likely to take customer deposits than NDBs

Table 6.12 Customer Deposits as a Percentage of Total Liabilities

Classification		Total	[0,10%]	[10,20%]	[20%,30]	[30%,40]	[40%,50]	> 50%
Number of Observations and Percentage		124	39, 29.1%	7, 5.2%	7, 5.2%	9, 6.7%	3, 2.2%	59, 44.0%
Development stage	HICs	36	17, 47.2%	2, 5.6%	1, 2.8%	3, 8.3%	1, 2.8%	12, 33.3%
	UMICs	45	10, 22.2%	2, 4.4%	3, 6.7%	6, 13.3%	2, 4.4%	22, 48.9%
	LMICs	38	11, 28.9%	2, 5.3%	3, 7.9%	0, 0.0%	0, 0.0%	22, 57.9%
	LICs	5	1, 20.0%	1, 20.0%	0, 0.0%	0, 0.0%	0, 0.0%	3, 60.0%
Bank size	Mega	11	5, 45.4%	2, 18.2%	1, 9.0%	1, 9.0%	0, 0.0%	2, 18.2%
	Big	25	8, 32.0%	1, 4.0%	2, 8.0%	0, 0.0%	0, 0.0%	14, 56.0%
	Medium	48	11, 22.9%	1, 2.1%	3, 6.3%	6, 12.5%	2, 4.2%	25, 52.1%
	Small	40	15, 37.5%	3, 7.5%	1, 2.5%	2, 5.0%	1, 2.5%	18, 45.0%
Official mandate	General mandate	76	27, 35.5%	5, 6.6%	3, 3.9%	3, 3.9%	1, 1.3%	37, 48.7%
	Trade	12	6, 50.0%	1, 8.3%	1, 8.3%	2, 16.7%	1, 8.3%	1, 8.3%
	Agriculture and rural development	10	1, 10.0%	0, 0.0%	1, 10.0%	0, 0.0%	0, 0.0%	8, 80.0%
	SMEs and entrepreneurship	18	4, 22.2%	1, 5.6%	0, 0.0%	3, 16.6%	1, 5.6%	9, 50.0%
	Housing	7	1, 14.3%	0, 0.0%	2, 28.6%	1, 14.2%	0, 0.0%	4, 57.1%
	Infrastructure	0	0, 0.0%	0, 0.0%	0, 0.0%	0, 0.0%	0, 0.0%	0, 0.0%
	Local government	0	0, 0.0%	0, 0.0%	0, 0.0%	0, 0.0%	0, 0.0%	0, 0.0%
Acceptance of household savings and deposits	Accept	64	8, 12.5%	3, 4.7%	1, 1.6%	3, 4.7%	1, 1.6%	48, 75.0%
	Do not accept	60	31, 51.7%	4, 6.7%	6, 10.0%	6, 10.0%	2, 3.3%	11, 18.3%

Note: The number of observations and the percentage represent the number of samples and the percentage of these samples in the total samples or samples in each subcategory respectively.

supporting trade, infrastructure construction, and local government financing, because the former primarily target retail clients and thus facilitate deposit acceptance. Customer deposits as a percentage of total liabilities are much higher in NDBs that take household deposits than those that do not, as household deposits are a main component of customer deposits. Therefore, customer deposits can act as a proxy of household deposits.¹⁷ However, this does not mean that customer deposits equals to household deposits because the latter is a subset of the former. We now turn to analyzing NDBs taking household deposits.

6.4.2 NDBs That Take Household Deposits

To further identify NDBs that take household deposits, we triangulated the following information to verify whether an NDB takes household deposits.

- Information related to products and services on the NDB’s website: We checked whether the NDB provides deposit services to residents and whether it opens a deposit account for individual residents.
- Acts and the NDB’s articles of agreement at the time of establishment: We read relevant provisions to check whether the NDB prohibits or permits the taking of household deposits.
- The NDB’s annual reports and financial statements: We checked whether household deposits constitute the NDB’s liabilities or whether there is any accounting item related to household deposits.
- Other information: We checked additional information, such as the NDB’s official history.

If relevant acts and the NDB’s articles of agreement at the time of establishment clearly stipulate that the NDB

is prohibited from taking household deposits, or if no information related to household deposits was found on the NDB’s website, in annual reports, and in financial reports, then we considered the NDB as not taking household deposits. The reason for using this criterion is that we assume an NDB will post information about relevant products on its website to attract household deposits.

Table 6.13 presents the statistics of taking household deposits by different types of NDBs.

Table 6.13 shows that regardless of size, most NDBs do not take household deposits. Regardless of mandate, the number of NDBs that do not take household deposits is much more than that of NDBs taking household deposits. The more likely an NDB is to accomplish its mandate through wholesale business, the less likely it is to take household deposits. For example, NDBs financing infrastructure primarily raise funds through project financing or wholesale loans, whereas NDBs financing housing mainly raise funds through retail business. In terms of the percentage of NDBs taking household deposits, the latter (47.6 percent) is far more likely to take household deposits than the former (0 percent).

Regarding development stage, NDBs from LICs are more likely to take household deposits (50 percent). By contrast, only 11.5 percent of NDBs from HICs take household deposits. The reason why a majority of NDBs do not take household deposits might be that taking household deposits as a funding source suffer from the following limitations:

(1) Risk mismatch — On the asset side, NDB projects carry high risks because of long maturity, slow reflows, or venture in a new industry or high-tech field. However, on the liability side, if an NDB takes household deposits, then the creditor (i.e., an ordinary resident) is risk averse

Table 6.13 Statistics of NDBs Taking Household Deposits

Classification		Number of NDBs Taking Household Deposits	Number of NDBs Not Taking Household Deposits	Percentage of NDBs Taking Household Deposits in the Total Number of NDBs in the Category
Total Samples		108	267	28.8%
Development stage	HICs	14	108	11.5%
	UMICs	37	83	30.8%
	LMICs	46	65	41.4%
	LICs	11	11	50.0%
Bank size	Mega	4	14	22.2%
	Big	20	24	45.5%
	Medium	30	73	29.1%
	Small	48	144	25.0%
Official mandate	General mandate	60	138	30.3%
	Trade	4	37	9.8%
	Agriculture and rural development	14	20	41.2%
	SMEs and entrepreneurship	20	46	30.3%
	Housing	10	11	47.6%
	Infrastructure	0	6	0.0%
	Local government	0	8	0.0%

and expects full repayment of their deposits. Therefore, taking household deposits will result in risk mismatch.

(2) Maturity mismatch — Household deposits are often of short maturity. The maturity of current deposits, savings deposits, and fixed deposits ranges from less than one year to five years or less than five years. This will result in maturity mismatch on the asset side. If the percentage of household deposits is too high, this may lead to a large amount of future capital outflow. Consequently, NDBs might be unable to comply with the liquidity requirements stipulated in the Basel Accords. Therefore, taking household deposits may lead to maturity mismatch.

(3) The paradox of interest rate pricing — If an NDB takes household deposits, then how does it price them? If the household deposit interest rate is lower than the market interest rate, then the NDB might be unable to attract deposits; if it is equal to or higher than the market interest rate, then the NDB might be accused of directly participating in market competition.

Despite the three aforementioned challenges arising from the taking of household deposits, some NDBs resort to taking these deposits as an alternative funding source. There are multiple reasons why this occurs.

Although deposit-taking NDBs are prone to maturity mismatch, risk mismatch and the paradox of interest rate pricing, some NDBs resort to taking household deposits as an alternative funding source.

First, the mission of some NDBs is to foster financial awareness among residents and achieve financial inclusion. Most of these banks come from less developed

economies. For example, the main mission of some banks is to provide household deposit services in remote areas where commercial banks would not open branches under market economy conditions. Such banks are fundamentally different in fixing market failures from the development banks that provide medium - and long-term financing.

Second, NDBs from countries with poor sovereign creditworthiness may resort to taking household deposits because they cannot effectively issue bonds on capital markets. NDBs can rely on national sovereign creditworthiness for bond issuance. For NDBs in a country with a good sovereign creditworthiness, bond issuance represents a low-cost means of financing. However, for NDBs in a country with a poor sovereign credit rating, bond issuance may not be feasible. Therefore, when bond issuance is restricted, NDBs might resort to household deposits as an alternative funding source.

Third, the borrowing cost of household deposits is usually lower than that of other market-based financing, which also encourages development banks with convenient conditions (such as having more branches and serving mostly retail customers) to take household deposits as their funding source.

However, it is important to note that NDBs that take household deposits may be forced to engage in more commercial projects in response to short-term liquidity needs, providing fewer long-term loans than NDBs that do not accept household deposits. Therefore, for those NDBs whose main mission is to provide medium - and long-term financing, taking household deposits is a choice of last resort, rather than a second-best solution for striking a right balance between expanding funding sources and fulfilling development missions.

Box 4: Industrial Bank of Korea (IBK) Taking Household Deposits

Founded in August 1961, IBK is dedicated to providing financing services to SMEs in Republic of Korea (ROK). Under Article 33 of the IBK Act, it can conduct business, including the taking of household deposits. In 1973, IBK's deposits reached KRW 100 billion. It started to issue SME bonds in 1982. In the 1990s, it began establishing offices outside ROK, such as in Tokyo, New York, Hong Kong, and Tianjin. Before the Asian financial crisis, IBK tried to pursue privatization reform in an effort to curtail government dominance. However, this effort was reversed as the government reinvested in the crisis's aftermath. Since the beginning of the 21st century, IBK has continued to optimize its management structure, products and services, and overseas presence. It maintains sound operations, making IBK a predominant bank in the field of SME financing in ROK.

As its 2017 annual report¹⁸ shows, IBK takes KRW 58.3 trillion in household deposits from 15 million clients, with a market share of 11.5 percent. During the same period, IBK's funding sources totaled KRW 232.4 trillion, of which bonds stood at KRW 90.1 trillion, loans at KRW 25.1 trillion, and deposits at total KRW 108.9 trillion. Household deposits undoubtedly constitute an important funding source, accounting for 53.5 percent of total deposits and 25 percent of total funding sources.

In terms of risk control, IBK is the first financial institution to weight risks to a performance system in the ROK. A prudent mechanism is in place to respond to risks. For example, IBK can predefine a crisis scenario to measure risks, and it has a well-established supervision mechanism to counter operational risks.

With respect to maturity match, relevant reports show the objects of loans are primarily SMEs, with a relatively short loan maturity. IBK's 2019 financial report shows the balance of loans due within one year accounts for 63.5 percent of the total balance, and the balance of loans due within five years or more accounts for only 13.9 percent. Nevertheless, this does not mean SMEs do not have medium- and long-term financing demands. IBK may take household deposits at the expense of its long-term lending capacity. Its loans total KRW 182.1 trillion, of which SME loans register KRW 140 trillion, household loans register KRW 31.9 trillion, and large company and other loans register KRW 7.8 trillion. IBK has been vigorously increasing the percentage of its core deposits.¹⁹ By the end of 2017, its core deposits totaled KRW 52 trillion, accounting for about half of total deposits. Moreover, small- and medium-sized industry financing bonds reached KRW 88.3 trillion, accounting for 48.4 percent of IBK's total funding sources in 2017.

The Bank of Korea's deposit safeguard provisions stipulate that commercial banks and policy banks must hand over 0–7 percent of the deposit reserve to the central bank according to the deposit's nature. Under the Deposit Insurance Act, a deposit of KRW 50 million (including principal and interest) will be fully protected, but a deposit of more than KRW 50 million is not entitled to protection.

In sum, if an NDB takes household deposits as a funding source, then it must adopt measures to address the limitations and challenges that accompany doing so.

¹⁸ BK. 2017. "IBK 2017 Annual Report." Accessed September 20, 2020: 8–61.

¹⁹ In the annual report, core deposits are defined as money deposited through automatic transfer payment equipment, which implies low cost and stability.

VII. Conclusions and Research Prospects

The world is witnessing a global renaissance of NDBs. Due to lack of data, few academic studies have been able to systematically examine NDBs' funding sources. To fill this gap, the Institute of New Structural Economics at Peking University has established a pilot database on the funding sources of NDBs worldwide.

Based on firsthand data from the database, we present the stylized facts of the funding sources for global NDBs. Our key findings are as follows.

First, generally, NDBs are funded either by public agencies or market actors. Either way, the government plays an important role in the financing process.

Second, bond issuance is one of the most important funding mechanisms by which NDBs secure sovereign creditworthiness to raise funds from capital markets. Through either explicit or implicit guarantees, governments support NDBs to issue long-term bonds at relatively low prices.

Third, internal financing and equity financing from

governments play more important roles in NDBs than in commercial banks.

Fourth, governments support NDBs' funding mainly through share capital, borrowing and deposits from governments, the establishment of trust funds, government subsidies, tax incentives, service fees, and various other means.

Fifth, on-lending and ODA from NDBs in HICs and MDBs play relatively more important roles in funding NDBs in developing countries.

Last but not least, although NDBs that take household deposits may be prone to liquidity risks and maturity mismatch, nearly 30 percent of NDBs resort to take household deposits because they may have limited alternative funding sources.

Building on the key characteristics of funding sources for NDBs worldwide, we propose the following 10 research questions for future exploration and encourage scholars who may be interested in this area to conduct further research.

- (1) What is the most appropriate financing structure for NDBs at different stages of development? How do NDBs at different stages of development find the right mix of funding sources from public agencies versus market actors and achieve the right balance between administrative means and market-based means?
- (2) If the goal of finance is to serve the real economy, what are the systemic differences in the size and risk profiles of the real economy supported by NDBs with different mandates, and how do these differences in the real economy affect the financing sources and mechanisms of NDBs?
- (3) How does the financing structure of NDBs affect the maturity of loans, risk appetite, and choice of financial instruments on the asset side?
- (4) Under what conditions can bond-issuing NDBs effectively contribute to the development of domestic capital markets?
- (5) Why do some NDBs issue bonds, whereas others are not given the similar level of domestic capital market development?
- (6) What determines the price, maturity, liquidity, and location (either domestic or international capital markets) of bond issuances by NDBs?
- (7) What is the most appropriate risk-sharing mechanism when a government commissions a fund with an NDB?
- (8) To what extent do on-lending and ODA from international and foreign public agencies discourage NDBs from mobilizing funds in their own countries or catalyze them to do so?
- (9) Under what circumstances would on-lending denominated in hard currencies from MDBs and foreign NDBs lead to a balance of payment crisis in the host country?
- (10) What are the effects of taking household deposits on an NDB's ability to fulfill its development-oriented mandate?

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