

# The Impact of Chinese New Budget Law on the Issuance cost of Urban Investment Bonds

Shuangjie Li<sup>1</sup> and Tianlun Zhao<sup>1</sup>

## Abstract

In the context of the continuously increasing risk of local government debt, reducing the issuance cost of urban investment bonds have become major concerns in society. Studying the impact and mechanisms of the new budget law, implemented under a stringent regulatory environment, on the issuance cost of urban investment bonds holds significant practical implications. This paper selects balanced panel data of urban investment bonds and industrial bonds issued nationwide from 2009 to 2021 as the research sample. The multi-period difference-in-differences (DID) method is employed to examine the impact and mechanisms of relevant government actions on the issuance cost of urban investment bonds. The results indicate that the promulgation and implementation of the new budget law have reduced the issuance price and financing cost of local bonds, thereby improving the financing environment for urban investment bonds. The examination of the action mechanisms reveals that the debt repayment situation of each province in these years plays a strong moderating role in the policy's impact. Moreover, these government actions influence the pricing and financing environment of urban investment bonds by standardizing their ratings. The research conclusions of this paper hold clear policy implications, providing guidance and reference value for the work of relevant government departments.

**JEL classification numbers:** C12, D74.

**Keywords:** Urban investment bonds, Bond prices, Systemic financial risk.

---

<sup>1</sup> School of Economics & Management, Beijing University of Technology, Beijing 100124, China.

## **1. Introduction**

Urban investment and construction bonds, also known as "Urban Investment Bonds", are an important financing tool for China's economic development, which have been widely used since 2009. As a bond with distinct national characteristics, the issuance scale of urban investment bonds has continued to expand, and the financing purposes have gradually diversified. Urban investment bonds play a crucial role in resolving local government financing difficulties, promoting local economic development, and improving the bond market.

The development of urban investment bonds can be traced back to China's economic reform and opening up in the early 1980s when China began to pilot urban investment plans. The demand for funds for a large number of infrastructure constructions gradually increased, but the imperfect fiscal system and financial market at that time made it difficult for local governments to obtain sufficient financing support. With the continuous development of China's economy and the gradual improvement of the financial market, urban investment bonds have gradually become an important way for local government financing.

However, there have been issues related to loan defaults on the Yunnan-Dian Highway that have caused considerable concern. In 1995, the Yunnan Provincial Government signed an agreement with the National Development Bank to borrow US\$1.5 billion from a number of international financial institutions for the construction of the Dianchi-Ruili Highway. However, starting in 1998, the Yunnan provincial government began to default on repayments, causing international financial institutions to start paying attention to the risks of this loan. In September 2001, international financial institutions filed a lawsuit demanding that the Yunnan Provincial Government repay the principal and interest of the Dian Road loan. After a year of negotiations, the Yunnan Provincial Government reached an agreement with the institutions to repay the debt of the Dian Road, totaling US\$1.9 billion. Finally, in January 2003, the Yunnan Provincial Government officially paid off the debt. This event caused significant financial pressure and credit crisis for the Yunnan Provincial Government, as well as considerable losses for international financial institutions. It also caused widespread attention and questioning from the domestic and international public regarding the repayment ability and default risk of China's local governments.

The issue of financial vulnerability caused by hidden debt of local governments has always been one of the key concerns of the Party Central Committee in preventing and defusing financial risks. After the global financial crisis in 2008, Chinese local governments invested heavily to pull the economy out of recession, but this resulted in a dilemma of preventing debt risks and maintaining economic growth. In order to prevent and resolve the hidden debt risks of local governments, the National Audit Office carried out a national local government debt statistics in 2013 that included local government financing platforms and other types of government hidden debts for the first time. Later, local government debts were screened and summarized by the end of 2014, and the "New Budget Law of the People's Republic

of China" was passed, which allowed the self-payment of local debts, "opening the front door" for local government financing. In March 2015, the first round of local government bond issuance and debt replacement began after necessary preparations were made.

The Chinese New Budget Law issued by the State Council at the end of 2014 explicitly stripped the government financing function of financing platform companies and implemented size control on local government debts, strictly limited government borrowing procedures and fund usage, and stipulated that the only legal way for local governments to borrow is through issuing local government bonds. After that, the Ministry of Finance, together with multiple departments, issued several articles to "clear the channels and block the hidden ways" of government financing and accelerate debt replacement, while strengthening risk control. However, illegal and irregular borrowing and guarantee by some regions still occur, and local debt risk should not be ignored.

With the increasing expansion of local government debt risk, how to regulate the borrowing behavior of financing platforms has been a focus of attention from all sectors of society. Research on the new budget law and financing platform governance policies, evaluation of their governance effectiveness, and exploration of financing platform behavior in a highly regulated environment have important practical significance. This not only helps to evaluate the effects of implemented governance policies, but also provides valuable reference for further improving governance policies and controlling local debt risks.

This article focuses on the "New Budget Law of the People's Republic of China" released in 2014 and implemented in 2015, and uses econometric methods to identify the impact of this policy and local government debt issuance on the prices of urban investment bonds. By evaluating the effectiveness of the policy, it provides useful reference for financing platform governance and preventing and resolving local debt risks.

## **2. Literature review**

### **2.1 Urban Investment Bonds**

In order to clarify the driving factors of local government financing, which is a prerequisite for studying the issue of Urban investment bonds, scholars have conducted a series of analyses on the driving factors of local government financing from the perspectives of budget soft constraint, mismatch between local government financial power and administrative power, and implementation of special market rescue measures. Zhou Lianan (2007) believe that under the promotion championship model, local officials tend to use various means to help enterprises and various businesses within their jurisdiction expand inefficiently in order to obtain promotion opportunities, resulting in excessive debt of local governments. In discussing the reverse soft budget constraint, Zhou Xueguang (2005) attributed the behavior of local governments breaking the budget limit to the separation of power and responsibility of local officials. In a certain context, budget

soft constraint, expected central government rescue, and public pool resources are similar in meaning. These three reasons are often used in literature to explain the expansion of local government debt (Wang Yongqin et al., 2016). The bias of China's local government financial expenditure structure towards infrastructure construction also objectively leads to local financing demand (Zhang Jun et al., 2007). The reform of the tax-sharing system has improved the central government's financial situation and increased the "two ratios", but it has also objectively resulted in a gap between local fiscal revenue and expenditure, a shift of financial power center, a decentralization of administrative power, a mismatch between financial power and administrative power, and an important reason for local debt (Yang Zhiyong, 2015). Since 2008, changes in macroeconomic conditions and central government market rescue measures have provided a loose credit and regulatory environment for local governments to borrow through financing platforms, which is also an important reason for the rapid expansion of local government debt (Wei Jianing, 2010). Based on the government's legal and moral rescue responsibilities, (Polackova Hana 1999) classified government debt into direct debt, indirect debt, explicit debt, and implicit debt, and proposed a famous debt risk matrix to measure local government debt risk. Reinhart and Rogoff (2011) included explicit guarantees, implicit guarantees, central bank debt, and off-balance sheet derivatives into government implicit debt.

## **2.2 The factors affecting the issuance cost of urban investment bonds**

Before 2015, the Budget Law prohibited local governments from issuing bond financing, and scholars mainly focused on the issue of local government's hidden debt. Liu Shangxi believes that in the absence of risk-sharing mechanisms between different levels of government finance, and without effective supervision from higher-level governments on the financial activities of lower-level governments, the latter will have an advantage in risk allocation, which will lead to an increase in local hidden debt. The key to the government's realization of implicit borrowing of debt lies in local governments circumventing regulatory norms on local debt behavior through financing platforms and other forms (Liu Shangxi, 2003).

Domestic research on financing platform debt mainly includes theoretical analysis of the reasons and necessity for the emergence of financing platforms (Ma Wanli, 2019), sorting out the problems and risks faced by financing platforms in development (Yang Canming and Lu Yuanping, 2013), and using various public information to estimate the scale of financing platform debt (Wen Laicheng and Li Ting, 2019). When domestic scholars study the influencing factors of local implicit debt quantitatively, most of them use the full-caliber debt of financing platforms or only the debt of urban investment as indicators to measure local government's implicit debt.

Chen Jing and Li Jianfa (2015) studied the relationship between decentralization, promotion incentives, and debt issuance from the perspective of urban investment bonds, showing that both are important driving factors for debt issuance. Luo

Danglun and She Guoman (2015) found that promotion pressure drove local governments to issue debt impulsively. Cao Jing et al. (2019) found that fiscal pressure had no significant impact on urban investment bonds, while promotion pressure and development pressure had a significant impact on the issuance of urban investment bonds. Xiao Peng and Fan Rong (2019) found that improving fiscal transparency would reduce the scale of government borrowing. Huang Chunyuan and Mao Jie (2015) used the comprehensively estimated full-caliber local debt scale to study the impact of various types of fiscal transfer payments on the scale of local debt, finding that both financial transfer payments and special transfer payments significantly affected local debts.

Overall, research on urban investment bonds in China mainly focuses on analyzing the impact of various policies and related events on the issuance volume of these bonds, and based on this, evaluating the relevant decision-making trends of the central and local governments and the effectiveness of policy implementation. However, urban investment companies are closely linked to local governments, and urban investment bonds have been used as a financing tool for local governments' hidden debt in the past, making the issuance volume of these bonds subject to various subjective factors and unable to fully reflect market and investor attitudes. As a result, the bond price, which is the outcome of a multi-party game, is a more objective variable and can be observed to better study the decoupling level of local government credit of urban investment bonds, making it a more meaningful research object.

In addition, conventional research methods such as the single difference method or event analysis method are used to evaluate the impact of policies, but these methods have limited effectiveness due to their inability to control other variables. This paper proposes a comparative analysis using industrial bonds, excluding urban investment bonds, as a reference group. The double difference method is used to skillfully control for influencing factors such as regional spread, grade spread, and term spread, making the experimental results more practically significant.

Finally, this paper proposes a novel method of measuring the comprehensive interest spread of urban investment bonds in various provinces by using the interest rate difference between the bond issuance rate and the rate of the same maturity and grade CDB bonds issued on the same day as the bond price. The weighted average is calculated according to the amount of bonds issued by the province, the issuance time and other factors, with the province as the unit. This indicator can better measure the local bond financing environment.

### 3. Research Design

This paper investigates the behavioral changes of regional financing entities under policy shocks, rather than providing a comprehensive and precise measurement of local implicit debts. Choosing a relatively easy-to-obtain data indicator as a proxy variable is feasible. While loan data accounts for the largest proportion in the classification of financing platform debt, its form is hidden and cannot be obtained through public channels. Urban investment bonds, which are second only to loans in terms of scale, provide accurate data that can be obtained from the wind database, making them a common choice in studies addressing similar problems (Wang Y. et al., 2016; Zhu Y. and Wang J., 2018).

#### 3.1 Research hypothesis

##### 3.1.1 The Impact of the Chinese New Budget Law on the Issuance cost of Urban Investment Bonds

Previous research suggests that the spread of urban investment bonds is influenced by the government's guarantee ability and willingness. Since urban investment bonds are closely linked to the level of local economic development, the issuance of urban investment bonds has been regulated by Chinese New Budget Law, which also outlines the repayment responsibilities. Additionally, after the local government allowed the issuance of local bonds in 2015, it is expected to ease the overall liquidity of the region's finances and provide a new definition and measurement of debt repayment risk, thus affecting the spread of urban investment bond issuance. In general, the improvement of the government's financial situation provides greater credit support to credit bonds, which narrows their issuance spread. Based on these findings, hypothesis H1 is proposed.

**H1:** Under controlled conditions, the implementation of the new budget law in 2015, the issuance of local bonds by local governments, and the implementation of various financing platform governance policies significantly improved the financing environment for local urban investment bonds.

##### 3.1.2 The Moderating Effect of Local Debt Repayment Pressure on the Policy influence

When analyzing the effectiveness of financing platform governance policies, it is important to consider regional heterogeneity. Different geographical divisions, such as the east, central, and west (Xiao P. and Fan R., 2019), administrative divisions at the provincial, city, and county levels (Huang C. and Mao J., 2015), or the characteristics of specific explanatory variables can be used for regional analysis. In this study, the proportion of the balance of urban investment bonds in each province's fiscal revenue in 2013 was used to classify provinces into high and low debt financing dependence groups. It is reasonable to speculate that if financing platform governance policies are effective, provinces that rely more on LGFVs for funding will be more affected than those that rely less on LGFVs.

**H2:** The promulgation and implementation of the new budget law, the issuance of local bonds by local governments, and the implementation of various financing platform governance policies will have varying effects on the price of urban investment bonds and the local financing environment, depending on the debt pressure of different provinces.

### **3.1.3 The impact mechanism of the Chinese New Budget Law on the issuance cost of urban investment bonds**

The price of corporate bonds is generally closely related to their credit rating. As a company's creditworthiness increases, its debt rating also increases, resulting in higher bond prices and a smaller yield spread. Conversely, as credit ratings decline, the bond price decreases, and risk premiums are compensated through larger yield spreads. Prior to 2015, urban investment bonds were the primary financing channel for local governments. Due to previous government financing defaults, domestic and foreign financial institutions generally questioned the ability and willingness of local governments to repay debt, resulting in a frequent mismatch between the credit rating, maturity, and price of urban investment bonds. However, the local management opinions state that to restore the market attributes of urban investment bonds, the bond price and credit rating will be more closely tied together.

**H3:** The promulgation and implementation of Chinese new budget law will improve the credit rating of urban investment bonds, affecting the price and financing environment of urban investment bonds.

## **3.2 Description of the data**

### **3.2.1 Sample selection and data sources**

To measure the debt of regional financing platforms, this paper uses urban investment bonds issued by financing platforms. As the overall issuance data before 2009 is relatively small, this paper uses the statistical data of urban investment bonds issued in China from 2009 to 2021 as a research sample. Due to missing data on the urban investment bonds of some provinces in some years, the basic sample excludes Hong Kong, Macao, Taiwan, Hainan, and Tibet. This results in a total of more than 50,000 groups of bond observations in 29 cities. To eliminate the influence of the individual effect of debt on the results, this paper chooses the province as the research unit and performs weighted average processing on the bond issuance situation of each province and city in each year.

The experimental group in this paper is the urban investment bonds issued by various provinces, while the control group is composed of non-urban industrial bonds. To ensure that the comparison standards between the experimental group and the control group are consistent, this paper selects corporate bonds, corporate bonds, medium-term notes, short-term financing bonds, and targeted instruments under fixed interest rate standards.

The data sources for this study include wind, the official website of the National Bureau of Statistics, and the China Statistical Yearbook.

### 3.2.2 Selection of influencing factors and description

In this paper, the bond price (*Price*) is selected as the dependent variable, which is typically used to measure the issuance cost of bonds. The bond prices in China generally refer to the interest spread. To overcome the impact of maturity factors, credit rating factors, and taxation factors, this paper uses the interest spread between the bond issuance rate and the same-day CDB bond rate of the same maturity and rating as its price. The bond prices are calculated as weighted averages by province, based on the amount of bonds issued by each province, to measure the comprehensive interest spread of each province.

The policy dummy variable (*Choose*) is used as Independent Variable to measure the impact of the "Opinions of the State Council on Strengthening the Management of Local Government Debt" issued at the end of 2014 and the subsequent first issuance of local government bonds in 2015. The article uses *Choose* as a policy indicator and expects a positive impact on bond issuance spreads. *Choose* is a dummy variable that takes a value of 1 for the issuance of urban investment bonds after 2015, and 0 otherwise. *Choose* is the interaction term between the dummy variables for urban investment bond industry bond grouping and the release of local government debt management policies and the first issuance time of local government bonds.

Based on the design by Chen Jing and Li Jianfa (2015), this paper also controls a range of factors.

1. Total local debt issuance. This paper uses the issuance of local debt to gauge the overall hotness of the bond market. The higher the issuance of local debt, the greater the demand for financing funds, indicating a greater need for better public facilities and services. Local governments need to use financing platforms to raise funds. However, the more developed the economy, the more resources the local government can draw from the economy, the more abundant its financial resources, and the less it may rely on financing platforms.
2. Local economic level. This paper uses the GDP index to measure the economic level of each region. The higher the GDP, the more developed the local economy, the greater the demand for better public facilities and services, and the more local governments need to use financing platforms. However, the more developed the economy, the more resources the local government can draw from the economy, the more abundant its financial resources, and the lower its dependence on financing platforms. The impact of the economic level on the amount of debt is uncertain.
3. Level of local fiscal revenue. In this paper, the local government's public budget revenue is used to measure its profitability and regeneration ability. The higher the income level, the stronger the repayment ability, and the lower the risk of default on urban investment bonds.
4. Local urban land area. This paper uses the urban land area of a province to represent the potential development capacity of an industrial cluster.
5. Urbanization rate. This paper uses the proportion of urban employed population



to the total population to measure the urbanization rate. The higher the urbanization rate, the greater the residents' demand for public services and infrastructure, and the greater the financing needs of local governments.

**Table 1: Variable names and definitions**

<b>Classification</b>	<b>Name</b>	<b>Symbol</b>	<b>Definition</b>
Dependent variable	Urban investment bond issuance spread	<i>Price</i>	City Investment Bond Issuance Rate - CDB Yield to Maturity for the Same Period
Independent variable	Policy dummy variable	<i>Choose</i>	When urban investment bonds are issued after 2015 in various localities, this variable takes a value of 1, otherwise it is 0. It is an interaction term between the dummy variable of urban investment bond industry bond grouping and the local policy issuance time dummy variable.
Control variable	Local debt issuance	<i>Total</i>	issued urban investment bonds & total industrial debts in year t- 1
	local economic level	<i>Gdp_rate</i>	Provincial Annual GDP / Base Year GDP
	Local fiscal revenue	<i>Income</i>	Provincial public budget revenue/population of the province
	Local urbanization level	<i>Area</i>	Provincial urban land area/Provincial area
	Urbanization rate	<i>People</i>	Urban employed population/total population of the province

### 3.3 Constructing the econometric model

The emergence of a measurement method is closely related to its institutional environment. Taking the double difference (DID) method as an example, it originated in the federal system of the United States, where each state government has the power to handle its own internal affairs and formulate laws applicable to the state. This system allows American economists to easily identify treatment and control groups when studying the effects of a specific policy in a certain state. Even if there is no ideal control group, they can use the synthetic control method to "create" one, as seen in the case of the smoking ban in California (Abadie et al., 2010). Such case studies can better distinguish correlation from causation.

Chen and Wu (2015) discuss the current status and potential problems of domestic research on the Difference-in-Differences method. This study critically reviews the literature and identifies areas for improvement in the application of DID in various research contexts. Card and Krueger (Card, Krueger, 2000) provide a case study of

the fast-food industry in New Jersey and Pennsylvania, analyzing the impact of minimum wage laws on employment using DID. The authors find that minimum wage increases did not reduce employment in these areas.

In recent research, many scholars have been utilizing the DID method to address various issues. Goin and Riddell (2023) conduct a simulation study and empirical example comparing two-way fixed effects and new estimators for differences-in-differences. The study provides valuable guidance on the appropriate selection of DID estimators in various research contexts. Peñasco and Anadón (2023) assess the effectiveness of energy efficiency measures in residential sector gas consumption through dynamic treatment effects using DID. They present evidence from England and Wales, demonstrating the impact of energy efficiency measures on gas consumption. Liu et al. (2022) use a quasi-natural experiment based on a carbon trading market pilot to investigate the relationship between carbon emissions trading and green technology innovation. This study employs DID methodology to estimate the causal effect of carbon trading on green technology development. Paaniappan et al. (2022) estimate the causal effect of the Medicaid expansion on heart transplant volume using a differences-in-differences model. The study provides valuable insights into the impact of healthcare policy changes on medical procedures. Fan and Zhang (2021) analyze the transformation effect of resource-based cities in China using the PSM-DID model. Their empirical analysis reveals the effectiveness of various policy interventions in transforming resource-based cities in China. Luis et al. (2015) investigates the echoes of the crises in Spain and the United States in the Colombian labor market using a differences-in-differences approach. The study identifies the spillover effects of economic crises on labor markets in other countries.

In China, local governments do not have the legislative authority that states in the United States have. Policies are either rolled out nationwide or piloted in several provinces before being implemented. However, the nature of pilot policies means that the implementation time may not be long, and the evaluation of the effect of the pilot policy using the DID method may be greatly compromised by the short time series data. Additionally, pilot policies themselves may have a strong endogenous nature, meaning that the selection of Province A as the pilot of a certain policy instead of Province B may be due to a characteristic of Province A being related to the policy, leading to the question of whether the parallel trend before the experiment is satisfied, as mentioned in the literature.

In this article, the state issued Chinese New Budget Law and the new budget law, which were implemented in all provinces at the end of 2014. The issuance of local government bonds was only piloted in Beijing, Shanghai, Guangzhou, and other regions in 2011 and was fully promoted in all provinces in 2015. Therefore, it is not meaningful to compare and test based on these factors. Instead, the article selects urban investment bonds in all provinces as the experimental group and innovatively chooses industrial bonds as the control group for the double difference test. The rationale is that urban investment bonds and industrial bonds are both important components of China's bond market, and investors can choose bond products based

on their investment and risk preferences to ensure that the experimental objects have similar characteristics. Moreover, industrial bonds do not have government support and their prices are not affected by the promulgation of Chinese New Budget Law or related government actions, making them suitable as a control group for the double difference analysis with urban investment bonds.

Based on previous research and the context of this article, the model constructed by the article is as follows:

$$\ln Price_{it} = \beta_0 + \beta_1 \times Choose_{it} + \gamma Control_{it} + \lambda_t + \mu_i + \varepsilon_{it} \quad (1)$$

$i$  represents the province,  $t$  represents the year, and the explained variable  $price$  is the bond price. This paper selects the difference between the current interest rate of the bond and the interest rate of the CDB bond with the same maturity and credit rating, and performs logarithmic processing in the regression model;  $choose$  is a dummy variable for the release of local government debt management policies and the first issuance of local government bonds, that is, when the local urban investment bonds are issued after 2015 (that is, the year and after), this variable takes a value of 1, otherwise it is 0, it is the interaction term between the dummy variables of urban investment bond industry bond grouping and the release of local government debt management policies and the first issuance time of local government bonds.  $Control$  Represents a set of control variables;  $\lambda_t$  and  $\mu_i$  are the year and city fixed effects, respectively;  $\varepsilon_{it}$  are the random error terms. This paper focuses on the coefficient  $\beta_1$  of the core explanatory variable ( $Choose$ ), that is, whether the state's issuance of Chinese New Budget Law and local government's debt replacement have an impact on the spread of urban investment bonds and the improvement of the local financing environment. In addition, all regressions use clustered standard errors at the provincial level.

This paper adopts the event study method (Event study) to conduct parallel trend assumptions and dynamic effect analysis to determine its robustness. Whether the influence of urban investment debt financing environment shows differences in cities with different economic environments and debt pressures, this paper constructs a series of variables of local debt pressures, and interacts  $Choose$  with them to verify their moderating effects; finally, this paper explores their mechanism of action, think that the Chinese New Budget Law and related government actions such as replacement bonds mainly promote the improvement of the financing environment of local urban investment by improving the credit rating of urban investment bonds, and based on this research the intermediary effect of debt credit ratings.

## 4. Empirical evidence test

### 4.1 Regression results and analysis

In order to verify the relationship between Chinese New Budget Law and related government actions and urban investment bond prices, this paper employs a double-difference model (Model 1) that controls for two-way fixed effects and gradually adds control variables for regression analysis. Table 2 reports the estimated results. The results in column (1) of Table 2 show that when only regional fixed effects and time fixed effects are controlled, and no other control variables are added, the estimated coefficient for the variable "Choose" is negative and significant at the 1% level. After gradually adding control variables that affect urban green and high-quality development in columns (2)-(6), the estimated coefficient of "Choose" remains negative and significant at the 1% level. The results in column (6) show that after the country promulgated Chinese New Budget Law in 2015 and local governments carried out debt replacement and other actions, the spread of urban investment bonds dropped by about 0.17, indicating that under the condition of other factors remaining unchanged, the change in interest spreads of urban investment bonds was higher than that of industrial bonds. This suggests that Chinese New Budget Law and related government actions have largely improved the financing environment for local urban investment, which preliminarily verifies the research hypothesis H1 proposed in this paper.

**Table 2: Regression results of the impact of the Chinese New Budget Law on the issuance cost of bonds**

	(1)	(2)	(3)	(4)	(5)	(6)
	Price	Price	Price	Price	Price	Price
Choose	-0.207***	-0.166***	-0.167***	-0.170***	-0.168***	0.169***
	(0.056)	(0.059)	(0.059)	(0.057)	(0.055)	(0.055)
Total		-0.031*	-0.030	-0.028	-0.036**	-0.034**
		(0.018)	(0.018)	(0.017)	(0.017)	(0.016)
Gdp_rate			-0.420	-0.179	0.426	0.511
			(1.039)	(1.098)	(1.059)	(1.065)
Income				-0.108	-0.178	-0.169**
				(0.138)	(0.149)	(0.147)
Area					-0.005*	-0.004
					(0.026)	(0.026)
People						-0.307*
						(0.527)
_Cons	0.530***	0.636***	2.613	2.293	0.006	2.060
	(0.035)	(0.075)	(4.906)	(4.935)	(4.778)	(6.028)
Time control effect	control	control	control	control	control	control
Individual fixed effects	control	control	control	control	control	control
N	734	711	711	711	699	699
R2	0.350	0.353	0.353	0.354	0.352	0.353

Standard errors in parentheses, \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## 4.2 Robustness test

### 4.2.1 Parallel trend test and dynamic test

The crucial assumption for dynamically evaluating the effect of local government bond issuance using the double difference method is that the outcome variable satisfies the parallel trend assumption between the treatment group and the control group. This means that if there is no policy impact, the change trend of the outcome variable in the two groups of samples is identical. Moreover, after policy implementation, the dynamic effect of the policy will also change over time, and it is necessary to test for time lag and decay effects in its policy effect. In this study, the event study method is used to test the parallel trend assumption and dynamic effect analysis, with the following regression model:

$$lnprice_{it} = \beta_0 + \beta_1 exp\_city_{it}^{-5} + \beta_2 exp\_city_{it}^{-4} + \beta_{12} exp\_city_{it}^6 + \gamma Control_{it} + \lambda_t + \mu_t + \varepsilon_{it} \tag{2}$$

Among them,  $exp\_city^{\pm k}$  is a dummy variable representing the "event" of local government bond issuance and related policy implementation. When the processing group is in the  $k^{th}$  year before the local government bond issuance and related policies are implemented, the value of  $exp\_city^{-k}$  is 1; when the processing group is in the  $k^{th}$  year after the local government bond issuance and related policies are implemented, the value of  $exp\_city^{+k}$  is 1; otherwise,  $exp\_city^{\pm k}$  is 0. Control variables are consistent with model (1). In order to show the parallel trend assumption and dynamic test results more intuitively, this paper draws the estimated coefficient trend chart under the 95% confidence interval according to the  $exp\_city^k$  regression results (show in Figure 1).

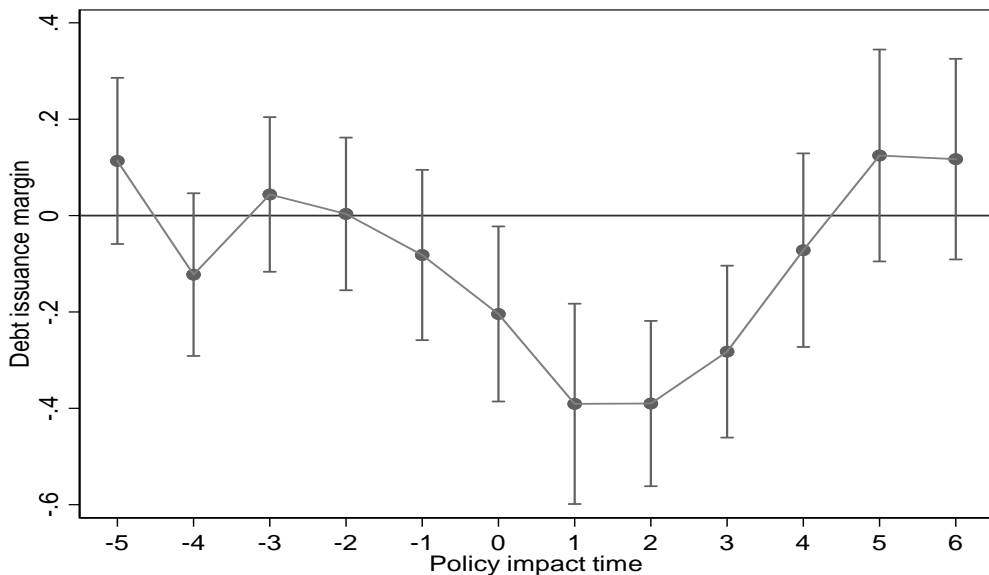


Figure 1: Parallel trend test and dynamic test

From Figure 1 that the coefficients of  $\text{exp\_city}^{-5}$ ,  $\text{exp\_city}^{-4}$ ,  $\text{exp\_city}^{-3}$  and  $\text{exp\_city}^{-2}$  are not significant, indicating that before the implementation of relevant policies such as  $\text{exp\_city}^{-1}$  the issuance of local government debts and the Chinese New Budget Law, there is no significant difference in the trend of the interest rate spread between urban investment bonds and general debts. It proves that the assumption of parallel trends is true; the dynamic test results mean that in the year and after the issuance of local government bonds and the implementation of the policy, the coefficient of  $\text{exp\_city}^k$  is statistically significant and negative, indicating that the impact of local government debt issuance on urban investment bonds is only after the issuance. Works without lag and anticipation effects. However, the effect of local government bonds issued and related implementation policies was significant in the first three years, but not in the fourth year and after, indicating that the effects of local government bonds issued and related implementation policies lasted only for three years, and may be affected by real estate after that. Debt shocks, the impact of continued tightening of local finances, and defaults in some areas, combined with the impact of the new crown epidemic, the spread of debt issuance has returned to its previous level.

#### 4.2.2 Placebo test

In order to further confirm the reliability of the benchmark results, a placebo test was conducted on the estimated results to eliminate the possibility of false regression caused by omitted variables and to ensure the true effectiveness of the policy treatment effect. This test involved changing the starting time of the release of Chinese New Budget Law and the government's implementation of control measures, respectively, one to three years earlier, to create false policy time points. Then, three false policy variables were constructed for the demonstration cities, and regression was conducted using the benchmark model (1). If the policy treatment effect does not exist, the coefficient of the false policy variable will still be significant after changing the start time of the issuance of Chinese New Budget Law and the government's implementation of control measures. Otherwise, it proves that the policy treatment effect is real and effective. The results of the placebo test showed that the estimated coefficients of the three variables were not significant (due to space limitations, the results were not reported), which passed the placebo test and confirmed the robustness of the benchmark results.

#### 4.2.3 Heterogeneity research

To investigate whether the impact of Chinese New Budget Law and related government actions on the financing environment of urban investment bonds differs across cities with varying economic environments and debt pressures, this study constructs a series of variables measuring local debt pressure. The study selects the urban investment bonds of each locality that will face debt repayment pressure in the future period (1 year, 2 years, 3 years, 4 years, 5 years, and all remaining), which refers to the debt balance that will mature within the specified time frame in each

region. When calculating the debt balance, the study excludes duplicated debts across markets and the balance of urban investment bonds that have been replaced through the issuance of replacement bonds in local government bonds. Additionally, the study introduces the interaction term  $\text{Choose} \times \text{tbl}$  into model (1), and the results are presented in columns 1-6 of Table 3.

**Table 3: Heterogeneity test**

	(1)	(2)	(3)	(4)	(5)	(6)
	Price	Price	Price	Price	Price	Price
Choose	-0.333***	-0.361***	-0.384***	-0.393***	-0.422***	-0.432***
	(0.046)	(0.046)	(0.052)	(0.054)	(0.053)	(0.060)
Tbl_1y	7.753***					
	(1.054)					
Tbl_2y		4.273***				
		(0.574)				
Tbl_3y			2.646***			
			(0.340)			
Tbl_4y				1.982***		
				(0.253)		
Tbl_5y					1.681***	
					(0.205)	
Tbl_all						1.121***
						(0.158)
Constant	6.605	7.934	7.985	7.397	5.941	1.228
	(5.520)	(5.475)	(6.004)	(6.204)	(5.978)	(6.350)
Control variable	control	control	control	control	control	control
Time control effect	control	control	control	control	control	control
Individual fixed effects	control	control	control	control	control	control
<i>N</i>	575	593	616	635	650	688
<i>R</i> <sup>2</sup>	0.532	0.539	0.521	0.510	0.511	0.489

The results indicate that the promulgation and implementation of the new budget law, as well as related government actions such as local bond issuance, have reduced the overall issuance spread of local bonds and improved their influence on the financing environment of urban investment bonds. However, this positive impact is significantly weakened in regions with high debt pressure, meaning that the marginal utility of the financing improvement effect is lower in areas with poor economic conditions and high debt pressure. Urban investment bonds issued in regions with a good economic environment and less debt pressure have seen

significant improvement in market perception as the market gradually learns about relevant national policies and behaviors. On the other hand, urban investment bonds issued in areas with poor economic conditions and high debt pressure cannot be fully recognized by the market due to the limited financial strength and ability to issue government bonds of local governments. The paper suggests that the implementation of relevant policies, such as Chinese New Budget Law, and related government actions, such as the issuance of local bonds, have improved the financing environment for urban investment bonds and reduced the overall spread of local bond issuance. However, the financing improvement effect differs based on the debt pressure in each region, which enhances the effectiveness of market efficiency and contributes to the effective allocation of relevant resources. This finding is of great significance to the construction of a healthy bond market environment and the prevention of systemic financial risks in China.

## 5. Mechanism research

The previous regression results have preliminarily supported the research hypothesis H1, which states that the issuance of Chinese new budget law by the state and the debt replacement by local governments have significantly reduced the interest rate gap between urban investment bonds and industrial bonds, thereby positively impacting the improvement of the local financing environment. However, how do relevant policies and government actions improve the issuance cost of Urban Investment Bonds? This question guides the article to explore the internal mechanism of this "black box." Based on the analysis of the previous research assumptions, this paper believes that relevant government actions, such as Chinese New Budget Law and replacement bonds, mainly improve the credit rating of urban investment bonds, thereby promoting the improvement of the local financing environment. To further verify the research hypothesis H2, this paper primarily conducts empirical testing through the method of mediating effect testing.

Chinese new budget law issued by the state and the debt replacement by local governments can affect the ratings and overall analysis standards of local urban investment by regulatory agencies, thereby influencing the rating results given by them. Based on this, the overall interest rate differentials of local urban investment bonds can be affected, facilitating the market-oriented development of urban investment bonds. To verify this mechanism, this paper uses the local debt credit rating coefficient variable (rate), and converts the credit ratings of local urban investment bonds and industrial bonds into scores and conducts weighted calculations according to the debt credit ratings AAA-C in the following table.



**Table 4: Debt Grade Scoring Table**

<b>Project</b>	<b>Debt rating</b>								
<b>Grade</b>	AAA	A-1	AA+	AAA	A-2	AA-	A+	A	A-
<b>Fraction</b>	1	1	2	3	3	4	5	6	7
<b>Grade</b>	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-
<b>Fraction</b>	8	9	10	11	12	13	14	15	16
<b>Grade</b>	CCC	CC	C						
<b>Fraction</b>	17	18	19						

The debt credit rating coefficient is used as the mediator variable, and the regression results are presented in Table 5. The dependent variable in column (1) is the local debt credit rating coefficient (rate), while the dependent variables in columns (2) and (3) are both debt spreads (y).

**Table 5: Inspection of government behavior influence mechanism**

	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>
	<b>Rate</b>	<b>Price</b>	<b>Price</b>
Choose	-0.086**	-0.213***	-0.171***
	(0.038)	(0.052)	(0.055)
Rate			0.491***
			(0.082)
Constant	-2.352	5.376	6.531
	(3.092)	(4.298)	(4.528)
Control variable	control	control	control
Time control effect	control	control	control
Individual fixed effects	control	control	control
<i>N</i>	721	721	721
<i>R</i> <sup>2</sup>	0.283	0.351	0.432

Standard errors in parentheses \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

The results indicate that the estimated coefficient of "choose" is significantly negative in column (1), which suggests that Chinese New Budget Law and related government actions have significantly improved the attitudes of rating and regulatory agencies towards the future development and credit risks of urban investment bonds, resulting in an improvement in the credit rating level of urban investment bonds. The estimated coefficient of "choose" is also significantly negative in column (3), and its absolute value relative to the benchmark result has declined. Meanwhile, the coefficient of "rate" is significantly positive at the 1%

level, indicating a strong partial mediating effect. This suggests that the mechanism of narrowing the credit spread of urban investment bonds is by improving the credit rating of debts. In other words, the Chinese New Budget Law and related government actions have significantly improved the overall credit rating of urban investment bonds given by rating and regulatory agencies in their reports. As a result, investors have greater confidence in the policy actions of the state and local governments, particularly in their support for urban investment, leading to a further increase in demand for urban investment bonds. This increase in demand has also led to a gradual decrease in the credit spread of urban investment bonds, allowing the bond market to gradually return to normal order.

## **6. Conclusion and insights**

With the increasing risk of local government debt, improving the financing environment for urban investment bonds has been a focus of attention. Research on the new budget law and financing platform governance policies is of great practical significance to evaluate their governance effects and explore the financing environment of financing platforms under a strong regulatory environment. Based on the institutional background and theoretical analysis, this study used balanced panel data of urban investment bonds and industrial bonds issued nationwide from 2009 to 2021 to examine the impact and mechanism of relevant government actions such as the promulgation and implementation of Chinese New Budget Law and local bond issuance using the multi-period double difference method (DID). The results indicate that Chinese New Budget Law and related government actions have reduced the overall issuance price of local bonds and improved the local financing environment for urban investment bonds. However, this positive impact is weaker in regions with high debt pressure and poor economic environments due to limited financial strength and the ability to issue government bonds. The study also verifies the mediating effect of credit rating, showing that Chinese New Budget Law and related government actions have improved the overall credit rating of urban investment bonds given by rating and regulatory agencies in their reports.

After 2018, negative news such as the impact of the real estate industry, tightened local finances, and technical defaults in some areas affected the spread of debt issuance. Additionally, the COVID-19 pandemic exacerbated the situation, causing the yield spread of debt issuance to return to its previous level. The government encourages local governments to strengthen debt management and improve their repayment capabilities to increase investors' confidence in local urban investment bonds. To prevent systemic risks in the financial system, the government can increase the debt limit, strengthen budget management, and optimize the structure of assets and liabilities. Different provinces' debt pressures have varying impacts on the price of urban investment bonds and the local financing environment. Therefore, the central government can implement different policies and measures based on the situation in different regions. For provinces with high debt pressure, the government can impose stricter debt limits and budget management measures, strengthen debt

risk prevention and control, and transfer payments through the central government and professional support to improve the financial strength and solvency of local governments. For provinces with relatively light debts, the government can encourage more funds to flow to the real economy by increasing support for their financing activities and achieving more effective resource utilization.

The credit rating of urban investment bonds is a crucial intermediary variable that policy measures affect the price of urban investment bonds and the financing environment of urban investment bonds. To improve the credit rating of urban investment bonds, the government can take several measures. First, they can strengthen financial transparency and improve the frequency and quality of financial information disclosure. Second, they can enhance debt management and reduce debt risks. Third, they can continuously improve the financial strength of local governments to enhance the credit rating of urban investment bonds. Finally, the government can continue to develop the bond market, expand the issuance scale of urban investment bonds, increase the circulation of urban investment bonds, improve the liquidity of urban investment bonds, ensure their pricing follows market rules, thereby improving the efficiency of the bond market.

## References

- [1] Zhou L. A. (2007). Research on the promotion tournament model of Chinese local officials. *Economic Research* (07), pp. 36-50.
- [2] Zhou X. G. (2005). "Reverse soft budget constraint": An organizational analysis of government behavior. *Chinese Social Sciences* (02), pp. 132-143+207.
- [3] Wang Y. Q., Chen, Y. H. and Du, J. L. (2016). Soft budget constraint and local government debt default risk in China: Evidence from financial markets. *Economic Research* (11), pp. 96-109.
- [4] Zhang J., Gao Y., Fu Y. and Zhang H. (2007). Why does China have good infrastructure? *Economic Research* (03), pp. 4-19.
- [5] Yang Z. Y. (2015). Study on the division of central and local administrative powers in the tax-sharing system reform. *Journal of Economic and Social System Comparison* (02), pp. 21-31.
- [6] Wei J. N. (2010). Where are the risks of local government financing platforms? *China Finance* (16), pp. 16-18.
- [7] Polackova H. (1999). Contingent Government Liabilities: A Hidden Risk for Fiscal Stability.
- [8] Carmen M. Reinhart and Kenneth S. Rogoff. (2011). From Financial Crash to Debt Crisis. *The American Economic Review* (5).
- [9] Liu S. X. (2003). Fiscal risk: An analytical framework. *Economic Research Journal* (05), pp. 23-31+91.
- [10] Ma W. L. (2019). Behavioral logic of the expansion of implicit debt of Chinese local governments: Path transformation and countermeasures for regulating local government borrowing behavior. *Fiscal Studies* (08), pp. 60-71+128.

- [11] Yang C. M. and Lu Y. P. (2013). Research on the status quo, causes and prevention strategies of local government debt risk. *Fiscal Studies* (11), pp. 58-60.
- [12] Wen L. C. and Li T. (2019). Research on the boundary and governance of implicit debt of local governments in China. *Journal of Central University of Finance & Economics* (07), pp. 18-26+114.
- [13] Chen J. and Li J. F. (2015). Fiscal decentralization, promotion incentives and local government debt financing behavior: Evidence from provincial panel data based on urban investment bonds. *Accounting Research* (01), pp. 61-67+97.
- [14] Luo D. L.; She G. M. (2015). Change of local officials and issuance of local government bonds. *Economic Research Journal* (06), pp. 131-146.
- [15] Cao J., Mao J. and Xue Y. (2019). Why does the urban investment bond continue to grow? An empirical analysis based on the new caliper. *Finance and Trade Economics* (05), pp. 5-22.
- [16] Xiao P. and Fan R. (2019). Research on local fiscal transparency from the perspective of debt control: An empirical analysis of 30 provincial-level governments from 2009 to 2015. *Fiscal Studies* (07), pp. 60-70.
- [17] Huang C. Y. and Mao J. (2015). Fiscal condition and local debt size: New findings based on the perspective of transfer payments. *Finance and Trade Economics* (06), pp. 18-31.
- [18] Wang Y., Chen Y. and Du J. (2016). Soft Budget Constraint and China's Local Government Debt Default Risk: Evidence from Financial Markets. *Economic Research Journal* (11), pp. 96-109.
- [19] Zhu Y. and Wang J. (2018). Can Market Constraints Reduce the Risk Premium of Local Debt? Evidence from the Urban Investment Bond Market. *Journal of Financial Research* (06), pp. 56-72.
- [20] Abadie A., Diamond A. and Hainmueller J. (2010). Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program. *Journal of the American Statistical Association*, 105(490), pp. 493
- [21] Chen L. and Wu H. (2015). Research Status and Potential Problems of Domestic Difference-in-Differences Method. *Quantitative & Technical Economics Research* (07), pp. 133-148.
- [22] Card D. and Krueger A. B. (2000). Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania. *The American Economic Review*, 90(5), pp. 1357-1392.
- [23] Goin D. E. and Riddell C. A. (2023). Comparing two-way fixed effects and new estimators for differences-in-differences: A simulation study and empirical example. *Epidemiology*, pp. 1-8.
- [24] Peñasco C. and Anadón L. D. (2023). Assessing the effectiveness of energy efficiency measures in the residential sector gas consumption through dynamic treatment effects: Evidence from England and Wales. *Energy Economics*, pp. 1-14.

- [25] Liu W., Qiu Y., Jia L. and Zhou H. (2022). Carbon Emissions Trading and Green Technology Innovation—A Quasi-natural Experiment Based on a Carbon Trading Market Pilot. *International Journal of Environmental Research and Public Health*, 19(24), pp. 16670.
- [26] Palaniappan A., Blitzer D., Takayama H. and Sellke F. W. (2022). Estimating the causal effect of the Medicaid expansion on heart transplant volume with a differences-in-differences model. *JTCVS Open*, pp. 1-8.
- [27] Fan F. and Zhang X. (2021). Transformation effect of resource-based cities based on PSM-DID model: An empirical analysis from China. *Environmental Impact Assessment Review*, pp. 1-16.
- [28] Luis E. A., Dolores M. and Nataly O. (2015). Echoes of the crises in Spain and US in the Colombian labor market: a differences-in-differences approach. *SERIEs*, pp. 141-173.