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Sustainable Financial Management of Local Capital Markets: A Cross-National Comparison between China, Mexico, South Korea and the United States

by

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ABSTRACT

This study aims to explore what determines subnational debt levels and sovereign financial sustainability. Scholars argue that subnational fiscal capacity help local governments deliver better public services and provide public goods, which in turn helps to promote economic growth. The paper comprised of two parts: The first provides solid understanding about the characteristics of administrative structure, management of subnational government debt, and structure of debt portfolio of each country. In the second part, we test our hypotheses focused on the distinct types of administrative structures, fiscal capacity, and political-economic factors that may affect the probability of profligate debt spending by local governments. Our findings show when central governments have clear rules to intergovernmental transfers in place and more liberal policies, lower amounts of profligate debt spending occur. Consistent with other studies (Canuto and Liu 2010), when local governments have more fiscal capacity (per capita) and high unemployment rates, they are likely to have higher amounts of debt at the local level. Suggesting the need for more authority and control by the central government, even when decentralization has been implemented (Smith and Revell 2016).

Keywords: subnational government debt, local finances, administrative structure, fiscal capacity, financial management

I. Introduction

Subnational governments play an important role in delivering public services in many countries (Leigland 1997; Martell and Teske 2007). In this rapidly globalizing world, profligate subnational spending and its macroeconomic effects, with its potential to undermine the positive benefits of capital market development (Fitchratings, 2002, 2009; Torres & Zelter, 1998), do not stay in a given region but may affect their neighbors. Governmental debt management and financial risk becomes a pressing issue in all countries around the world. The International Monetary Fund (IMF), the Organization for Economic Cooperation and Development (OECD) and the World Bank have examined the financial sustainability of various countries; however, studies tend to focus more on central governments than subnational governments (Canuto and Liu 2010; Cecchetti, Mohanty, and Zampolli 2010; Cernuschi and Platz 2006). Yet, according to a study on public debt in OECD countries, fiscal decentralization has two faces: it causes excessive borrowing of subnational governments on the one hand, while improves fiscal stability of the public sector on the other (Baskaran 2010). So how should central government create management structures to control profligate subnational debt spending?

In general, subnational capital markets give local officials access to affordable finances to undertake large-scale public investments, such as in roads and public transportation systems, and public services like water delivery and sanitation (Cernuschi & Platz 2006; Martell & Guess 2006; Leigland 1997). Improved public services raise constituents' living conditions, as well as bring economic rewards to their local communities (Oates 2005; Weingast 2009). The expansion of subnational capital markets and the development of various financial instruments within them should aid not just the economies of emerging market nations but also global economic growth (Fitchratings, 2002, 2009; Torres & Zelter, 1998). The impact of intergovernmental fiscal relations that may produce inefficient public policy decisions on macroeconomic stability have been studied quite extensively. Specifically, high vertical fiscal imbalances (Rodden, 2002) and a lack of hard budget constraints (Rodden, Eskeland, & Litvack, 2003) reduce the incentive for subnational politicians to design efficient public policies, leading to poor provision of public services, high public policy costs, and thus unnecessary excess fiscal spending.

Less studied are the administrative roles and public management concerns, which also govern the development of capital markets. Administrative structure of subnational debt is based on three archetypes of management: the market discipline, defined rules, and direct administrative control systems, all of which are used to benchmark subnational debt. In general, international financial institutions most frequently advocated rule-based structure for creating harder budget constraints and stronger capital markets overall (Martell & Guess 2006). Yet, both the political economy that govern how the public officials are elected and the public management systems that determine how micro-decisions are made, clearly are vital factors less understood in this debate.

While sovereign debt ratings are useful, they do not capture the management structure of national governments to control subnational debt (Jensen 2005; Hanniman 2016). These authors argue that theories of second generation fiscal federalism (Weingast 2014) creating competition between subnational entities is at conflict with the amount of foreign direct investment entering into a country. Despite the growing attention and its

importance on the economy, few if any, have investigated whether or what management factors may be important in determining the level of subnational government debt is appropriate and where subnational governments access their foreign capital.

In this paper, we attempt to assess subnational debt sustainability by comparing the four countries—the United States, Mexico, China and South Korea—which are all in a different phase of economic development and show a great deal of variety in their aggregate subnational debt levels (Ahrend et al. 2013). Specifically, the paper investigates several factors that affect the subnational debt level by paying particular attention to the administrative structure, decision-making discretion that public managers have to mitigate risks, and – build fiscal capacity at the central and subnational levels of government.

The study tests these assumptions by analyzing the causal mechanism of fiscal constraint. For each country, the paper tests the level of local fiscal capacity or fiscal autonomy; the amount of local administrative control or discretion to make decisions and controls for the type of political-economic management each county has to make their own decisions. The paper assumes that countries with more local authority and autonomy will be more likely to control their subnational debt, which is consistent with Alesina (1996) classic theory that voters will protect the amounts of subnational authorities by voting profligate local public officials out of office.

This paper comprises of two major parts: the first part provides solid understanding about the characteristics of financial management, administrative structure, and fiscal capacity and sustainability of each country. In the second part, we test our hypotheses focused on the distinctive effects of the factors of each country on the level of subnational government debt. We find that when central governments must have clear rules to intergovernmental transfers in place and more liberal policies to lower amounts of profligate debt spending occur. Central government's hard budget constraints (Rodden, Eskeland, & Litvack, 2003) and management structures (Canuto and Liu 2010) can control local governments accesses, but should also impose more control when fiscal capacity (per capita) is weak at times when unemployment rates are high. Suggesting the need for more authority and control by the central government. Overall, we expect this study to provide theoretical and practical implications of financial development and debt sustainability within the global context.

II. Market Mechanisms, Fiscal Rules and Administrative Structure

III. Country Comparisons

In order to identify essential management factors needed by central governments to ensure greater subnational fiscal capacity and sustainability, we outline the historic attributes of how the systems were formed and organized, the current subnational debt trends, and structures of debt portfolios of each country. We characterized the United States as a decentralized market driven model, South Korea as having more centralized and direct administrative control and Mexico in the midst of developing a rules-based system to manage its subnational finances and China which is in the processes to determine its structure to manage debt.

1. United States

The United States has a long history of leveraging the bond market that goes back to paying for its railroads in the 1800s. It is renowned for its decentralized local governance system since Alexis de Tocqueville's 1831 visit to the US. Yet, the relationship of the fiscal federalism—prescribed as the assignment of fiscal functions and division of economic responsibilities among federal, state, and local governments—has changed overtime from layer cake to marble cake federalism and then to new federalism whereby the federal government used block grants and state aid programs to leverage their economic development and political support (Krane et al. 2004).¹

In contrast to many countries around the world, the United States has autonomous states that create their own budget and fiscal rules. The long history has made it the benchmark for other countries to follow. The fragmented institutional arrangement of the central government—without a central budget authority—allows public managers at the state and local governments to create independent rules unique to the situation and tie them to different revenue sources. This allows credit systems and market mechanisms to work independently from budget authorities. The United States shows a limited federal control over state and local borrowing, debt, and bankruptcy (known as Chapter 9 in the United States) with virtually no federal bailouts (Laubach 2005; Kincaid 2012).

The common pool resource problem of overreaching municipal debt was managed in the intergovernmental system in the United States through balanced budget requirements, tax and expenditure limitations (TELS), and debt limitations (von Hagen 1991). Effectively all states have some sort of balanced budget rules, whether they are statutory or constitutional; related to tax and expenditure limits; or some sort of local bankruptcy or fiscal distress provisions (Spiotto, Acker and Appleby 2012). State variations reflect individual policy decisions and fiscal behavior in the absence of federal bailouts. These unique fiscal rules and subnational differences help to impose fiscal discipline on the whole subnational credit market (Rodden 2006).

Financial responsibilities of general-purpose governments are closely related to the vertical relationship with the federal and state governments. The federal government outlines policy programs and state governments decide whether to take them and how to implement it. States mandate local governments to perform the same specific function within the state (Mullin and Daley 2010). With a long history of devolution to state and local governments (Krane et al. 2004), the vertical relationship has been various: cooperative, coercive, and contractual (Conlan 2008). According to Watson and Gold (1997), the recent devolution from state to local governments responsibility now focuses on the transfer of programs to the local level, alleviating states' budget pressures as well allowing discretion to localities to develop their own initiatives.

In short, devolution, fragmentation, and shared responsibility across all levels of government feature the US government system. Despite the tensions between the state and local governments, collaboration can be an effective tool in striking balance between the local autonomy and state control (Mullin and Daley 2010). The federal government “does

¹ Local government in the US includes various forms of government: general purpose government such as county and municipal governments, and special purpose governments such as school districts. The US Census Bureau in 2012 identified 89,000 local governments located in the United States, of which an estimate 39,000 are “general purpose” and the other 50,000 are “special purpose.” All of the local governments discussed in this article are in the “general purpose” category.

not monitor, control, or interfere in” the local programs or debt market, rather it controls indirectly through allocation of funds for them (Freire et al. 2004: 404).

Management of Subnational Government Debt

Overall, US bonds are each rated on a variety of factors. Rating agencies evaluate municipal budgets (or enterprise’s budgets) based on their financial systems, operational activities, economic profiles, and other eight rating criteria, such as economic, liquidity, debt, finances, and systems support. Other than the major rating entities including Standard & Poor’s, Moody’s, Fitch, there are commercial rating agencies. Each rating agency has a different methodology for determining their rate.²

Partly because of the sophistication of the US municipal bond market, the market-based approach has created high credibility of the US financial system. Several international investors use the US bond system for its sub-sovereign guarantee to invest capital. But with recent bankruptcy problems of several cities in the United States, there is a concern that this will affect the credibility of the market.³

However, local revenue structures in the US have attracted relatively little attention. There are two reasons for this: first, a considerable amount of local revenues comes from intergovernmental transfers in the US, and second, local governments have little discretion in raising property tax, the largest share of tax revenue, because of the tax and expenditure limitations (TELs) approved in nearly every state in early 1970s. However, institutional arrangements, administrative processes, and dire economic situation allows US local governments to adapt their own revenue sources to local needs.

Types of Public Investment Bonds

In general, there are three types of bonds in the US system (Thau, 2011). First, general obligation bonds finance government projects like parks, streets, schools, and public buildings. They usually use a full government guarantee and are exempted them from taxes once approved by referendum.

Second, revenue bonds are issued for special purpose projects or facilities for specific usage such as development or improvement of sewer and water systems, public airports, toll roads, hospitals, housing, and public parking facilities. They require repayment from usage fees or charges, and sale of a project related income generated from the financed project. The government units that issues revenue bonds are obligated to pay for the debt services from the revenue. The revenue bonds with government guarantees are called “double-barreled” bonds because they have less risk than other bonds have.

Third, industrial development bonds are to promote economic development and serve both public and private benefit. They must include job creation and increase in the local tax bases to create a multiplier effect to help the local economy. In general, these bonds were to expand, attract, and retain existing financing for hospitals, utilities, and

² For example, Fitch Ratings have a two-step approach: first there is a judgment of the Transfer and Convertibility (T&C) risk as reflected in the country ceiling rating; and second there is an assessment of the capacity of the entities and transactions to survive the economic and financial stress associated with sovereign debt crisis.

³ Public data are available by the U.S. Census Bureau. State and Local Government Finance <http://www.census.gov/govs/local/> for various years and by the U.S. Bureau of Labor Statistics Consumer Price Index, <http://www.bls.gov/cpi/home.htm> for various years

transportation services. Various laws have been enacted to monitor the use the tax-exempt status.

2. Mexico

Mexico has Federal District and 31 states with 2,444+ municipalities, which having the ability to contract public debt from public and private sources for capital investment. Mexican states and municipalities also enjoy soft budget constraints and thus have access to local capital markets fairly freely. In recent years, this has resulted not only increase total amount of state and municipal public debt loads, but also in growing variation in the type assumed. States and municipalities may select from the public development bank loans, commercial banks, trust funds or accessing the bond market directly. Often with these choices many public managers are not selecting the most type of financial instrument for their public projects.

Mexico's state and municipal governments rely on intergovernmental transfers, with highly vertically imbalanced fiscal relations. The 1997 National Fiscal Coordination Law (Ley de Coordinación Fiscal or LCF) centralized most tax rights and revenues in the national government. Since then, the federal government has distributed fiscal resources to states (and a small share to municipalities) in earmarked and un-earmarked transfers, with states responsible for financing municipalities through the redistribution of a set share of their un-earmarked federal transfers to them (according to their own state criteria). Between 2001 and 2010, for example, 7 percent of total state revenues came from own sources, 85 percent from federal transfers, 2 percent from "financing" (a euphemism for unfunded deficits run as arrears or covered with short-term bridge loans not studied here), and the remainder from "other" sources. Between 2001 and 2010, 22 percent of total municipal revenues came from own source revenues, 69 percent from federal and state transfers, 6 percent from "financing," and the remainder from "other" sources.⁴ Scholars regularly note that state and municipal reliance on federal fiscal transfers leads them to avoid collecting their own taxes (Cabrero and Carrera 2002; Giugale et al. 2000; Sour 2004).

Management of Subnational Government Debt

Mexico is one of the first countries to create a hybrid market-based and government-backed local bond market. New legislation in the 1990s and later reforms to subnational debt financing required two private rating agencies to appraise municipal budgets by evaluating their financial systems, operational activities, economic profiles and performance using criteria such as liquidity, debt, systems support, etc. The four major rating entities in Mexico include Standard & Poor's, Moody's, Fitch and HR Ratings. The Mexican debt system provides states and cities with several ways to take out public loans. Public officials can select higher or lower interest rates and longer or shorter terms for the services by using either public or private sector packages. All subnational public loans in Mexico are sub-sovereign subordinated debt, managed in local currency.

The subnational government debt market is divided into short-term and long-term credit. Often private banks are contracted to provide short-term credit. These loans are generally incurred and paid in full within the fiscal year and are used for cash management or contingent liabilities such as pensions. The four major categories of financing long-term

⁴ See Mexico's National Institute for Geographic and Informational Statistics (Instituto Nacional de Estadística Geografía e Informática (INEGI)).

credit which municipal officials may select from include: loans provided by the national development bank, loans guaranteed by own-source revenue, loans based on future transfers, and loans placed on the Mexican securities market. The national development bank provides loans to the lower income and less financially soluble municipalities. These public sector loans are typically used to finance a wide variety of public services such as groundwater removal, sanitation, as well as municipal waste disposal, roads, and traffic lights.

The country has experienced a significant rise in the indebtedness of states and municipalities since 2001, the first full year under the nation's revised laws governing subnational borrowing rights. Mexico's subnational debt is still at reasonable levels compared to other countries – total state and municipal debt was equivalent to 1.5 percent GDP in 2001 and 2.5 percent GDP in 2011 (Secretaría de Hacienda y Crédito Pública (SHCP)). However, total subnational debt went up from a total of 990 pesos per capita in 2001 to 3,450 pesos per capita in 2011 (Secretaría de Hacienda y Crédito Pública (SHCP)).

Structure of Debt portfolios

Beginning in 1997, the Mexican Ministry of Finance (SHCP) created reforms to open its access to buy and sell government securities. These reforms included the improving of regulatory bodies within financial systems through the creation of the National Banking and Securities commission (CNBV), the National Financial Services (CNSF) and the National Savings System for Retirement (CONSAR), through the umbrella agency, the Federal Regulatory Improvement Commission (COFEMER). These regulatory bodies helped to create a solid foundation for Mexico's internal municipal bond market, which became operational in 2001. These structural considerations encouraged the use of credit ratings and structured finance in order to leverage retirement accounts (AFORES) to be used as guarantees for financing infrastructure within states and municipalities. The traditional method for issuing government debt was only operational through the auctions that big investors, who only had access. Now retail debt through a system called *CETES Direct* gives small investors the opportunity to buy government securities without intermediaries.

In the Mexican debt system subnational governments, state or at the municipal level, with strong fiscal accounts can easily access private banks for short-term loans. These loans are generally incurred and paid in full within the fiscal year and are mostly used for cash management or for contingent liabilities such as pensions or supplier's credit (Revilla, 2013). Subnational governments with fewer fiscal resources tend to use national development banks. The long term loans are reserved for market based approaches by using credit agencies to evaluate credit which allows municipalities or states to access the "trust fund" mode or the bond market directly. The most market-based option is federal guarantees from the Mexican securities, which are place on the national stock exchange. These last two models are increasingly used by state level governments.

The trust fund model is the most contentious as it provides for the highest amount of centralize authority to their loans. Long-term credit is provided by using trust funds with dedicated funding streams from inter-governmental transfers or guaranteed by payments for services. Funds transferred from federal to state governments are managed by the states (and constitute approximately 85% of most states' revenues). Additionally, the trust fund model can be used to take out loans repaid by own-source revenue (such as user fees for

utilities or specific tax assignments for general obligation bonds). The same principle mechanism using a trust fund and creating separate accounts also is done. The distinction is with the guarantees of the funds originate from user fees for utilities and not future transfers

Above all, states borrow more than municipalities. Since the federal public investment spending is for investment projects, municipalities need constant capital injection (maintenance or improvement), therefore, the amount of debt contracted by the federal entity will increase. There are several municipalities that take out more debt.

As public funds are used for investment projects, municipalities need constant capital injection (maintenance or improvement), and therefore, the amount of debt contracted by the federal entity will increase. Yet the question of inter-generational equity and the remaining contingent liabilities that exists among state and local governments. Since states have nearly exacerbated the amount of transfers used for these trust funds, new regulations are considered by central authorities to ensure the funds are used for the golden rule or considered for productive measures. Many short-term loans have by-passed the central governments registration process, these private sector loans are accumulating and now need to be restructured into long-term debt. The implication of this has created unjust use for un-productive loans, while obligate further future national transfers. Currently, the Federal government is reforming the countries public finances in order to homogenize the accounting codes of all public entities. Yet it is still uncertain how to deal with the issue of profligate subnational spending.

3. South Korea

The trend of the Korean sovereign government debt shows relatively well-managed financial sustainability. The ratio of subnational government debt to the gross domestic product (GDP) takes up a small part of government debt. It has been relatively stable within the range of 2.0% to 3.0% between 2000 and 2010, and even decreasing in recent years, however, the amount of subnational debt increased since 2008 when the global crisis hit the economy (the year 2010 constant). Consolidated balances maintain surplus since 2000s, except the year of 2008 when the global crisis hit. The Korean government responded to the global crises with the highest fiscal stimulus out of GDP (6.5%) among the OECD countries.

However, the financial sustainability is threatened by the vulnerability of the economy, political pressures for more spending, demands for welfare in the aging society with low birthrates, as well as potential costs for reunification of the Korean peninsula. The central government's debt ratio to GDP is getting higher since the late 1990s (Figure 7). This growing trend is mostly due to the financial crisis in the East Asian countries in the late 1990s, global crisis in the late 2000s, as well as the debt crisis of the Euro Zone in 2011, in addition to the increasing population and demand for welfare.

Subnational governments in South Korea are organized by two levels: first by seven Metropolitan cities, including Seoul, and then by nine Provinces with hundreds of smaller units, such as cities, districts, and townships, often called as "local governments" below their authority. Similar to those in the US, Korean local governments also depend heavily on revenue transfers from the higher levels of government. Yet the level of local fiscal autonomy is much more limited and under close supervision by the central government (Freire et al. 2004).

The role of Korean subnational government in managing public service delivery is limited. In response to the fiscal crises of 1998 over the East Asian countries, Korean local governments have acquired more autonomy from the central government authorities. The beginning of nationwide local election in 1995 also affects the trend of decentralization; however, local governments have little incentive to raise own-source revenue: the share of own-source revenue is small and local borrowing decisions are tied up to the regulations by the central government. Notwithstanding some variation, the share of own-source revenue is around 20% for most local governments, where the remaining portion originates from payments transferred from the central government. The revenue structure has not been much changed since 1995.

Likewise, local borrowing systems are regulated by the central government to ensure that they are consistent with the national development plans (Freire et al. 2004). However, the level of subnational debt has been well managed, while sovereign debt has been doubled between 1995 and 2001 (Kim 2002). The risk of moral hazard, decrease in efficiency and accountability, and dependence on the central government create heavy costs for centralized system of government. The local government system is managed through the Ministry of Security and Public Administration (MOSPA) and Ministry of Strategy and Finance (MSF).

Credit policy has also been a strong tool for development in Korea since the 1980s. The Economic Planning Board (EPB) gave the country an unprecedented power to organize and nationalize the banking system, targeting industrial sectors and managing fiscal policies. The commercial banks in Korea function as development banks with large public sector debt portfolios. Non-bank financial institutions operated freely, often times without sufficient regulation, but were used as a way to expand the financial operation and economic of the country. In the 1980s, the chaebol, a deeply inter-connected business group that had special access to the national banking systems in order to leverage specific developments of private industries, was successful.

To avoid default, the government would absorb and reschedule the domestic bank loans, giving preference to larger firms and not providing accessible credit to small and medium size firms. This led to high-growth rates until the government became overambitious. High risk sharing schemes between creditors and borrowers led the Korean government to take on dangerous balance sheets leading to near financial collapse. Similar to the 2008 financial stresses in the United States, the Korean economy was hit hard in 1997. The central government was quick to assess their internal problems. Aided by the international community, the government took out internationally financed loans from the World Bank and others to meet the private sectors demands and reconstructing the national economy.

Management of Subnational Government Debt

The management of Korean subnational government debt can be summarized as a direct administrative control by the central government. Subnational debt incurred by local loan or bond market is under the approval from the central government. By prioritizing stability and consistency over efficiency, subnational borrowing decisions involve complex approval procedures through central government agencies. Unlike the US federal government, the Korean central government has much influence over local governments' choices of specific local programs and their eligibility of borrowing (Freire et al. 2004;

Ter-Minassian 1997). For example, local governments can issue debt in the "appropriate projects" consistent with the Mid-term Local Finance Plan set by the central government (Kim 2002: 28-29). Thus, local debt is viewed as another form of financial assistance from the central government, rather than tax burden passed down to future generations (Kim 2002).

The central government is responsible for subnational government debt therefore the subnational governments may never go broke. There is no bankruptcy law in Korea for sovereign debt. Because the local borrowing process is tightly controlled, the loans approved are considered being guaranteed by the central government (Ter-Minassian 1997). The control-and-guarantee partly contributes to recover trust from the foreign investors and financial institutions. Nevertheless, it is closely related to the moral hazard-driven behavior of both the subnational governments accumulating debt and the central government passing the buck (Ahrend et al. 2013). The moral hazard and common pool problems associated with the problem of soft budget constraint inevitably brings about an unsustainable fiscal situation.

Structure of Debt portfolios

Subnational debt consists of local public loans and bonds. First, local loans have three types of domestic loans and two types of foreign loans (for details, see Kim 2002: 31). Domestic loans originate from the central government, local governments, and private banks and financial institutions. Subnational loans account for most local debt (86% in 2010) and are mostly from the government-owned financial institutions, and less commonly from the private banks and foreign banks.

Second, local bonds have three types of domestic bonds and two types of foreign income sources (for details, see Freire et al. 2004: 407-410). Domestic bonds include public bonds, also known as flotation bonds, compulsory bonds, and compensation bonds. Among these, compulsory bonds such as Metro Railroad Bond, Regional Development Bond, and Urban Development Bond are unique to the Korean subnational finance. The issuing government set the term of compulsory bonds, which are required to purchase by the local service providers and secured with the improvement of local finance. For more flexibility in debt management, Seoul Metropolitan city has reduced its capital investment on compulsory bonds.

Local public debts also can be categorized into three types based on the characteristics of their target projects: general account debt, special account debt, and public enterprise debt.⁵ Korea has favorable conditions in developing subnational debt market, such as high per capita GDP and savings, well-developed and competitive financial intermediaries, legal and regulatory systems, and public and private contractual savings institutions. However, the lack of fiscal autonomy and managerial capacity (Freire et al. 2004: 410-411), the disparity of authority between the central and local governments as well as between different levels of local governments, and unclear division of financial responsibility associated with the soft budget constraint (Kim 2002) stand in the way of achieving a more efficient and accountable subnational debt market.

Outstanding debt as a share of total revenue peaked at the time of financial crisis in

⁵ General account debt includes the public projects for road, bridge, repair, disaster relief; special account debt finances housing, sewage, water, and rural enterprise; public enterprise debt is used for subway, water, sewage, public development, and regional development (Kim 2002: 31).

1997-98 and has decreases since that time (Freire et al. 2004). Almost half of subnational government debt in Korea consists of the debt from the subway companies and other local public enterprises. Notwithstanding variations among the major metropolitan cities, subway debt becomes a serious challenge for the central government in managing local debts. Not just because of the large share of the local debt, the subway debt is related to the lack of financial reasonability of local governments and unclear division of responsibilities between governments and public enterprises (Kim 2002: 43).

Overall, the Korean subnational governments enjoy significant benefits under the highly centralized regulatory framework, such as subsidized interest rates, extended loan tenors, and the total shared risk for their local bonds. However, this condition has constrained the development of a more efficient local credit market (Freire et al. 2004).

4. China

Notwithstanding its sheer size and diversity, China has been a unitary and centralized state. The main organs of state power are the National People's Congress (NPC), the highest legislative branch, and the State Council, the highest executive branch. Since the Communist Party of China (CPC) is the founding and ruling political party, the Politburo and its Standing Committee play most significant roles in policy decision. The subnational (provincial) government in China exercises jurisdiction over 22 provinces, 5 autonomous regions, 4 municipalities under the central government (Beijing, Tianjin, Shanghai and Chongqing), and 2 mostly self-governing special administrative regions (Hong Kong and Macau). Under the provincial-level government, there is a three-level administrative network of prefectures, counties and cities and townships and districts.

Decentralization of powers away from central government is an important component of China's transition to a market economy, although the extent is quite debatable. The 1980s has seen various contracting reforms to break down its highly centralized fiscal system. As a result, the "two ratios" experienced continued decline: the budgetary revenue to GDP went down from 22.91% in 1984 to 12.56% in 1993 (Figure 10) and the central to total budgetary revenue declined from 40.5% in 1984 to 22% in 1993. In response, in 1994, China introduced the "tax sharing system" under which each type of tax is shared by the central and subnational governments according to a stated percentage. The new system achieved immediate impact on the division of revenue sources between the central and subnational governments, and finally ended the central government's reliance on the local remittance. The budgetary revenue to GDP percentage reversed the declining trend and continued to grow. In 2013, the share was 22.7%. Figure 11 shows the percentage change of subnational government revenue and expenditures. As shown in the Figure, the percentage of subnational revenue dropped below 50% in 1994 and remained at this level till 2010. The Figure also shows that since 1990, the percentage of the subnational government expenditures had stabilized at 77% till mid-2000s, but from then now, it kept increasing to 85.4% in 2013.

The 1994 tax-sharing reform improved the transparency and stability of the central-local fiscal relations, but it also shows a new trend of recentralization of fiscal power. The subnational fiscal gaps have been mainly filled in by the operation of intergovernmental transfers. In fact, Central-provincial transfer accounts for 67% of provincial needs and provincial-local fiscal transfer accounts for more than half of local fiscal resources (Shen et al. 2012). The central-subnational transfers in China can be classified into two broad

categories: general purpose (e.g. tax rebate and equalization transfer) and specific purpose transfers (e.g. grants, earmarked funds for projects). In 2012, the central-subnational government transfer reached to 4536.2 billion yuan (7200.3 billion USD), doubled the number of 2008.

Management of Subnational Government Debt

The 1994 taxation reform gave birth to the Budget Law of China. Under the Budget Law, subnational and other local governments are forbidden to incur either domestic or foreign indebtedness. When the local governments needed investment outstripped their revenues, the central government would sort to the occasions. In 1998, to stave off impacts of Asian financial crisis, the central government, acted as debtor, issued 108 treasury bonds of billion Yuan and transferred the loans to local governments. In addition, there been circuitous route of debts that local governments are the debtors, such as direct borrowing, loan guarantee, borrowing from commercial banks, indirect borrowing form local-owned enterprises or Trust and Investment Companies (TICs). The total local borrowing was estimated to be over 120 billion USD by the end of 2004 (Wei 2004). Some local governments were actually on the verge of bankruptcy due to debt services; however, there were lack of legal procedures for resolving local government insolvency.

As a result of a deliberate state-driven stimulus program to mitigate potential economic collapse in the aftermath of the 2008 global financial crisis, Chinese central government put forward an economic stimulus package of 4 trillion yuan (586 billion USD) within 3 years, including 1.18 trillion yuan (172.9 billion USD) from central government and the rest as match-up fund from local governments. The call opened the door for local governments to seek financing channels, which made the local government debt issues worse.

The first approach is through bond issuance. From 2009-2011, the Finance Ministry issued 200 billion yuan each year but different than before, the local governments should be responsible for paying the loans back. Realizing the necessity to let local government be accountable for the quality of loans, in April 2009, a team was formed for drafting a revised Budget Law. After three-year pilot bond issuance experimentation in 6 local provinces and municipalities and four rounds of review, the new Budget Law was passed in 2014 after. The revised Budget Law makes local government debt more transparent and accountable by granting local government the right to issue bonds on their own.

The second approach is through the establishment of the Local Government Financing Vehicles (LGFVs). LGFVs are state-owned enterprises set up by local governments to conduct infrastructure projects that would normally be undertaken directly by the governments themselves. Local governments support the LGFVs by injecting cash into or transferring state land to them, which the LGFVs use as collateral to borrow from banks and capital markets. The number of LGFVs increased fast. It reached to 6576 by 2010. The State Council began to discipline the LGFVs by imposing curbs on bank loans and tightening the promotional controls of lower-level officials.

Local governments also borrow through the less transparent shadow-banking system. The lenders are nonbank financing agencies, with which the borrowing is not regularly disclosed. Funds borrowing from shadow banks grew from 360 billion USD in 2011 audit to almost 1.2 trillion USD in June 2013 (Huang and Bolser, 2014). In response, the State Council sent orders to clarify the situation and enhance supervisory responsibility.

Structure of Debt portfolios

The Chinese National Audit Office (NAO) categorizes government debts into three types: government direct debt, government guaranteed, and other contingent. In 2010 and 2013, NAO published audit report that unveiled the China's government debt situation (NAO, 2013). Figure 12 shows the composition subnational government debt-GDP percentage. Local governments are the most indebted public institutions. It is estimated that the local government debt has doubled from less than 20% of GDP in 2007 to nearly 32% in 2013. By mid of 2013, the total local liabilities has amount to the 17.89 trillion yuan (2.89 trilliion USD), 66.9% higher than the figure in 2010. Adding the central government's debt of 12.38 trillion yuan (2 trillion USD, 21.77% of GDP) would bring the total government debt to 53.2% of GDP, still acceptable by international standard.

According to the 2013 NAO report, the percentages of direct debts by each level of subnational government were as follows: provincial, 16.3%; prefectural, 44.5%; county level, 36.4%; and township level, 2.82%. Obviously the prefectural and country level governments are the main debtors. The subnational debts are mainly borrowed for investment. More than 37% of the direct debt financed municipal building works, another 16.7% used for land overhaul and preservation, 13.8% paid for transportation infrastructure and 7% paid for affordable housing. Many of these investments have not yet started to generate returns, which raised the risk of defaults, but the situation may improve in the future. The debt swap policy is to roll the loans over and shrink its size to the economy.

IV. Empirical Tests

This section provides our empirical analysis on whether local fiscal capacity, local market discipline or central government administrative control are better to constrain subnational government debt. Specifically, the paper tests the causal mechanism used to constrain fiscal accesses by subnational governments and encourage more local capacity to build their debt policy. In particular, the we pay particular attention to management techniques of how managers can mitigate risks, and – build fiscal capacity subnational level of government while accessing new capital for public infrastructure projects.

In effect for each country, the paper tests the level of how much fiscal capacity or fiscal autonomy the central government allows to local governments to access the debt markets. Second, we evaluate the amount of discretionary control to access the bond market and encourage international capital to flow into the national market. Finally, the paper tests controls for the type of political-economic management each county has to make their own decisions. Overall, the paper assumes that countries with more local authority and autonomy will be more likely to control their subnational debt, which is consistent with Tabellini and Alesina (1988) classic theory that voters will protect the amounts of subnational authorities by voting profligate local public officials out of office. Hypotheses, data sources and how these variables are measured are included into this section. The empirical results and discussion will follow.

1. Hypotheses

Traditionally, the literature has focused on subnational fiscal autonomy and capacities as a way to manage subnational debt portfolios issued by voters (Alesina 1996; Tabellini and Alesina, 1988). Yet not all counties have strong democratic capacity at the local level nor do they allow local elections to vote the rascals out (Smith and Revell 2016). In the public finance literature, fiscal capacity is essential to ensure a solidified and successful bond market. The healthier the local fiscal situation is, the more likely localities will be able to pay back its debt with their own-source revenue, allowing for a lower risk premium which lowers the cost of the local debt to the borrower (Bahl & Wallace 2005). Therefore, more local revenues, either through taxes or fees, will improve and increase the guarantee for a loan. Otherwise, central or higher levels of government need to guarantee their loans which helps to lower the amount of risk to default. This can also affect the amount of financial credit available to local governments.⁶

Hypotheses 1: The higher degree of local decisions making capacity and local fiscal autonomy will be lower the total level of subnational debt to GDP.

There are three management options for subnational debt market: (a) market-based discipline; (b) fiscal rules to manage the subnational loans; and (c) strict case-by-case administrative control by the federal/central government limiting economic freedom. Many US scholars have stressed the reliance on market discipline as the optimal management model for countries to access capital markets (Cernuschi & Platz 2006; Martell & Guess 2006; Leigland 1997). This system uses the financial market to manage sub-sovereign risk and restrict the access to foreign capital by using market controls (i.e. rating agencies), but supplies the capital through national leaders along with development banks.⁷ Typically the national treasury will require subnational governments to report their debt loads as a way to manage subnational borrowing capacities. Second, fiscal rules are the internal requirements that governments create in order to control subnational borrowing. The most important element of fiscal rules is how to constrain public managers from over-consuming the common pool resources either through off-budget expenditures, investments not tied to assets, or capital enhancements based on expired future revenue streams from the national government.

On the other hand, direct government actions by administrative control can also manage out-of-control sub-sovereign debt by increasing fiscal capacity, managing political economic factors, and ensuring good public management, and controlling for the influence of purely political decision making. Direct administrative control is based on the national treasury controlling the access of the capital markets. Typically, the central government acts as the direct conduit to the international capital markets by creating an umbrella of

⁶ Sovereign risk and country risk are not the same. The former is assessment of risk that the government of the sovereign nation will not honor its debt obligations. The later relates to risk to cross-border foreign currency lending and investment arising from events in a particular country, which are outside the control of the private sector. We are using country risk loosely here.

⁷ An important tool for central government official to manage fiscal policy at the local governments is by using a rating system. Bond rating tools are used in market-based capital markets to determine the risk premium for repayment, evaluating the financial capacity of the local government based on such criteria as economic, liquidity, debt, finances, systems support, etc.

subnational debt into a larger lump sum for the country to access. Then the national treasury distributes smaller sums to predetermined cities or subnational governments to receive financing. This control model may use a loan council at the central level to determine which city or state may access to loans. This is useful for enforcing the financing golden rule, which states that loans must be used for productive measures. It also provides better terms for the loans for smaller countries.

This typology implies the question of what level should market mechanism be implemented to leverage the most amount of control of the national budget. We test the assumption that the market based mechanism with little rules will promote more control of the local debt market.

Hypotheses 2: Strong national government market mechanisms will be decrease the amount of total subnational debt to GDP.

Nearly every country has some type of hard budget constraint with fiscal rules to control for debt within local congresses. Empirical evidence shows that states with harder balanced-budget rules react more promptly to revenue or spending shocks (Poterba, 1994; Alt and Lowry, 1994) and state budget rules affect the level and composition of state debts (Poterba, 1994; von Hagen 1991). International comparative research has found that the federal system controls subnational governments better than the unitary government system, because they are better able to construct these fiscal rules at the local level (Ter-Minassiani, 1997). Yet Bails and Tieslau (2000) suggest there is a conflict in the literature between “public choice” and “institutional irrelevance” of state budget institutions, which includes the public management approach to oversee excessive budgeting. Specifically, who is in charge of creating the rules, who enforces them and how to they become institutionalized overtime.

Traditional political economy literature bemoans the need for better administrative capacity to manage bond markets efficiently and effectively, nevertheless, there is little guidance on which is the best management system for subnational capital markets. Furthermore, endogeneity issues on whether rules need to be created before institutions or whether strong institutions are needed to create better rules are tussled throughout this body of empirical literature. Arguably, fiscal rules may be only effective if they are created in democratic systems with sound designs, a robust legal system, based on implementation tools that include firm enforcement mechanisms (Ter-Minassian 1997). Yet meeting all these prerequisites is far from insignificant, and flaws at any one of these stages can lead to profligate subnational spending.

Finally, scholars argue that subnational capital markets and their evolution, especially in developing economies, need to be overseen and managed by national governments (Canuto 2010, Leigland 1997, Martell and Teske 2007, Cernuschi and Platz 2006). This may be done through market mechanisms (like credit rating agencies), administrative rules or legal channels such as bankruptcy proceedings. Many academics believe that developing country without any debt restrictions clauses, such as Brazil’s Fiscal Responsibility Law, could threaten macroeconomic growth and be detrimental to inter-governmental relations of the country. The question remains if subnational debt is controlled by administrative authority, legal changes or if market mechanisms are more

likely to be effective at managing the common pool problem of excessive debt issuance at the local level.

Hypotheses 3: The higher degree of administrative control over the subnational governments will be positively related to the lower level of subnational debt to GDP.

Yet, too much control and oversight can limit the possible benefits accrued by individual communities' autonomy to access capital for specific public projects. Centralized and efficient control of balance sheet and deficits may increase centralized budgeting authorities to select projects. This is even at the state government level where many duplicate responsibilities that perhaps should be managed at the local level (Alesina, Hausmann, Hommes, and Stein, 1999; Poterba and Rueben, 1999; Tabellini and Alesina, 1988). This is why public management concepts are important to understand and locate at the appropriate level of government to allocate these additional resources.

Too little control, in contrast, can create corruption and pockets of fiscal holes in the budget. For example, this may create fiscal space for lower-level financial managers—creating capital budgets without proper asset guarantees—to overreach their budget requirements. Or too little control can also inhibit the central government's ability to foster public private partnerships with foreign investors, corporations, and those who want to build the partnerships at the local level (Santiso 2005). Primarily because often central government authorities need to umbrella projects to meet investor demands which are much higher amounts than some community need. All in all, adequate fiscal discipline can help prevent subnational debt crisis and the appropriate rules are required to ensure sustainable and collaborative intergovernmental fiscal arrangements.

2. Data and Measures

The study uses the panel data aggregated with a range of control variables from each country to assess the effect of local fiscal autonomy and central government's control and fiscal capacity. Two measures for the dependent variable are used: (1) subnational government debt to GDP (%), (2) subnational government debt to subnational revenue (%).

The key independent and control variables were grouped into three categories: local fiscal capacity/ autonomy, administrative control and political-economic controls.

Local fiscal autonomy is created by three variables. The first is the per capita fiscal capacity (own-source revenue + intergovernmental transfers)/ population. The second variable is the amount of the intergovernmental transfers to GDP (measured as a percentage). Finally the variables is measured by local borrowing/saving to total subnational revenue, also measured as a percentage. Subnational governments with higher revenue, either through taxes or fees, will improve and increase the guarantee for a loan.⁸

For the national standardized equivalent to aggregate all subnational ratings, we measure a country's controls on financial risk of capital markets by bank nonperforming

⁸ Local governments in the face of reducing intergovernmental revenue and increasing demands for more spending, choose to raise own-source revenue by various strategies: increasing nontax revenue, such as user fees, charges, fines, and forfeiture and issuing local bonds as an important tool of local fiscal activities. However, these alternative revenue sources take up only small portions of the total amount of local revenue.

loans to gross loans (measured as a percentage. The amount of financial soundness index is published by International Monetary Fund (IMF) (<http://fsi.imf.org>).⁹ This is necessary because we were unable to find a comparative data set which evaluated subsovereign debt for our countries in the study. Administrative control over the national economy is captured by the overall score of the index of economic freedom published by Heritage Foundation (www.heritage.org/index).

Political/economic control variables include a country's political risk and instability, annual GDP growth rates, unemployment rates, political ideology, and financial crises. A country's political risk and instability is measured by one of the Worldwide Governance Indicators (WGI) from the World Bank database (<http://info.worldbank.org/governance/WGI>).¹⁰ Political ideology of the government is measured by the indicator variable coded one for liberal governments.

We gathered data from various national and international sources from the United States, Mexico, Korea, and China. Due to the data collection problem and availability, the time scope of the study is restricted to between 2002 and 2013. For details on data, measures, and sources can be found in Table 1.

[Table 1 Data and Measures]

3. Results and Discussion

The panel data analysis of four very different countries between 2002 and 2013 shows quite consistent findings. As each country has its own unique characteristics and our interests are in analyzing the impact of variables that varies over time within a country. Therefore, we use the fixed-effects (FE) model that assumes time-invariant characteristics are unique to the entity, which allows us to estimate coefficients not biased by the omitted characteristics such as culture. The Hausman test also supports FE model for the analysis. Yet the result table shows the random-effects (RE) model for comparison. The results of the random-effects (RE) GLS models showed similar correlations with our dependent variables, although less interesting.

Several diagnostics are conducted to test for time-invariant effects, cross-sectional dependence, heteroskedasticity, and serial correlation; and the cluster-robust standard errors are adjusted for four groups (i.e., countries). The mean VIF is 6.09. The summarized result table is presented. Descriptive statistics, correlation, and heteroscedasticity across countries and years are presented following the summarized result table.

⁹ Ratio of defaulting loans (payments of interest and principal past due by 90 days or more) to total gross loans (total value of loan portfolio). The loan amount recorded as nonperforming includes the gross value of the loan as recorded on the balance sheet, not just the amount that is overdue.

¹⁰ The WGI is a research dataset summarizing the views on the quality of governance provided by a large number of enterprise, citizen and expert survey respondents in industrial and developing countries. These data are gathered from a number of survey institutes, think tanks, non-governmental organizations, international organizations, and private sector firms. The WGI do not reflect the official views of the World Bank, its Executive Directors, or the countries they represent. The WGI are not used by the World Bank Group to allocate resources (World Bank).

[Table 2 Analysis Results]

The fixed effects model with the dependent variable of subnational debt to GDP (SND) shows the significant influence of the degree of fiscal capacity and autonomy local governments have on the SND. The per capita local fiscal capacity measured by subnational revenue including own-source revenue and intergovernmental revenue had a negative impact on SND. The negative relationship also found at the fixed effects model with dependent variable of subnational debt to subnational revenue (SNDLR). This implies that local governments with more fiscal capacity will likely to have less debt and sounder financial situation.

Another indicator for local fiscal capacity, dependence on intergovernmental revenue (IGT), turned out to be significant. The relationship between the IGT and SND was positive and significant, suggesting that a subnational government that depends more on intergovernmental transfers will have higher level of subnational debt. This positive relationship, however, was not found in the SNDLR fixed-effects model.

Regarding the administrative control over financial market and economy, financial soundness measured by bank non-performing loans (%) found to be positively significant at the 0.01 p-value as expected. However, the variable for overall administrative control over the economy was not significant.

Among the political/economic control variables, unemployment rates and political ideological preference of the government have a marginally significant impact on the level of subnational debt, suggesting that subnational governments tend to spend more and have more debt under the liberal government.

The empirical analysis is an attempt to determine at what degree of local fiscal capacity/autonomy and administrative control and political risks affect the level of subnational government debt. In an essence, this study provides evidence that subnational government debt is a product of localities and central governments of the country. Political factors such as ideological preference influences the financial markets of subnational governments as well as economic factors such as unemployment rates. Although this study is not looking for the right level of administrative control and effective fiscal rules, we found evidence that it is important for nation states to manage bond markets to ensure sound market mechanism. Even though many developing countries seek to have more centralized control to leverage the international capital market, efforts to create sound local capital market within their countries should come before control over the economy.

Capital markets in the United States have grown by exponential rates that are based not on fiscal rules but on their market mechanisms (ACIR 1987). Defaults and credit constraints can play a more positive role in disciplining irresponsible, sovereign borrowers (Bayoumi, Goldstein, and Woglom 1995). This optimistic view has played a key role in the debate on the most effective way to restrain subnational governments.

However, an important aspect of the market discipline is an assumed nonlinear relationship between yields and debt variables. Advocates of market discipline assume that yields will rise smoothly at an increasing rate with the level of borrowing, thereby providing the borrower with an incentive to restrain excessive borrowing. If these incentives prove to be ineffective, however, the credit markets will eventually respond by denying the irresponsible borrower further access to credit and be constrained through bankruptcy proceedings. Yet bankruptcy is not a one-size-fit-all solution. Levitin (2012)

argues that states' fiscal problems are generally structural-political problems that bankruptcy cannot be expected to fix. Accordingly, bankruptcy makes sense only as a political tool, rather than a financial-legal restructuring tool.

Countries in the diverse stages of development would have a strategy different from the U.S. Recent empirical efforts describe how clarity within the rule making process helps eliminate information asymmetries and allows for market mechanisms to operate at the subnational level (Kelemen and Teo 2014; Goldstein and Woglom 1992; Bayoumi, Goldstein and Woglom 1995; Poterba and Ruben 1997; and Lawry and Alt 2001).¹¹ However, it is difficult to build robust capital markets in the subnational government without administrative capacity for sanction and control over the subnational debt.

VI. Conclusion

The study aimed to better understand the variations of administrative structures, subnational fiscal capacities, and debt management by investigating the factors that affect the level of subnational debts in the context of four different countries: the US, Mexico, China and South Korea. We seek to add to the literature to demonstrate the casual mechanism of how to create stronger subnational debt markets with more administrative control by also paying attention to the national governments abilities to control for risk to access international markets. From the comparative study, we attempt to provide a better understanding at how to create harder budget constraints at the central level of government while improving decision-making at the local level (Rodden and Wibbles 2005). We expect this study to offer theoretical as well as practical implications for national governments when deciding when to decentralize their authority to implement debt policy at the local level.

Our findings show when central governments have clear rules to intergovernmental transfers in place and more liberal policies, lower amounts of profligate debt spending result. Consistent with other studies (Canuto and Liu 2010), when local governments have more fiscal capacity (per capita) and high unemployment rates, they are likely to have higher amounts of debt at the local level. Suggesting the need for more authority and control by the central government. The ability to establish and set in rules must come from local congresses. In addition, national governments should also consider the micro-decision making authority of these subnational governments. In a way, alternative factors can be involved, such as political ideology, that influence local debt policy (Smith and Benton 2017). This is relevant to national governments for various reasons.

First, there are many factors that affect the marketability of bonds outside of the government and therefore within the marketplace itself. This may be used to determine how a country risk can leverage the market outside of its governmental risk. For example, all subnational debt is subject to sovereign risk that is not the same as the country risk. The former is assessment of risk that the government of the sovereign nation will not honor its

¹¹ The clarity of rules includes if a state or local government has the following: 1) budget reported on the General Accepted Accounting Principles; 2) frequency of its budget annual cycle; 3) if the legislature is prohibited from passing open ended appropriations and 4) whether the budget is required to publish performance measures.

debt obligations. The later relates to the risk to cross-border foreign currency lending and investment, which is beyond the control of the private sector. A country ceiling rating strengthen is positively correlated with the sovereign rating (i.e. the higher the sovereign rating, the more likely a country ceiling is fortified).

Corporate, banks and structured transactions can only be rated as sovereigns. Therefore, their stand-alone credit rating is no judged independent of country risk. A “sovereign ceiling” is the long-term foreign currency rating that will withstand sovereign debt crisis. This is either because of substantial export earnings, foreign assets, production overseas and/or foreign parents or strategic partners will and are able to provide financial support, may be rated above the country ceiling. Furthermore, within the market place there are other influencing factors such as: bond denominations, coupon rates, credit ratings, maturity schedules, and call/redemption privileges. In general, the higher the credit rating, the more profitable the maturity structure for investors, and the further the call feature is from the issuing date, the more appealing the issue will be to investors.¹²

Second, within these emerging institutional environments, public managers should abide by the institutional rules such as standardized accounting measures, regular auditing procedures with internal/and external control that minimize political influences in order to obtain a high quality rating and cheaper credit. Furthermore, public managers must be knowledgeable about debt financing mechanisms and options within their local markets. Finally, public managers need to understand that loans are based on better terms and solid tangible assets, or fees-based structure to be able to pay back their loans within a reasonable time period. Own-source revenues, for example local tax collection efforts or fee-based structures for services, made to payback local loans are fundamental for internal bond markets to be operational.

Third, government bankruptcy is not very common and fiscal rules do help to avoid drastic measures like these in the case that they do not exist. Even before New York bankruptcy claims of the 1970s, governments have been dealing with the way to mitigate the likelihood of sub sovereign default. Today’s political dialogue of how to manage the bankruptcy of Detroit along with California’s relationship with San Bernardino, Vallejo, and City of Bell are similar to developing countries, such as Mexico’s treatment of Acapulco, Nuevo Leon and Michoacán’s over consumed debt during the 1994 Tequila Crisis. Often these bankruptcy charges are more a political tool to manipulate rigid fiscal structures (Tang et al 2014).

Finally, several aspects of the study need further development for future research. Although we focus on the administrative structure as a determining factor of fiscal decentralization, it is a challenge to find an appropriate proxy for this variable. Another challenge from an international comparative study with very different contexts is that a standard dataset with comparable variables and factors is somewhat limited and not always available. Despite the limitation, it is still important to develop an empirical model to assess financial sustainability with different types of administrative structures and public management variables to better understand how to manage these systems better.

¹² Designing a bond issue: A Guide “Municipal Bonds” an MIS Repot, published by ICMA Vol. 19 Number 6, June 1987. A good source for criteria considered by investors and rating agencies in determining rates, etc: Clark, Terry Nichols, G. Edwards DeSeve, and J. Chester Johnson, *Financial Handbook for Mayors and City Managers* (New York: Van Nostrand Reinhold Company, Inc., 1985), p. 79.

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Table 1 Data and Measures

| Factors | Measures | Source |
|--|---|---|
| Dependent variable | Subnational government debt to GDP (SND) (%) | US: US Census Bureau (http://factfinder.census.gov) Mexico: Instituto Nacional de Estadística Geografía e Informática (INEGI). "Sistema Municipal de Base de Datos (SIMBAD)." < http://www.inegi.gob.mx >. China: National Bureau of Statistics (http://www.stats.gov.cn) Korea: Economic Statistical System (ECOS) (http://ecos.bok.or.kr) |
| | Subnational government debt to total subnational revenue (SNDtoLR) (%) | |
| Local Fiscal Capacity/ Autonomy | Per capita fiscal capacity (own-source revenue + intergovernmental transfers)/ population (FA) | US: US Census Bureau (http://factfinder.census.gov) China: National Bureau of Statistics (http://www.stats.gov.cn/) |
| | Intergovernmental transfers to GDP (IGT) (%) | Ministry of Finance (http://www.mof.gov.cn/index.htm) |
| | Local borrowing/saving to total subnational revenue (LBtoLR) (%) | Mexico: Instituto Nacional de Estadística Geografía e Informática (INEGI). "Sistema Municipal de Base de Datos (SIMBAD)." < http://www.inegi.gob.mx >. Korea: National Assembly Budget Office (http://nabo.go.kr), Economic Statistical System (ECOS) (http://ecos.bok.or.kr) |
| Administrative Control | Fiscal control over capital markets: Bank Nonperforming Loans to gross loans (%) (BNL) | International Monetary Fund (IMF) (http://fsi.imf.org/) Financial Soundness Indicators |
| | Administrative/political control over the economy overall: Index of Economic Freedom (IEF): Overall score | Heritage Foundation http://www.heritage.org/index/ |
| Political-Economic Controls | A country's political risk: The Worldwide Governance Indicators (WGI) | World Bank Database (http://info.worldbank.org/governance/WGI) |
| | Annual GDP growth rates (GDPGR) | US: Bureau of Labor Statistics (http://bls.gov) Mexico: National Population Council, or <i>Consejo Nacional de Población</i> (CONAPO) www.conapo.gob.mx China: International Monetary Fund (http://www.imf.org) Korea: Economic Statistical System (ECOS) (http://ecos.bok.or.kr) Korean Statistical Information Service (KOSIS) (http://kosis.kr) |
| | Unemployment rates (UNEM) | |
| | Ideological preference of Presidents (Liberals=1, others (Populist or Conservatives)=0) (LIBERAL) | Self coded |
| | Global Financial crises (1997, 1998, 2008, 2011=1, others=0) (FC) | |

Table 2 Analysis Results

| DV | Subnational Debt to GDP (SND) | | Subnational Debt to Subnational Revenue (SNDLR) | |
|-----------------------------------|---|---|---|---|
| Models | Fixed-effects (within) | Random-effects GLS | Fixed-effects (within) | Random-effects GLS |
| Per capita fiscal capacity (FA) | -.0044168 * .0014078 | .0015846 .0024324 | -.0781713 * .0307036 | -.0285132 .0265182 |
| Intergovernmental transfers (IGT) | 6.048324 ** 1.429271 | 2.679329 ** 1.040223 | 65.69641 31.87738 | 39.95206** 8.587104 |
| Local borrowing to revenue (LBLR) | -.1023602 .2945022 | -.9899404 .6602667 | -3.655774 3.36145 | -11.20551 7.991309 |
| Financial soundness (BNL) | -.2935403 ** .0870523 | .0197781 .2073315 | -7.406482 7.753523 | 1.306174 7.974474 |
| Economic freedom (IEF) | -.0837324 .1917855 | .2035391 .1610546 | -.6356672 3.130533 | .4568551 1.625459 |
| Political risk (WGI) | .0089648 .0168104 | -.0230105 .0912196 | .1839796 .6044243 | -.2416684 .414525 |
| GDP growth rates (GDPGR) | .3314221 .1900024 | .1349066 .284414 | 3.155434 1.846585 | 1.577182 2.493044 |
| Unemployment rates (UNEM) | -2.710148 * .978516 | -.1647458 1.082928 | -32.87216 * 11.51203 | -21.65506** 9.573591 |
| Ideological preference (LIBERAL) | 2.392197 * .872484 | .6119031 1.864243 | 29.87228 * 11.07973 | -19.73544 16.20773 |
| Global Financial crises (FC) | -7.197367 5.236216 | 13.99442 2.007826 | -90.64607 47.60009 | 60.16487 ** 18.02856 |
| Constant | 3.188807 19.07184 | -22.3759 * 13.05356 | 62.96098 266.7336 | 9.21902 166.4262 |
| <i>Model Specification</i> | | | | |
| Number of Obs | 45 | 45 | 38 | 38 |
| Number of Groups | 4 | 4 | 4 | 4 |
| R-squares | within = 0.8084 between = 0.5204 overall = 0.5539 | within = 0.5512 between = 0.9975 overall = 0.9426 | within = 0.8471 between = 0.5397 overall = 0.5398 | within = 0.6797 between = 0.9990 overall = 0.9523 |
| Prob > F | . | . | . | . |

Note: Standard errors are adjusted for 4 countries. Year-fixed dummies are included. * p < .10, ** p < .05

Figure 1 Fixed Effects: Heterogeneity across Countries and Years

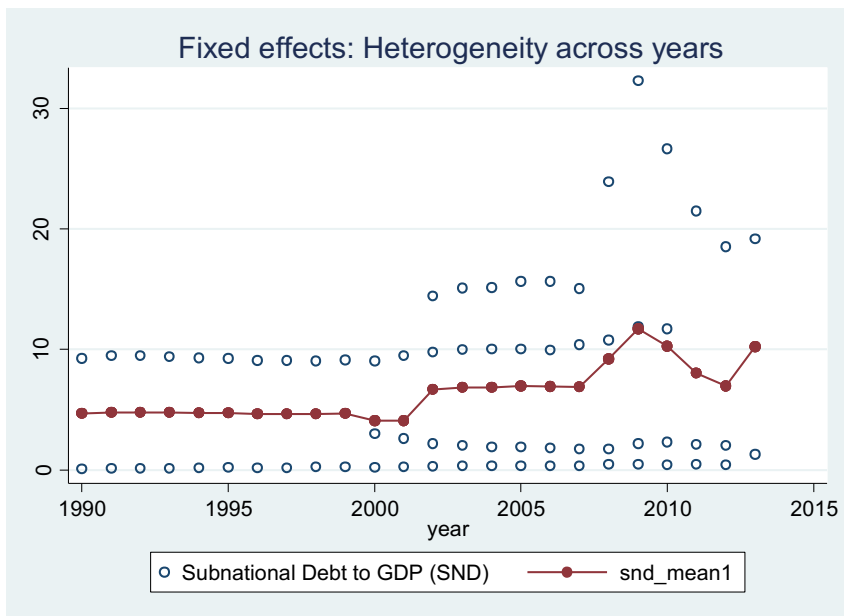
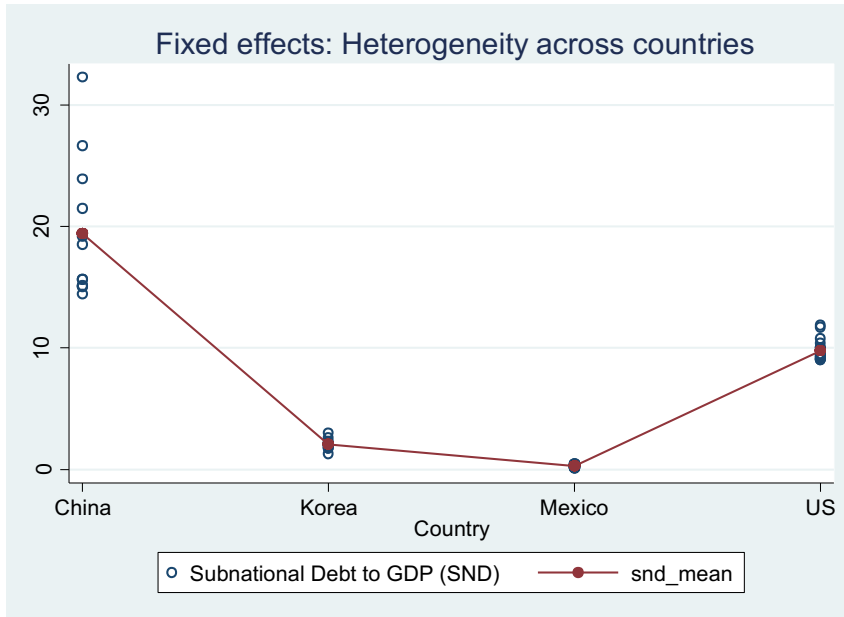


Table 3 Descriptive Statistics

| | Obs | Mean | Std. Dev. | Min | Max |
|-------------------------------------|-----|----------|-----------|----------|----------|
| Subnational Debt to GDP (SND) | 45 | 8.054692 | 8.43621 | .28 | 32.26726 |
| Subnational Debt to Revenue (SNDLR) | 38 | 70.69126 | 73.13173 | 1.42 | 337.3965 |
| Per capita fiscal capacity (FA) | 45 | 775.1205 | 1403.857 | .6453887 | 4876.295 |
| Intergovernmental transfers (IGT) | 45 | 3.948862 | 2.386185 | .93 | 8.732299 |
| Local borrowing to revenue (LBLR) | 45 | .6821979 | 2.022955 | -3.83 | 6.24 |
| Financial soundness (BNL) | 45 | 3.360083 | 4.825803 | .484 | 26 |
| Economic freedom (IEF) | 45 | 66.475 | 9.660459 | 51 | 81.2 |
| Political risk (WGI) | 45 | 42.83812 | 15.81609 | 19.62 | 68.25 |
| GDP growth rates (GDPGR) | 45 | 3.908125 | 4.328741 | -6.06 | 14.64 |
| Unemployment rates (UNEM) | 45 | 4.648958 | 1.610004 | 2.98 | 9.63 |
| Ideological preference (LIBERAL) | 45 | .5 | .5052912 | 0 | 1 |
| Global Financial crises (FC) | 45 | .1666667 | .3766218 | 0 | 1 |

Table 4 Bonferroni adjusted Correlations

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| (1)SND | 1.0000 | | | | | | | | | | | |
| (2)SNDLR | 0.9187* | 1.0000 | | | | | | | | | | |
| (3)FA | 0.8097* | 0.7412* | 1.0000 | | | | | | | | | |
| (4)IGR | 0.9173* | 0.9159* | 0.8748* | 1.0000 | | | | | | | | |
| (5)LBLR | -.5270* | -0.1880 | -0.3962 | -0.3349 | 1.0000 | | | | | | | |
| (6)BNL | 0.2526 | -0.0945 | 0.1157 | 0.2655 | -0.2953 | 1.0000 | | | | | | |
| (7)IEF | -.4998* | -.4320 | -.7564* | -.5972* | 0.2118 | -0.4017 | 1.0000 | | | | | |
| (8)WGI | -0.2768 | 0.0077 | -0.4754 | -0.1780 | 0.4979* | -0.2472 | 0.6659* | 1.0000 | | | | |
| (9)GDPGR | 0.6171* | 0.6278* | 0.6743* | 0.7106* | -0.2152 | 0.4094 | -.7607* | -0.3809 | 1.0000 | | | |
| (10)UNEM | 0.2158 | 0.0448 | -0.1133 | 0.0549 | -0.3473 | 0.0361 | 0.4964* | 0.3074 | -0.3286 | 1.0000 | | |
| (11)LIBER~ | -.5981* | -.5866* | -.5571* | -.6880* | 0.1641 | -0.3527 | 0.3897 | -0.1357 | -.5425* | -0.2240 | 1.0000 | |
| (12)FC | 0.0329 | -0.1622 | 0.0702 | 0.0496 | -0.0280 | -0.1242 | 0.0216 | 0.0366 | -0.0722 | 0.0568 | -0.0000 | 1.0000 |

Note: * p < 0.5