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How Local Government Financing Vehicles Can Lay the Foundation for Market-Oriented Transformation—Based on Measuring the Liquidity and Default Risk of LGFV Bonds

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Abstract. Due to the heavy burden of local financing and infrastructure construction tasks, local government financing vehicles (LGFVs) have accumulated significant outstanding debts. Some of these debts, characterized by high borrowing costs, have resulted in substantial interest payment pressures, posing severe short-term liquidity risks and long-term challenges to sustainable development. This paper aims to explore how LGFVs can establish a solid foundation for market-oriented transformation while effectively addressing existing local debt and the default risks of LGFV bonds. By adopting multidimensional indicators to represent liquidity, as well as incorporating bond market adaptability, local government fiscal conditions, LGFV bond characteristics, and local macroeconomic factors, the study examines the relationship between default risk and bond liquidity for LGFVs. Regression analysis reveals that bond liquidity, local government fiscal health, and LGFV bond characteristics all significantly influence the default risk of LGFV bonds, with bond liquidity exerting a pronounced negative impact on default risk. A reduction in the bid-ask spread enhances asset liquidity, thereby mitigating the default risk of LGFV bonds. By analyzing the current state and causes of LGFV debt risks and providing a comprehensive measurement of bond liquidity and default risk, this paper proposes critical pathways and strategic recommendations for LGFVs to build a robust foundation for market-oriented transformation, aiming to serve as a reference for the high-quality development of LGFVs.

Keywords: LGFV bonds, default risk, liquidity

1. Introduction

As the scale of local debt ceases to grow, addressing local debt risks has become a critical issue for maintaining current economic stability. As a significant component of implicit local government debt, the risk management of LGFV bonds has emerged as an essential subject in mitigating financial risks. In recent years, the scale of LGFV bonds has continuously expanded, with their proportion steadily increasing. Before 2020, when China's economy faced downward pressure, infrastructure investment often served as a crucial counterbalance, with LGFVs playing a primary role in infrastructure projects, leading to more lenient policies in this area. By 2023, however, the number of defaults on LGFV non-standard debts had surged, with the risks extending to economically developed provinces. This served as a wake-up call for the central government, prompting swift action. At the Politburo meeting on July 24, 2023, the central government emphasized the need to "effectively prevent and resolve local debt risks" and outlined a comprehensive debt resolution plan. This approach focuses on resolving existing debts while preventing the accumulation of new ones. Specific measures include issuing the Guidelines for Financial Support in Resolving Financing Platform Debt Risks (State Council Document No. 35, 2023) and the Trial Measures for Strengthening the Management of Government Investment Projects in Key Provinces (State Council Document No. 47, 2023).

Since 2024, under the guidance of the "335" indicators, LGFVs have been forced to transform their business models by reducing the proportion of urban construction assets and revenues. The "335" indicators—introduced in the Guidelines for Financial Support in Resolving Financing Platform Debt Risks issued by the State Council—stipulate that non-operating assets (urban construction assets) should not exceed 30% of total assets; non-operating revenues (urban construction revenues) should not exceed 30% of total revenues; and fiscal subsidies should not exceed 50% of net profits. Under this strict debt prevention framework, the growth of implicit debts by LGFVs has been curtailed, and overall local government debt risks have eased. However, significant risks remain in the stock of implicit debts, which are difficult to resolve. Historically, LGFVs have operated with a relatively coarse approach, with some debts incurring high borrowing costs, leading to considerable interest payment

pressure. Particularly under tightened financing conditions, LGFVs face mounting challenges in meeting maturing debts and paying substantial interest. When basic operations are under significant pressure, pursuing transformational development becomes even more arduous. Thus, the immediate priority for LGFVs is addressing existing implicit debts, mitigating short-term repayment pressures without allowing these debts to expand further, and progressively resolving stock debt issues during the transformation process.

This paper aims to examine how the liquidity of local government bonds influences the default risk of LGFV debts and how this relationship affects the resolution of stock debts in the context of market-oriented transformation. First, it explores the development background of LGFVs and relevant policy documents to analyze their future development direction, current challenges, and urgent issues. Second, it introduces indicators reflecting bond liquidity in China's current bond market, local government fiscal conditions, LGFV bond characteristics, and local macroeconomic factors. Third, a regression model is constructed to empirically test the impact of local bond liquidity on default risk using panel data. Finally, from a robustness perspective, the role of guarantees is analyzed to elucidate how local bond liquidity influences default risk and to propose measures for resolving stock debts and alleviating short-term liquidity pressures to achieve market-oriented transformation.

Based on an in-depth analysis of LGFV debt risks and the market environment, this paper proposes innovative market-oriented transformation strategies. These strategies include not only traditional approaches such as debt restructuring and asset revitalization but also innovative financial tools like public infrastructure REITs, providing LGFVs with diversified transformation options. These innovative strategies aim to help LGFVs adapt to market changes and policy adjustments, achieving sustainable development. Furthermore, this paper emphasizes institutional safeguards and policy recommendations, such as improving modern corporate governance, establishing market-oriented operational mechanisms, and enhancing financial independence, to ensure robust institutional support for LGFVs' market-oriented transformation. By offering actionable and targeted policy suggestions based on the current policy environment, this study provides a valuable reference for governments and regulatory authorities in formulating policies for LGFVs' market-oriented transformation.

The remainder of this paper begins with a literature review to develop research hypotheses, followed by a detailed research design and data description, including the construction of regression model indicators and theoretical foundations for key explanatory variables. The paper then empirically tests the research hypotheses based on the research design and concludes with findings and recommendations.

2. Literature Review

2.1. Overview of Foreign Studies

Internationally, urban investment bonds are typically referred to as municipal bonds. Due to their early origin, research on municipal bonds began as early as the 1960s. Studies on the factors influencing the default risks of municipal bonds can generally be categorized into the following aspects:

2.1.1. Macroeconomic and Policy Environment

Carleto and Lerner (1969) discovered that factors such as population size, average tax rates, unemployment rates, and property values are significantly correlated with the credit risk of municipal bonds. Similarly, James M. Poterba and Kim S. Rueben (1997) demonstrated that local governments' economic conditions, fiscal policies, and the scale of existing debt affect the issuance costs of municipal bonds, thereby influencing their credit risk. The degree of fiscal policy relaxation or tightening directly impacts local governments' debt repayment capacity, thereby affecting the default risk of municipal bonds. Karpf and Mandel found that while the average return on traditional bonds surpasses that of green bonds, this difference can largely be explained by the fundamental characteristics of the bonds [21]. Green bonds are becoming increasingly attractive investments, offering potential to bridge funding gaps for climate change mitigation and adaptation. Bergstresser focused on the practical implications of the municipal bond market, including its unique characteristics, such as the unusually high level of direct participation by individual investors compared to other bond markets, as well as the market's taxation and regulatory frameworks [18].

2.1.2. Debt Liquidity

Cestau and Hollifield noted that the municipal bond market underwent structural transformations, with liquidity challenges arising from financial crises and the collapse of insurance companies [19]. They argued that liquidity constraints and other frictions in municipal bond transactions stem from tax-based segmentation and market fragmentation, which reinforce each other. Schwert, using three distinct and complementary methods, decomposed municipal bond spreads into default and liquidity components [24]. After adjusting for tax-exempt status, the study revealed that default risk accounted for 74% to 84% of the average spread.

2.1.3. Local Government Finances

Adelino, Cunha, and Ferreira demonstrated that fiscal constraints on municipal authorities significantly impact local employment and growth [17]. Local governments often increase spending after credit rating upgrades expand their debt capacity, with debt-financed government expenditures helping to mitigate the economic downturn during recessions. Fabozzi and Peterson (1998) argued that government credit provides implicit guarantees for municipal bonds, yet the risks associated with unstable macroeconomic policies should not be overlooked. Under certain circumstances, the credit risk of municipal bonds may exceed that of corporate bonds with the same credit rating.

2.2. Overview of Domestic Studies

In recent years, the debt problems of urban investment companies have become increasingly prominent, characterized by a massive scale of outstanding debt and an accumulation of default risks. Scholars have conducted in-depth research on the debt risks of urban investment companies from various perspectives. Wu Guangming and Chen Hongwei, using multi-factor and KMV models, pointed out that while the default rate of urban investment bonds in China remains low and overall risks are manageable, potential risks are unevenly distributed [11]. Specifically, the potential default risks are higher in western regions, with greater debt repayment pressures, particularly at the prefecture and municipal levels. Pan Yan and Wu Xiuyao demonstrated that the liquidity assets of local governments have a significant negative impact on default risk [6]. Hu Yue and Wu Wenfeng found that in regions with better fiscal conditions, local government credit acts as an implicit guarantee, reducing the issuance spreads of urban investment bonds [3]. Conversely, in regions with poorer fiscal conditions, local government credit manifests as implicit concerns, leading to higher issuance spreads for urban investment bonds.

Faced with severe debt pressures and default risks, the market-oriented transformation of urban investment companies has become an inevitable choice. On one hand, such transformation helps optimize debt structures, reduce financing costs, and alleviate short-term liquidity pressures. On the other hand, by enhancing self-sustaining capabilities and market competitiveness, urban investment companies can achieve sustainable development. Furthermore, as the nation strengthens local government debt management and capital markets continue to develop, the conditions for the market-oriented transformation of urban investment companies are becoming increasingly mature. Domestic scholars have conducted extensive research on the impact of debt scale on the default risks of municipal bonds (or urban investment bonds). Han Liyan (2003) used the KMV model to measure the default situation of municipal bonds and calculate the theoretical default rate of debt. The study concluded that an excessively large scale of total expenditure debt may increase the debt repayment pressure on local governments, thereby raising the default risk of urban investment bonds.

2.3. Research Perspective and Innovation

Compared with the aforementioned studies, this paper focuses on the impact of bond liquidity on debt default risks. It uses the bid-ask spread of bonds as a proxy for liquidity, identifying it as a key factor in assessing local government default risks. Through empirical testing, the study concludes that bond liquidity can reflect and evaluate local government default risks, aiming to provide a basis for accurately assessing such risks. This paper not only addresses the current debt status and default risks of urban investment companies but also integrates multiple dimensions, including local government debt management, capital market development, and the policy environment. By conducting quantitative analyses of indicators such as the issuance scale, issuance term, and repayment capacity of urban investment bonds, this study scientifically measures the relationship between outstanding debt and default risks, offering a scientific foundation for formulating risk prevention measures and market-oriented transformation strategies.

3. Research Design and Data Description

3.1. Sample Selection and Data Sources

This study constructs provincial panel data from 2015 to 2022, covering 31 provincial-level administrative regions in China, excluding Taiwan, Hong Kong, and Macau. Data on urban investment bonds are sourced from the Wind database, including information such as the bond issuer, issue size, term, coupon rate, historical credit rating, and guarantee status. The basic data structure is panel data, comprising 18,636 bond-quarter observations after removing missing values from an initial 19,208 observations. Fiscal and macroeconomic data for local governments are obtained from the annual China Statistical Yearbook. Key local government data include the actual GDP growth rate and the fiscal deficit ratio. These data are annual at the provincial level and are converted into quarterly values for use in the panel regression analysis.

Daily data, such as bond prices, yields to maturity, highest and lowest prices, and trading volumes, are used to calculate related variables like yield spreads and daily high-low price spreads. These variables are then averaged quarterly. As most urban investment bonds have a term of 5–7 years, this study uses the 5-year Treasury yield as the benchmark risk-free rate. The yield spread of urban investment bonds is defined as the difference between the bond's yield to maturity and the Treasury yield. For

credit risk control, the issuer's credit rating at the end of each quarter is selected as the rating variable, which spans seven levels: A-, A, A+, AA-, AA, AA+, and AAA. These levels are converted into integers from 1 to 7, with higher values indicating better ratings and theoretically lower default risks.

3.2. Regression Model Based on Bond Liquidity

$$Yield\ spread = Rate - r_t$$

$$Yield\ spread = \alpha + \beta_1 Liquidity + \beta_2 Fiscal + \beta_3 Bond + \beta_4 Economy + \varepsilon$$

In this model, the dependent variable is $Yield\ spread$. $Rate$ refers to the urban investment bond yield, while r_t represents the risk-free rate, proxied by the 5-year Treasury yield. Following the research of Pastor and Veronesi, the yield spread between urban investment bonds and the risk-free rate is used as a proxy for default risk [22]. For the key explanatory variable, the high-low price spread of bonds is introduced as a measure of bond liquidity. Fiscal reflects local government fiscal conditions, including the tax revenue-to-debt ratio. Empirical research by Luo Danglun and She Guoman indicates that fiscal revenue is a critical factor in assessing default risks for urban investment bonds, with per capita fiscal revenue negatively correlated with default risks. Bond includes control variables reflecting bond characteristics, such as term, issue size, guarantee status, and credit rating. Economy represents control variables for local macroeconomic performance, including actual GDP growth rate and fiscal deficit ratio. The variables and indicators are summarized in Table 1.

Based on the above analysis, the research hypothesis of this study is as follows:

Hypothesis: Under given institutional conditions, the smaller the high-low price spread of local bonds, the better their liquidity, and the lower the likelihood of default.

Table 1. Variable Definitions

Variable Type	Factor	Indicator	Predicted Impact
Key Explanatory Variable	Bond Liquidity (Liquidity)	High-Low Price Spread (High-Low)	Positive (+)
	Local Government Fiscal Condition (Fiscal)	Revenue-Expenditure Gap (Gap)	Positive (+)
Control Variables	Urban Investment Bond Characteristics (Bond)	Issue Size	Negative (-)
		Bond Term (Term)	Positive (+)
		Credit Rating (Rating)	Negative (-)
		Guarantee Status (Guarantee)	Negative (-)
	Local Macroeconomy (Economy)	Fiscal Deficit Ratio	Positive (+)
		GDP Growth Rate (GDP Growth)	Negative (-)

4. Empirical Testing

4.1. Descriptive Statistics

Table 2. Descriptive Statistics

Variable	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
Yield spread	18636	0.016	0.004	0.01	0.031
High-Low	18636	0.909	1.828	0	20.05
Gap	18636	0.061	0.041	0.016	0.109
GDP Growth	18636	0.049	0.025	0.022	0.085
Fiscal Debt Ratio	18636	0.064	0.014	0.034	0.084
Issue size	18636	6.556	0.606	4.331	10.131
Term	18636	6.71	2.292	2	27
Rating	18636	6.193	0.805	2	7
Guarantee	18636	0.121	0.029	0.056	0.234

As shown in the table, the Yield spread, an important indicator of the risk associated with bonds or loans, has a relatively low mean (0.016) and a small standard deviation (0.004), indicating minimal fluctuation in the spreads of these bonds or loans. The mean of the High-Low Price Spread is 0.909, with a standard deviation of 1.828, reflecting some differences in the high-low price spreads across different quarters. Indicators related to local government fiscal conditions, urban investment bond characteristics, and local macroeconomic factors exhibit noticeable differences in their means. The mean of Gap (revenue-expenditure gap) is 0.061, with a standard deviation of 0.041. Both the mean and standard deviation of local government debt stock suggest significant variation. The differences between the minimum and maximum values indicate fiscal condition disparities across quarters. The mean of GDP Growth (actual GDP growth rate) is 0.049, with a standard deviation of 0.025, indicating some level of fluctuation. The mean of Fiscal Debt Ratio is 0.064, and its standard deviation is 0.014, showing relatively low mean and standard deviation values. The mean of Issue size is 6.556, with a standard deviation of 0.606. The relatively high mean and moderate standard deviation suggest differences in issuance sizes among entities, although the overall scale is large. The mean of Term (bond term) is 6.71, with a standard deviation of 2.292, indicating a longer average term and substantial variation, reflecting significant differences in the design of bond or loan terms across entities. The mean of Rating (credit rating) is 6.193, with a standard deviation of 0.805. While the mean rating is relatively high, the large standard deviation indicates a wide distribution, predominantly favoring high ratings. The mean of Guarantee is 0.121, with a standard deviation of 0.029. This suggests a relatively low mean guarantee ratio and small standard deviation, implying limited support for these bonds or loans in terms of guarantees.

4.2. Regression Analysis

Table 3. Regression Results

Regression Results			
Explanatory Variable	Model 1	Model 2	Model 3
High-Low	0.00000379 (0.4)	0.0000142 (1.47)	0.0000455***(4.25)
Gap	0.0927945***(108.81)	0.0796818***(146.39)	0.0632554*** (82.69)
GDP growth	-0.1874181***(-52.07)	-0.207272***(-83.12)	
Fiscal Debt Ratio	-0.3815558***(-62.51)	-0.4072299***(-97.22)	
Issue size	-0.0001677***(-3.70)		0.0017855***(48.61)
Term	0.0000948*** (11.94)		0.0001876***(20.90)
Rating	-0.0001544***(-7.24)		-0.0001892***(-7.75)
Guarantee	-0.0308363*** (-32.89)		-0.319701***(-31.13)
N	18636	18636	18636
R-squared	0.6350	0.6098	0.5213
Adj R-squared	0.6349	0.6097	0.5211

Note: The values in parentheses are t-statistics adjusted using White's heteroscedasticity correction. The symbols *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively, while blank spaces indicate variables that are not yet considered.

From the table, the results of the multiple linear regression analysis show that for every 1% increase in High-Low Price Spread, the average yield spread of urban investment bonds rises by 0.000379%, consistent with our expectations. Regarding fiscal conditions, the revenue-expenditure gap (Gap) is significantly positive at the 1% statistical level. For every 1% increase in the revenue-expenditure gap, the average yield spread of bonds increases by 9.27945%. This indicates that even slight changes in the fiscal revenue-expenditure gap can lead to substantial fluctuations in default risk. Hence, fiscal revenue is not only a crucial measure of local governments' repayment capacity but also an important factor influencing the default risk of urban investment bonds. Moreover, this result suggests that when local governments face fiscal deficits or debt pressures, the instability and uncertainty of fiscal revenue growth exacerbate the default risk of urban investment bonds. Finally, the r^2 and adjusted r^2 values of Model 1 are both above 0.63, indicating that Model 1 fits well overall and supports the hypotheses proposed in this study. The empirical results of Model 1 further validate that strong bond liquidity helps improve investors' expectations regarding default risk (measured by yield spreads). The reduced High-Low Price Spread achieved by local governments through bond issuance suggests improved liquidity, enhanced ability to manage debt risks, and better fiscal conditions. Consequently, the probability of default for issuing governments decreases. This enhances investors' confidence in bond investments, making it easier and more advantageous for governments to refinance (issue bonds) in the bond market, thus increasing their competitiveness.

To reduce errors arising from model variables, control variables are incorporated into the equations one by one (as shown in Models 2 and 3 in Table 3) and estimated separately. Compared to Model 1, Model 2 excludes the characteristics of urban

investment bonds. In Model 2, the coefficient of High-Low Price Spread differs slightly, and the actual GDP growth rate (GDP Growth) is significantly negative at the 1% level. For every 1% increase in GDP Growth, the average yield spread of urban investment bonds decreases by 20.7272%. This finding implies that fluctuations in GDP growth rates cause significant changes in default risk. The r^2 and adjusted r^2 values of Model 2 decrease to 0.6098 and 0.6097, respectively, indicating a slight decline in explanatory power, though the model remains effective.

In Model 3, the coefficient of High-Low Price Spread further increases and is significantly positive at the 1% level. For every 1% decrease in High-Low Price Spread, the average yield spread decreases by 0.00455%. This suggests that increased liquidity in local bonds helps to reduce default risk. Term (bond term) is significantly positive at the 1% level in both Model 1 and Model 3, indicating that the maturity of issuance has a positive impact on the target variable. This implies that longer-term bonds or loans positively influence the target variable. The coefficient of Rating is negative, possibly indicating that higher ratings (represented by lower numerical values) are associated with lower values of the target variable. The r^2 and adjusted r^2 values in Model 3 drop to 0.5213 and 0.5211, respectively, showing a reduction in explanatory power, though the model remains robust.

5. Conclusions and Recommendations

Bond market defaults have become a primary manifestation of global debt crises, and the default risk of local government debt in China has recently become a focal point of academic interest. In recent years, China's domestic economy has faced downward pressure, particularly in the context of a complex and volatile global economic environment. Infrastructure construction, as one of the key measures to stabilize economic growth, has received strong policy support. However, this has also led to the further expansion of urban investment company debt and the accumulation of default risks. Currently, urban investment companies face substantial existing debt and escalating default risks. This paper examines the impact of bond liquidity on the default risk of urban investment bonds and analyzes its role in resolving existing debt during the companies' market-oriented transformation. Empirical research reveals that bond liquidity has a significant negative impact on default risk: the higher the bond liquidity, the lower the default risk of urban investment bonds. This finding indicates that enhancing the liquidity of urban investment bonds is an effective means of reducing their default risk. As a proxy for liquidity, the reduction of existing debt enhances the asset liquidity of urban investment companies, thereby mitigating default risks. This underscores that reducing the existing debt of urban investment companies is a critical measure for alleviating their debt burden and reducing default risks. Factors such as issuance scale, bond maturity, credit rating, and guarantee conditions significantly influence default risks. Specifically, larger issuance scales, longer maturities, lower credit ratings, and weaker guarantees are associated with higher default risks for urban investment bonds.

From the perspective of bond liquidity, this paper explores the marketability of local government assets and identifies existing debt as an important basis for evaluating local government default risk. Empirical tests show that default risk is a key reference for bond market investors when deciding whether to purchase or hold bonds. The research findings offer several insights:

(1) Facing significant debt pressure and default risks, urban investment companies must pursue market-oriented transformation. This approach helps optimize debt structures, reduce financing costs, enhance self-sustainability, and improve market competitiveness, ultimately achieving sustainable development. Urban investment companies should actively transition from reliance on government-driven businesses to the development of market-oriented operations. Measures such as optimizing business structures, improving operational efficiency, and enhancing market competitiveness can facilitate sustainable development. Urban investment companies must innovate their strategies for transformation. Beyond traditional approaches like debt restructuring and asset revitalization, innovative financial tools such as publicly offered REITs (Real Estate Investment Trusts) for infrastructure should be introduced to provide more diversified transformation options. Urban investment companies should establish comprehensive debt risk control mechanisms to strengthen the management of debt scale, structure, and costs, ensuring that debt risks remain controllable.

(2) The government should expedite the formulation of relevant policies to promote the establishment of modern corporate systems and market-oriented operating mechanisms for urban investment companies, thereby enhancing their financial independence and market competitiveness. The government should provide necessary policy support and guidance, including tax incentives and financial subsidies, to create a favorable institutional and policy environment for market-oriented transformation. Additionally, the government should strengthen supervision and evaluation of the transformation process of urban investment companies. Regular assessments of transformation progress and effectiveness should be conducted to promptly identify issues and implement corrective measures. Furthermore, the government must enhance monitoring and early warning systems for the debt risks of urban investment companies to ensure financial stability and economic security.

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