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CONDUIT BOND FINANCING OF LOCAL GOVERNMENTS—PERSPECTIVE FROM THE U.S. AND CHINA

Zihe Guo

University of Kentucky, guozihe@gmail.com

Author ORCID Identifier: http://orcid.org/0000-0002-3815-4123

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Zihe Guo, Student

Dr. Dwight V. Denison, Major Professor

Dr. Eugenia F. Toma, Director of Graduate Studies
CONDUIT BOND FINANCING OF LOCAL GOVERNMENTS—
PERSPECTIVE FROM THE U.S. AND CHINA

DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
Martin School of Public Policy and Administration
at the University of Kentucky

By
Zihe Guo
Lexington, Kentucky

Director: Dr. Dwight V. Denison, Professor of Public and Nonprofit Finance
Lexington, Kentucky

2016

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ABSTRACT OF DISSERTATION

CONDUIT BOND FINANCING OF LOCAL GOVERNMENTS—
PERSPECTIVE FROM THE U.S. AND CHINA

As an alternative way to issue bonds, conduit financing has been widely used by local governments and nonprofit organizations. Conduit financing allows one entity to issue debt on behalf of single or multiple borrowers. In the state of California in the U.S., a local agency is allowed to issue municipal bonds in compliance with law, but can also borrow through a joint powers agency (JPA). In this case, the JPA serves as a conduit. Conduit financing is preferred by local agencies in certain circumstances because it is more convenient or fixed issuance costs can be split between several conduit borrowers through bond pooling. In China, various Chinese local government issued debts through the local government financial vehicles (LGFV); LGFV is viewed as a conduit. Conduit operations, however, bring extra financial and administrative burdens. In this dissertation I examine borrowing costs of local governments in the U.S. and in China, particularly paying attention on debts issued through conduits.

The chapter 2 provides a background context and theoretical foundation of the whole dissertation. In addition, two mechanisms--borrowing through JPAs in the U.S. and through Chinese local government funding platforms will be compared to identify the similarity and distinctive perspectives. Based on data from California Debt and Investment Advisory Commission (CDIAC), the third chapter of my dissertation aims to probe into two issues: (1) what drives local agencies to use conduit? (2) Did conduit financing produce lower TIC than other revenue bonds? The emergence and existence of this type of conduit is profoundly historical and political. One reason for this is informational asymmetry in the municipal bond market. The disclosure requirements of the municipal bond market are weaker than the corporate bond market, and plenty of small issuers are less known by municipal bond investors. Although bond pooling provided by conduits is supposed to lower borrowing costs, most bonds issued by JPAs finance a single local agency. Therefore, it is important to investigate the incentives for these local agencies to use conduits instead of arm’s-length investors. As a matter of fact, during the borrowing process, the JPA is a type of financial intermediary that can reorganize small issues more efficiently. Hence, sophisticated local agencies with strong
backgrounds prefer to borrow directly from the credit market under their name. To avoid selection bias and potential endogeneity problems, a two-stage least squares (2SLS) regression will be used. My empirical results show that ceteris paribus, TICs of California local governments are significantly reduced through conduit financing.

Chapter 4 focuses on Chinese local government debts issued through the local government financial vehicles (LGFV). Specifically, this chapter addresses two questions: (1) in Chinese quasi-municipal credit markets, is there any evidence that the quasi-municipal bond market is influenced by market principles? (2) How are borrowing price, borrowing volume, and infrastructure expenditure interconnected? Using data from 2007 to 2012, through a simultaneous equation model, I found that the municipal credit system in China has the mixed characteristics of relationship-based and market-based systems; and that the available fiscal resources and debt have a complementary relationship.

To my knowledge, there are very few studies that consider drivers of debt financing choices of local governments and empirically examined the impact of conduit financing on their borrowing costs. My research seeks to bridge this gap. Since most local governments have been burdened with heavy debts, understanding how the conduit financing fiscally influence local governments is very important.

KEYWORDS: municipal bonds, conduit financing, subnational government debts, Marks-Roos bonds, Chinese urban investment bonds

Zihe Guo

November 9, 2016
Date
CONDUIT BOND FINANCING OF LOCAL GOVERNMENTS—
PERSPECTIVE FROM THE U.S. AND CHINA

By

Zihe Guo

Dr. Dwight V. Denison
Director of Dissertation

Dr. Eugenia F. Toma
Director of Graduate Studies

November 9, 2016
To my grandfather, a man of incredibly wisdom, integrity, and kind-hearted, who taught me the value of life.

To my mother, who is one of many to encourage me to chase my dream and give me endless support and love.
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Chapter 1 Overview of Dissertation

Introduction

Municipal bonds have been widely used since the 1800s, playing an important role in fiscal management and economic development. Municipal bond financing gives state and local governments more resources for building infrastructure and investing in capital projects, makes living environments more convenient, and can potentially stimulate economies. The two most commonly used types of municipal bonds are the general obligation bond (GO bond) and the revenue bond. Most GO bonds are secured by the full faith and credit of the issuer, require voter approval prior to issuance, and are usually paid from the general funds of the issuer, depending on state or local laws. GO bonds usually obtain very high credit ratings and are viewed as the safest type of bond aside from treasury bonds. On the other hand, revenue bonds are backed and paid from a specific source of revenue that varies from case to case. “Pledged revenues may be derived from operation of the financed project, grants, or excise or other specified non-ad-valorem taxes. Generally, no voter approval is required prior to issuance of such obligations.”¹ Revenue bonds are more complicated than GO bonds, and their credit risks depend on repayment sources and the revenues specifically pledged in the contract. This leads to a large range of credit ratings and borrowing costs. Those investing in revenue bonds therefore take the risk that the pledged revenues may not be sufficiently profitable to repay them, as they have no legal recourse to the state’s general funds or tax revenues.

¹ The definition is from the Municipal Securities Rulemaking Board. For more information, see: http://www.msrb.org/Glossary/Definition/REVENUE-BOND.aspx
Thus, revenue bonds generally obtain lower credit ratings and bear higher interest costs than GO bonds. Local governments utilize both GO bonds and revenue bonds to finance public goods.

After two hundred years of development, municipal bonds have become so abundant and diverse that various categories have developed, each providing different financing methods. Among them, local governments and nonprofit organizations have used conduit debt financing as an alternative to other common issuance methods. Conduit debt financing allows one entity to issue debt on behalf of one or multiple governments. The creation of conduit debt financing was intended to promote the utilization of bond pooling in order to reduce local borrowing costs. However, issuers are required to pay a substantial amount of issuance costs. Since many local governments often carry heavy debts, it is important to investigate whether or not conduit debt financing actually decreases their borrowing costs. In this dissertation, I examine conduit financing in the context of local governments in the U.S. and China, paying particular attention to Marks-Roos bonds and Chinese urban investment bonds.

This chapter will explain the motivation for the study, define the major research questions examined in the three chapters that follow, and describe the overall organization of this dissertation.

**Motivation**

Although debt financing broadens the financing channel of local governments and contributes to economic and social development, there is a downside: debt can be a
serious problem if it gets out of control. This concern about risk has been present since the origin of municipal bonds. State and local governments can be subject to balanced budget requirements, competition between comparable jurisdictions, and the influence of federal policies. The question of how to use municipal bonds wisely and constrain the level of debt within the affordability scope has been a point of considerable interest for public finance researchers.

Conduit financing provides an alternative way for local governments to access credit markets and potentially reduces borrowing costs, but it is also a high-risk bond type. Investment in conduit bonds reduces significantly during financial crises, and the default rates of conduit bonds are higher than average municipal bonds. To my knowledge, there is a dearth of studies on conduit financing. This dissertation seeks to fill this gap, that is, to contribute research on the municipal bonds of local governments issued through conduits in the U.S. and through Chinese local government funding platforms, a similar mechanism.

**Research Question**

The broad purpose of this dissertation is to explore the role of conduit financing in the municipal bond market. The chapter 2 provides background, context, and the theoretical foundation of the whole dissertation. It includes the following main sections: the definition of conduits; description of types of different conduits; focus on a particular type of conduit financing in which a conduit agency issues bonds and passes the proceeds to local government. Two cases are explained in detail: Marks-Roos Bonds (MRBs) in
California and Chinese urban investment bonds (UIBs). I examine the motivation for using conduits and outline the key characteristics of conduit bonds. Furthermore, I analyze MRBs and UIBs in order to compare and contrast the perspectives of these two mechanisms.

The third chapter of my dissertation will explore two questions: (1) what drives local agencies to use conduits, and (2) did conduits save money for local agencies or cost more? Although bond pooling provided by conduits is supposed to lower borrowing costs, most of the bonds issued by JPAs finance, a single local agency. It is important to investigate the incentives of these local agencies to use conduits instead of arm’s length investors, and whether or not conduit financing reduces borrowing costs.

The forth chapter focuses on Chinese local government debts issued through local government financial vehicles (LGFV). Specifically, this chapter addresses two questions: (1) in Chinese quasi-municipal credit markets, is there any evidence that market principles influence the quasi-municipal bond market? (2) How are borrowing price, borrowing volume, and infrastructure expenditure interconnected? Using data from 2007 to 2012 and applying a simultaneous equation model, I found that the municipal credit system in China has the mixed characteristics of relationship-based and market-based systems, and that available fiscal resources and debt have a complementary relationship. Apparently, due to highly different credit systems in the U.S. and China, it is reasonable to expect distinct credit system operations. Because of this, the mechanisms that have been documented in the U.S. do not necessarily work well in China. At the moment, the Chinese central government is arranging for the extensive use of municipal bonds.
Concerns about financial vehicles, including the lack of transparency and weak risk management practices of Chinese subnational governments, keep rising and are attracting attention from both scholars and practitioners. This analysis provides some evidence of market development status, which is the foundation of future research and policy making.

**Organization of Dissertation**

This dissertation consists of five chapters. The second chapter provides a definition of conduit financing, as well as an overview of background, context, and major features. Additionally, two mechanisms – conduit financing in the U.S. and borrowing through Chinese local government funding platforms – will be compared to identify the similarities and differences of these perspectives. In the third chapter, I test the hypotheses of debt financing choices and the impact of TIC through an empirical analysis using data from the California Debt and Investment Advisory Commission (CDIAC), which covers all municipal bonds issued by California local governments from 1984 to 2016. In chapter four, I conduct an empirical analysis on Chinese local government debts issued through local government financial vehicles (LGFV), in which I apply a simultaneous equation model to data from 2007 to 2012. Finally, chapter five concludes by addressing the policy implications of my major findings.
Chapter 2 Conduit Financing -- What is It and How does It Work?

Introduction

Conduit financing, which allows one entity to issue debt on behalf of one or multiple governments, provides an alternative way for local governments to access credit markets and potentially reduces borrowing costs. But conduit operation brings additional financial and administrative burdens. Local governments do not have to borrow from conduits – joint powers agencies; rather, they can approach investors directly by issuing municipal bonds. Conduit financing, however, provides extra benefits that are valuable to local agencies.

To my knowledge, there are only a limited number of studies on conduit financing. This chapter provides this dissertation’s background, context, and theoretical foundation. First, it reviews the definition of conduits and describes the different types of conduits; then, it provides an analysis of the motivation for using conduits, and describes key characteristics such as who is using conduits, what role do they play, and the responsibility of paying conduit debts. Furthermore, MRBs and UIBs are compared to identify the similarities and differences of the perspectives presented by these two mechanisms. Finally, this chapter is intended to provide an objective picture of how conduit financing has been used and to facilitate discussion surrounding the costs and benefits of using conduit financing.
Definition and Categories of Conduits

The word “conduit” has various definitions and meanings. Merriam-Webster defines a conduit as “someone or something that is used as a way of sending something (such as information or money) from one place or person to another.” Conduit financing is when an entity sends money as a bridge between two other parties. Scholars in the fields of finance, economics, and public administration have all studied conduits with different purposes and emphases.

In finance literature, a “conduit” refers to “a financial organization or entity whose business purpose is to buy loans or other financial assets from correspondents, with the goal of earning a profit by repackaging and selling the assets as securities (Elmer, 1999). In other words, finance literature views a “conduit” as “a type of business that specializes in securitizing loans and other types of financial assets.” In general, conduits buy or generate loans at low prices from mortgage bankers, mortgage brokers, banks, thrifts, or secondary markets. They then sell them at high prices as securities to securities brokers and dealers, or as whole loans to secondary markets. This type of conduit has existed in the finance field since the early 1980s. Finance scholars believe that conduits are not just simple arbitrages. They also bring their expertise and bear risks.

Economics literature studies conduit countries from a tax perspective. Multinational companies shift their income from high to low tax jurisdictions, and conduit countries are used for this purpose. Conduit countries have “both large capital outflows and inflows (not just one or the other). Some of these countries have special laws, such as bank secrecy (Switzerland and Luxembourg), a strong judicial system (the
United Kingdom) and corporate governance rules (Delaware in the United States) that encourage companies to set up holding companies in their jurisdictions (Mintz, 2004).” Other countries “have a tax regime that encourages investment flows through them that enables multinationals to substantially reduce taxable income on a worldwide basis.” These scholars discuss reasons of emerge, the revenue costs of governments, and allocation efficiency and its implications (Mintz and Smart, 2004; Andersson and Fall, 2001; Mintz, 2004).

In the public administration field, scholars discuss conduit financing in the form of private activity bonds. A state or local governmental entity can issue private activity bonds and “passes the proceeds through to businesses and individuals for their private use in the hope of spurring economic development (Zimmerman, 1989).” The use of this form of conduit financing became widespread in the late 1960s and attracted the attention of the federal government. Since it is believed that many of the services funded by private activity bonds “provide minimal or no benefits to Federal taxpayers,” this financing form makes it so the “Federal government loses its ability to control its budget,” and considers “tax-exempt bonds as a substitute for taxable debt.” This shows the “inefficiency of tax exemption as a subsidy” and “reduce[s] the progressivity of the income tax.” Congress and the Treasury Department interfered with the use of private activity bonds by enforcing a series of laws and regulations such as the Revenue and Expenditure Control Act of 1968, the Tax Reform Act of 1969, the Mortgage Subsidy Bond Tax Act of 1980,  


An example of conduits is special purpose entities. A variety of states “special purpose entities” or SPEs are created as “enterprises” to run state programs as an integral part of state government. These types of state SPEs typically finance their operations by issuing revenue bonds (also called revenue debt), repayable solely from the profits of the enterprise. Investors in those bonds therefore take the risk that the enterprise will be insufficiently profitable to repay them. They generally have no legal recourse to the state’s general funds or tax revenues, and thus the bonds “are not considered state debt.” These SPE had been created in every state by the 1980s (U.S. Bureau of the Census, 1983). State governments have delivered numerus public services through SPEs for a long time.

There are various categories of conduit financing, and it is impossible to cover all of them thoroughly. In this study, I investigate a particular category of conduits: when an entity issues debt on behalf of one or multiple local governments. To be more specific, the primary subjects of this dissertation are Marks-Roos Bonds in California, U.S.A., and Chinese Urban Investment Bonds, which I will discuss in the following sections.

**Marks-Roos Bonds in California**

Marks-Roos Bonds (MRBs) are bonds issued by joint powers authorities (JPAs) under the Marks-Roos Local Bond Act of 1985(Article 4 of the Joint Exercise of Powers Authority law), the proceeds of which are passed to local governments to finance a wide variety of purposes. JPAs can loan the proceeds to local governments or buy whole
municipal bonds issued by local governments using the proceeds of MRBs. In this case, the joint powers agency serves as a conduit and is called the conduit issuer. The local agency borrowing money through a JPA is called the conduit borrower.

Regarding debt limits, the Marks-Roos Act does not impose additional restrictions on conduit borrowers: “the form of the loan agreement between a JPA and local agency in each instance is tailored to the restrictions on indebtedness faced by the local agency obligor, rather than any restrictions imposed by the Marks-Roos Act itself. The Marks-Roos Act imposes minimal procedural requirements on the issuance of bonds” (Fong, 1998). The most common uses of the Marks-Roos Act include financing “public capital improvements,” creating pooled bond issues, and financing working capital or insurance programs. Only JPAs can issue MRBs (Lockyer, 2006; Fong, 1998).

JPAs are special government entities created under the Joint Exercise of Powers Authority Law. “Joint powers are exercised when the public officials of two or more agencies agree to create another legal entity or establish a joint approach to work on a common problem, fund a project, or act as a representative body for a specific activity” (California State Legislature, 2007). Joint powers can be exercised only through a joint powers agreement, or if the member agencies create a new, independent government organization. This government organization is known as a JPA, which is legally independent of the member agencies, but shares powers common to them. Joint powers are defined in the joint powers agreement. According to the California State Legislature, the “Agencies that can exercise joint powers include federal agencies, state departments, counties, cities, special districts, school districts, redevelopment agencies, and even other
joint powers organizations.” They also point out: “a California agency can even share joint powers with an agency in another state. JPAs are commonly used in areas such as groundwater management, road construction, habitat conservation, airport expansion, redevelopment projects, stadium construction, mental health facilities construction, educational programs, employee benefits services, insurance coverage, and regional transportation projects” (California State Legislature, 2007). In addition to the JPAs that handle these projects, there is also a kind of JPA created specifically for capital financing by issuing bonds. This is called a public financing authority.

**Chinese Urban Investment Bonds (UIBs)**

The State Council defines Local Government Funding Platforms (LGFPs) as legal entities founded by local governments and their subsidiaries by means of financial appropriation or asset injection (such as land, equity, etc.), specializing in funding, investing, constructing, and operating public or quasi-public projects commissioned by local governments (Wu, 2010).” LGFPs usually include many companies that are devoted to a specific purpose. These are called urban investment companies, such as the Shanghai Urban Construction Investment and Development Corporation. The bonds issued by these urban investment companies are called urban investment bonds (UIBs), which are considered quasi-municipal bonds. He and Man (2012) provide further explanations:

“These quasi-public agencies generally are incorporated as different investment companies in order to finance and invest as a commercial entity. The state and local governments backed these financing platforms by imputing hard assets, such as land, state-owned properties, and even revenue from fees and taxes. In other words, the state and local governments bear certain liabilities to pay for the debt if the financing
platforms fail to meet their engagements. So these debts are considered to be the “hidden debt” of the SNGs although they are not included in the SNGs’ balance sheet.”

The State Council’s definition articulates that LGFPs have the following characteristics:

First, it is the local governments and their subsidiaries that are actually in control of the urban investment companies within LGFPSs. Most of the projects they operate are nonprofit, though on the surface they often look like for-profit companies.

Second, the local government’s investments usually include “financial appropriation or asset injection.” Financial appropriation involves the authorization of fiscal resources, and asset injections are the investment of nonfinancial assets such as land, stock rights or charge rights. Each LGFP utilizes a mix of financial appropriation and asset injection activities.

Third, the LGFPs’ services for “public or quasi-public projects,” like “constructing the infrastructures and properties, supporting facilities, communications and transportation, and so on” are “commissioned by the local governments.”

Forth, LGFPs are independent legal entities. Most of them are limited liability companies, as are general trading companies such as construction investment companies, state-owned property operation companies, and industry investment companies such as water utility companies and transportation companies (Ministry of Finance, Development and Reform Commission, People's Bank of China, China Banking Regulatory Commission, 2010). It is important to emphasize that, despite being considered

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3 SNGs refer to local governments in this dissertation.
independent legal entities, LGFPs benefit from potential credit enhancements supported by local governments; in other words, these entities integrate government credits and commercial credits. In the early stages of an LGFP’s development, local governments usually inject assets to make the platforms bigger, and may also provide guarantee documents if necessary. Figure 2.1 shows the operation forms of LGFPs.

The 4 trillion yuan economic stimulus plan includes 2.8 trillion yuan matching funds raised by local governments. Since there was a large gap between the local governments’ revenue and the matching funds, the central bank and China Banking Regulatory Commission provided some solutions, offering conditional support to local governments in establishing the funding platforms, issuing enterprise bonds, medium-term notes, and using other financing instruments to broaden the financing channels (The People’s Bank of China, China banking regulatory commission, 2009). This kind of bond is called an urban investment bond and is viewed as quasi-municipal bond. As the municipal credit market expanded, many of the Chinese local governments took on large amounts debt. Along with this debt, new issues and concerns appeared, such as a high debt ratio and inadequate repayment abilities. In response, the central government began a series of reforms to prevent the potential municipal debt crisis. Since then, China’s local government funding platforms have become a high-priority social and economic issue.

The regulatory supervision of quasi-municipal bonds in China is similar to enterprise bonds. They are subject to similar taxes and regulations as the enterprise bonds issued by for-profit corporations and are placed off-budget, which means that these debts are not reported in the same way as other municipal debts. This means that the Chinese budgeting and government accounting system does not officially provide any information
about the magnitude of these contingent debts. This arrangement ignores the objective needs presented by the development of municipal debt and that it will bring potential economic risks to both the central and local governments.

LGFPs are creations of Chinese local governments and have different degrees of dependency on their parental governments. The relationships between LGFPs and their parental governments mainly depend on the leading departments of the urban investment companies’ executive, as well as the social status of the corporate executives involved. If their parental government agencies are important departments and are in charge of principal leaders of the municipal government or the Department of Finance, that LGFP would be very likely to receive strong government support. The social status of the corporate executives is also an important factor: if the corporate executives are also principal government leaders or former principal government leaders, then the possibility of access to government support is greater. Figure 2.1 below presents the operation form of LGFP, which shows the close connections between urban development and construction companies and parental governments. Figure 2.2 presents the operation structure of quasi-municipal bonds.
As quasi-public agencies, the city investment companies incorporated in LGFPs do not have the right to levy taxes. In China, official central and local governments reserve this right. LGFPs exist only to solve capital shortage problems for the local governments and to provide public services.
This section summarizes five categories of conduit financing and focuses on a particular category of conduits in which an entity issues debt on behalf of one or multiple local governments: MRBs in California, U.S.A., and UIBs in China. In the following, detailed analysis of MRBs will be illustrated. MRBs will then be compared with UIBs to illustrate their characteristics further.

**Background of MRB**

This section reviews the motivation of utilizing MRBs and outlines the key characteristics of MRBs. MRBs are issued under the Marks-Roos Bond Act of 1985. Their issuance has been increasing gradually since 1986. MRBs are typically considered to be relatively risky. The issuance MRBs is reduced significantly during economic downturns, as the two figures below illustrate. Figure 2.3 and Figure 2.4 show the principal amount and numbers of issuance of MRBs. The blue bar indicates the actual number of MRBs, and the orange curve indicates their percentage compared to the whole long-term municipal bond market.
Motivation of Utilizing MRB

The motivation to engage in MRBs has been presented in several ways. The enactment of the Marks-Roos Local Bond Act of 1985 was meant to facilitate bond
pooling, which would lower the costs of issuance (Lockyer, 2006). Bond pooling is especially useful when the par value of new issuance is small since a certain amount of fixed costs can be spread across different issues. Fixed issuance costs do not increase proportionally with the bond’s principal amount. Hence, MRBs are a greater burden for small issues than large issues. Small issues can benefit from economies of scale by entering a bond pooling through JPAs.

Another motivation to engage in MRBs is enhanced marketability. On the one hand, JPAs have issued many bonds and built a relatively good reputation. Compared to small local agencies, investors are more familiar with JPAs. It has been documented that an issuers’ reputation influences borrowing costs. Typically, the use of MRBs is expected to result in lower borrowing costs than common municipal bonds issued by local agencies. On the other hand, in many cases, besides MRBs, local agencies can only issue certificates of participation (COP)⁴. It is believed that investors are more likely to accept Marks-Roos bonds than COPs. Therefore, conduit financing can potentially decrease local agencies’ borrowing costs because of marketability.

The third motivation for local governments to use MRBs is the flexibility in issuance. MRBs issuance only requires a JPA passing a resolution. Voter approval is not required, which grants local governments more flexibility. However, the JPA has to

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⁴ A typical certificate of participation (COP) is “An instrument evidencing a pro rata share in a specific pledged revenue stream, usually lease payments by the issuer that are typically subject to annual appropriation. The certificate generally entitles the holder to receive a share, or participation, in the payments from a particular project. The payments are passed through the lessor to the certificate holders. The lessor typically assigns the lease and the payments to a trustee, which then distributes the payments to the certificate holders (Municipal Securities Rulemaking Board, MSRB).” By investing a COP, investors (the certificate holders) are eligible to receive a share in the payments from a project associated with this COP. The proceeds of the sale of the COPs are used to finance the project.
prove that the debt financing would generate significant public benefits before authorizing a new issuance. Some research on the role of public authorities in municipal capital markets states that public authorities are “borrowing machines” (Leigland, 1994; Davis, 1935), circumventing “many of rules that constrain general-purpose governments, such as voter approval and debt limits (Robbins & Simonsen, 2012).” It has also been suggested that conduit financing through public authorities “provides the legal framework for borrowing large sums of money (CDAC, 1993).” Revenue cuts due to changes in law and reduced federal aid promote this motivation. “In 1978, Californians enacted Proposition 13, which limited the ability of local public agencies to increase property taxes based on a property’s assessed value (California Tax Data).” Proposition 13, along with “sharp cuts in federal aid to state and local governments,” significantly “limited local government’s ability to fund public infrastructure.” As something of a response, the Marks-Roos Bond Pooling Act (Government Code §6584-6599.1) was created in 1985 “to provide a flexible alternative method of financing needed improvements, along with the benefit of reduced borrowing costs through the use of bond pools.”

To sum up, the motivation of utilizing MRBs is to obtain greater financing flexibility at lower borrowing costs compared to the interests paid in the absence of the Marks-Roos Act.

**Key Characteristics of MRB**

**Players**

Federal agencies, state departments, counties, cities, special districts, school districts, redevelopment agencies, and even other joint powers organizations can establish
JPAs. JPAs may issue debt under the Mark-Roos Bond Pooling Act of 1985 to purchase municipal bonds from local agencies or make loans to them. Local agencies such as cities, counties, Mello-Roos community facilities districts, and special districts can be conduit borrowers or local obligors.

**Role of JPA**

JPAs play three important roles in conduit financing: producing information, providing potential enhancement, and promoting bond pooling. Before authorizing a new issuance, the JPA has to prove that debt financing would generate significant public benefits. The close relationships between JPAs and local agencies give the JPAs more opportunities to gain information about conduit borrowers’ qualities, even including some private information. Compared to a single local agency, especially a small one, JPAs usually have higher levels of management expertise, along with professional financial teams. This information could be used during the issuances of new MRBs. A number of conduit borrowers are small local agencies that may be unfamiliar to investors. In contrast, JPAs have usually built a strong reputation. These local agencies gain potential reputation enhancement from JPAs by using MRBs instead of directly issuing bonds themselves. Furthermore, JPAs are platforms for bond pooling, which can potentially reduce the borrowing costs due to issuance economies of scale.

**Responsibility of paying MRB**

In general, conduit financing is secured by the conduit borrower's credit, and the obligators are local agencies involved in the MRBs. JPAs are not responsible for the repayment of the debts. Rather, JPAs act “as a conduit issuer for the local agency and
[have] no obligation on the bonds other than to make payment from the payments received under the underlying agreement with the local agency (Fong, 1998).” In these situations, “the source of revenues for the underlying agreement with the local agency can vary greatly and will determine which type of agreement will likely be used.” Although JPAs, unlike insurance companies, do not have to pay the obligation in the event of default, they should avoid it regardless, as default would harm a JPA’s reputation.

**Comparison of the MRB and the UIB**

This section compares the MRB and the UIB from five perspectives. The key difference is that MRB is a municipal bond, and UIB is essentially a corporate bond.

**Issuing Purpose**

MRBs are used for a variety of purposes. Figure 2.5 below presents a summary of principal amount with respect to MRB issuance for the 1985-2016 period. The largest category in terms of principal amounts is “multiple capital improvements,” which includes a variety of categories\(^5\). The term “multiple capital improvements” does not specify the actual purpose of issuing; for example, this category may include exhibition buildings, police stations, and fire stations.

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\(^5\) For a list and example of “multiple capital improvements” please see California Debt and Investment Advisory Commission (CDIAC), California debt issuance primer, 2006, page 146.
UIBs usually finance “public or quasi-public projects commissioned by local governments,” such as constructing infrastructure and properties, supporting facilities, communications, and transportation, and so on. Urban investment bonds mainly focus on urban infrastructure construction.

**Tax-exempt Status**

For tax purposes, municipal bonds in the U.S. can be classified into two categories: tax-exempt or taxable. “Qualifying municipal bonds are tax-exempt, which means that the interest earned on these bonds is exempt from federal (and usually state) income tax (Dwight, 2012).” Most MRBs are tax-exempt. MRBs do not have unique federal tax issues, but, like other common municipal bonds, are subject to federal tax limitations and the requirements of local governments, such as limitations relating to private activity bonds, arbitrage bonds, and hedge bonds (Lockyer, 2006).
In China, there is no specific tax-exemption policy for either issuers or investors of UIBs. Urban investment companies need to pay corporate taxes, just like other general, for-profit companies; the bondholders also have to pay income tax. While at this stage, the government gives these urban investment enterprises various tax preferential policies as a form of subsidy.

**Types of Securities**

Marks-Roos Act does not specify a revenue source that must be pledged as security for MRBs, and MRBs may potentially be secured by any local agency’s revenue sources, regardless of whether it is tax, fee, or another revenue source. Thus, MRBs involve a variety of debt types. Figure 2.6 below presents four categories of debt type based on a summary of the principal amount of MRB issuance for the 1985-2016 period. The largest category in terms of principal amounts is “special assessment bond”; the source of repayment for this category is the special assessment payments that secure assessment bonds. The JPA purchases assessment bonds using the proceeds of its MRBs, and the debt service’s payments on assessment bonds flow through the JPA to the bondholders of MRBs. Again, “the use of special assessment is restricted by law to public improvements that provide a direct benefit to the assessed property” (Fong, 1998).
In China, local governments have issued many UIBs as “quasi-municipal bonds” through LGFPs. These bonds usually tie into certain projects such as utility services or public transportation. Some bonds are for paid by the revenue of these projects, but in most cases, local governments allocate funds annually to establish a certain amount of special sinking funds in order to purchase special services or to dedicate certain special revenues (such as a specific area of land premium) for the repayment of debt funding. This means these bonds are partially supported by local governments’ tax revenues. Because platform companies lack operating assets, either asset disposal will occur or third party guarantors will have to deal with the compensatory situation in the event that the issuers of such bonds are unable to pay the principal and interest of the source of funds. Quasi-municipal bonds could be considered as a mix of revenue bonds and GO bonds/public funds. In general, such bonds do not fit easily into either category.
Method of Sale

Three methods of sale are used for MSBs: competitive sale, negotiated sale, and private placement. In the U.S.A., large issuers with a strong credit rating (and strong market) usually tend to use competitive bids. Issuers use negotiated bonds sales to get more flexibility for timing and marketing the issuance.

In China, competitively bids are widely used; however, negotiated bond sales exist as well, usually called “Private Placement Notes.” PPNs are usually issued to specific institutional investors in the inter-bank bond market by way of the non-public issuance of debt. On April 29, 2011, China’s National Association of Financial Market Institutional Investors (NAFMII) released "inter-bank bond market, non-financial corporate debt financing instruments [and] non-public private placement rules." On May 4, 2011, the inter-bank bond market launched the first non-public debt financing instruments.

Conclusion and Policy Implication

This chapter reviews the background context and provides analysis of the motivation for using conduits, as well as their key characteristics. MRBs and UIBs are compared to identify the similarities and differences of the two mechanism’s perspectives. This chapter is intended to provide an objective picture of how conduit financing has been used, and to facilitate discussions about the costs and benefits of using conduit financing. Conduit financing provides an alternative method for the local agencies to
finance public projects, offers more flexibility, and potentially reduces local agencies’ borrowing costs.

Are stricter regulations needed to curb abusive transactions in conduit financing? There is no easy answer. As a matter of fact, regulations related to MRBs and UIBs have been amended. In California, the Marks-Roos Act has changed to “curb the imposition of excessive fees, to severely restrict blind pools, and to outlaw Roving JPAs” (Fong, 1998). Fong believes that the current problem stems from “a deficiency in [the] enforcement of the law, rather than a flawed statute” (Fong, 1998). The California debt and investment advisory commission “believes that the flexibility afforded by the Marks-Roos Act has allowed local agencies to save time, money and effort in their issuance of bonds. Moreover, there appears to be little to be gained by undertaking a major reform effort, as what problems do exist are better addressed by law enforcement” (Fong, 1998). According to Fong, the appropriate use of the Marks-Roos Act “provides a valuable tool for local officials in carrying out their debt management duties.” On the other hand, along with concerns regarding Chinese municipal debt after the 2008 financial crisis, the central government is very determined to tighten the issuance and management of UIBs. To control the risk of municipal debt, China’s State Council issued ‘notice on strengthening management issues of local government financing platform’ in June of 2010, calling for the constraints of local governments’ municipal debts. Additionally, the China Treasury and other related committees put forward some implement measures in July. Furthermore, the central government is actively moving to legalize the issuance of local

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6Shanghai Institute research group of state-owned capital operation. Shanghai local government investment and financing platform for investment and financing mechanism’s innovation research [J]. Shanghai Administration Institute, May 2012 Volume 13, No. 3, P59-70.
governments’ municipal bonds to replace the “quasi-municipal bonds” role of UIB. In fact, the central government amended the budget law about limitations on local government bond issuance. Under the new budget law, the country's 31 provincial-level administrative units and five municipalities can issue municipal bonds and do not have to rely on debt financing through LGFP as of 2015, which many regard as a significant change of budget law.
Chapter 3 Does Conduit Financing Reduce Borrowing Costs of Local Governments?

Introduction

Municipal bonds have played an important role in fiscal management and economic development. Municipal bond financing makes more resources available for state and local governments to invest in infrastructure and capital projects. It can also make living environments more convenient and potentially stimulate economies. However, there are also drawbacks to municipal bond financing, as the debt it creates can be a problem if it gets out of control. Concern about this kind of risk has been present since the origin of municipal bonds. State and local governments might be subject to balanced budget requirements, competition between comparable jurisdictions, and the influence of federal policies. As a result, public finance researchers have considerable interest in how to use municipal bonds wisely and constrain the level of debt within the affordability scope.

A conduit, which allows one entity to issue debt on behalf of one or multiple governments, provides an alternative way for local governments to access credit markets and can potentially reduce borrowing costs. But conduit operation brings extra financial and administrative burdens. Since most local governments carry heavy debts, it is important to study whether or not conduit financing actually decreases their borrowing costs. To my knowledge, there are very limited studies on conduit financing. This dissertation seeks to bridge this gap.
Two main questions need to be addressed: (1) what drives local agencies to use conduits, and (2) did conduits save money for local agencies or cost more? Although conduit financing is supposed to lower borrowing costs through bond pooling, most of the bonds issued by JPAs are financed by a single local agency. It is important to investigate the incentives of these local agencies to use conduits instead of arm’s length investors, and whether or not conduit financing reduces borrowing costs.

Background

Marks-Roos Local Bonds (MRBs) are authorized by the Marks-Roos Local Bond Act of 1985 (Article 4 of the Joint Exercise of Powers Authority law), which provides joint powers authorities (JPA) with the general ability to issue bonds for a variety of purposes. This legislation was enacted primarily to provide local agencies with the opportunity to achieve issuance cost economies through bond pooling. However, its actual usage has been broader, as its flexibility allows it to be used for single project financing (Lockyer, 2006; Fong, 1998).

The most common uses of the Marks-Roos Act include financing “public capital improvements,” creating pooled bond issues, and financing working capital or insurance programs. Only JPAs may issue MRBs. JPAs are special government entities created under the Joint Exercise of Powers Authority Law through an agreement between two or more public agencies, who are considered JPA members.

CDIAC gives several reasons for why local agencies use JPAs, including the flexibility of issuance, the marketing advantage provided by substituting bonds for COPs,
and the ability to disperse fixed issuance costs through bond pools. The issuance of MRBs requires only that a JPA pass a resolution. No voter approval is needed, which grants local governments more flexibility. For example, redevelopment agencies frequently issue MRB rather than traditional revenue bonds since they have to meet “a competitive bid requirement on new issues and advance refundings of tax allocation bonds under the Health & Safety Code (Fong, 1998).” Although the creation of a conduit is intended to reduce local borrowing costs and to promote the utilization of bond pooling, Robbins and Simonsen (2012) found that conduit bonds, based on data of Marks-Roos Bonds in California from 2007 to 2009, pay higher interest costs and issuance costs.

**Theoretical Framework**

Municipal bonds differ on their interest rates or yields from one to another; one of the most important reasons are varying degrees of default risks that they carry. “A default is a situation when a debt obligation is not met, that is, the principal or interest payments are not paid when they are due (Levine, Scorsone & Justice, 2012).” Accordingly, default risk is the “issuer’s ability and willingness to make principal and interest payments on time and in full (Johnson & Kriz, 2002).” All of municipal bonds are subject to default risks, and therefore, issuers are required by investors to pay default risk premiums, which are positively associated with their default risks. Specifically, a default risk premium is defined as (Rose &Marquis, 2007):

\[ \text{Default risk premium} = \text{Promised yield on a risky asset} - \text{Risk-free interest rate} \]
where the promised yield on Promised yield on a risky asset is the yield to maturity of a risky security; and the risk-free interest rate is the interest rate of a risk-free security, such as treasury securities. A greater default risk is associated with a higher default risk premium.

Interest rates of municipal bonds are clearly associated with risks. All investors of municipal bonds face credit risk and market risk. The credit risk is the chance that the obligor on municipal bonds will be unable to make the debt service payments; credit risk is unique to a particular bond and is reflected in its bond rating (O'Hara, 2011). Market risk refers the potential price fluctuation of a bond due to changes in the market interest rates, including inflation risk and liquidity risk. Liquidity risk is “the risk that an investor may not be able to buy or sell a bond because there is no market for that bond at a particular time (O'Hara, 2011).” When investors believe that they carry more risks for holding a particular municipal bond than other securities, they ask for a higher yield or interest rate.

However, only the issuers know the true information about their default risk. They have incentives to hold the bad information and only publish good information. Because of the information asymmetry problem, investors of municipal bonds will always require high yields if they cannot distinguish bonds between high and low default risks. High quality debtors would go for other financing methods if they can reduce the costs. Finally, only low quality debtors stay at the municipal bonds market, which cause the “lemon problem.” Scholars and practitioners have been working to promote market transparency and flow of information, to avoid this from happening.
Information asymmetry is of greater concern for conduit bonds. While a local agency is allowed to issue municipal bonds in compliance with the constitution and laws within the debt limit, it also can borrow through a JPA. In this case, the joint powers agency serves as a conduit, and is called the conduit issuer. The local agency that is borrowing money through a JPA is called the conduit borrower. During the borrowing process, a JPA, especially a public financing authority (formed solely for the purpose of executing Marks-Roos bonds), serves as a type of financial intermediary. The emergence and existence of this type of conduit are profoundly historical and political. One reason for this is the asymmetry of information within the municipal bond market. The disclosure requirements enforced by the municipal bond market are less strict than those imposed by the corporate bond market, and many small issuers are less known by municipal bond investors.

During the borrowing process, the JPA is a type of financial intermediary that can reorganize small issuances more efficiently. Hence, sophisticated local agencies prefer to borrow directly from the credit market under their name. They do not choose their debt financing method randomly, which implies a selection bias. To deal with this problem, I implement two-stage selection model. In the two sections that follow, I will analyze two questions. The first section identifies what kinds of local agencies utilize the direct bond issuing method. That is: what drives local agencies to use conduits? The second section

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7The MRSB website provides definitions and more information of related concepts: “the issuance of municipal securities by a governmental unit (referred to as the “issuer” or “conduit issuer”) to finance a project to be used primarily by a third party, which may be a for-profit entity engaged in private enterprise, a 501(c)(3) organization, or another governmental entity (referred to as the “conduit borrower”). In a conduit financing, the conduit borrower is liable for making debt service payments on the bonds. Industrial development bonds, multi-family housing revenue bonds and qualified 501(c)(3) bonds are common types of conduit financings. See: 501(c)(3); HOUSING REVENUE BOND — Multi-family housing revenue bonds; INDUSTRIAL DEVELOPMENT BOND; PRIVATE ACTIVITY BOND.”
examines whether or not conduit bonds bear greater or lesser costs than non-conduit bonds.

**Debt Financing Choices**

Solutions to the rampant asymmetry of information within the municipal bond market are in high demand. Credit rating agencies exist for this reason; they work as certification agencies, which screen and sort debt issuers (Wakeman, 1981; Johnson, 1999; Johnson & Kriz, 2002). On one hand, credit rating agencies use their resources to collect both available and non-published information on financial, economic, administrative and other relevant attributes of debt issuers; on the other hand, professionals in credit rating agencies process this information based on their financial knowledge and provide sophisticated predictions of the issuers’ default risks. Similarly, JPAs also screen MRBs issuers for “loose” certification. A potential advantage of JPAs is that they are more likely to obtain private information by communicating regularly with conduit borrowers.

Finance literature considers banks – a type of financial intermediary – to be good reorganizers (Bolton and Sharfstein 1996; Gilson, Kose, and Lang 1990; Cantillo and Wright 2000). The research of Cantillo and Wright (2000) is perhaps the most relevant. They argue that financial intermediary theories “assume that intermediaries extract information more efficiently than arm’s length investors, which implies that companies with severe informational asymmetries borrow through banks.” Their empirical results suggest that “intermediaries are indeed at an informational advantage over arm’s length
investors, and that this advantage is best captured by a theory that sees banks as reorganizers rather than as project screeners.”

The Marks-Roos Local Bond Pooling Act allows local agencies to borrow through a JPA. The problem of information asymmetry is more severe in municipal bond markets than in corporate bond markets, and financial intermediaries play a more important role in extracting, reorganizing, and delivering information. Unlike banks, JPAs absorb capital and make investments simultaneously.

Borrowing the theory of intermediaries’ reorganization from finance literature, my model assumes that JPAs extract and reorganize information about local agencies more efficiently than municipal bond investors and that these transaction costs can decrease even further as a result of repeated coordination between JPAs and conduit borrowers. This implies that borrowers with severe information asymmetry go to JPAs and borrowers with less information asymmetry and avoid the extra intermediaries since the extra fee they charge outweighs any potential benefit. Based on this line of reasoning, I propose the following hypotheses:

First of all, it is generally known that high-quality borrowers are very unlikely to default, and so they require less verification. Consequently, they can avoid JPAs to reduce borrowing costs. Low-quality borrowers, however, are at a higher risk of defaulting. They benefit from JPAs’ reorganization and verification, which entails lower borrowing costs than directly tapping into municipal bondholders. Figure 3.1 shows that although both issue methods charge more to low-quality borrowers, municipal bondholders increase their rates faster than JPAs.
Hypothesis 1: high-quality local agencies that are in great fiscal condition will tap directly into the credit market. Low-quality local agencies, however, will use conduits.

Second, many small issuers are less known by municipal bond investors. Because of information asymmetry, JPAs may have marketing advantages over small local agencies that are less sophisticated and not as well known by investors. Since the transparency within the municipal bond market is still relatively low, and information cannot flow freely, sophisticated issuers benefit from the experience and professionalism of JPAs, which results in lower borrowing costs.

Hypothesis 2: sophisticated issuers prefer arm's length investors.

Third, CDIAC states that local agencies use JPAs in order to disperse fixed issuance costs through bond pools. Fixed issuance costs do not increase proportionally with a bond’s principal amount. Hence, they are a greater burden for small issues than large issues. Small issues can benefit from economies of scale by engaging in bond pooling through JPAs. For large issues, however, this benefit is outweighed by the
diminished flexibility that borrowers have to coordinate with other borrowers within the same pool and may not obtain the best results in terms of timing and structures.

_Hypothesis 3: Bond issues of a small principal amount prefer conduit financing._

_Hypothesis 4: Bond issues for some purposes are more likely to utilize conduit financing._

**Interest Costs**

As mentioned above, most conduit bonds are issued for a single borrower, although the legislation of JPA debt financing aims to lower costs through bond pooling. As a matter of fact, conduit bonds may or may not obtain lower interest costs or issuance costs. There are many reasons for this:

a). Risk dispersion

Normal municipal bonds issued by local agencies disperse the risk of default to a number of different investors. Each investor holds only a small portion of the bond and bears a small portion of default risk. However, if local agencies access credit market through a conduit (etc., a JPA in California) either through a loan or purchased bonds, the JPA bears all of the default risks. To be clear, a JPA is not required to pay off conduit debts if a local agency decides to default. But the default harms the reputation of the JPA, as the JPA is the conduit issuer. This will increase the borrowing cost of other bonds in the future. As an intermediary, JPA may ask for a higher risk premium. Therefore, the borrowing costs would be higher than normal municipal bonds.

b). Marketability
JPAs have issued many bonds and built a relatively good reputation. Compared to small local agencies, investors are more familiar with JPAs. It has been documented that the reputation of issuers influences borrowing costs. Additionally, local agencies can often only issue COPs, while local agencies can get the bond proceeds of Marks-Roos bonds through a JPA. It is believed that investors accept Marks-Roos bonds more readily than COPs. Therefore, conduit financing potentially decreases local agencies’ borrowing costs because of marketability.

c). Complexity

Generally, the municipal bond market is considered highly illiquid. Compared to other revenue bonds, conduit bonds are even more complex. One MRB may involve one or several local agencies as conduit borrowers with different projects. Though the special features of municipal bonds give borrowers more flexibility and attract certain investors with similar demands, securities with simpler features and standard characteristics, such as treasury bills, are typically more likely to find sellers and buyers and therefore, are more liquid. If a security is not liquid and a seller finds it difficult to have bond buyer demands, the seller has to sell the security at a discount or hold onto it. “Improved liquidity is expected to increase securities values because rational investors discount securities more heavily in the presence of higher trading costs, holding other things equal” (Amihud, Mendelson, & Pedersen, 2012). Investors have the illiquidity expectation of municipal bonds and are not willing to accept low yields even though the actual default rate is very low. Conduit debt financing is usually more complex and involves
more information asymmetry. Investors may require higher yields than other municipal bonds.

For these reasons, it is not obvious whether or not JPAs help local agencies to reduce their borrowing costs. In the following section, I will use empirical analysis to explore this question further.

Empirical Model

Data

The data used in this chapter comes from the California Debt and Investment Advisory Commission (CDIAC), which covers all levels of debt issuers during the years of 1984 to 2016, and was supplemented by the Revenue Bond Index produced by the Bond Buyer. The fiscal information of local governments comes from the United States Census Bureau, and is organized by Kawika Pierson, Mike Hand, and Fred Thompson (Pierson, Hand, & Thompson, 2015).

Methodology

Debt financing Choices

Municipalities vary in terms of scale. They have distinct levels of population, revenue, and expenditure. They also differ in their financial management capacity. Literature on fiscal decentralization has revealed a concern about the capacity of local level governments. Because of relatively lower salaries and fewer opportunities for career advancement, it is harder for local governments to attract elites’ participation than it is for higher-level governments. Although the democratic process implies that elected officials
should follow the will of their jurisdiction, Prud'homme (1995) argues that this does not always happen at the local level (Prud'homme 1995). Financial management capacity can vary across states and different levels of government.

The quality of an issuer is a combination of its financial situation and financial management capacity. Ideally, the quality of debtors should be measured by the fiscal indexes of the local agencies. Unfortunately, this data is limited, and I would lose most observations if I were to use the revenues of jurisdictions. In this study, two factors – “not rated” and “issuer group” – are used as proxies of borrowers’ qualities. Dummy variables indicating “not rated” bonds and “issuer group” are incorporated into the model to test their impact on debt financing choices.

In order to test the second hypothesis, I use two proxies for issuer sophistication. First, following Roden and Bland (1986), issuer sophistication is measured by the number of issues sold in the prior 10 years. Only the direct issues are considered, and bond issues through JPAs are viewed as irrelevant. Second, if a local agency has a top 10 financial advisor to provide professional opinions, then the local agency is considered a sophisticated borrower.

To test the third and fourth hypotheses, bond issuance purpose and principal amount are used to examine the impact of bond features on decision making. 30 year Treasury bond rates are used as a riskless capital rate.

*Interest Costs*

Literature on municipal bonds’ concerns about interest costs is rich and extensive (Liu and Denison, 2014; Simonsen, Robbins and Helgerson, 2001; Peng and Brucato,
Most early studies focus on the role of the issue feature of the bond and the characteristics of bond issuers in determining the interest costs. Numerous studies indicate the effects of different bond characteristics, such as the features of specific tax-exempt bonds, the characteristics of the issuers, the scope of the market for the bonds, and the conditions under which the bonds are initially sold all vary greatly across individual bond issues, on a bond’s yield (Cook 1982). In terms of sale types, both competitive bidding and negotiated sale have their advantages and disadvantages. In general, competitive bidding is expected to produce lower costs, and negotiated sale is especially useful for those issuers that have not built their reputations. Using data on municipal bond sales in Oregon from 1994 to 1997, Simonsen, Bill, Mark D. Robbins, and Lee Helgerson found that competitive sales result in significantly lower interest rates compared to negotiated sales.

The bond true interest rates (TIC) and issuance costs are modeled as a function of Marks-Roos bond propensity score, market interest rate, and control variables. My empirical model is as follows:

\[
TIC \ or \ issuance \ cost = f (Market \ interest \ rate, \ Marks-Roos \ bond \ propensity \ score, \ w),
\]

where

Market interest rate = market interest rate produced by the Bond Buyer (the Revenue Bond Index)

Marks-Roos bond propensity score = A latent scale of the degree to which a county or school district, etc., is likely to use a conduit bond.
\( \mathbf{w} \) is a vector of control variables. Following previous studies (Robbins and Simonsen, 2012; Ely, 2013; Liu and Denison, 2014), control variables include

- Competitive = Dummy variable; 1 if the bond is sold via competitive bid; 0 if not
- Ln (principal)\(^8\) = Natural logarithm of the principal amount of the bond/note
- Ln (years to maturity) = Natural logarithm of the bond length
- Refunding = Dummy variable; 1 if the bond is sold to refund another bond; 0 if not
- Credit Ratings = Highest credit ratings provided by Moody’s, S&P or Fitch.
- Enhancement = Dummy variable; 1 if the bond has any kind of credit enhancement; 0 if not
- Sale Year = Year that the bond was first issued
- Bond Type = A series of dummy variables representing bond types by payment sources
- Callable = Dummy variable; 1 if the bond is callable; 0 if not

**Estimation**

In order to examine what drives the decision between debt financing methods and whether conduit financing reduces interest rates, this study uses a data set that covers long-term bonds issued by all levels of local governments during the years of 1984 to 2016, including Cities, Counties, K-14 Schools, Mello-Roos, Special Districts, JPAs, and

\(^8\) Along with previous public finance literature, this study also use natural logarithm of the principal amount and natural logarithm of the bond length. This transformation has good features: it does not change the fluctuation direction of a variable, but the coefficients are easier to interpret.
UC & CSU. This sample not only has the information of bond features but also contains data on issuer characteristics, including the number of issues sold in the prior 10 years by a government agency. If the agency has a top financial adviser, the Bond Buyer Revenue Bond Index is used as a market benchmark of the interest rates; Treasury bill yield is used to control the inflation factor; both of them are matched in the same week with the issue date of the particular bond.

**Summary Statistics**

Table 3.1 below shows the summary statistics of continuous variables. Summary statistics of the full sample, conduit bonds, and non-conduit bonds are reported separately. Means of TIC, Bond Buyer Revenue Bond Index, and years to maturity are similar in the three samples. Marks-Roos bonds have smaller average principal amounts than other bonds in the sample. The prior issuance number of Marks-Roos bonds has a larger mean, but also a larger standard deviation than other bonds.
Table 3.1 Summary Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Full sample</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIC</td>
<td>6,554</td>
<td>5.467</td>
<td>1.573</td>
<td>0.126</td>
</tr>
<tr>
<td>Bond Buyer Revenue Bond Index</td>
<td>6,560</td>
<td>5.608</td>
<td>1.013</td>
<td>4.290</td>
</tr>
<tr>
<td>Treasury bill yield</td>
<td>6,560</td>
<td>5.492</td>
<td>1.574</td>
<td>2.490</td>
</tr>
<tr>
<td>Principal amount (million)</td>
<td>6,560</td>
<td>30.700</td>
<td>74.700</td>
<td>0.006</td>
</tr>
<tr>
<td>Year to maturity</td>
<td>5,574</td>
<td>22.338</td>
<td>8.526</td>
<td>1.000</td>
</tr>
<tr>
<td>Prior issuance number</td>
<td>6,560</td>
<td>16.926</td>
<td>30.613</td>
<td>0.000</td>
</tr>
<tr>
<td>Natural log of principal amount</td>
<td>6,560</td>
<td>16.058</td>
<td>1.653</td>
<td>8.693</td>
</tr>
<tr>
<td>Natural log of year to maturity</td>
<td>5,574</td>
<td>2.999</td>
<td>0.530</td>
<td>0.000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Non-MRB</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIC</td>
<td>6,177</td>
<td>5.470</td>
<td>1.583</td>
<td>0.126</td>
</tr>
<tr>
<td>Bond Buyer Revenue Bond Index</td>
<td>6,178</td>
<td>5.637</td>
<td>1.032</td>
<td>4.290</td>
</tr>
<tr>
<td>Treasury bill yield</td>
<td>6,178</td>
<td>5.531</td>
<td>1.607</td>
<td>2.490</td>
</tr>
<tr>
<td>Principal amount (million)</td>
<td>6,178</td>
<td>31.900</td>
<td>76.600</td>
<td>0.006</td>
</tr>
<tr>
<td>Year to maturity</td>
<td>5,192</td>
<td>22.338</td>
<td>8.566</td>
<td>1.000</td>
</tr>
<tr>
<td>Prior issuance number</td>
<td>6,178</td>
<td>16.290</td>
<td>30.382</td>
<td>0.000</td>
</tr>
<tr>
<td>Natural log of principal amount</td>
<td>6,178</td>
<td>16.099</td>
<td>1.663</td>
<td>8.693</td>
</tr>
<tr>
<td>Natural log of year to maturity</td>
<td>5,192</td>
<td>2.998</td>
<td>0.533</td>
<td>0.000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>MRB</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIC</td>
<td>377</td>
<td>5.418</td>
<td>1.410</td>
<td>0.905</td>
</tr>
<tr>
<td>Bond Buyer Revenue Bond Index</td>
<td>382</td>
<td>5.140</td>
<td>0.403</td>
<td>4.380</td>
</tr>
<tr>
<td>Treasury bill yield</td>
<td>382</td>
<td>4.867</td>
<td>0.616</td>
<td>2.980</td>
</tr>
<tr>
<td>Principal amount (million)</td>
<td>382</td>
<td>10.600</td>
<td>17.100</td>
<td>0.110</td>
</tr>
<tr>
<td>Year to maturity</td>
<td>382</td>
<td>22.348</td>
<td>7.974</td>
<td>2.000</td>
</tr>
<tr>
<td>Prior issuance number</td>
<td>382</td>
<td>27.204</td>
<td>32.488</td>
<td>0.000</td>
</tr>
<tr>
<td>Natural log of principal amount</td>
<td>382</td>
<td>15.388</td>
<td>1.305</td>
<td>11.608</td>
</tr>
<tr>
<td>Natural log of year to maturity</td>
<td>382</td>
<td>3.014</td>
<td>0.486</td>
<td>0.693</td>
</tr>
</tbody>
</table>
Table 3.2 and Figure 3.2 show bond issue purposes. In this sample, most Marks-Roos bonds are issued for “multiple capital improvements” and “Redevelopment,” which account for approximately 67.28%. Other bonds are concentrated in K-12 school facilities and other purposes.

### Table 3.2 Bond Issue Purposes

<table>
<thead>
<tr>
<th></th>
<th>Non-MRB</th>
<th>MRB</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>K-12 School Facility</td>
<td>Multiple Capital Improvements, Public Works</td>
<td>Redevelopment, Multiple Purposes</td>
</tr>
<tr>
<td>Frequency (F)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-MRB F</td>
<td>2,269</td>
<td>617</td>
<td>523</td>
</tr>
<tr>
<td>MRB F</td>
<td>72</td>
<td>150</td>
<td>107</td>
</tr>
<tr>
<td>Total F</td>
<td>2,341</td>
<td>767</td>
<td>630</td>
</tr>
<tr>
<td>Row Percentage (RP)</td>
<td>36.73</td>
<td>9.99</td>
<td>8.47</td>
</tr>
<tr>
<td>Non-MRB RP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRB RP</td>
<td>18.85</td>
<td>39.27</td>
<td>28.01</td>
</tr>
<tr>
<td>Total RP</td>
<td>35.69</td>
<td>11.69</td>
<td>9.60</td>
</tr>
</tbody>
</table>

Note: F refers to frequency; RP refers to row percentage

### Figure 3.2 Bond Issue Purposes (Percentage)
Table 3.3 and Figure 3.3 present bond credit ratings. In this sample, 96.07% of Marks-Roos bonds are not rated. Other bonds of “not rated” only account for 24%, and 49.95% of them have the highest ratings (AAA).

Table 3.3 Bond Credit Ratings

<table>
<thead>
<tr>
<th></th>
<th>AAA</th>
<th>AA</th>
<th>A</th>
<th>BBB</th>
<th>BB</th>
<th>Not rated</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-MRB</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>3,086</td>
<td>918</td>
<td>497</td>
<td>190</td>
<td>4</td>
<td>1,483</td>
<td>6,178</td>
</tr>
<tr>
<td>RP</td>
<td>49.95</td>
<td>14.86</td>
<td>8.04</td>
<td>3.08</td>
<td>0.06</td>
<td>24.00</td>
<td>100</td>
</tr>
<tr>
<td>MRB</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>13</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>367</td>
<td>382</td>
</tr>
<tr>
<td>RP</td>
<td>3.40</td>
<td>0.00</td>
<td>0.26</td>
<td>0.26</td>
<td>0.00</td>
<td>96.07</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>3,099</td>
<td>918</td>
<td>498</td>
<td>191</td>
<td>4</td>
<td>1,850</td>
<td>6,560</td>
</tr>
<tr>
<td>RP</td>
<td>47.24</td>
<td>13.99</td>
<td>7.59</td>
<td>2.91</td>
<td>0.06</td>
<td>28.20</td>
<td>100</td>
</tr>
</tbody>
</table>

Note: F refers to frequency; RP refers to row percentage

Figure 3.3 Bond Credit Ratings (Percentage)
Table 3.4 and Figure 3.4 shows bond issues divided by bond features and conduit financing, where "General obligation bond" accounts for 36.26% in the non_MRB sample, while 37.7% of Marks-Roos bonds in this sample are "Limited tax obligation bond."

Table 3.4 Debt Types

<table>
<thead>
<tr>
<th></th>
<th>Non-MRB</th>
<th>MRB</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>General obligation bond</td>
<td>Limited tax obligation bond</td>
<td>Marks-Roos Authority Loan</td>
</tr>
<tr>
<td>F</td>
<td>2,240</td>
<td>415</td>
<td>12</td>
</tr>
<tr>
<td>RP</td>
<td>36.26</td>
<td>6.72</td>
<td>0.19</td>
</tr>
<tr>
<td>MRB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>64</td>
<td>144</td>
<td>83</td>
</tr>
<tr>
<td>RP</td>
<td>16.75</td>
<td>37.70</td>
<td>21.73</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>2,304</td>
<td>559</td>
<td>95</td>
</tr>
<tr>
<td>RP</td>
<td>35.12</td>
<td>8.52</td>
<td>1.45</td>
</tr>
</tbody>
</table>

Note: F refers to frequency; RP refers to row percentage

Figure 3.4 Debt Types (Percentage)
Table 3.5 and Table 3.6 show other bond features and issuers characteristics. The majority (52.69%) of non-MRB bought enhancement, while only 7.33% of Marks Roo bond. In terms of the issuer groups, it involves a number of local governments, city government’s account for 22.59% of bond issue.

Table 3.5 Other Bonds Statistics (Frequency and Percentage)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Non-MRB</th>
<th>MRB</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>RP</td>
<td>F</td>
</tr>
<tr>
<td>Top financial advisor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO</td>
<td>4,354</td>
<td>76.94</td>
<td>235</td>
</tr>
<tr>
<td>YES</td>
<td>1,305</td>
<td>23.06</td>
<td>143</td>
</tr>
<tr>
<td>Total</td>
<td>5,659 100</td>
<td>378 100</td>
<td>6,037 100</td>
</tr>
<tr>
<td>Competitive sale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO</td>
<td>4,866</td>
<td>78.76</td>
<td>360</td>
</tr>
<tr>
<td>YES</td>
<td>1,312</td>
<td>21.24</td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td>6,178 100</td>
<td>382 100</td>
<td>6,560 100</td>
</tr>
<tr>
<td>Enhancement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO</td>
<td>2,923</td>
<td>47.31</td>
<td>354</td>
</tr>
<tr>
<td>YES</td>
<td>3,255</td>
<td>52.69</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>6,178 100</td>
<td>382 100</td>
<td>6,560 100</td>
</tr>
<tr>
<td>Callable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO</td>
<td>3,135</td>
<td>50.74</td>
<td>122</td>
</tr>
<tr>
<td>YES</td>
<td>3,043</td>
<td>49.26</td>
<td>260</td>
</tr>
<tr>
<td>Total</td>
<td>6,178 100</td>
<td>382 100</td>
<td>6,560 100</td>
</tr>
<tr>
<td>Refunding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO</td>
<td>4,098</td>
<td>66.46</td>
<td>212</td>
</tr>
<tr>
<td>YES</td>
<td>2,068</td>
<td>33.54</td>
<td>169</td>
</tr>
<tr>
<td>Total</td>
<td>6,166 100</td>
<td>381 100</td>
<td>6,547 100</td>
</tr>
</tbody>
</table>

Note: F refers to frequency; RP refers to row percentage
Table 3.6 Summary of Issuer Groups

<table>
<thead>
<tr>
<th>group(IssuerGroup)</th>
<th>Freq.</th>
<th>Percent</th>
<th>Cum.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cities</td>
<td>8,754</td>
<td>22.59</td>
<td>22.59</td>
</tr>
<tr>
<td>Counties</td>
<td>2,622</td>
<td>6.77</td>
<td>29.36</td>
</tr>
<tr>
<td>JPA &amp; Marks-Roos</td>
<td>8,758</td>
<td>22.60</td>
<td>51.96</td>
</tr>
<tr>
<td>K-14 Schools</td>
<td>6,844</td>
<td>17.66</td>
<td>69.63</td>
</tr>
<tr>
<td>Mello-Roos</td>
<td>2,731</td>
<td>7.05</td>
<td>76.68</td>
</tr>
<tr>
<td>Special Districts</td>
<td>4,258</td>
<td>10.99</td>
<td>87.67</td>
</tr>
<tr>
<td>State of California</td>
<td>4,541</td>
<td>11.72</td>
<td>99.39</td>
</tr>
<tr>
<td>UC &amp; CSU</td>
<td>238</td>
<td>0.61</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>38,746</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Regression Results

Table 3.7 shows the results of the Probit regression\(^9\) of the debt financing method decision model. The models are significant, and most of the factors are significant, and most of the coefficients are as expected. The results suggest that all else being held equal, “not rated” bonds and small principal amount issues are more likely to use conduit financing. The negative coefficient of the prior issuance number proves the hypothesis that sophisticated issuers are less likely to use conduits. Counter to expectation, the coefficient of top financial advisors is positive, which suggests that more sophisticated issuers also prefer conduit financing. This could be explained by two reasons. First, issuers with top financial advisors are more familiar with the municipal bonds market and believe that conduit financing brings greater benefits for those conduit financing cases. Second, the top financial advisors do not perfectly capture issuer sophistication.

---

\(^9\) Probit model is more preferred here than linear probability model because the aim to use this model is to predict issuers’ financing decisions rather than coefficients of dependent variables.

Table 3.7 Probit Regression of Debt Financing Method Decision Model

|                      | Coefficient | Standard Error | z    | P>|z| | [95% Interval] | Confident     |
|----------------------|-------------|----------------|------|-----|----------------|---------------|
| MRB                  |             |                |      |     |                |               |
| Not rated            | 1.389       | 0.051          | 27.26| <0.001| 1.289         | 1.489         |
| K-12 School Facility | 0.907       | 0.072          | 12.67| <0.001| 0.767         | 1.047         |
| Multiple Capital     | 0.946       | 0.055          | 17.11| <0.001| 0.838         | 1.055         |
| Improvements, Public Works |         |                |      |     |                |               |
| Redevelopment, Multiple Purposes | 1.445    | 0.062          | 23.36| <0.001| 1.324         | 1.566         |
| Treasury bill yield  | -0.236      | 0.012          | -20.12| <0.001| -0.259        | -0.213        |
| Natural log of       | -0.032      | 0.012          | -2.57| 0.010 | -0.056        | -0.008        |
| principal amount     |             |                |      |     |                |               |
| Top financial advisor| 0.228       | 0.041          | 5.61 | <0.001| 0.148         | 0.308         |
| Prior issuance       | -0.001      | 0.000          | -2.16| 0.030 | -0.002        | 0.000         |
| number               |             |                |      |     |                |               |
| Issuer Group         |             |                |      |     |                |               |
| Counties             | 0.010       | 0.066          | 0.16 | 0.875 | -0.120        | 0.141         |
| K-14 Schools         | -0.698      | 0.088          | -7.96| <0.001| -0.870        | -0.526        |
| Mello-Roos           | 0.334       | 0.054          | 6.20 | <0.001| 0.229         | 0.440         |
| Special Districts    | -0.227      | 0.073          | -3.10| 0.002 | -0.371        | -0.083        |
| UC & CSU             | -0.177      | 0.546          | -0.32| 0.746 | -1.248        | 0.894         |
| Constant             | -1.462      | 0.214          | -6.82| <0.001| -1.883        | -1.042        |

*Note: issuer group "Cities" are omitted as the reference group.

Table 3.8 shows the results of instrumental variables (2SLS) regression of interest costs model. The IV strategy here is to predict a propensity score from a Probit, which is then used as the IV for using a conduit bond. This is similar to using propensity scores in other policy studies. The propensity score is the fitted value from the Probit, which is a
latent scale of the degree to which a county or school district, etc., is likely to use a conduit bond\textsuperscript{10}. In the dummy variable group of "rating," bonds with rating lower than BBB are omitted as the reference group; in the dummy variable group of "Debt Type," other debt types except the four groups that are listed here are omitted as the reference group, and Cities in the “Issuer Group” are omitted as the reference group to avoid the “dummy trap.”

Most of the control variables are the same as expected. The coefficients of the dummy variable “Marks-Roos bond indicator” are negative and significant. This suggests that controlling for other factors, TICs of conduit bonds are less than other bonds in the sample by an average of 3.665 percent. That is, conduit financing costs less in terms of interest rates. This finding is different from the results of Robbins and Simonsen (2012), where they report that “The bonds sold to issue debt through these JPAs carried, on average and all else equal, interest costs 24 basis points higher and issuance costs 33 percent greater than what would be expected for the same issues sold directly by a local government.” This article by Robbins and Simonsen (2012), however, does not consider the endogenous nature of debt financing choice. That is, local agencies do not randomly choose conduit financing or direct issuance, and they make these decisions based on their specific background. Thus, my study addresses this problem through a two stages analysis. Surprisingly, enhancement is not associated with lower TIC. Enhancement is, of course, not random.

\textsuperscript{10} It is similar in concept to psychology latent scales such as intelligence or depression, or in politics the strength of support for a candidate, which is expressed by voting one way or another. The propensity score is estimated from the probit and then used as a standard IV in the regression for TIC.
Table 3.8 Instrumental Variables (2SLS) Regression of Interest Costs Model

<table>
<thead>
<tr>
<th>Instrumental variables (2SLS) regression</th>
<th>Number of obs = 5,288</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wald chi2(23) = 3095.64</td>
</tr>
<tr>
<td></td>
<td>Prob &gt; chi2 = 0</td>
</tr>
<tr>
<td></td>
<td>R-squared = 0.1845</td>
</tr>
<tr>
<td></td>
<td>Root MSE = 1.2202</td>
</tr>
</tbody>
</table>

| TIC                                                                 | Coefficient | Standard Error | z     | P>|z|   | [95% Conf. Interval] |
|---------------------------------------------------------------------|-------------|----------------|-------|-------|---------------------|
| Marks-Roos bond indicator                                           | -3.665      | 1.025          | -3.58 | <0.001| -5.674 -1.656       |
| Bond Buyer Revenue Bond Index                                        | 1.027       | 0.042          | 24.63 | <0.001| 0.945 1.109         |
| Competitive sale                                                    | -0.368      | 0.046          | -7.95 | <0.001| -0.458 -0.277       |
| Natural log of principal amount                                     | -0.049      | 0.014          | -3.57 | <0.001| -0.077 -0.022       |
| Natural log of year to maturity                                      | 0.784       | 0.038          | 20.85 | <0.001| 0.710 0.858         |
| Refunding bond                                                       | -0.152      | 0.073          | -2.07 | 0.039 | -0.296 -0.008       |
| callable                                                             | -0.027      | 0.040          | -0.67 | 0.503 | -0.105 0.051        |
| enhancement                                                          | 0.428       | 0.076          | 5.63  | <0.001| 0.279 0.578         |
| Bond ratings                                                         |             |                |       |       |                     |
| AAA                                                                  | -2.887      | 0.615          | -4.69 | <0.001| -4.093 -1.682       |
| AA                                                                   | -2.724      | 0.614          | -4.44 | <0.001| -3.928 -1.520       |
| A                                                                    | -1.939      | 0.615          | -3.15 | 0.002 | -3.145 -0.733       |
| BBB                                                                  | -1.874      | 0.624          | -3.00 | 0.003 | -3.096 -0.651       |
| Not rated                                                            | -1.533      | 0.637          | -2.41 | 0.016 | -2.782 -0.284       |
| Debt Type                                                            |             |                |       |       |                     |
| General obligation bond                                              | 0.431       | 0.136          | 3.17  | 0.002 | 0.165 0.698         |
| Limited tax obligation bond                                          | -0.116      | 0.255          | -0.46 | 0.649 | -0.616 0.384        |
| Marks-Roos Authority Loan                                            | 3.689       | 0.923          | 4.00  | <0.001| 1.881 5.497         |
| Special assessment bond                                              | 0.527       | 0.120          | 4.40  | <0.001| 0.292 0.762         |
| Tax allocation bond                                                  | 0.690       | 0.100          | 6.93  | <0.001| 0.495 0.885         |
| Issuer Group                                                         |             |                |       |       |                     |
| Counties                                                             | -0.204      | 0.083          | -2.46 | 0.014 | -0.367 -0.042       |
| K-14 Schools                                                         | -0.396      | 0.094          | -4.20 | <0.001| -0.581 -0.211       |
| Mello-Roos                                                           | 1.062       | 0.272          | 3.91  | <0.001| 0.530 1.595         |
| Special Districts                                                    | -0.255      | 0.062          | -4.11 | <0.001| -0.376 -0.133       |
| UC & CSU                                                             | 0.663       | 0.411          | 1.61  | 0.107 | -0.142 1.468        |
| Constant                                                             | 0.521       | 0.686          | 0.76  | 0.448 | -0.825 1.866        |

*Note: in the dummy variable "rating" group, rating lower than BBB are omitted; other in the dummy variable "Debt Type" group, other debt types except the four group that listed here are omitted*
Besides TIC, I also investigate issuance costs in detail, that is, fees paid to financial teams. Interestingly, when examine the effect of conduit financing on Issuance cost, I found the opposite result. As shown in table 3.9, this model use “Issuance cost per principal amount” as the dependent variable, and all independent variables identified in TIC model, which is the common method used in other literature. The coefficient of the dummy variable “Marks-Roos bond indicator” is positive and significant. It suggests that controlling for other factors, conduit bonds pay more issuance fee by an average of 8.734 percent than other bonds in the sample. That is, conduit financing costs more in terms of issuance costs per principal amount of bond issues. This finding is consistent with the result in Robbins and Simonsen (2012) who find issuance cost of Marks-Roos bonds is 33 percent greater than expected fee for the same issues sold directly by a local government, although the effect is much smaller.
Table 3.9 Instrumental Variables (2SLS) Regression of Issuance Cost Per Principal Amount

Instrumental variables (2SLS) regression  
Number of obs  =  4,735  
Wald chi2(22)  =  969.75  
Prob > chi2  =  0  
R-squared  =  0.0099  
Root MSE  =  3.9983  

| Issue Costs Pct of Principal Amt | Coefficient | Standard Error | z     | P>|z| | [95% Conf. Interval] |
|----------------------------------|-------------|----------------|-------|------|---------------------|
| Marks-Roos bond indicator        | 8.734       | 3.475          | 2.51  | 0.012 | 1.923 - 15.545      |
| Bond Buyer Revenue Bond Index    | -0.597      | 0.124          | -4.80 | <0.001 | -0.841 - 0.353      |
| Competitive sale                 | -0.984      | 0.158          | -6.21 | <0.001 | -1.295 - 0.674      |
| Natural log of principal amount  | -1.116      | 0.051          | -22.07| <0.001 | -1.215 - 1.017      |
| Natural log of year to maturity  | 0.374       | 0.134          | 2.80  | 0.005 | 0.112 - 0.636       |
| Refunding bond                   | -1.031      | 0.221          | -4.67 | <0.001 | -1.464 - 0.598      |
| callable                          | 0.214       | 0.139          | 1.54  | 0.124 | -0.059 - 0.487      |
| enhancement                       | 1.226       | 0.266          | 4.61  | <0.001 | 0.705 - 1.747       |
| Bond ratings                      |             |                |       |       |                     |
| AAA                              | -1.413      | 2.320          | -0.61 | 0.543 | -5.961 - 3.135      |
| AA                               | -0.105      | 2.320          | -0.05 | 0.964 | -4.651 - 4.441      |
| A                                | -0.126      | 2.325          | -0.05 | 0.957 | -4.683 - 4.432      |
| BBB                              | -0.597      | 2.351          | -0.25 | 0.799 | -5.206 - 4.011      |
| Not rated                        | -3.742      | 2.370          | -1.58 | 0.114 | -8.388 - 0.903      |
| Debt Type                        |             |                |       |       |                     |
| General obligation bond          | -1.343      | 0.423          | -3.18 | 0.001 | -2.172 - 0.514      |
| Limited tax obligation bond      | -2.967      | 0.870          | -3.41 | 0.001 | -4.672 - 1.262      |
| Marks-Roos Authority Loan (omitted) | 0.000      |                |       |       |                     |
| Special assessment bond          | 1.148       | 0.403          | 2.85  | 0.004 | 0.358 - 1.938       |
| Tax allocation bond              | -0.815      | 0.332          | -2.45 | 0.014 | -1.466 - 0.164      |
| Issuer Group                     |             |                |       |       |                     |
| Counties                         | -0.287      | 0.287          | -1.00 | 0.317 | -0.850 - 0.275      |
| K-14 Schools                     | 0.115       | 0.300          | 0.38  | 0.701 | -0.473 - 0.704      |
| Mello-Roos                       | 3.096       | 0.985          | 3.14  | 0.002 | 1.165 - 5.026       |
| Special Districts                | -0.690      | 0.255          | -2.70 | 0.007 | -1.190 - 0.190      |
| UC & CSU                         | -0.247      | 1.429          | -0.17 | 0.863 | -3.048 - 2.554      |
| Constant                         | 24.703      | 2.570          | 9.61  | <0.001 | 19.665 - 29.741     |
| Instrumented:                    | MRB         |                |       |       |                     |

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*Note: in the dummy variable "rating" group, rating lower than BBB are omitted; other in the dummy variable "Debt Type" group, other debt types except the four group that listed here are omitted

**Conclusions and Implications**

In this research, I investigate two questions: what drives local agencies to use conduits, and whether interest costs of conduit bonds are significantly reduced. MRBs in California are used as an example. As an alternative way to issue bonds, conduit financing has been widely used by local governments and nonprofit companies and brings benefits to the organizations involved, such as flexibility and the potential reduction of borrowing costs due to economies of scale. Based analysis using data on MRBs during the year 1984 to 2016, I find that controlling for other factors, conduit bonds cost less by an average of 3.665 percent. Low-quality local agencies or small bond issues can potentially achieve lower borrowing costs through conduit financing. Borrowing cost, however, is not the only issue of local government borrowing. In spite of the benefits, conduit financing also provides a channel for avoiding voter approval and circulating debt limits. A large amount of MRBs are not rated, which means these bonds are not investigated by rating agencies. Bond pooling can involve several local agencies with different levels of fiscal conditions and distinct capital projects to finance. If keeping the debt burden of a local government within the debt repayment capacity is a desirable goal, conduit financing should definitely be appropriately and effectively regulated.
Chapter 4 Quasi-Municipal Bonds of Chinese Subnational Governments:
Borrowing, Pricing and Fixed-Assets Expenditures

Introduction

With the acceleration of urbanization, the need to finance urban infrastructure is critical in many developing countries. Adequate financial resources supporting long-term urban infrastructure are necessary for economic development and enable the cities to better face the challenges of globalization (Attinasi & Brugnoli, 2001). Bond finance has been widely used in the U.S. as a relatively low cost direct financing option and increasingly is considered within developing countries. China has a long history of public bond financing, which could be traced back to the Qing Dynasty in the 19th Century based on maritime customs duties (Huang & Zhu, 2009). The growth of local government debts appeared in recent years, and the regulation of local debt is not clear. In particular, the RMB four-trillion economic stimulus plan requires subnational governments to provide matching funds, which further increases subnational government debts. Growth has especially occurred for contingent debt, i.e. debts through financial vehicles launched by subnational governments, including the urban investment bond, which is also called quasi-municipal bond\(^\text{11}\). These financial vehicles help governments to build public infrastructure, provide various public services, and make contributions to social development.

\(^{11}\) In the U.S.A., “municipal bond” refers to bonds issued by state and local governments and the interest on qualified municipal bonds is exempt from federal and most states income taxes. “Quasi-municipal bond” is a special category of Chinese bonds and is not tax-exempt. “Quasi-municipal bond” is used because these bonds are issued to fund public projects for local governments, but not the tax-exempt status.
As in other developing countries, governance in China is highly centralized, especially in the period of the planned economy. The central government made the investment decisions and mainly relied on “pay-as-you-go” financing, and the debt magnitude was relatively small, but things began to change since the reform of the 1980s. The Chinese central government gradually decentralized fiscal power. After Third Plenary Session of the 11th Central Committee of the Chinese Communist Party in 1978, China began to carry out a comprehensive reform of the economic system. Adapt to demand of the economic system transition, the government financial management system has undergone major reforms and adjustments in 1980, 1985 and 1988. The 1994 fiscal reform of the tax sharing system basically established norms of fiscal power and service delivery responsibilities between the central and local governments. The following tax reforms mainly aimed for the construction of public financial framework focusing on expenditure management reforms. As a matter of fact, revenue share of GDP of the subnational governments declined after the 1994 fiscal reform.

The 1994 Budget Law forbade the subnational governments to run deficits and borrow from the direct bond market—they can borrow only from the central government and banks which are also under tight restrictions. The 1995 Guarantee Law forbade the subnational governments to provide guarantees for other entities’ borrowing transactions. For example, the subnational governments are not allowed to legally guarantee state-owned companies’ borrowing. However, subnational governments’ demands gradually drove the change of the financing system. In order to fill the financial gap and bypass the legal restrictions, subnational governments have been heavily involved in contingent
debts “which are placed off-budget” (Jun Ma & Liu, 2005b)—these debts are not reported in the same way as other debts and Chinese budgeting and government accounting system did not officially provide any information about magnitude of these contingent debts. The central government was shocked by the rapid growth of the contingent debts. The central government issued a series of policies to regulate the contingent debts, while actively paving the way for subnational governments to access the bond market in appropriate ways. In this way, the central government controlled what it viewed as inappropriate financing while providing an acceptable alternative source of debt funding for subnational governments.

Meanwhile, since the end of the 20th century, the central government launched a series of financial reforms to set up the credit system in a way to benefit the economy. A key reform transformed the credit system from a relationship basis to a market basis. The relationship-based system, “…as embraced by many Asian countries in the mid-1990s, is advantageous when policy goals are to shelter and develop young borrowers” (Martell, 2003a). The market-based system, “…as embraced by the US and other western countries, is advantageous when policymakers wish to design financing arrangements for municipalities such that arrangements are commensurate with municipal expenditure responsibilities and repayment capacities” (Martell, 2003a).

Previous research on municipal debt either focuses on bond market issues in the U.S., or the theoretical debates on whether or not to allow the Chinese subnational governments to issue bonds. There are limited empirical studies on the market status of the Chinese bond market, and we are unaware of any study that examines the connections
among borrowing and investment by subnational governments. This research aims to fill this gap.

This work addresses two questions: (1) In Chinese quasi-municipal credit markets, is there any evidence that the quasi-municipal bond market is partially influenced by market principles; for example, do bond pricing choices reflect borrower risk? (2) How are the borrowing price, the borrowing volume, and infrastructure expenditure interconnected? Using data from 2007 to 2012, through a simultaneous equation model, we find that the municipal credit system in China can be categorized as a mixture of relationship-based and market-based characteristics; the fiscal resources available and debt have a complementary relationship. Apparently, due to highly different credit systems in the U.S. and China, it is reasonable to expect distinct credit system operations, and the mechanisms that have been documented in the U.S. do not necessarily work well in China. At the moment, the central government is arranging extensive use of municipal bonds. Concerns about financial vehicles, including lack of transparency and weak risk management of Chinese subnational governments, keep attracting and elevating attention from both academic and practical perspectives.

**Background**

The past decade is called the “the golden decade of China” because of the fast economic growth. According to the national bureau of statistics, the average annual growth of GDP of China in 2002-2011 is 10.2%, and the government expenditure is considered as a valuable contributor. However, China’s local governments’ debts
expanded as well. Especially from 2008 to 2009, the debt balance of local government rose sharply—growth rate is 61.92%. The RMB 4 trillion (US$ 586 billion) economic stimulus plan includes RMB 2.8 trillion matching funds raised by local governments. Since there was a large gap between the local governments’ revenues and the matching funds, the central government encouraged local governments to broaden the financing channels. The central bank and China Banking Regulatory Commission put forward some solutions including conditional support of local governments to establish the funding platforms, issue urban investment bonds, medium-term notes and using other financing instruments.\(^{12}\)

As the municipal credit market expanded, many of the Chinese local governments were burdened with heavy debt, and the new issues and concerns appeared, such as high debt ratio and inadequate repayment abilities. Therefore, the central government began a series of reforms to prevent the potential municipal debt crisis. Since then, China’s local government funding platforms (LGFP) became a priority social and economic issue. The subnational governments get access to the credit market through LGFPs by way of bank loans or enterprise bonds—urban investment bonds. Since the proceeds of these enterprise bonds are mainly used to finance the public projects or services, these bonds are also called quasi-municipal bonds. Compared to bank loans, quasi-municipal bonds have lots of advantages, such as a lower borrowing cost in a mature market. However, a more important reason for the Chinese central government actively promoting the municipal bond during recent years is that the bank has already

\(^{12}\)For more information, please see: the People’s Bank of China (central bank), China banking regulatory commission (CBRC). ‘Guidance about further strengthen the credit structure adjustment to promote stable and rapid economic development’ (Yin Jian Fa [2009] NO.92). March 2009.
borne heavy risk as the loans of subnational governments rapidly increased. Systematic financial risk might destroy the whole economy if large scale defaults happen, and already there are some signals of trouble, such as the growth in the volume of non-performing loans\(^\text{13}\).

Current administrative divisions of China consist of four levels of subnational governments: the province, prefecture, county, and township. The provincial level includes autonomous region, province, municipality, and special administrative region. The higher levels have authority over the lower, for example, the provincial level governments have authority over other subnational administrative levels. The central government has authority over all subnational governments. Since 1994, China implemented revenue-sharing financial management system\(^\text{14}\). From the expenditure perspective, the central government is in charge of national security, foreign affairs, and the central state operating activities. In addition, the central government is responsible for necessary expenditures that adjust the national economic structure, coordinate regional development, and the implement macro-control. Subnational governments are mainly responsible for the expenditures of the operation of subnational administrative departments and the region's economic development, such as support for agriculture, urban maintenance and construction funds, and local culture, education, health and other operating expenses.

\(^{13}\) According to 2014 financial statements of banks, the volume of non-performing loans rose more than 30% in several large banks than in 2013. For example, the non-performing loans of Industrial and Commercial Bank of China increased by 33% over the previous year, and non-performing loan ratio was 1.13%, which increased by 0.19%, rising for two consecutive years (For more information, please see http://wallstreetcn.com/node/215779).

\(^{14}\) For more information about the government revenue and expenditure, please see the web site of Ministry of Finance of the People’s Republic of China (http://yss.mof.gov.cn/zhuantilanmu/zhongguocaizhengtizhi/).
The fiscal revenues are divided into three categories: the central tax, local tax and shared tax. (1) The central tax is the revenue of the central government, which aims to safeguard national interests and the implement macro-control policies for tariffs, consumption taxes, income tax of national owned corporations. (2) Shared taxes are shared by the central and subnational governments, which include taxes that are directly related to economic development, including value-added tax, resource tax, and securities transaction tax. (3) Local taxes consist of other taxes that are suitable for local collection, for example, business tax, income tax of local business, real estate tax, and personal income tax.

Subnational governments get transfer payments from the central government in addition to the shared taxes and local taxes generated at the local level. There are two kinds of transfer payments: the general transfer payment and the special transfer payment. The general transfer payment is that the central government provides subsidies to subnational governments to compensate for financial inequities (primarily in the Midwest region). The special transfer payment refers to the subsidies that are earmarked for a particular purpose and are mainly used for education, social security and agriculture.
China’s Local Government Funding Platforms (LGFPs)

The State Council defines the Local Government Funding Platforms (LGFPs) as legal entities founded by local governments and its subsidiaries by means of financial
appropriation or asset injection (such as land, equity, etc.), specializing in funding, investing, constructing, and operating public or quasi-public projects commissioned by local governments (Guo, 2010). LGFP usually includes lots of specific purpose companies which are called urban investment companies such as Shanghai Urban Construction Investment and Development Corporation. The bonds issued by these urban investment companies are called urban investment bonds, which is viewed as quasi-municipal bonds. He and Man (He & Man, 2012) provide further explanations:

“These quasi-public agencies generally are incorporated as different investment companies in order to finance and invest as a commercial entity. The state and local governments backed these financing platforms by imputing hard assets, such as land, state-owned properties, and even revenue from fees and taxes. In other words, the state and local governments bear certain liabilities to pay for the debt if the financing platforms fail to meet their engagements. So these debts are considered to be the “hidden debt” of the SNGs although they are not included in the SNGs’ balance sheet.”

The actual controllers of the urban investment companies in the LGFPSs are the subnational governments and their subsidiaries, and most of the projects operated by them are nonprofit, although on the surface they often look like for-profit companies. They have the status of independent legal entities. Most of them are limited liability companies, including general trading companies such as construction investment companies and state-owned property operation companies, and industry investment companies such as water utility companies and transportation companies. LGFP are usually supported by the subnational governments through financial appropriation or asset injection. Financial appropriation involves the authorization of fiscal resources.

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15 SNGs refer to local governments in this paper.
Asset injections are investments of nonfinancial assets such as land, stock rights or charge rights. Each urban investment company will utilize a mix of financial appropriations and asset injection activities. The urban investment company provides public or quasi-public goods, such as constructing the public infrastructures and properties, supporting facilities, and public transportation\textsuperscript{17}.

One thing to emphasize here is that, despite of the status of independent legal entities, the urban investment companies gain the potential credit enhancements supported by the local governments; in other words, these entities integrate the government credits and commercial credits. In the original phases, the local governments usually inject assets to make the platforms bigger, and the local governments may also provide guarantee documents if necessary. LGFPs are creations of Chinese subnational governments and have different degrees of dependency on their parental governments.

Plenty of literature discusses the causes for the debt expanding of the local governments and the emergence of LGFPs (Ba, 2009; China-Development-Review, 2010; Feng, 2014; Jiang & Xu, 2014; Jun Ma & Liu, 2005b), and many of them agree the following points: since the reform of tax-sharing system in 1994, financing capacity of local governments is significantly constrained; in the Budget Law of 1994, local governments are prohibited from issuing local government bonds, except as otherwise prescribed by laws or the State Council; as a result, LGFPs came into being to provide finance for local infrastructure construction, and to boost economic growth. At the end of 2010, there were 6,576 LGFPs.

\textsuperscript{17}Ebit.
Incentives of Subnational Government Officials to Borrow

Governments are operated by public officials. Public administration theories generally suppose the government officials are rational decision makers. Why do subnational government officials choose debt finance? Based on Ma and Liu (2005) and the “reverse soft budget constraints” theory (Zhou, 2005), behaviors of subnational government officials can be explained from three perspectives: the institutional environment, incentive mechanism, and constraints (Jun Ma & Liu, 2005a).

First, since the reform in 1978, China's ruling party began to establish the legitimacy of the ruling on the basis of economic development, although it has changed from the achievement view that emphasizing on economic growth alone to emphasizing both economic and social development. In addition, subnational governments operate in a fiscal decentralization system under an administrative centralization. After the reform of

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18 SNG refers to the subnational government, and LGFP refers to Local Government Funding Platforms.
tax-sharing system in 1994, lots of subnational governments had fiscal difficulties, especially in central and western regions. On the one hand, the legitimacy of the ruling requires performances; on the other hand, the available resources are limited. The institutional environment produces factors that induce the subnational governments break the budget constraints. Second, subnational governments consist of officers that pay attention to their professional and personal interests. Their salaries and other benefits are directly related to job position. The existing cadre promotion system is a typical "eliminated" system-- officials gradually promoted from the bottom to the top, and once an officer does not get promoted in a certain level, he loses the promotion opportunities to the higher level. This incentive mechanism induces local government officers concerning short-term achievement, and passing the achievement signals to the higher level governments through large-scale and resource-intensive investments and projects, such as roads and bridges, which is also effective and easily measured signals. Third, the institutional, social and creditor constraints are very weak (Jun Ma & Liu, 2005a).

Theoretical Framework and Hypotheses

Previous scholars categorized credit systems into two forms: relationship-based and market-based systems (Diamond, 1991; Peterson & Hammam, 1997; Rajan & Zingales, 1998). Financial intermediation, including relationship banks\(^\text{19}\) and credit rating agencies, “emerges as a natural institutional arrangement in an asymmetric information economy” (Martell, 2003a).

\(^\text{19}\) In China, the banks are still largest investors in the enterprise bonds.
Transactions could be made through relationship or market contracts. Based on transaction cost theory, relationship contracting is preferred when lack of information producing financial intermediation (credit rating agencies) and information verification is difficult; otherwise, market contracting has greater merit (Williamson, 1979a). In the relationship-based system, price may not closely associated with default risk, and “quantity adjustments have much better incentive-compatibility properties than do price adjustments” (Williamson, 1979b).

In a relationship-based system, the financier (relationship bank) usually has monopoly power on the market. The entrance barriers come from regulation or a low degree of transparency (Rajan & Zingales, 1998). In this case, the transaction is made through negotiations, and borrowing cost depends on bargaining power. Therefore, institutional relationships are very important, and a good relationship may lead to discounted borrowing prices or larger borrowing volume. The relationship-based system is particularly useful when the market is immature or the borrower lacks a good reputation (Diamond, 1991; Peterson & Hammam, 1997).

In a market-based system, institutional relationship is not as important, since the transaction decision is determined by market competition, and the interest rate should reflect default risk. Credit rating agencies provide information to deal with information asymmetry problems. Various financiers make their investment decisions based on bonds ratings and other published information, and their investment returns are protected by contracts (Martell, 2003b).
Given the characteristics of two forms of credit systems, what should we expect? In the context of China, who is borrowing, how much do they pay, and does infrastructure demand drive the bond issuance? Further, based on the above evidence, after several decades of market reform, should this bond market be characterized as a market-based credit system? Focusing on these questions, this study examines the following hypotheses.

**H1:** under a market-based credit system, borrowing cost is positively associated with default risk.

**H2:** in a market-based credit system, subnational governments with higher repayment capacity and higher financing demands will issue more bonds.

**H3:** annual fixed asset expenditures of a subnational government should be positively related to infrastructure demands and available resources, and negatively related to debt financing costs.\(^{20}\)

**H4:** in a relationship-based municipal credit system, risk will not be completely expressed by prices. Therefore, some or all of the above hypotheses might fail.

**Methodology**

A municipal bond market with highly marketization degree should allocate the resources efficiently. High risk bonds will bear relatively high borrowing costs, and vice versa. We are particularly interested in how urban investment bonds are priced, which

\(^{20}\) Debt financing should include bonds and bank loans. However, because of data limitation, this paper only focuses on bond issuances.
partially captures the image of subnational governments’ debt financing. To our knowledge, limited research examines the question of what drives pricing of Chinese urban investment bonds and no empirical research exists addressing the relationships between the pricing, borrowing and fixed asset expenditures. Yihe Qian and Xuejun Jin use data of medium-term notes excluding urban investment bonds find that the inter-bank bond market already has a reasonable risk pricing capability (Qian & Jin, 2013). Qi et al (2012) using data of several kinds of urban investment bonds in 2009, found that the credit spread of the Chinese urban investment bonds significantly associated with asset sizes of issuing corporations, the per capita GDP of the regions that the corporation located, interest rates of reference corporation bonds, and guarantee utilization (Qi, Ge, & Meng, 2012). Ma and Yang (2013) found that the type of financial backing on urban investment bonds has a significant impact on the credit spread (Jinhua Ma & Yang, 2013).

In the following section, a more comprehensive model is developed to estimate the risk premium of an urban investment bond and test the relationships. All equations and variables are described.

Simultaneous equations models require identification assumptions. In this model, the risk premium, annual new issuance of bonds, and fixed assets expenditure are simultaneously determined.

The assumptions here are summarized as follows (endogenous variables are in italics). (1) The revenue ratio, bond rating, GDP, maturity, par value and previous bond issuances affect risk premium. (2) The risk premium, GDP, margin, urban, and previous bond issuances affect both the annual new issuance and fixed-Assets expenditures. (3)
Annual new issuance and fixed-Assets expenditures affect each other because money is required to build assets, while the availability of borrowing increases the size of infrastructure projects.

Determinants of Risk Premium (Equation 1)

The risk premium is the difference between coupon rate of an urban investment bond and risk-free lending rate. The risk premium is viewed as determined by the issuer’s fiscal capacity, the feature of a bond, and macroeconomic conditions (Cook, 1982; Dwight V. Denison, Yan, & Zhao, 2007; Liu & Thakor, 1984; Simonsen, Robbins, & Helgerson, 2001). Studies have found that issuers with better fiscal capacities tend to get lower risk premium. In this study, the ratio of annual revenue to expenditure (Revratio) is used to capture the fiscal capacity of each province or direct-controlled municipality.

We consider some futures of a particular bond issue related to default risk that have been documented in previous literature (D. V. Denison, 2001; Dwight V. Denison, 2012; Hsueh & Kidwell, 1988; Qi et al., 2012; Qian & Jin, 2013). Higher bond credit ratings imply higher credit quality and lower default risk. Accordingly, the bond market requires higher risk premium for the lower rating bonds. Longer maturity is generally associated with higher risk because “a bond with longer maturity is less liquid and is vulnerable to interest rate risk. Municipal bonds may be less susceptible to changes in the business cycle than corporate bonds, but the risk of municipal revenue bonds backed by

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21 This study uses the interest rate of the Treasury bill in the year that the urban investment bond was issued as the risk-free lending rate.
22 The expenditure includes both current and capital expenditure of each province or direct-controlled municipality.
elastic revenues such as the sales and income taxes will oscillate with the business cycle" (D. V. Denison, 2001).

Determinants of Annual New Issuance (Equation 2)

In a market-based credit system, the annual debt issuance (D) should depend on the repayment capacity and debt financing demands. The operation margin (Margin) and economic condition (GDP) are used to capture repayment capacity of the subnational governments. Borrowing price and previous bond issuance represent debt management. Issuers that face higher risk premiums are expected issue less bonds. Furthermore, local annual fixed asset expenditures and urbanization represent the demands for capital and should drive debt issuance into higher volume.

Determinants of Annual Fixed Asset Expenditures (Equation 3)

Annual Fixed Asset Expenditures (I) depends on infrastructure demands, available funding, borrowing costs, and previous fixed asset expenditures. General operating expenditure is considered as the lowest expenditure requirements to operate a government agency; operating margin is calculated by ratio of the difference between revenue and general operation expenditure over revenue. The higher the general operating expenditure, the lower the resources left for fixed asset expenditures. Urbanization reflects infrastructure demand, and should be positively associated with fixed asset expenditure. GDP, annual new bond issuance, and previous debt reflect the available resources, which should be positively correlated with fixed asset expenditures. Borrowing price should reduce borrowing. Investment is highly auto-correlated,
presumably because investment takes time. Bond rating is in categories, which works as well as rating being a scale (note the monotonicity).

More specifically, the mathematical model is represented by the following simultaneous equations. Risk premium (R), annual new issuance (D), and annual fixed asset expenditures (I) are endogenous variables; other variables are exogenous. Note that financial data are in units of RMB 100,000,000 and that in the last ten years, the yuan-dollar exchange rate has been between 6.0 and 8.0 Yuan per dollar since 2005. This model is identified by Urban not being in R, and bond ratings not in the second & third equations, and lagged investment only in investment itself, where the coefficient is not significantly different from 1.0.

\[
R = f_n(-\text{Revratio}, -\text{bondAAA}, -\text{bondAA+}, +\text{bondAA-}, +\text{bondA+}, -\text{GDP}, +\text{Maturity}, +\text{Parvalue}, +\text{Debtprev}) + \epsilon^{23} \tag{1}
\]

\[
D = f_n(+I, +\text{Margin}, -R, +\text{GDP}, +\text{Urban}, -\text{Debtprev}) + \epsilon \tag{2}
\]

\[
I = f_n(+\text{lagged I}, +\text{Urban}, +\text{GDP}, +D, -R, +\text{Debtprev}, +\text{Margin}) + \epsilon \tag{3}
\]

Data Analysis and Empirical Findings

Data used in this study is collected from two main sources. First is the Wind database, which is a comprehensive financial database including detailed information for bonds and stocks. Since there are only a few bond issuances before 2007, and including lots of missing data, this study uses the data from January 2007 to December 2012. The Wind database provides information about the coupon rate, the issuer, the maturity, the

\[23\text{ Bonds with credit rating AA are used as the reference group, and hence omitted in the formula.}\]
credit rating, and the par value. The interest rates of treasury bills also come from the Wind database, and then the risk premium is calculated by subtracting the risk-free rate. The average bond yield of the one-year treasury bill is viewed as the risk-free security, in particular the average bond yields of the one-year treasury bill at the year the bond was issued, to capture the market condition at that time.

The repayment ability is believed to be a very important factor and directly influences the bond yields if the market is efficient, but how to measure the repayment ability is a difficult question. One method is to examine the financial condition of each direct issuer of enterprise bonds, but since most urban investment enterprises are unlisted, it is difficult to collect their financial statements. Available financial reports show that few of them earn enough income from their own operation to pay off bonds—a large portion of them pay debts by subsidy or transformed funding from the parent subnational governments (Qi et al., 2012). Therefore this study measures repayment capacity by fiscal conditions of these subnational governments. Government fiscal information comes from the China National Bureau of Statistics. There are 1314 observations, including most of the bonds issued through the financial vehicles. Among 31 provinces and direct-controlled municipalities, 30 of them issued urban investment bonds, although the debt levels are quite different.

The model is estimated by three-stage least-squares regression, but we also considered two-stage least-squares estimation and the overall conclusions remain unchanged. Table 4.1 shows the results of the simultaneous equations. All of the three
equations are statistically significant at \( p < 0.001 \). The \( r^2 \) is 0.2639, 0.8321, and 0.9748 respectively.

The results suggest that there is some evidence for market-based borrowing. The findings are discussed in context of the hypotheses previously discussed. The interest rate is positively associated with default risk which is consistent with a market-based system [Hypothesis #1]. Risk premium is negatively correlated with annual new issuance (coefficient is -34.34), suggesting that borrowing price significantly affects how much they are borrowing. Bond credit ratings significantly affect the risk premium—the higher the credit ratings, the less the issuer paid. Both maturity and previous debt are significantly and positively correlated with risk premium, indicating that the market price reflects default risks. However, par value is negatively and significantly associated with risk premium. The market-based theory states that larger par-values imply greater default risk and therefore associated with higher risk premium. The positive coefficient of par value may suggest the existence of quantity discount or economies to scale and is consistent with the transaction cost theory observed by Martell (Martell, 2003a)

Hypothesis two posits that subnational governments with higher repayment capacity and higher financing demands issue more bonds. Subnational governments with healthier fiscal conditions measured by credit ratings and higher GDP have lower risk premiums on average. Lower risk premiums are associated with more annual debt issuance. Higher risk premiums are associated with lesser amounts of annual new bond issuance.

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Hypothesis three posits that the annual fixed asset expenditures of a subnational government are positively related to infrastructure demands and available resources, and negatively related to debt financing costs. The borrowing price, the annual bond issuance, and the fixed asset expenditure by the subnational governments are interconnected; more fixed asset expenditure leads to more annual bond issuance; and the lower the borrowing price, the larger the amount of bonds issued. Fixed asset expenditure and bond issuance are significantly explained by each other, which suggests that the urban investment bonds contribute to public fixed asset expenditure, and meanwhile bond issuance is driven by demand for infrastructure financing, which supports the market-based hypothesis.

Hypothesis four states that risk will not be completely reflected by prices in a relationship-based municipal credit system. Economic condition and the operating margin are negatively and significantly associated with annual bond issuance. This finding is counter to the market-based hypothesis but is consistent with the pecking-order theory where organizations prefer to use their earnings to finance business activities and thus use less debt capital. Previous bond issuance is highly correlated with annual new issuance, which is also counter to market-based system expects. Due to risk management concerns, the regulatory authority tightened the debt financing rules since 2009, but also promoted the smooth completion of old projects of LGFP. The subnational governments that issued more bonds previously tend to issuance more. One explanation could be follow-up funding requirement of LGFP projects and those regions burdened with debts are most in need. Another explanation could be familiarity of bond financing and good reputation establishment.
Fixed asset expenditures exhibit mixed evidences of market-based system. Positive coefficients of GDP, Margin and annual debt issuance suggest that regions with more available resources tend to spend more on investment in fixed assets. However, counter to market-based theory, the fixed asset expenditure is positively associated with borrowing prices and negatively related to urbanization. Fixed asset expenditure is highly auto-correlated, presumably because investment takes time.

In summary, the empirical results indicate mixed evidence. Even after several financial reforms, the Chinese credit system cannot be categorized fully as a market-based system. The relationship-based characteristics still exist. Deeper market reforms may decrease concerns for funding allocation and efficiency.
Table 4.10 Results of Three-stage Least Squares Estimation

<table>
<thead>
<tr>
<th>Risk Premium (R) (%)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue ratio(%)</td>
<td>-0.905***</td>
<td>(-5.56)</td>
</tr>
<tr>
<td>Bond AAA</td>
<td>-1.215***</td>
<td>(-15.02)</td>
</tr>
<tr>
<td>Bond AA+</td>
<td>-0.236***</td>
<td>(-5.36)</td>
</tr>
<tr>
<td>Bond AA-</td>
<td>0.548***</td>
<td>(3.60)</td>
</tr>
<tr>
<td>Bond A+</td>
<td>1.193</td>
<td>(2.39)</td>
</tr>
<tr>
<td>GDP(trillion)</td>
<td>0.0125</td>
<td>(0.46)</td>
</tr>
<tr>
<td>Maturity(year)</td>
<td>0.0470**</td>
<td>(3.06)</td>
</tr>
<tr>
<td>Par value(100 million)</td>
<td>-0.0167***</td>
<td>(-4.32)</td>
</tr>
<tr>
<td>Debt previous(100 million)</td>
<td>0.000271***</td>
<td>(3.50)</td>
</tr>
<tr>
<td>Constant</td>
<td>4.728***</td>
<td>(35.48)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Annual Bond New Issuance (D) (100 million)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk premium (%)</td>
<td>-34.34**</td>
<td>(-3.13)</td>
</tr>
<tr>
<td>Fixed asset expenditures(100 million)</td>
<td>0.0147***</td>
<td>(8.13)</td>
</tr>
<tr>
<td>GDP(trillion)</td>
<td>-0.00324***</td>
<td>(-3.79)</td>
</tr>
<tr>
<td>Margin (%)</td>
<td>-476.3***</td>
<td>(-4.75)</td>
</tr>
<tr>
<td>Urban (%)</td>
<td>0.306</td>
<td>(0.44)</td>
</tr>
<tr>
<td>Debt previous(100 million)</td>
<td>0.793***</td>
<td>(45.67)</td>
</tr>
<tr>
<td>Constant</td>
<td>467.8***</td>
<td>(5.86)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fixed Asset Expenditures (I) (100 million)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lagged fixed asset expenditures(100 million)</td>
<td>0.996***</td>
<td>(69.04)</td>
</tr>
<tr>
<td>Annual bond new issuance(100 million)</td>
<td>3.578***</td>
<td>(6.27)</td>
</tr>
<tr>
<td>Risk premium (%)</td>
<td>243.8***</td>
<td>(3.96)</td>
</tr>
<tr>
<td>GDP(trillion)</td>
<td>0.0596***</td>
<td>(12.77)</td>
</tr>
<tr>
<td>Margin (%)</td>
<td>2183.6***</td>
<td>(3.39)</td>
</tr>
<tr>
<td>Urban (%)</td>
<td>-22.11***</td>
<td>(-5.71)</td>
</tr>
<tr>
<td>Debt previous(100 million)</td>
<td>-2.387***</td>
<td>(-5.15)</td>
</tr>
<tr>
<td>Constant</td>
<td>-1077.5*</td>
<td>(-2.07)</td>
</tr>
</tbody>
</table>

t statistics in parentheses
*p < 0.05, **p < 0.01, ***p < 0.001
Note: sample size = 1314, and all equations are statistically significant at p<0.0001. The r² is 0.2639, 0.8321, and 0.9748 for R, D, I, but the r² is not maximized in this estimation.

Most of financial data are in units of 100 million Yuan except GDP, and that in the last ten years, the yuan-dollar exchange rate has been between 6.0 and 8.0 Yuan per dollar since 2005.
Conclusion and Discussion

In the U.S., a relatively mature market-based credit system has been formed for state and local governments. The story is different in China. The high GDP growth was maintained in China over the last 10 years, even during the financial crisis. However, subnational government debt is increasing rapidly. Although the previous budgetary law forbade subnational governments from directly issuing municipal bonds, many of them are burdened with heavy debts, primarily issued through financial vehicles. These financial vehicles help governments to build public infrastructure and provide various public services. However, as subnational debt increases, concerns about the Chinese credit system and the whole economy become more serious. This paper examines the market characteristics of the credit system, and empirical results indicate that the quasi-municipal credit system in China can be characterized as a mixture of relationship-based and market-based characteristics. The fiscal resources available and debt have a complementary relationship.

Possible policy implications may be drawn from our analysis. Since the credit system is still highly relationship based, the central government should promote the legal financing mechanism based on bond financing to enhance transparency so that debt management of subnational governments could be under public scrutiny and increase incentives to improve debt management.

Due to the data limitations, this work does not include measurements of bank loans, intergovernmental transfers, and administrative management ability. In order to
capture a more comprehensive picture of funding allocation, further studies should consider these perspectives.
Chapter 5 Conclusion and Policy Implications

Introduction

As a finance instrument, municipal bonds played a pivotal role on financing public works, make more resources available for states and locals to build their infrastructures and capital projects, and potentially stimulating the economy of the society. Municipal bonds typically come in two forms: the general obligation bond (GO bond) and the revenue bond, which is secured by the full faith and credit of the issuer, or backed by a specific source of revenue. Along with the development of public administration strategy and financial technology, municipal bonds have become abundant and diverse that appeared various categories and providing different financing methods. Among them, the conduit debt financing, which allows one entity to issue debts on behalf of one or multiple governments, has been used by local governments as an alternative financing vehicle. Although local governments need not borrow from conduits--they can approach investors directly by issuing municipal bonds, conduit financing is compelling to some local agencies that they believe it provides extra benefits.

In the state of California in the U.S., a local agency is allowed to borrow through a joint powers agency (JPA); in China, various Chinese local government issued debts through the local government financial vehicles (LGFV). Both JPA and LGFV serve as conduits. Conduit financing is preferred by local agencies in certain circumstances because it is more convenient or fixed issuance costs can be split between several conduit borrowers through bond pooling. Conduit financing is intended to provide flexibility to
local governments at reduced borrowing costs. However, conduit financing has been accused of circumventing state regulations imposed in the local governments for a long time, and the previous studies find no significant borrowing costs saving compared the conduit bonds to similar revenue bonds. Why does conduit financing still have great vitality? In this dissertation I examine debts of local governments issued through conduits in the context of the U.S. and China, particularly paying attention to Marks-Roos bonds and Chinese urban investment bonds.

Chapter 2 provides a background context and foundation for the whole dissertation. The chapter reviews the background context and provides analysis of motivation for using conduits and key characteristics. MRBs and UIBs are compared to identify the similarity and distinctive perspectives of the two mechanisms. It is intended to provide an objective picture of how conduit financing has been used and to facilitate deliberations over costs and benefits of using conduit financing. Then there are two chapters that empirically examine two examples of the conduit bonds market and interest costs of local governments. Chapter 3 investigates the Marks-Roos bonds in California, and chapter 4 investigates Chinese urban investment bonds. Based on data from California Debt and Investment Advisory Commission (CDIAC), chapter 3 of my dissertation addresses two issues: (1) what drives local agencies to use conduit? (2) Did conduit financing produce lower true interest costs than other revenue bonds? During the borrowing process, the JPA efficiently reorganizes small issues as a financial intermediary. Sophisticated local agencies with strong backgrounds prefer to issue municipal bonds directly. A two-stage least squares (2SLS) regression are used to avoid selection bias and potential endogeneity problems. The econometric model and results
suggest that ceteris paribus, TIC of California local governments are significantly reduced through conduit financing compared to in the absence of this choice. Chapter 4 focuses on Chinese local government debts issued through the local government financial vehicles (LGFV). Specifically, this chapter addresses two questions: (1) in Chinese quasi-municipal credit markets, is there any evidence that the quasi-municipal bond market is influenced by market principles? (2) How are borrowing price, borrowing volume, and infrastructure expenditure interconnected? Using data from 2007 to 2012, through a simultaneous equation model, I found that the municipal credit system in China has the mixed characteristics of relationship-based and market-based systems; and that the available fiscal resources and debt have a complementary relationship.

**Contributions to the Literature**

To my knowledge, there are very few studies that consider the drivers of local governments’ debt financing choices and empirically examine the impact of conduit financing on their borrowing costs. This dissertation contributes to three streams of literature. The first is the literature on municipal finance concerned about local governments. Although research on state government debt is vast, local government debt financing receives less attention. A number of local governments bear heavy service obligations but have limited revenue resources. Debt financing is of importance to those municipalities without sufficient revenues to support the demand of public expenditures. This dissertation contributes to this stream of literature in that it presents the evidence on borrowing costs savings through conduit financing compared to the instances where conduit financing is not used.
The second stream of literature is that of conduit financing. The majority of literature on conduit financing is concerned with taxing multijurisdictional corporations or arbitrage in the financial market, and tax-exempt bonds used for private activities. This dissertation shows that some municipalities prefer to use conduit financing, and it can have a positive effect in the case of fair use.

The third stream of literature that this dissertation contributes to is that of research methods. Prior research has used OLS regressions to investigate TIC of Marks-Roos bonds and Chinese urban investment bonds, which ignore potential selection bias and endogeneity problems. When addressing these econometrics problems with 2SLS or simultaneous equation models, the resulting estimations present new evidence that differs significantly from previous studies.

**Future Research**

While this dissertation has enriched the literature with several analyses, it also presents abundant opportunities for future research. One potential direction is to expand the scope of this study to predict municipalities’ financing choices. Debt issuing is a complex process and requires lots of resource and time. Government officials make financing decisions by integrating their fiscal, political and social constraints. Thus, other factors, such as transaction costs, debt limits, and political environments might be also important. In addition, clearer identifications for debtors’ qualities and issuer sophistication should be explored. Or, instead of investigating borrowing costs, it could
be productive to examine the effect of conduit financing on infrastructure construction, property values, and economic development.

**Policy Implications**

Conduit financing provides an alternative way for local governments to finance public works. The conduit works as a financial intermediary between conduit borrowers and investors by producing information, providing loose certification and potential enhancement, and thereby potentially reducing costs. This section discusses policy implications from several perspectives.

First of all, MRBs require local agencies to prove that the issuances of debts will lead to significant public benefits, which can range from “demonstrable savings in effective interest rate” and “bond preparation, bond underwriting, or bond issuance costs,” to “significant reductions in effective user charges levied by a local agency,” “employment benefits from undertaking the project in a timely fashion,” and “more efficient delivery of local agency services to residential and commercial development (Lockyer, 2006).” These requirements force borrowers to examine public benefits prior to issuing new debt, and debts that cannot meet this requirement will be denied. This potentially increases the rationality and justifiability of carrying public debts.

Second, the results in Chapter 3 suggest that MRBs may produce lower interest costs. This is important given that most local governments carry heavy debts and their revenues are limited compared to their obligated expenditures. By saving funding from
reduced interest costs, local governments may provide services in other aspects and therefore taxpayers may also benefit from the conduit financing.

Third, JPAs typically have financing teams and are responsible for the structure of financing, including documentation, and thus might reduce the search costs for local agencies. If local agencies enter a bond pool, they might also get lower issuance costs due to the economies of scale.

Fourth, research costs for investors could be significant, especially for the individual investors. With the screening and monitoring of JPAs, the research costs of investors might be reduced. Because of the repeated cooperation between JPAs and local agencies, the research costs of JPAs might also be reduced, which improves the efficiency of bond issuance processes.

Fifth, MRBs provide diversification for investors. The diversification of security portfolios benefits investors through lower risks and higher yields. MRBs generally pay higher interest rates than general obligation bonds with AAA credit ratings. A number of MRBs are not rated. Due to the screening and certification of JPAs, MRBs could be an investment option for those investors interested in high yield securities.

For a long time, as Chinese local governments’ investment and financing platform, the urban investment companies have the shells of marketed enterprises along with the essence of the government platform, and exercise finance functions of government projects in the name of the enterprises. Under the background that local governments were not allowed to issue municipal bonds before the implementation of the new budget law in 2015, the urban investment companies are regarded as Chinese "municipal bonds"
alternatives. Note that the market investors believe that the urban investment bonds are significantly less risky than bonds of the ordinary enterprises as a result of local governments pledging support.

Recognizing the default risk of urban investment bonds, the central government adopted a series of measures to promote the standardization of local government bonds in recent years. On the one hand, local governments are allowed to issue municipal bonds within the debt limits; on the other hand, the Ministry of Finance explicitly promotes market transformation of urban investment companies. Unlike earlier urban investment debts, most of the new debts should not be identified as local government debts, but are legally debts of urban investments companies, and safety should be questioned. However, urban investment bonds with new low yields are still in high demand. An important reason is that there is excess demand resulting from excessive of cash while limited supply of quality credits, and investors have different views about the credits of urban investment companies since the standards and methods of local governments to process the debts are not uniform. During exploration of the model of cooperation between government and enterprises in recent years, urban investment bonds will still play an important role. Promoting marketization of urban investment debts, enhancing the transparency of the market, and further improving professional of issuers and investors will facilitate efficiency of the capital market and also protect investors.
Appendix: Background of Chinese Urban Investment Bonds

The past decade is called the “the golden decade of China” because of the fast economic growth. According to the national bureau of statistics, the average annual growth of GDP of China in 2002-2011 is 10.2%, and the government investment is considered as a valuable contributor. Although the growth rates of lots of countries were very low in 2008 and 2009, under China's 4 trillion yuan stimulus plan launched by the central government in 2008, China’s GDP growth still maintained 9.6% and 9.1% respectively, indicating the power of the government investment. It’s generally believed that the government investment contributed to China’s rapid economic development over the past decade. The local governments’ investments have played a very important role in China’s local economic development.\(^{25}\)

However, China’s municipal credit market expanded as well. Especially from 2008 to 2009, the debt balance of local government rose sharply—growth rate is 61.92%.\(^{26}\) The 4 trillion yuan economic stimulus plan includes 2.8 trillion yuan matching funds raised by local governments. Since there was a large gap between the local governments’ revenues and the matching funds, the central government encouraged local governments to broaden the financing channels which included issuing more bonds.

The municipal bond market has developed substantially in the U.S. since the 1800s. The municipal bonds are issued by state and local governments to “finance infrastructure and capital projects (Dwight, 2012).” Unlike in China, the growth of the

\(^{25}\) In this paper, China’s local governments refer to all levels’ government agencies except the central government.

\(^{26}\) National Audit Office of China, 2011 No. 35: the national local government debt audit results.
municipal bond market in the U.S. is relatively stable. Except slight fluctuations in certain years, in general, the U.S municipal debt outstanding is in a state of slow growth. The municipal bond market in the U.S. is much more mature and the regulation and management mechanism is more comprehensive.

Although old China's stock market has a long history, after the founding of People's Republic of China, the government agencies in all levels rarely issued bonds and the entire security market was closed from 1952-1981. The first stock market is the Treasure bond market. In 1981, the central government began to issue treasury bills, which marked the development of China's securities market entering a new historical stage. However, the Budget Law prohibited local governments to issue bonds directly on concerns of repayment abilities of local governments.²⁷ Two approaches to borrowing from credit market have been developed in order to address temporary financial capital shortages of local governments: “Proxy Treasure Bond” and “city investment bonds” (He and Man, 2012). The city investment bonds are also called quasi-municipal bonds.

**Proxy Treasure Bond**

The process of debt financing for local government has evolved over the past decades. In 1998, the Asian Financial Crisis was raging and the storm swept many countries in Asia. The State Council decided to issue treasury bonds by the Ministry and lend money to local governments for local economic and social development projects. “The issue process of such bond is exactly the same as the Treasure Bond and the

²⁷ According to the 28th paragraph of the Law of Budgeting, the local governments should not issue municipal bond, except as otherwise provided in the law and the state council (China’s debt). Although the new budget law implemented in 2015 has relaxed the restrictions.
distribution of the revenue raised by such bond depended on the negotiations among the central government with each provincial government (He and Man, 2012)."

Another issuing peak appeared during the Global Financial Crisis. In 2009 the State Council agreed that the Ministry of Finance issued 200 billion yuan local bonds on behalf of local governments and must be disclosed in the provincial budget, which can be viewed as a facility move of local governments’ issuing municipal bonds. The Ministry of Finance issued bonds on behalf of local governments and they paid the debt through the Ministry of Finance as well. These bonds are named "2009 XX Province/autonomous regions/municipalities/separately listed cities government bonds (XX period)."

The pilot program could be viewed as a big progress. Since 2011, Shanghai, Guangdong and four other provinces were approved by the State Council to carry out their own bonds as pilots, and the pilots expanded to six provinces in 2013. Currently, only four provinces published information of local self-bonds in this year and the total amount have reached 50 billion yuan, showing a breakthrough in both the bond sizes and issuing form. The local self-bond is the transition from bonds that the central government issues as a proxy and the actual municipal bonds that are completely issued by the local governments. The "pilot approach of local self-bond in 2013" announced by the Ministry of Finance further clarified in underwriting and bidding.28

28 Full content could be seen here: (June 25, 2013) http://gks.mof.gov.cn/zhengfuxinxi/gongzuodongtai/201307/t20130704_948951.html
Urban Investment Bonds and LGFP

The 4 trillion yuan economic stimulus plan includes 2.8 trillion yuan matching funds raised by local governments. Since there was a large gap between the local governments’ revenues and the matching funds, the central bank and China Banking Regulatory Commission put forward some solutions including conditional support of local governments to establish the funding platforms, issue enterprise bonds, medium-term notes and using other financing instruments to broaden the financing channels\(^{29}\). This kind of bond is called a “quasi-municipal bond.” As the municipal credit market expanded, many of the Chinese local governments were burdened with heavy debt, and the new issues and concerns appeared, such as high debt ratio and inadequate repayment abilities. Therefore, the central government began a series of reforms to prevent the potential municipal debt crisis. Since then, China’s local government funding platforms became a priority social and economic issue. At present, the regulatory supervision of quasi-municipal bonds in China is still in alignment with enterprise bonds, which is accused as ignoring the objective needs of the development of the municipal debt, and will bring potential economic risks to both the central and the local governments.

The development of LGFPs went through the following several phases\(^{30}\):

1980-1994 First phase of exploration

\(^{29}\) The People’s Bank of China (central bank), China banking regulatory commission (CBRC). ‘Guidance about further strengthen the credit structure adjustment to promote stable and rapid economic development’ (Yin Jian Fa [2009] NO.92). March 2009.

\(^{30}\) For more information, please see: Shanghai Institute research group of state-owned capital operation. Shanghai local government investment and financing platform for investment and financing mechanism’s innovation research [J]. Shanghai Administration Institute, May 2012 Volume 13, No. 3, P59-70.
In the 1980s, Guangdong province for the first time tried to construct roads by a loan and pay the principal and interest by the road toll. In 1988, the State Council of China proclaimed the reform plan of the investment management system: transform from appropriation to loan to construct the basic infrastructures. Six professional investment companies are established by the central government: energy, transportation, agriculture, raw material, forestry, and textiles, which is the original form of LGFPs (Zhao, 2011).

1994-1997 early exploration

Since the reform of tax-sharing system in 1994, financing capacity of local governments is significantly constrained. In order to meet the needs of local area and solve the funding problems, lots of the authorities were established to plan and manage the municipal construction to promote the economic development.

1997-2008 development in an all-around way

Facing the Asian financial crisis of 1997-98, the Chinese central government and local governments launched lots of mass infrastructure construction to stimulate economic development. Since 1998, China Development Bank advocated funding platforms, and issued loans for infrastructure construction projects. From then, LGFPs opened up a new phase (Zhao, 2011).

While LGFPs help to boost economic development, LGFPs were also responsible for substantial increases in local debt levels. In 2006, NDRC (National Development and Reform Committee) and four other committees issued a notice calling for financial institutions to stop giving loans and credits to governments and local
governments to stop providing guarantee or implicit guarantee, which play an important role on constraining the scale of local governments’ debt.\textsuperscript{31}

\textit{2008-2010 explosions}

In order to deal with the financial crisis of 2007, China's central government launched 4 trillion yuan stimulus plan in 2008, which includes 2.8 trillion yuan matching funds raised by local governments. Since there was a large gap between the local governments’ revenues and the matching funds, the central bank and China Banking Regulatory Commission put forward some solutions including conditionally support local governments to establish the funding platforms, issue corporate bonds, medium-term notes and using other financing instruments to broaden the financing channels. Under the policy, plenty of funding platforms with different forms appeared. \textsuperscript{32}

\textit{After 2010}

In order to control the risk of municipal debt, in June of 2010, China’s State Council issued ‘notice on strengthening management issues of local government financing platform’, calling for rectification of municipal debts by local governments. Moreover, in July, the China Treasury and other related committees put forward some implement measures. \textsuperscript{33}

\textsuperscript{31} For more information, please see: Development and Reform Commission, Ministry of Finance, Ministry of Construction, China People's Bank, China Banking Regulatory Commission. On strengthening macro-control, remediation and standardize various bundled loans notice .2006 April.
\textsuperscript{33}Shanghai Institute research group of state-owned capital operation. Shanghai local government investment and financing platform for investment and financing mechanism’s innovation research [J]. Shanghai Administration Institute, May 2012 Volume 13, No. 3, P59-70.
After 2015

In recent years, the Chinese central government is implementing an unprecedented budget reform, which is the first significant budget reform since 2000. Under the new budget law, since 2015, the country's 31 provincial-level administrative units and five municipalities can issue municipal bonds and do not have to rely on debt financing through LGFP, which is viewed as a significant change of budget law.


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Vita

Zihe (Lauren) Guo

EDUCATION

University of Kentucky
Ph.D. in Public Policy and Administration. James W. Martin School of Public Policy and Administration (expected 2016)

Peking University
Master in Financial Information Engineering (2011)

Shaanxi University of Science and Technology
Bachelor in Electronic Science and Technology (2006)

CURRENT RESEARCH

Dissertation
Title: Conduit Bond Financing of Local Governments—Perspectives from the U.S. and China

Publications and Papers


Conference Papers and Presentations


Research in Progress

Dwight V. Denison, Zihe Guo. Debt Leverage and Budget Volatility.

Zihe Guo. Do Governance Abilities Affect the Debt Management of Local Governments?

RESEARCH AND TEACHING INTERESTS

Research Interests
Public Finance and Budgeting, Financial Management for Public and Nonprofit Organizations

Teaching Interests
Public Finance and Budgeting, Nonprofit Financial Management, Economics, Public Policy, Research Methods, and Organization Theory

RESEARCH AND TEACHING EXPERIENCE

Research Experience
Research Assistant (August 2011- August 2016)
Martin School of Public Policy and Administration, University of Kentucky

Teaching Experience
Primary Instructor (January 2014-May 2014)
Gatton College of Business and Economics, University of Kentucky.

REVIEWING AFFILIATION
Public Finance and Management

PROFESSIONAL AFFILIATIONS

2013-Present Member, American Society for Public Administration (ASPA)
2013-Present Member, Association for Budgeting and Financial Management (ABFM)
2014-Present Member, Association for Public Policy Analysis and Management (APPAM)