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Municipal Pooled Financing of Infrastructure in the United States

Experience and Lessons

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Abstract

Despite a world awash with liquidity, large infrastructure supply gaps exist across developing and emerging markets. Infrastructure has been largely decentralized to subnational governments in many countries, and many policymakers are keenly interested in developing subnational bond markets to give subnational governments access to private financing for infrastructure. Despite this, the transaction costs of bond issuance are still prohibitive for many subnational governments to access financing. Pooled financing, through regional infrastructure funds, municipal funds, or bond banks, has become a sought-after solution for helping subnational governments access private financing for infrastructure. In the United States, municipal bond banks that were established since the 1970s have become a cost-effective and stable model for expanding subnational financing for many small municipalities, while maintaining strong credit ratings with virtually no defaults from sub-borrowers. The municipal bond banks have been successful in lowering financing costs for many small, unrated local governments, with loan sizes as low as less than $50,000. This paper examines the policies and structures that have made pooled financing successful in the United States, including regulatory frameworks, governance and managerial systems, the role of project appraisal, operations and pricing, and managing the default risks of borrowers. The paper also explores broader lessons for developing countries that are interested in establishing pooled financing for subnational infrastructure.

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Municipal Pooled Financing of Infrastructure in the United States: Experience and Lessons

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I. Introduction

The unprecedented scale of urbanization in developing countries requires large-scale urban infrastructure financing to help absorb massive influxes of rural populations to urban centers. Developing countries have increased investment in infrastructure from 3.5 percent of GDP in 1980 to 5.7 percent in 2008. Despite this increase, these numbers fall short of the estimated 6.6 percent of GDP investment needed for developing countries. Low income countries have even higher infrastructure expenditure needs, estimated at 12.5 percent of GDP. Of the total $19.2 trillion[2] needed to meet infrastructure demand between 2010 and 2030, there will be $15.8 trillion in demand from Asia, $1.3 trillion demand from emerging Europe, $1.2 trillion from Latin America, $0.7 trillion from Africa, and $0.2 trillion from the Middle East (World Bank 2014).

As a result of decentralization in many countries subnational governments have become responsible for a large share of infrastructure investments. Borrowing enables subnational governments (SNGs)[3] to capture the benefits of major capital investments immediately, rather than waiting until sufficient savings from current income can be accumulated to finance them. Infrastructure investments benefit both current and future generations. Subnational borrowing finances the cost of infrastructure more equitably across multigenerational users of infrastructure services because the debt service can be paid during the economic life of the assets that the debt is financing. Therefore, infrastructure services can be paid for by the beneficiaries of the services over the life of the services achieving an intergenerational equity.

Developing a subnational bond market has been an emerging priority in developing countries. Loans from commercial banks have been a major source of infrastructure financing for subnational governments in many countries. However, the asset-liability structure of the commercial banking system generally limits its capacity for long-term financing. China has been at the forefront of reforms in developing subnational capital markets for infrastructure financing. The 2014 Budget Law has authorized provinces to issue bonds within the context of developing a prudent regulatory framework for debt management, medium-term capital budgeting and fiscal transparency. SNGs and their financing vehicles in other countries have also issued bond instruments on a smaller scale (for example, Colombia, India, Mexico, Poland, the Russian Federation, and South Africa). Other countries, such as Indonesia, are considering policy frameworks to facilitate subnational debt market development, and some others such as Peru are engaging in capacity-building activities and are allowing selected SNGs to pilot-test transactions (Canuto and Liu 2010).

A key challenge is to assist smaller municipalities to access capital markets for infrastructure financing. Available data indicate that in countries where subnational governments have issued bonds only larger subnational governments have been able to access the capital market.[4] In countries where a subnational capital market has just started, usually only the most creditworthy SNGs such as capital cities issue bonds. However, even in well-developed capital markets, access to the capital market by small municipalities has remained elusive.

Bond financing is inherently complex and requires assembling a team of finance specialists, including, a financial advisor, bond counsel, trustee, and underwriters. Issuing debt is a process that involves preparing bond documents prior to the sale of the bonds, selecting the method of sale (competitive or negotiated), sizing and structuring the bond issue, attracting investors, obtaining credit ratings, providing adequate

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[2] All dollar amounts are United States dollars.

[3] The terms subnational governments refer to all tiers of the government that are below the central government.

[4] From Canuto and Liu 2010 and discussions with the World Bank teams working on difference countries on recent developments.

disclosure to investors, investing the bond proceeds, and complying with various legal requirements for these activities.

The complex process of bond issuance poses a special challenge for small SNGs even within a well-developed capital market. The fixed costs of bond issuance (e.g., legal costs, underwriter fees, and credit ratings), when spread over a low volume of bonds, can make the total cost of bond financing prohibitive, thereby limiting this financing option for smaller municipalities issuing a small volume of bonds. For many small municipalities, the process of raising private financing is complex and costly due a lack of financial expertise, limited access to financial markets, and the need to borrow relatively small amounts of capital.

To address this issue, several states in the United States established pooled financing mechanisms in the 1970s. A state may create a public financing entity (for example a state bond bank) which functions as a financial intermediary between the capital market and local governments that need financing for capital projects. The bond bank aggregates several smaller municipal borrowings into one larger bond issue, structures the terms of the bond issue, and handles the legal, financial, and processing requirements of the issuance. The proceeds of the bond bank bonds are then lent by the bond bank to the municipal borrowers to finance their municipal infrastructure projects. The structure of pooled financing has successfully provided many small municipalities with access to private capital markets and lowered their financing costs. The state bond banks in the United States have also maintained strong credit ratings without government guarantees and with virtually no defaults from municipal borrowers.

The objective of this paper is to review the experience of the pooled financing structures and mechanisms in the United States, with a focus on municipal bond banks and to draw lessons and implications for developing countries that might pursue this type of financing mechanism.[5] The success of pooled financing relies primarily on the creditworthiness of the municipal borrowers. The municipal borrowers' credit strength is shaped by the state's intergovernmental fiscal system including tax sharing and fiscal transfers, a municipality's own revenue and expenditure flexibility, and financial management, accounting and reporting systems. The systemic reform of these factors is outside the scope of this paper. This paper examines these factors only in the context of how they may impact pooled financing.

The structure of the paper is as follows. Section 2 reviews the rationale, origin and types of pooled financing in the United States, and how pooled financing relates to the overall regulatory framework for the subnational bond market in the country. Section 3 provides an overview of legal, governance, managerial and financial operation of municipal bond banks. Section 4 discusses the potential role of pooled financing in developing countries and draws lessons from the United States experience. Section 5 concludes.

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[5] Pooled financing has also been used in Canada and Europe, both of which are not covered by this paper. The Canadian municipal bond bank model, started in 1956, differs from the United States model in two significant ways: (i) with the exception of the Municipal Finance Authority of British Columbia (MFABC), the senior Canadian government directly guarantees the loans of Municipal Finance Corporations (as municipal bond banks are called in Canada); (ii) with the exception of a few large cities, municipalities located in MFC jurisdictions are required to finance through MFCs. Our primary interest is the model of pooled financing where municipal borrowers have the option of going to the market on their own, and that the government as the owner of the municipal bond bank does not provide guarantees to the pooled financing facility. For a review of the European experience with pooled financing (Anderson 2014).

II. Pooled Finance: Rationale, Origin, and Regulatory Context

A. Rationale

The United States has a large and diversified subnational bond market.[6] Each year, about 44,000 SNGs issue bonds in an average aggregate amount of $359 billion per annum from 2013 to 2016.[7] Total debt outstanding was $3.069 trillion in the third quarter of 2016 (Congressional Research Service 2016).

Despite an active and robust municipal finance market, small municipalities face challenges in accessing capital markets. Many small municipalities need to borrow a relatively small amount of capital. For example, the median size of borrowing from the Maine Municipal Bond Bank from 2012-2016 is $854,000, with the smallest amount only $30,000. For the lowest 50% of loans, the average size of a loan is $425,000. In New Hampshire, the median-size loan from 2008-2016 was $1.3 million, with the smallest amount $41,000 and the largest $37 million.[8] The process of hiring necessary specialized professionals including an investment bank, a bond counsel, a financial advisor and obtaining a rating is complex and expensive, relative to the size of the bond issuance. Investors are less willing to finance such a small amount of what would be an illiquid, and possibly un-rated debt issue. For these reasons, the cost of financing such small borrowings can be prohibitive.

Municipal bond banks have been offering a unique and advantageous mechanism for small communities to finance modest municipal projects by providing:

- Lower transaction costs of issuance due to economies of scale in packaging several municipal borrowings into a larger bond issue
- Increased liquidity by packaging smaller issues into a larger issue making the bond issue more attractive to buyers
- More favorable interest rates because the pool often has a better credit rating than the participating municipal borrowers, and the municipal bond bank is a more frequent issuer of debt and better known to the capital market participants
- Technical and professional assistance in the debt issuance process
- Professional and stable management for the issuance of debt as well as for the surveillance and monitoring of the municipal credits while the bonds and municipal borrowings are outstanding.

B. Origin and Types

Municipal bond banks were established in the United States in the 1970s. The first municipal bond banks were created in the states of Vermont and Maine in 1969 and 1972, respectively. This soon was followed in the next several years by the Alaska Municipal Bond Bank Authority (1975), North Dakota

[6] In the United States, the use of "subnational" and "municipal" are exchangeable. The municipal capital market also includes securities issued by the states or special purpose vehicles of the states.

[7] The Securities and Exchange Commission estimated around 44,000 sub-national issuers of municipal debt in 2011. See U.S. Securities and Exchange Commission 2012. Average issuance taken from Electronic Municipal Market Access: http://emma.msrb.org/MarketActivity/ViewStatistics.aspx.

[8] Author's calculations based on publicly-available documentation in the New Hampshire and Maine bond issues and websites. The New Hampshire values are based on total outstanding loans as of the 2016 Series A issue.

Municipal Bond Bank (1975), and the New Hampshire Municipal Bond Bank (1977). Municipal bond banks, which are utilized in various forms by several states, lend the proceeds of their bond issues to a wide range of government units from very small towns to large cities, school districts, and utility districts.

Municipal bond banks are financial intermediaries, providing municipal borrowers access to the subnational bond market by providing professional assistance and lowering transaction and financing costs for municipal borrowers. Municipal bond banks aggregate several smaller municipal borrowings into one larger bond bank bond issue that is sold in the capital market. The bond bank approves applications from municipal borrowers, structures the terms of the bond bank bond issue, prepares the necessary documentation for the issuance and sale of its bonds complying with legal requirements, prepares the documentation for the municipal borrowing from the bond bank, and seeks assurance that all legal requirements for the municipal borrowing have been complied with. The proceeds of the bond bank bonds are then lent by the bond bank to the municipal borrowers to finance their municipal infrastructure projects. The repayment by the municipal borrowers to the bond bank is used to pay the debt service on the bond bank bonds. The bond bank monitors the timely payment by the municipal borrowers to assure the principal and interest on the bond bank bonds are paid when due.

A municipality, depending on its needs, can choose whether to issue debt through the municipal bond bank, other financing authorities, or on its own, depending on the financing options available in the state and in the capital market. Larger municipalities with good credit ratings and more frequent issuances may prefer to issue their own bonds rather than issue through a municipal bond bank. A municipality will evaluate its financing options based on several factors:

- Interest cost
- Administrative review, monitoring and control by third parties
- Transaction costs
- Available principal maturities related to the useful life of the project to be financed
- The municipality's credit rating relative to that of the municipal bond bank.

Another major form of pooled financing is State Revolving Funds (SRFs). SRFs were developed under the 1987 federal Clean Water Act, to leverage federal grants for revolving loans for local environmental water projects. Although the primary focus of this paper is on municipal bond banks, SRFs provide another model for pooled financing of sub-national government infrastructure projects. A short review of the history and structure of SRFs is provided as Annex B.

C. Regulatory Context

Pooled financing in the United States emerged in the 1970s within a well-developed regulatory framework for municipal borrowing. At the time, the first municipal bond bank was created by the state of Vermont in 1969, the regulatory frameworks for subnational capital market were established. Since the late 18th century, subnational capital market development in the United States was based on a series of reforms that were often carried out in response to various crises that occurred in the market. As a result, when the first municipal bond bank was created in 1969, a set of market institutions had been developed and operated

within a robust legal framework, resulting in a very low rate of defaults on subnational debt that created a perception of safety for the subnational debt market.[9] Market reforms included:

- The establishment of various state constitutional public debt limits as the result of the debt crisis in the early 1840s
- The innovative development of revenue bonds in the late 19th century
- The requirement of a legal opinion of independent bond counsel[10] in the late 19th century to strengthen market participation, giving investors confidence as to the legality of the debt
- The enactment of Chapter 9 of the United States Bankruptcy Code to address municipal defaults during the Great Depression
- The securities laws enacted in the 1930s, with anti-fraud provisions applicable to subnational borrowers.

Municipal bond banks and their municipal borrowers are each governed by an established legal framework that govern their respective borrowings. The creation, mandate, and function of the municipal bond banks are governed by state legislation relating specifically to the municipal bond bank. These legal requirements provide that municipal bond banks have the authority to finance public purpose capital projects on behalf of municipalities. Municipal borrowers financing through a municipal bond bank or independently are subject to the legal framework for municipal borrowing, including municipal borrowers' compliance with any state or local limitations on the purpose or amount of municipal debt.

A municipality is not limited to borrowing only from a municipal bond bank and may have financing alternatives. The subnational capital market in the United States emphasizes competition and financing options. As noted earlier, a municipality evaluates its financing options by considering several factors including the cost of capital. Debt outstanding from pooled financing is about $100 billion comparing to $3 trillion total subnational debt outstanding.[11] Pooled financing is one of several financing options available, however it helps to provide smaller municipalities with access to the capital market by lowering the cost of transaction, issuance and capital.

III. Legal Structure, Management, Financing and Operation

A. Legal Framework

Although municipal bond banks are created and operated pursuant to their respective state laws, the precise structure of each municipal bond bank is tailored to the legal framework of the state and is governed by the legislation creating the municipal bond bank. As a result, municipal bond banks are administered and financed differently across states. However, they share many common elements, for example,

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[9] For a detailed review of the development of regulatory frameworks for subnational capital market, see Liu, Tian and Wallis 2013.

[10] An independent bond counsel is an attorney or firm of attorneys with specialized expertise in the field of municipal finance and is not an employee of the municipal bond bank, subnational government (e.g. state, district, or municipality), or the financing vehicle of a subnational government.

[11] The estimate is based on authors' meeting discussion with rating agencies in New York City, February 23-24, 2017.

municipal bond banks operate as independent and self-supporting authorities[12] and are not backed by the credit of the state.

A municipal bond bank does not have any taxing power. This is a crucial difference in the legal framework governing municipal borrowers and the legal framework governing the municipal bond bank that lends to municipal borrowers. The difference stems from the limited nature of a legislatively created municipal bond bank as a special purpose vehicle without any taxing authority and the role of the municipality as a local governing body and as a borrower. While the municipality typically has its own taxation power and ability to generate revenues, the municipal bond banks do not have taxation power. Thus, the municipality's credit is supported by the full faith and of the municipality backed by the taxation power or by a pledge of other legally available funds generated by the municipality. The municipal bond bank's credit is based primarily on the repayment of the loans made to its municipal borrowers.

Municipal bond banks are created by the state as special financing vehicles and operate independently. There are several reasons for this. First, being a financing vehicle of the state allows the municipal bond bank to issue bonds for public purpose capital projects of the borrowing municipalities, the interest on which is tax-exempt. This is a unique feature of the United States subnational government finance system. Second, publicly owned and managed municipal bond banks lower the costs of financing to municipalities. Public institutions do not pay dividends, seek rates of return to satisfy equity investors, or pay taxes. If these costs were added to the operation of the municipal bond banks, they would be charged to the municipal borrowers and conflict with the objective of mobilizing private capital to finance public infrastructure projects at a low cost. The overall effect of municipal bond banks as government instrumentalities therefore reduces the costs of financing public-purpose capital projects.

Municipal bond banks provide either general purpose or special purpose structures, or a combination of both, to finance local infrastructure projects. Some municipal bond banks, for example the New Hampshire Municipal Bond Bank, have general-purpose programs, which finance a variety of local infrastructure projects from school construction to water supply without sector limitation. Other municipal bond banks, such as the Maine Municipal Bond Bank, have both general-purpose programs and sector-specific programs such as clean water and school facilities.

Municipal bond bank legislation varies from state to state but typically provides the common elements of:

- The authorization of the municipal bond bank to make loans to municipalities to finance only public-purpose capital projects
- The scope and limitations of municipal bond bank programs, such as general purpose infrastructure or special purposes, or both
- The exemption of the municipal bond bank as a financially-independent agency from the state's constitutional limits on state and municipal debt[13]

[12] Some municipal bond banks, such as Maryland, have the state cover operational costs for program staff issuing pooled bonds on behalf of municipalities when they are embedded in a larger state department.

[13] However, any state guarantee of municipal bond bank debt, or municipal debt, would be subject to state debt legal limits. Limitations on the amount of debt that can be issued by municipal bond banks may be limited by state budgetary or other legislation.

- The legal requirements for loans to municipal borrowers, including municipal borrower's compliance with any state or local limitations on municipal debt and authorization procedures

- The legal requirements for the issuance of municipal bond bank bonds, such as requirements for bond resolutions, municipal bond bank board approval, methods of sale, and types of debt instruments that may be issued

- The scope and limitation of any state participation or responsibility in connection with municipal bond bank bonds, including the lack of any state guarantee of the municipal bond bank bonds, the ability of the municipal bond bank to intercept state aid payable to a municipality that has defaulted on its loan to the municipal bond bank, a permitted moral obligation of the state to make up any shortfall in municipal payments, and other methods of securing the bonds available in the event of default (e.g. state intervention in the management of a financially-stressed municipality).[14]

Additionally, a state typically has laws governing municipal borrowing. Each municipal borrower, whether financing through the municipal bond bank or independently, must comply with the requirements of such laws when borrowing including borrowing from a municipal bond bank. Such legal frameworks usually include:

- Special procedures for debt authorization, such as a voter referendum approving the infrastructure project and the borrowing, and/or public hearings and local council approval of the project and the borrowing. The approval must be obtained as a condition to the issuance of any municipal borrowing.[15]

- Limitations on the amount of total debt that a municipality may have outstanding.[16]

- The permissible sources of payment for any municipal borrowing. The municipal obligation may be a general obligation of the municipality secured by the full faith and credit of the municipality or a revenue obligation payable for certain specified revenues of the municipality.

- Requirements that debt must finance public capital investment, and the term of maturity cannot exceed the useful life of assets.[17]

Furthermore, all municipal bonds, including municipal bond bank bonds, must meet the following market requirements or expectations:

- A legal opinion from an independent bond counsel, as to the due authorization, validity and enforceability of the municipal obligation. This is a requirement from capital market purchasers to assure that the bond has been duly authorized, is valid and is enforceable under state law.

- Standards for all municipal borrowers on financial transparency including audit and disclosure of financial statements. This is expected by capital market participants.

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[14] Section III.C.1 will discuss state guarantee and moral obligation. Section III.C.4 will discuss default remedies.
[15] For example, in New Hampshire, municipal borrowing must be approved by a town council vote. In Maine, while there is no general debt limit, almost all municipal borrowers are required to have their debt approved by a voter referendum.
[16] For example, in New Hampshire the municipal obligation must be within the debt limits established by law for that category of municipality.
[17] These requirements may be in the United States tax codes and a state's municipal borrowing legislation.

Municipal bond banks must comply with the federal tax-code to qualify for tax-exemption of interest on its bonds and the anti-fraud rules in federal security laws. First, to qualify the interest on the municipal bond bank bonds to be tax-exempt, the federal United States tax code requires the public purpose nature of the facilities being financed and other requirements. Second, the disclosure to bondholders in the prospectus that offers the bonds for sale must comply with the standards set forth for municipal obligations under federal securities laws with respect to the accurate nature of the information and the inclusion of all relevant information necessary for a potential buyer to make an informed decision.

Finally, the municipal bond bank must complete a set of documents that would typically be required to complete any municipal financing transaction. This set of documents, which is publicly available, will reflect compliance with all legal requirements. The typical set of documents to carry out such financing transactions include the following:

- Offering memorandum, prospectus or official statement pursuant to which the municipal bond bank bonds are offered for sale
- Trust agreement, resolution or indenture setting forth the legal provisions relating to the issuance of the municipal bond bank bonds, their terms and payment
- Loan agreements between the municipal bond bank and each municipal borrower providing for the loan of funds from the municipal bond bank to the municipal borrower and the repayment by the municipality to the municipal bond bank
- Authorizing resolutions of the municipal borrowers and other documentation evidencing compliance with the legal requirements for the issuance of municipal debt
- Various legal opinions by an independent bond counsel of the municipal bond bank relating to the due authorization, validity and enforceability of the municipal bond bank bonds and by an independent bond counsel of the municipal borrower relating to the due authorization, validity and enforceability of the municipal obligation pursuant to the loan agreement between the municipal borrower and the municipal bond bank.[18]

B. Management

Municipal bond banks are managed by a board of directors, who are appointed by Governors for fixed-term renewable periods. Board membership is structured to maintain independence from state politics and focus on the successful operation of the municipal bond bank.[19] Municipal bond bank boards share many of the following elements. Board member compensation is limited, with most members serving from a sense of civic duty or for the status associated with board membership.[20] The State Treasurer is an automatic member of the board, as is a representative from the state's municipal association. In addition, several board members are required to have backgrounds in public finance, which makes them more likely to evaluate

[18] Both the New Hampshire and Maine Municipal Bond Banks require the borrowing municipalities to retain independent bond counsel to opine on such matters.

[19] For example, in New Hampshire, the board of directors has five members appointed for five-year terms, while in Maine appointments are for three years.

[20] For example, in New Hampshire, the Bank's directors serving on the board receive no compensation for their roles, and are only reimbursed any expenses incurred, while in Maine board members receive a modest per diem for board-related duties.

the fiscal risks of municipal borrowing rather than political incentives for lending.[21] Finally, a surety bond ensures the fulfillment of the board members' responsibilities.[22]

Municipal bond banks are managed by a relatively small, highly professional staff, whose low turn-over rates contribute to the institution's stability.[23] The Maine Municipal Bond Bank is managed by 11 full-time equivalent staff, who oversee eight separate loan programs. The New Hampshire Municipal Bond Bank, which has a more limited lending portfolio, is managed by an Executive Director, who is selected by the board, with the support of two additional full-time staff. Staff hired at municipal bond banks have financial backgrounds, with degrees in accounting or business administration. On-the-job professional development is a critical part of municipal bond bank operations – as municipal bond banks may only issue pooled bonds once or twice per year, this training process may take longer than in other private sector institutions. Thus, the pay scale and benefits offered to municipal bond bank staff, which are set by the board, are on par with civil service salaries to encourage staff retention.

Municipal bond banks function effectively with a limited staff by relying on the advice and services of a highly-developed private sector network of professional experts. These services include bond counsel, financial advisors, a bond trustee, underwriters and auditors. In Maine and New Hampshire, the municipal bond banks have developed long-term relationships with their advisors that provide reliable and accurate professional advice.[24]

The professionalism of municipal bond bank staff, along with strong policies and mechanisms to ensure bond repayment, has been essential to building credibility with private sector institutions. Responsibilities of the municipal bond bank management include:

- Assisting municipalities with the loan application process
- Reviewing the creditworthiness of municipal borrowers
- Assuring compliance with legal requirements for municipal borrowing through the municipality's independent bond counsel review
- Aggregating the principal installments of the municipal loans into the principal installments of the municipal bond bank bonds
- Marketing the municipal bond bank bonds to investors with advice from financial advisors and underwriters, and a rating issued by ratings agencies
- Calculating the borrower's loan interest rates based on municipal bond bank bond interest rates

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[21] In both New Hampshire and Maine, for example, two members of the board are mandated, by law, to have a public finance background, and the remaining members often have experience with the financial sector. Board members with backgrounds in finance provide a layer of protection against political pressure, as they are more likely to be concerned with the viability of municipal loans rather than political connections.

[22] In New Hampshire directors sign a surety bond in the penal sum of $50,000, conditioned on their faithful performance of their duties, where the issuing costs are borne by the municipal bond bank. In Maine, each commissioner signs a $25,000 surety bond and the executive director signs a $50,000 surety bond.

[23] This is based on our interview of municipal bond bank management in Maine and New Hampshire in January 2017. The strong credit ratings of municipal bond banks (Table 1) is a testimonial to the sound management of municipal bond banks.

[24] For more details on the types of professional services required for municipal bond issues, see the Municipal Securities Rulemaking Board's Overview: http://msrb.org/msrb1/pdfs/Financing-Team.pdf.

- Setting terms and timing for borrower repayment
- Monitoring and enforcing timely borrower repayments
- Managing cash flows, bond repayments, and reserve fund investments through the services of the bond trustee
- Conducting an annual review or audit of the municipal bond bank's financial positions for the board and state government.

Municipal bond bank management does not select or assess the feasibility of municipal projects to be financed by the municipal bond bank; municipal governments have primary responsibility for project selection and appraisal. Municipal bond banks are not involved in the project selection and appraisal process at the local level other than to assure the projects comply with legal requirements for municipal infrastructure projects. In New Hampshire, a municipality must conduct public town hall meetings and have public voting (referendum) on projects to be financed by debt. The decision of what types of revenues would be used to provide for the payment of debt services is made at the same time as the project is selected and method of financing is determined. The public commitment to raise taxes or fees for debt is an important process of project selection and debt issuance to ensure that the project has the support of voters.

Management policies, procedures and qualities are important elements of municipal bond bank credit ratings. For example, Moody's methodology for United States Municipal Program Debt assigned a 15% weight to management quality. Management is rated on five-point scale based on the agency's assessment of management's ability to swiftly address program challenges. This includes the number of staff and resources in a municipal bond bank and their track record in ensuring payments, even during times of fiscal crisis. Standard and Poor's methodology also has a three-point scale on financial policies and practices, that evaluate the municipal bond bank's governing policies on loan applications, loan monitoring, default and delinquency policies, and long-term planning. Both rating methodologies aim to assess the strength of the management systems to recognize and respond to challenges and ensure investor repayment in the event of a potential borrower delinquency (Moody's 2013; Standard and Poor 2012).

C. Financing and Operations

1. Financial sustainability

Municipal bond banks in the United States have maintained financial sustainability with strong credit ratings and virtually no defaults. Municipal bond banks have maintained financial strength even during and after the 2008 subprime crisis.[25] Table 1 below summarizes the current credit ratings of municipal bond banks.

[25] Based on authors' interviews with rating agencies, Moody's, S&P Global, and Fitch Ratings, in February 2017.

Table 1 Credit Ratings of Municipal Bond Bank Bonds

State Bond Bank[26]	Outstanding Loans as of 2016	Moody's	S&P	Fitch
Alaska Municipal Bond Bank Authority	$1.07 billion		AA	AA
Indiana Bond Bank	$419 million		AA	
Maine Municipal Bond Bank	$910 million	AA2	AA+	
Maryland Local Government Infrastructure Financing Program	$120 million	AA2 / AA3		
Michigan Finance Authority[27]	$4.6 billion	AA1		
New Hampshire Municipal Bond Bank	$942 million	AA2	AA+	
North Dakota Public Financing Authority	$132 million		AA	
Vermont Municipal Bond Bank	$534 million	AA2	AA+	
Virginia Resources Authority[28]	$1.66 billion	AA2	AA	

Source: Author's compilation based on municipal bond bank websites and publicly-available bond documents from EMMA (http://emma.msrb.org/)

The primary security for the payment of the municipal bond bank bonds is the obligation of municipal borrowers to make timely debt service payments to the municipal bond bank. The payment obligations of the municipal borrower are payable as a general obligation of the municipality which reflects the full faith and credit of the municipality, or secured by certain pledged revenues, taxes or other pledged assets.

Municipal bond banks may pursue legally enforceable remedies against a defaulting municipal borrower based on the terms of the loan agreement and the state's legal framework. Many municipal bond banks have statutory authority to intercept state aid transfers payable to municipal governments if the latter should default on obligations to repay their loans.[29] Some states go further. For example, the Maine Municipal Bond Bank can seize the property of residents for debt payments. Additionally, the Maine Municipal Finance Board, a state agency, has the legal authority to exercise control over any municipality that experiences financial difficulty (Maine Municipal Bond Bank 2015).

Municipal bond banks are financially independent, as states generally do not provide guarantees of municipal bond bank debt, nor budget support for municipal bond bank operations. Most states do not

[26] Ratings shown are for the most recent bond issue under the pooled financing program within the municipal bond bank, in the case that the municipal bond bank manages multiple programs such as SRFs.
[27] Local Government Loan Program – offers low-interest loans based on the pooled sale of loans from the Michigan Finance Authority. Borrowers can pledge state aid, investment credit or bond insurance as security. The rating here is for the unlimited tax general obligation local project bonds.
[28] Figures are for the state's municipal pooled program, the Virginia Pooled Financing Program.
[29] For example, municipal bond banks in the following states can intercept any state aid to municipalities in the event of municipal default on its loan to the municipal bond bank: Alaska, Maine, Maryland, New Hampshire, and Vermont. Municipal bond banks in the following states may intercept a certain portion of aid, or the aid relating to certain program: Indiana, Michigan, and Virginia. See Peterson 1997:9, updated based on the author's research.

appropriate annual budget subsidies for municipal bond bank operations.[30] Some municipal bond banks may have received initial loans to cover start-up costs, while others issued their initial pooled bonds without start-up funding.[31]

Most states provide some form of credit enhancement or financial commitment to pooled financing issues. The credit ratings of pooled financing facilities are thus generally higher than those of most municipalities included in the pool, resulting in interest rate savings to municipal borrowers. Credit enhancement primarily includes the interception of state aid and a state's moral obligation to replenish the debt reserve fund under certain circumstances. A moral obligation of a state is a non-binding agreement to appropriate funds to make up any shortfalls in funds needed for debt services on municipal bond bank bonds by replenishing the municipal bond bank reserve fund.[32] Although such an agreement is not legally enforceable, if a state fails to honor the moral obligation, the state could face the threat of its credit being downgraded by the rating agencies.[33]

Several operational factors also contribute to strong credit ratings for municipal bond bank bond issues, as discussed below. Municipal bond bank management must be diligent in:

- Analyzing a borrower's creditworthiness and compliance with legal requirements, such as debt limits and due authorization of the borrowing to reduce the risk of borrower default, and establish evidence of political commitment to the borrowing and the project to be financed

- Maintaining a diverse mix of borrowers in the pool as well as controlling any individual borrower's share of the total pool obligation

- Monitoring borrower loan payments to provide for the timely payment of the municipal bond bank bonds

- Pursuing legal remedies upon a borrower default such as intercepting state aid payable to the defaulting borrower

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[30] A few municipal bond banks may receive state funding to cover operational costs. In Maryland, for example, the pooled loan program is administered by the Community Development Administration, which is part of the Department of Housing and Community Development, and the operations of the department are financed by the state government. The administration also subsidizes part of the bond issuance costs (Peterson 1997; State of Maryland 2017).

[31] The Maine Municipal Bond Bank, for example, received an initial loan of $50,000 from the state government, which was then repaid within three years. The New Hampshire Municipal Bond Bank issued initial bonds without any initial capital allocation (Oliver and Mauro Undated Draft).

[32] In case of a default, the municipal bond bank covenants that it will "*request"* the state legislature to appropriate and provide the needed funds. This pledge is factored into the overall rating of the resulting pooled program by the ratings agencies; and each agency maintains a methodology for assessing the strength of the pledge, based on the clarify of the legal framework, how essential the projects are to government functions, and the timeframe for replenishing the debt reserve. Fitch Ratings, for example, usually place the value of the moral obligation at two notices below the state's rating, however if the pool is only one notch below the state's general obligation rating, then there is no enhancement. Moody's also has a notching range for moral obligation at two to three notches below the general obligation rating for the state. S&P allows for a moral obligation to result in a rating above the traditional full category if there are other security measures present. Source: Authors' review of ratings agency criteria.

[33] Based on authors' discussions with the ratings agencies in February 2017, the moral obligations of the states to municipal bond banks have never been called up.

- Managing cash flows and the investment of reserve funds to improve the creditworthiness of the entire municipal bond bank pool.

2. *Review of borrower credit and legal compliance*

A core municipal bond bank function is to conduct a review of the borrower's credit and maintain the credit strength of the bank's bonds. Higher credit ratings lead to lower costs of borrowing; therefore, the municipal bond banks actively assess the creditworthiness of a municipal borrower and its impact on the credit quality of the pool. For those municipal borrowers that do not have an independent credit rating the municipal bond banks utilize a similar methodology as the rating agencies though the review is not as extensive as a formal credit rating process. For example, the New Hampshire Municipal Bond Bank developed a quantitative model for credit analysis, drawing from the rating criteria of a rating agency.[34] Key factors include the amount of the requested loan, budget expenditures, revenue sources, annual fiscal balances, the assets, revenues or taxes are being pledged to pay the debt services on the loan, the municipality's current outstanding debt, any previous defaults by the municipality, the local economy, the largest employers, and population figures.

Another core municipal bond bank function is to ensure that a municipal borrower meets the state's legal requirements for municipal borrowing. A municipal borrower must submit the opinion of its independent bond counsel as to the due authorization, validity and enforceability of the municipal obligation and that the municipality has complied with the legal requirements for municipal borrowing as provided in state law (as summarized in section A). Additionally, an independent bond counsel to the municipal bond bank conducts a legal review to ensure the due authorization, validity and enforceability of the municipal bond bank bonds, including the compliance of the municipal bond bank with the state's legal requirements for the issuance of the municipal bond bank bonds.

The legal review relies on the diligence and formal opinions issued by independent bond counsels retained by the municipal borrower and the municipal bond bank, respectively. Legal opinions give comfort to prospective bondholders as to the legal enforceability of the municipal bond bank and municipality to pay their respective obligations.

3. *Pooling mechanism: maturities, interest rates and yields*

Pooled financing aggregates multiple small loans from municipal borrowers into a larger municipal bond bank bond issue. Municipal bond bank bonds are issued with the primary security of loan repayments from municipalities to the municipal bond bank, including principal and interest payments. This pooling mechanism serves two main purposes: 1) building a diversified pool of loans from multiple borrowers, which enhances the overall credit of the municipal bond bank bonds and lowers the cost of borrowing, and 2) sharing the administrative costs of bond issuance among multiple municipal borrowers.

The municipal bond banks use a basic pooling mechanism to aggregate loans of different amounts and maturities into a single bond issue. A simplified example of a pooled financing bond issue is shown in

Table *2*, below. In this example, the annual principal payments from four loans are aggregated into the annual maturities of a single bond issue. Municipal loans are structured so that principal payments are

[34] The information in this section is based on reviews of municipal systems and discussions with the staff of the Maine Municipal Bond Bank and New Hampshire Municipal Bond Bank in January 2017.

spread over the useful life of the proposed project.[35] The pooled bond is then issued by the municipal bond bank with annual maturities that match the principal payments from the different municipal loans.[36]

Table 2 Sample Pooled Bond Structure

Year	Principal Loan Repayments (in '000 USD)				Pooled Bond	
	Town A: $1 million, 5-year Project	Town A: $10 million, 10-year Project	Town B: $1.75 million, 7-year Project	Town C: $8 million, 10-year Project	Maturity	Interest Rate (%)*
2017	200	1,000	250	800	2,250	1.77%
2018	200	1,000	250	800	2,250	2.07
2019	200	1,000	250	800	2,250	2.18
2020	200	1,000	250	800	2,250	2.33
2021	200	1,000	250	800	2,250	2.20
2022		1,000	250	800	2,050	2.25
2023		1,000	250	800	2,050	2.58
2024		1,000		800	1,800	2.65
2025		1,000		800	1,800	2.70
2026		1,000		800	1,800	2.74

Source: Authors' work. **Note*: Annual interest rates - In some cases, when bonds are sold at a premium, the interest rates charged will be higher than the overall yield to amortize the premium. Bonds sell at a premium when the bond issue is sold at a price above its par, or face value, in the market. This higher value results in a higher coupon, or interest rate, however it also reduces the total yield at bond maturity. The net effect is that premium bonds have an effective interest rate at prevailing market rates, despite the higher coupon.

Interest rates and yields for each municipal bond bank bond maturity are priced based on the sale of the municipal bond bank bonds to the capital market. The pricing of a pooled municipal security is therefore set by the demand from investors, including individual purchasers and financial institutions, such as mutual funds and pension funds.[37] An important feature of market pricing of municipal bond bank pooled bond issues is the market transparency and credit strength of the underlying municipalities, and the various mechanisms utilized to enhance the credit of the municipal bond bank bonds, for example the reserve fund, state aid intercepts and a moral obligation of the state. Nearly all municipal bond banks bonds are issued with fixed interest rates, as opposed to variable interest rates.[38]

The municipal bond bank does not independently determine the price of each municipal loan; interest rates on the municipal loan reflect the interest rates set on the municipal bond bank bonds of the same

[35] This example uses a level-principal method of pricing the debt service, which means that the principal payments are evenly distributed throughout the life of the project resulting in higher overall debt service payments in the earlier years. Both the Maine Municipal Bond Bank and the New Hampshire Municipal Bond Bank structure most of their loans using level-principal payouts. This is a more conservative method of calculating debt service, since the debt service payments are greater in the early years of the loan, however total interest cost is less.

[36] A bond can be structured with varying annual maturities through either a serial structure or a term bond with mandatory annual redemptions. A serial bond structure has a portion of the bonds maturing at regular intervals. A term bond has a single maturity but is subject to periodic mandatory redemption of the term bond; thereby providing that all or part of the term bond is paid before its maturity.

[37] Bond sales on the capital market can be sold on a negotiated basis or by competitive bidding.

[38] Variable interest rate bonds can potentially lower the costs of borrowing in the short-term, and some larger municipalities will issue variable-rate bonds to try and capture these savings for tax payers. Municipal bond banks, however, usually rely on fixed-interest rate bonds because their smaller municipal sub-borrowers may not be able to manage the risk of an increased interest rate over time.

maturity. The municipal bond bank utilizes the interest rates on the municipal bond bank bonds determined by the market for each maturity to determine the interest rates on each related municipal payment. Each municipality with the same loan principal payment date will pay the same annual interest rate on the maturing loan principal.[39]

As part of the loan pooling process, municipal bond banks can include additional fees or surcharges to the borrower's loan repayment structure to cover the municipal bond bank's operational costs. The earliest municipal bond banks used the proceeds from investing their reserve funds to finance operational costs, however a tax law restriction in 1986 has since eliminated this revenue source.[40] Since then, municipal bond banks have financed operational and bond issuance costs through several revenue sources, including: borrower application fees, fees on outstanding loans, interest rate surcharges on municipal loans, or interest earnings on unused cash balances.[41] The interest rate surcharges and fees charged by the municipal bond bank are usually reasonable, given the relatively small staff, large volume of loans in most municipal bond banks loan portfolios, and their non-profit status. The resulting borrowing costs are usually lower than other financing alternatives, such as the costs of independently issuing municipal bonds or borrowing from commercial banks.

Each municipal bond bank pooled bond is typically rated by one or more rating agency to assess the credit quality of the municipal bond bank bond. Ratings agencies assess a variety of factors in assigning a credit rating to a pooled bond issue, including the number and diversity of pool participants, the underlying credit quality of pool participants, legal arrangements, reserve funds, default remedies, municipal bond bank management and policies, and the various credit enhancement mechanisms. Ratings agencies will run financial stress test models on the bonds, based on these criteria, to assign their ratings.

Since most municipal borrowers in a pooled financing are not independently rated, rating agencies will examine how municipal bond banks assess the creditworthiness of their borrowers. For larger pools, with more than 10-50 participants, ratings agencies will determine the average creditworthiness of the borrowers, recognizing that larger and more diversified pools have lower risks. For smaller pools, however, ratings agencies will assign the entire pool the rating of the lowest-rated borrower, or the 'weakest-link', recognizing that default of one borrower in a small pool would likely result in a default on the municipal bond bank bond. Similarly, if one project in a pool represents more than 25% of the total borrowing, the benefits of risk diversification are mitigated and the rating for that pool of projects may be reduced due to concerns about concentration of risk. For example, as Moody's was rating the Maine Municipal Bond Bank's Fall 2016 issue, they assigned a high Aa2 rating based on the wide pool of 274 borrowers and only 28% of all loans concentrated in the top five borrowers. The average underlying credit of the borrowing pool is in the A-range, however the pooled bond issue received a higher rating due to the pool diversity and other credit enhancements of the debt reserve fund, moral obligation and state aid intercept (Moody's 2016).

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[39] When municipal bond bank bonds are sold competitively, a municipal bond bank will not be able to give exact borrowing interest rates to their municipal borrowers before the bond is sold. Municipal bond banks can usually provide accurate estimates based on current market rates and prior bond sales, and the municipalities will agree, as part of their loan agreements, to pay the final rates as determined at the time of the sale.

[40] Prior to United States tax law restrictions established in 1986, municipal bond banks could arbitrage funds borrowed at a tax-exempt rate and invest the funds at a higher taxable rate. Such arbitrage earnings were used to fund operations.

[41] In some municipal bond banks, bonds are also sold at a premium, meaning that the price of a bond is higher than its par value, and investors pay more upfront to buy the bond to then receive higher interest payments throughout the duration of the maturity. In this case, the municipal bond bank can use some of the premium proceeds to pay for operational costs, and distribute the remainder back to municipal borrowers by lowering their principal repayment amounts.

4. *Surveillance, cash management, and default remedies*

Municipal bond banks actively monitor municipal borrower loan payments to ensure timely payment of debt service on the municipal bond bank bonds. In the New Hampshire Municipal Bond Bank, for example, the staff issues an invoice 60 days before the payment due date on the municipal loan, and then follows-up with an email two weeks before the due date. If payment is not received a few days before the due date, staff will call municipal treasurers to ensure the payments are being processed in a timely manner. The New Hampshire Municipal Bond Bank has also structured borrower payments so that all principal and interest on the municipal loan payments are required to be made 30 days before payments are due on the municipal bond bank bonds. These advance payments are structured so that the staff have adequate time to assist municipalities, utilize reserve funds or initiate the available credit enhancement measures (e.g. state aid intercept) to ensure the timely payment on the municipal bond bank bonds.

Municipal bond banks also use independent trustees to manage bond proceeds, debt service payments, and other funds to assure that the funds are used only for their permitted purposes. Upon the issuance of the municipal bond bank bonds the proceeds of the sale are deposited with the trustee pending the disbursement of the loans to the respective municipalities to finance the municipal projects. Additionally, the loan repayments, received by the municipal bond bank from the municipal borrowers are held by the trustee to be applied to the payment of the municipal bond bank bonds, as well as the reserve funds securing the municipal bond bank bonds.

Municipal bond banks actively manage cash flow and reserve funds to ensure they have liquidity to make timely debt service payments on their bonds. A debt service reserve fund is typically equal to the maximum annual debt service in any future year or some higher ratio.[42] The debt reserve funds can be drawn in the event of a payment shortfall from municipal borrowers to make debt service payments. The amounts on deposit in the reserve fund are invested only in highly rated securities[43] that mature at such times as to assure the availability of funds to make timely debt service payments, if needed.

Finally, municipal bond banks have multiple, overlapping mechanisms to mitigate the risk of default on a municipal bond bank bond:

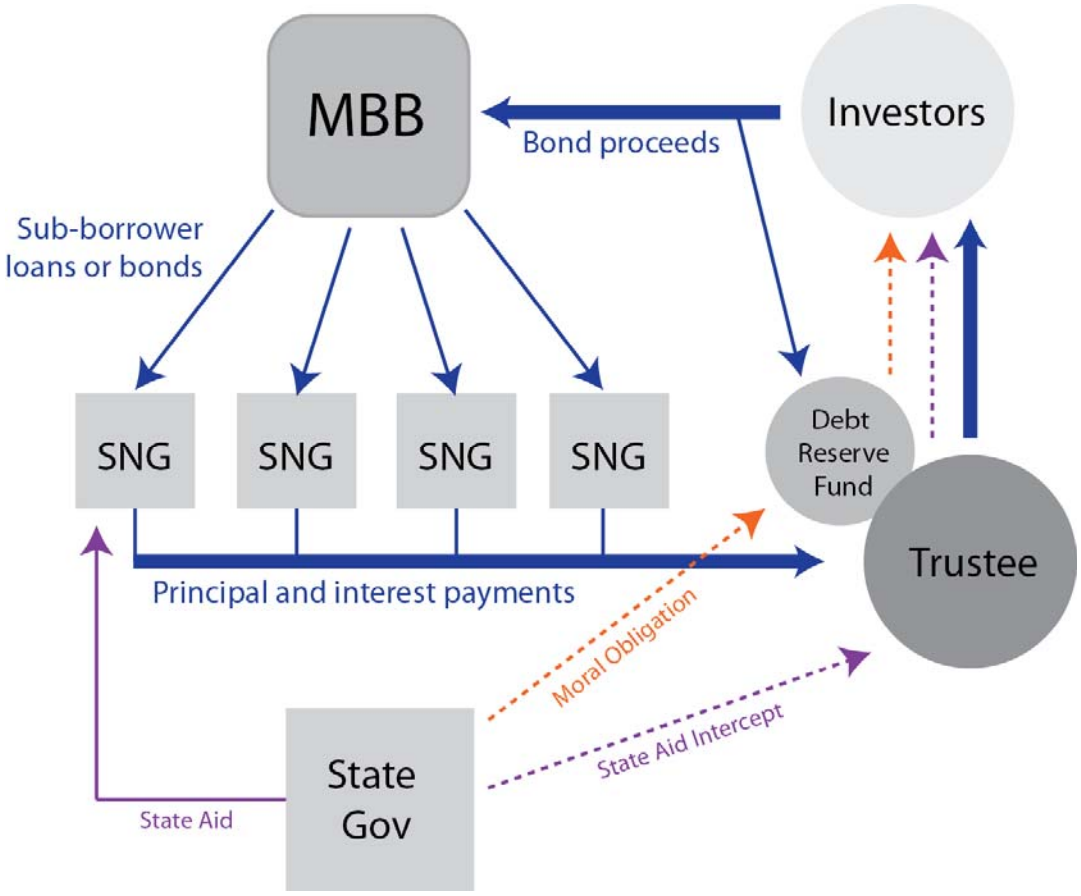
- A robust legal framework preventing excessive borrowing
- Enforcing the defaulting municipality's obligation to raise taxes and/or revenues
- Intercepting state aid payable to the defaulting municipality
- Using the reserve fund
- Calling upon the state's moral obligation to replenish the reserve fund when utilized

In summary, Figure 1, below, presents a simplified model of funds flow and credit enhancement mechanisms in a municipal bond bank pooled financing mechanism. In this example, bond proceeds are distributed to local governments (LGs), and then repayments are made via a trustee to investors (in blue). In the event of default (shown by dotted lines), additional municipal bond bank default remedies include

[42] The Maine Municipal Bond Bank maintains its reserve fund at a level 1.25 X the maximum annual debt service of its bonds.
[43] Investments in the reserve fund are limited to AAA government securities.

the state aid intercept (in purple) and the state's moral obligation pledge to replenish the debt reserve fund in case of SNG default (in orange).

Figure 1 Municipal Bond Bank Funds Flow Model



Source: Adapted by authors from Johnson 2005: Introduction to Pooled Financing.

IV. Lessons for Developing Countries

The experience of the United States shows that pooled financing operates within and not separate from the broader regulatory framework for subnational capital markets. At the time that the first municipal bond bank was established in 1969, the essential elements of the regulatory framework for municipal finance were well established having developed from a series of reforms established since the first state debt crises in the 1840s. Pooled financing operates within the legal and regulatory framework and functions of the subnational capital markets, including:

- Mature and competitive capital market for securities
- Clear identification of revenue sources that secure the payment of the municipal obligation
- Debt limits for municipal borrowers
- Financial audit and disclosure requirements
- Independent professional management, including staff and board
- Limiting state liability for municipal debt and state guarantees
- Effective and enforceable remedies upon the event of default and insolvency
- Pooled financing as an option among other financing alternatives, and not a requirement for municipalities

Sustained efforts in regulatory reforms are essential in developing countries, and pooled financing is not a magic bullet to solve or avoid the need for fundamental challenges facing borrowers and investors. Interest in pooled financing has grown in developing countries, through a variety of instruments, such as a municipal development fund, regional development fund, infrastructure bank, and bond bank. These instruments do not operate in a vacuum. These financial intermediaries are participants in the capital market. A competitive capital market with participation from a variety of private participants, such as pension funds, mutual funds, and insurance companies, and individual investors, lowers the cost of financing for municipal borrowers. Pooled financing has proven to be most effective in a competitive capital market environment where municipalities have financing flexibility and options in addition to pooled financing. Situations where a municipal development fund becomes the dominant player in the municipal capital market, or has special privileges granted by the government not available to private players, have proven to be ineffective.

Municipal bond banks differ from development banks in important ways. Municipal bond banks:

- Are non-profit
- Are managed by a small number of staff
- Do not screen projects
- Do not price the on-lending loans to municipalities individually; instead, the capital market competitively prices individual loans.

An established legal framework for municipal borrowing is essential, including debt limits for municipal borrowers. The lack of clarity resulting from conflicting statutory provisions creates potential confusion and uncertainty for bondholders who may attempt to enforce their legal rights to payment. This is also the case where contract law is not well defined and the contractual agreements securing the payment of the bond issue may be subject to political interference or an inexperienced judiciary. This is a concern especially in project finance, where the contractual obligation to raise tariffs, user fees or tolls may not be politically popular. This issue can be addressed through the establishment of a comprehensive legal framework that clearly defines the rights and responsibilities of borrowers and lenders, including voter approval of projects and the debt used to construct them.

The success of pooled financing relies on the creditworthiness of the municipal borrowers. While some borrowers within a pool may have stronger credit than others, the overall portfolio is the aggregate credit strength of the pooled borrowers. While the municipal bond bank can help lower the cost of financing and transaction for borrowers, the municipal bond bank does not compensate for the weaknesses of a borrower's credit. The creditworthiness of local governments is strongly influenced by the intergovernmental fiscal system. Deficiencies in the intergovernmental system can weaken the creditworthiness of local government in a variety of ways: central government fiscal transfers to finance subnational fiscal deficits without consideration to fiscal discipline, unsteady transfers and frequent changes in transfer formula, instability in revenue assignment, and lack of incentives for local governments to raise own revenues. Although these issues are outside the scope of the paper, the importance of intergovernmental fiscal reforms needs to be emphasized here, as it relates to the basics of the pooled financing.

Loans must be made only to creditworthy borrowers based on principles of sound, fundamental credit analysis. This will be a difficult objective to comply with in countries where political pressure to lend to certain SNGs or to finance particular projects is strong. This could result in crony capitalism, which may be involved in the granting of concessions to operate privatized municipal operations, or from incentives to support SNGs with strong political ties to the central or local government. If the lending organization is not sufficiently insulated from the political process, it is likely to fail.

Government guarantees of the pooled financing should be discouraged, forcing investors to analyze the pool risks. Since many municipal borrowers lack credit strength in developing countries, the use of government guarantees to help a pooled financing facility to access the market can be tempting, however it adds to the government's total debt stock. In the United States, states generally do not provide guarantees to the municipal bond banks. The states often do use their moral obligations to enhance the creditworthiness of the pool. However, a moral obligation is not legally enforceable and is not the sole credit enhancement mechanism; revenue intercepts are a more important credit enhancement device. Moreover, a moral obligation only works in a mature capital market environment. It does reflect the state's commitment to the pooled program; although not legally enforceable against the state. The state is aware that if it does not honor the moral commitment, its own credit rating may be negatively affected. The capital market punishment of a state that does not honor its moral obligations can be serious and real. Improving fiscal transfers and revenue flexibility is a more effective method to enhance municipal creditworthiness than guarantees.

Local control and accountability are fundamental to the pooling process in a decentralized system. Municipal bond banks in the United States are not involved in appraising individual projects, although they do look at the nature of a project to ensure it meets the legal requirements of capital investment financing. Municipal governments have primary responsibility for project selection and appraisal. The capital investment plans by municipalities typically follow a transparent process where the public can participate in the town meetings. When a municipal government chooses an investment project to finance through debt, it must obtain voter approval and commit revenue sources to provide for the payment of debt service. The

local accountability for project selection and the public commitment to raise taxes or fees for debt service are among the most important features of the decentralized public finance system in the United States.[44]

Broader reforms in public financial management are important to ensure the success of pooled financing. Many local governments in developing countries do not produce financial reports that are standardized and transparent, and thus do not give an accurate picture of their financial condition. The problem can be even more acute in newly decentralizing countries which are creating new tiers of governments, or consolidating and restructuring existing local government units. In these cases, assets and liabilities will need to be reclassified and recorded. Private investors require annual audited financial statements from borrowers. Although the municipal bond bank can help its portfolio borrowers strengthen reporting and financial management, the development of appropriate, uniform standards of financial reporting and accounting requires the overall reform of the public sector financial management at all levels of the government. The municipal bond bank cannot be used as a technique to compensate the systemic weaknesses in the public financial management and accounting.

Simple and conservative structuring of pooled loans and bond issuance are preferable to complicated financing structure. Municipal bond banks have relied on basic, conservative financing structures and mechanisms. Although various financing strategies, for example variable rates, may have short-term benefits, they are also associated with additional risk.[45]

Notwithstanding the complex requirements for a successful pooled program, the process of establishing pooled financing mechanisms in developing countries can be a catalyst for reforms. Through establishing pooled financing mechanisms, the government may establish a legal framework for subnational borrowing, standardize financial reporting, audits and disclosure for participating municipalities.

Instead of resorting to government guarantees for the pooled facility, the government may want to consider broader intergovernmental fiscal reform, including some revenue flexibility for municipalities, and a transparent rule-based transfer system. The pooled model provides several methods of credit enhancement without resorting to government guarantees, such as the debt reserve fund, state aid intercept, surveillance and effective remedies.

In countries with an active sovereign bond market, the government may assess its capital market structure to design a reform program to increase competition in the sub-sovereign capital market. As of now, in many emerging economies, commercial banks or public banks are the dominant players in subnational capital markets. Reforms should encourage the participation of private market players, such as mutual funds, insurance companies, pension funds, and other institutional investors.

In countries where concessional loans from international financial institutions are a main supply of infrastructure financing in the medium or longer term, government may consider ring-fencing funds disbursement to intended beneficiaries or projects and strengthen basic capacity in public financial management, including standardizing reporting, audit and disclosure requirements for fund use.

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[44] For more details, please see Liu, Tian, and Wallis 2013.

[45] Jefferson Country in Alabama, which includes the city of Birmingham, filed for bankruptcy in 2011, because of using structured financial products to resolve the overindebtedness of the county's sewer system. After the Global Financial Crisis in 2008-2009, the price of debt service increased substantially, and in 2008 the county defaulted on its sewer payments, resulting in an acceleration of the debt, which eventually led to the county filing for bankruptcy (Canuto and Liu 2013: 328-329).

V. Conclusions

Large infrastructure supply gaps exist across developing and emerging markets. Infrastructure has been largely decentralized to SNGs in many countries. Policymakers are keenly interested in developing subnational bond markets to give SNGs access private financing for infrastructure. Pooled financing – through a variety of forms such as regional infrastructure funds, municipal funds, infrastructure banks, or bond banks – has become a sought-after solution to help SNGs access private financing for infrastructure.

To ensure the success of the pooled financing, a set of issues must be addressed – from governance to management, from legal requirements to operational guidelines, from project appraisal to loan structure, from default remedies to moral hazard. And more fundamentally, what is the broader regulatory environment – from intergovernmental system to capital market structure – under which the pooled financing facilities operate?

The experience of the pooled financing, particularly the municipal bond banks, in the United States, offers powerful and illustrative lessons. Similar to many developing countries, many small municipalities in the United States lack the knowledge of financial markets and need to borrow relatively small amounts of capital, the process of raising private financing can be difficult and costly. Since the 1970s, the municipal bond banks have become a cost-effective and stable model for expanding subnational financing for many small municipalities, while maintaining strong credit ratings with virtually no defaults from sub-borrowers.

The success of the municipal bond banks is not an accident. It is rooted in a well-developed and competitive capital market with sound regulatory frameworks, the result of a series of profound reforms undertaking over more than 150 years of history. The municipal bond banks also function within a mature, developed federal structure. Credit culture, professionalism, and a respected judicial system are all parts of why the pooled financing has worked well.

In summary, pooled financing is not a magic bullet. It is critical to reform intergovernmental systems, strengthen public financial management and accounting, and develop regulatory prudence for subnational borrowers, and oversight and regulations in the securities market. The pooled financing mechanisms cannot be used as substitute to compensate the lack of reforms in these areas. Nevertheless, credit pooling programs may be well suited to small municipalities with modest projects that have limited financing opportunities. With the broad areas of reform proceeding, it is advisable to design pooled financing programs. For developing countries that are actively pursuing the development of sub-sovereign capital markets, pooled financing can be used as a catalyst for competitive reforms.

Annex A: Overview of the Maine and New Hampshire Municipal Bond Banks

The Maine Municipal Bond Bank

Maine is the second most rural state in the United States, and many of its smaller municipalities struggled to independently access capital markets. The state has 850 local governments serving a population of 1.3 million that deliver essential services that require capital investment, including road construction, waste disposal, water utilities, police, fire protection and public education. The Maine Municipal Bond Bank was established in 1972 by the Maine State Legislature as an independent agency to provide access to capital markets and to lower the cost of borrowing for these small local governments. The Maine Municipal Bond Bank issues loans to cities, towns, school systems, water and sewer districts, and other governmental entities through the sale of its tax-exempt bonds. The Maine Municipal Bond Bank has been highly successful; as of 2017 issuing a total of $4.9 billion in bonds and never having a default in its 44-year operating history (Census 2007; Census 2012; Maine Municipal Bond Bank 2017).

The Maine Municipal Bond Bank is an efficient organization running eight different programs with only 11 full-time equivalent staff, while being financially self-supporting. At its founding, the Maine Municipal Bond Bank was issued a $50,000 “start-up” loan from the state legislature, that it repaid in three years. Since then, the Bank entirely funds operations and bond issue costs from interest rate surcharges to borrowers and investment earnings. The first loan program operated by the Maine Municipal Bond Bank was the General Bond Resolution Program, which was established in 1973 for general purpose loans and has since issued 1,815 loans to 517 government units, covering more than half of Maine’s local governments. The Maine Municipal Bond Bank later added seven additional programs, including a state revolving loan fund for drinking water and waste treatment backed by federal grants, transportation, and technology purchases (Maine Municipal Bond Bank 2017).

Maine Municipal Bond Bank bonds maintain high credit ratings through a combination of active administration, pool diversification, and credit enhancements, which lower the cost of borrowing. The Maine Municipal Bond Bank’s General Resolution Program has received ratings of AA+ from S&P Global and Aa2 from Moody’s, which are higher than smaller municipalities could receive independently. The Maine Municipal Bond Bank manages this credit rating through credit analysis, monitoring and loan administration. Borrowing municipalities submit a credit application, modeled on the rating agencies’ worksheets, which is reviewed by the Maine Municipal Bond Bank team and approved by the Maine Municipal Bond Bank’s board. The Maine Municipal Bond Bank also requires annual audited financial statements from borrowers, and actively monitor loan payments, which are due 30 days before bond payments. Pooled bonds are also secured by a diversified portfolio, comprised of 87% general obligation bonds and 13% revenue bonds. The largest borrower in the pool represents only 6% of the total pool and the top ten borrowers account for 32% of the total pool. Finally, the General Resolution program is set up with credit enhancement features, including a debt reserve fund equal to the maximum annual debt service, a supplemental reserve fund currently at $13.3 million, a state aid intercept mechanism, and a moral obligation pledge from the state (Maine Municipal Bond Bank 2015; Maine Municipal Bond Bank 2017).

The success of the Maine Municipal Bond Bank can be attributed both to the strong regulations and management of the institution, but also to the overall conservative fiscal management in Maine’s municipalities. Maine does not have a state debt limit for local government, however bond issues are subject to public approval through a council vote or referendum. In cases of financial mismanagement of crisis, the state is authorized to intervene and suspend a town council. Furthermore, general obligation bonds, which are backed by the full faith and taxing power of the government entity, also include the ability to seize private property of residents in case of default. Revenue authorities also have the power to cut off service to non-paying customers, also ensuring a stable revenue base. These regulatory frameworks have

established a highly credible system for debt repayment, making the pooled Maine Municipal Bond Bank loans an attractive, low-risk investment for potential buyers in the capital market (Oliver and Mauro Undated Draft).

The New Hampshire Municipal Bond Bank

The New Hampshire Municipal Bond Bank was established in 1977 and is similarly structured as the Maine Municipal Bond Bank and adapted to fit New Hampshire's lending needs. New Hampshire is small state with 1.3 million people, however, it is more urban than Maine with 60% of the population living in urban areas. The larger municipalities in New Hampshire issue bonds independently and some of the smaller towns operate capital reserve funds to self-finance projects through savings. Nevertheless, a financing gap for small and medium towns and municipalities remained, and since its founding until 2016 the New Hampshire Municipal Bond Bank has issued 1,198 loans to government entities, with a total of $2.4 billion in municipal bonds. Individual loans range in size from $49 million for a school district to $19,000 for repairs to a fire truck (New Hampshire Municipal Bond Bank 2016; New Hampshire Municipal Association 2008).

The New Hampshire Municipal Bond Bank only offers general purpose loans to municipal borrowers for capital projects, operating effectively with minimal operational costs. While New Hampshire also has other loan programs, such as a state revolving fund, these are managed separately from the New Hampshire Municipal Bond Bank. The New Hampshire Municipal Bond Bank is staffed by three full-time staff, which conduct credit analysis and loan administration. At the time of its founding, the New Hampshire Municipal Bond Bank did not receive a loan from the state but instead directly issued non-asset bonds and funded operational costs through interest rate surcharges to municipal borrowers. Operational costs continue to be funded from a combination of interest rate surcharges, application fees from borrowers, and investment earnings (Interviews with New Hampshire Municipal Bond Bank Staff 2017).

New Hampshire Municipal Bond Bank bonds are issued under three resolutions, which have evolved over time. Most bonds are issued under the 1978 Resolution, which has an established reserve fund and separate account groups for general funds, operating costs, principle, interest and reserve funds. In 1979, an additional resolution was issued for state-guaranteed debt for state priority projects, however this resolution has been being phased out since the late 1990s. In 2005, a new resolution was created using sureties instead of a reserve fund, however when the sureties market collapsed in 2008, the New Hampshire Municipal Bond Bank restructured these bonds to utilize reserve funds. The 1978 Resolution has remained the New Hampshire Municipal Bond Bank's largest and most diversified pool, with $636 million in outstanding debt in 2016 (New Hampshire Municipal Bond Bank 2016).

New Hampshire Municipal Bond Bank staff actively monitor their loan portfolio and loan repayments, though their surveillance of borrowers is limited. Borrowing municipalities submit an application that includes audited financial statements, which is reviewed and then approved by the New Hampshire Municipal Bond Bank's five-member board. Once a loan has been issued, the New Hampshire Municipal Bond Bank staff is proactive in ensuring on-time payments by sending invoices 60 days before the due date, with follow-up emails then two weeks prior and phone calls if payments are not received a few days prior. The New Hampshire Municipal Bond Bank does not conduct active surveillance of projects or municipal finances, however, due to the strong regulations around municipal debt, nor are continued annual audits required. Any municipal bond is required to be approved by 2/3 vote at a town meeting. Once approved, debt service is required to be included in the town's annual budgets. The state of New Hampshire also set debt limits for municipal governments. As of 2015, New Hampshire Municipal Bond Bank bond issues have credit ratings of AA+ from S&P and Aa2 from Moody's (Author Interviews, New Hampshire Municipal Bond Bank 2016).

Annex B: State Revolving Funds

In the United States, state governments have developed additional financing models for critical infrastructure through State Revolving Funds (SRFs). The SRF model developed following the 1987 federal Clean Water Act that provided direct federal grants to states for water and wastewater treatment plants with a 20% matching contribution from the state government, which can then be used by states to make low-cost or no-interest loans for eligible water infrastructure projects. The revolving funds are set up so that the money, once repaid, does not go to a general fund, but rather back to the loan fund so it can be re-loaned. The Act gives the states wide discretion in structuring the, including setting interest rates and loan terms, and managing administration through bond banks, state financing authorities, other state agencies, or independent non-profit associations (Kehew, Matsukawa and Peterson 2005; Puentes and Thompson 2016).[46]

The United States developed the Clean Water Act to stimulate capital spending on pollution control and wastewater, however it recognized that grant funding alone would not cover infrastructure demand. Instead, states can use the funds in various ways, including direct lending or leveraging the initial federal and state capitation to issue bonds which are secured by project revenues and enhanced by the additional grant equity. By allowing leveraging of the grant funds, the Environmental Protection Agency has estimated that each dollar invested in the Clean Water federal grant program results in $2.90 worth of investments in water infrastructure through the SRFs. All 50 states and Puerto Rico have since established some model of the SRF and 28 states have used leveraging to expand the reach of their grant funds. Since the program began until 2016, total federal contributions have reached $41 billion, matched by $7.6 billion in state grants, which has been multiplied by the SRFs into $120 billion available for project financing (Copeland, Maguire and Mallett 2016; Environmental Protection Agency 2016a).

Leveraged SRFs can issue highly-rated bonds by pledging all or part of their capital funding to the repayment of the bond using either a reserve fund model or cash flow model:

- Reserve Fund Model: Equity from the clean water grants are held in a reserve fund that is used to back revenue bonds issued by municipal and local governments. Reserve funds serve as security for bonds but can also be used to subsidize interest rates. Often reserves are overcapitalized, providing 25 to 50 cents of reserves for every dollar in loans, especially in SRFs where there is small number of larger borrowers.

- Cash Flow Model: States initially lend the original equity to projects and then pledge loan repayments as security to issue revenue bonds that can be used to make additional loans. Bonds are structured with more loan repayments pledged then required for bond debt payments, and the principal and interest payments are first used for bond repayment, and then for replenishing the SRF. SRFs can also use a hybrid model, using some portion of their equity for a reserve fund and the remainder to fund loans to be used as security for revenue bonds.

In recent years, more SRFs have been using a hybrid or cash-flow model due to low market interest rates that make reserve fund structures less attractive for investors (Fitch 2016b; Oliver and Mauro Undated Draft).

Credit scores for SRF programs are enhanced by the equity enhancements, pool diversity, and other default remedy provisions put in place by state governments. Of the leveraged SRF programs rated by Fitch,

[46] The Clean Water act allows grant money to be used to issue low-interest rate loans, buy municipal bonds, guarantee local government loans, serve as revenue or security on bonds sold to make loans, earn interest or pay for administrative costs.

for example, 80% of programs are rated AAA, despite the median implied pool rating of BBB-. Most this credit enhancement is likely to come from the equity enhancements instead of pool diversity, as top-10 borrower concentration within the pooled programs is high, with a median of 59%. A large factor driving these high credit ratings is the low leverage levels that SRFs use to issue loans and bonds. In Fitch's stress tests, they estimate that 85% of their 33 rated programs could withstand 100% loan repayment defaults over three four-year periods. SRF credit scores can be enhanced by additional measures, similar to municipal bond banks, including: state aid intercepts, additional reserve funds, security measures in loan agreements, and surveillance and enforcement procedures. High credit scores for SRF leveraged programs can result in significant savings for SRF borrowers; borrowing at up to 3 percent below the market rate (Fitch 2016b; Environmental Protection Agency 2016b; Oliver and Maduro Undated Draft).

The success of the Clean Water SRF model has led it to be expanded and replicated at the federal and state levels. In 1996, the federal government authorized an additional Drinking Water State Revolving Fund program for public water systems, modeled on the Clean Water Act. This program focuses on water provision, where providers are often private sector or non-profit; thus, the program expanded eligible recipients. The new act also allowed for the clean water and drinking water funds to cross-collateralize their obligation and transfer funds between programs States have also expanded the SRF model to include additional innovations to expand the capital available for infrastructure, creating transportation SRFs in State Infrastructure Banks using capitalization from federal funding from the Transportation Department or from additional state revenues (Puentes and Thompson 2016).

The SRF model differs from municipal bond banks in several key areas, including: the use of federal grant funding, project application and selection criteria, and setting borrower interest rates. The municipal bond bank model is not reliant on federal or state grants to capitalize loans; instead using the pooling mechanism and credit enhancements to lower the cost of borrowing. SRFs, on the other hand, use federal or state equity to raise their credit ratings and subsidize borrowing costs.[47] In reviewing potential applicants for loans, the municipal bond bank and SRF also differ in terms of their selection criteria. Municipal bond banks can offer loans to all applicants, once they have satisfied criteria for creditworthiness and project eligibility, as these loans can be automatically packaged into their next bond issue. SRFs, on the other hand, will vary in procedures by states, using either a 'first-come first-serve' approach or evaluating projects based on selection criteria and ranking based on state priorities. Finally, SRFs and municipal bond banks vary in terms of procedures for setting interest rates. Municipal bond banks set interest rates based on market rates and any additional interest rate surcharges needed to cover operational costs. SRFs on the other hand, have wide discretion to set interest rates and often subsidize borrowers based on hardship criteria (Kehew, Matsukawa and Peterson 2005; Puentes and Thompson 2016). Despite these differences, both models have been effective at financing key infrastructure investments at the subnational level and leveraging pooled financing mechanisms to lower the cost of borrowing.

[47] Without these capital injections, it is possible than SRF offering subsidized interest rates will begin to lose equity over time, but it is also possible that the SRF could offer subsidized rates based on the pooling mechanism and credit enhancement measures alone. A 1992 paper estimated that subsidized loans below market rates and inflation rates would reduce the total loan capacity over time; while a 2007 study suggested that an SRF offering 1% interest rates could still maintain its loan volume, but would need to raise interest rates to increase loan capacity (Puentes and Thompson 2016).

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