The Impact of the Mixed Reform Policy on the Credit Spread of the Quasi-municipal (Chengtou) Bond

Yu Hui

Supervisor: Guangyu Mao

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1. Introduction

State-owned enterprises are a special category of enterprises in developing countries: since much of the infrastructure in developing countries is assumed to be not well developed, these enterprises are frequently required by the government to undertake public welfare obligations and strategic responsibilities, meaning that they have to provide positive externalities to the society rather than just to pursue the profit maximization goals. However, in China at present, with rapid development, an increasing number of private companies are emerging with high efficiency and profitability, making the long-standing institutional imperfections and operational inefficiencies of SOEs more prominent. In addition, because of the close ties between SOEs and the (local/central) government, the asset price of SOEs are being distorted with rising expectations of the implicit government guarantees on SOEs' bonds. As the SOE's bond issuance accounts for more than half of the total bonds issued in the country, this fact become one of the most obvious risk factors for the domestic capital market.

China has been reforming its SOEs since 1978. Experienced the policy of "downsizing and reconstructing in SOEs" in the 1970s and the reform of the supervision and management mechanism of state-owned capital around the 1990s, China began to introduce the goal of corporate modernization since the beginning of the 21st century, formulating a series of top-level policy design and the corresponding pilot projects. Among them, mixed ownership reform policy is one of the most important policies. The mixed ownership reform policy aims to improve corporate efficiency and change the public expectations of SOEs by improving the share of private ownership within SOEs. The proposal of mixed ownership reform is mainly based on the phenomenon of gradual decline in profitability of SOEs, the background of declining fiscal revenues of local governments, and the need for dismantling of vested interest groups (Zheng, 2014). The study of this policy has important implications for the transformation of economic systems in developing

countries.

In this paper, we assume the mixed ownership reform policy may affect SOEs from the two channels of reducing local government implicit guarantee and improving corporate operations, and the effect will be transmitted to the asset price, more specifically, the credit spread of the SOEs' bond. The implicit guarantee indicates the market expectation of government responsibility of backing up for debt when corporate defaults. The existence of it on quasi-municipal bonds (mostly the bond issued by SOEs) has already been proved by many researchers. Theoretically, the mixed ownership reform will reduce the government's implicit guarantee by changing the internal equity structure of the company and raising the transaction cost of the government's implicit guarantee process for SOEs. However, this has not been empirically proved. In addition, the mixed ownership reform is bound to bring about changes in the way companies operate, and though there have been numerous studies confirming the efficiency gains of mixed reform, whether the efficiency gains of mixed reform are being aware of the market and will affect investors' expectations has not been adequately studied. Currently, the Chinese government expects the mixed ownership reform policy to have a market-oriented effect. In other words, to test out whether the policy is effective, the best measurement could be using the data from the market, from the investor of SOEs, and from the comparison between SOEs and their competitor. If the above transmission paths of implicit guarantee reduction or corporate efficiency improvement are valid, they are highly likely to be reflected by the asset prices, and by comparing the SOEs' asset price with its more market-based competitor (private ownership enterprises), we may be able to characterize whether the reform has achieved the policy goal of making the SOEs market-oriented.

Luckily, China's quasi-municipal bond market provides a good laboratory to help us study the effectiveness of the policy. Quasi-municipal bonds are generally issued by local government Financing

Vehicles (LGFVs), a category of enterprises in which the local government is the largest or major shareholder. In the 1994 budget law, the state prohibited local governments from raising funds directly on their own through the capital market, so LGFVs provide a platform for local governments to raise funds and invest in local infrastructure development. This type of bond can be considered as a corporate bond on the one hand, and on the other hand, due to its relationship with the government, it is usually viewed by investors as a government bond, indicating that it carries an implicit government guarantee to a greater degree. Most importantly, as a special kind of state-owned enterprise, LGFVs are also involved in the mixed ownership reform policy, so we can use it to study the impact of mixed ownership reform on such companies.

Against the backdrop of the Chinese government's emphasis on revaluing SOE assets, it is important to examine the impact of the policy on bond valuations. Our study will provide some academic insights into the development of China's SOE in the bond market and will address several gaps in related literature. First, the current research on the impact of policies on the pricing of assets of LGFVs focuses more on the restrictive policies (limiting the role of LGFV to issue bonds), and the research on the policies related to the mixed ownership reform is insufficient, not to mention about the mechanism of this policy impact. Second, the limited number of existing papers on LGFV mixed ownership reform are largely focused on case studies, while empirical research on the impact of mixed reform on the economy and financial markets is still insufficient. Since 2013, the restructuring and reorganization of SOEs have introduced more than 2.5 trillion RMB of various types of social capital, and the number of mixed-ownership enterprises in central and local SOEs now exceeds 70% and 54%, respectively, and the impact of the mixed-ownership policy has been widespread - the effect of mixed-ownership reform is no longer limited to individual cases, but has driven changes in the market environment. Therefore, there is some significance in studying the impact of mixed

reform on the overall financial market environment by means of empirical research. Third, most of the studies on quasi-municipal bonds choose the spreads of bonds as the research object, and very few choose both the spreads of bonds issued by LGFVs and other corporate bonds for research, and very few studies explore the changes (tightening or widening) of the credit spreads between the two under the influence of policies. This paper takes quasi-municipal bonds and private corporate bonds as samples to assess the market effect of the policy by portraying the change of spreads between them, which is innovative. Fourth, the current research on the implicit guarantee of LGFVs mostly uses provincial-level data. This paper uses county and city-level panel data to portray the financial situation of local governments, which improves the accuracy of the research to some extent.

Through a series of pooled cross-sectional regressions, we obtain a series of results. First, we confirm that the mixed reform can reduce the effect of implicit guarantees of LGFVs on credit spreads and weaken the association between the credit spreads of LGFVs and the financial strength of local governments. Second, we find that the reform can significantly improve the internal profitability (before the epidemic) and operations of LGFV, and decrease the debt-asset ratio of LGFV. Moreover, the decrease in the debt-asset ratio and increase in profitability caused by reform can be significantly reflected by the change in the spread of quasi-municipal bonds. This suggests that the transmission path of "mixed reform - LGFV's financial situation - credit spreads" is present. The above effects of the mixed ownership reform and the feasibility of two transmission paths illustrate the effectiveness of the policy.

The remainder of the paper will be organized in this way. First, the article will provide some institutional and policy background, and in Section 2, the article will review the present literature and develop our hypothesis, Section 3 describes the data-gathering process. Section 4 outlines the research methodology. Section 5 shows the empirical result, while Section 6 shows the result of the robustness check.

Section 7 concludes.

2. Background and hypothesis development

2.1 Institutional background

2.1.1 Local Government Financial Vehicle

2.1.2 Policy Background of Mixed Ownership Reform

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2.2 Literature review and hypothesis development

The theoretical basis of implicit government guarantees for corporate bonds is discussed in Kahan and Rock (2010), who argue that government investors have more political and social considerations in their decisions than private investors that simply have the primary goal of profit maximization. Also, the government can influence the financing cost of the firms it invest through its relationship with the invested firm. In addition, Flannery and Sorescu (1996) study the effect of implicit government support on the yield spread of U.S. bank subordinated debt between 1983 and 1991. They argue that investors perceive that subordinated bonds have an implicit government guarantee.

Furthermore, numerous research indicate the presence of implicit guarantees issues with Chinese quasi-municipal bonds: (Lin, 2004, Xu, Gao, 2018, Wang, Jianfeng, 2022) concludes that the existence of implicit guarantees in Chinese quasi-municipal bonds is primarily due to the fact that the government is the issuer's de facto controller and the actual bearer of their project losses, and has an incentive to provide bailouts to avoid the LGFVs' bankruptcy. In addition, due to the policy burden of LGFVs, the micro returns of their investment projects are generally low, and since the government cannot accurately grasp the amount

of potential project losses of LGFVs before investing, it has to bear the losses in full. Moreover, a large number of empirical studies show that implicit guarantees will reduce the credit risk spread of LGFVs' bonds: Luo (2016) uses local government financial strength to portray the implicit guarantee capacity and implicit guarantee willingness of local governments, and finds that the better the financial status of local governments, the smaller the issuance spread of unsecured LGFVs after controlling for other factors, confirming the existence of implicit guarantees; Walker. et al (2021) used data of Chinese bonds market from 2010 to 2017 and found that, because of the implicit government guarantee, investors have significantly lower risk sensitivity to LGFV bonds relative to other corporate bonds.

The mixed-ownership reforms may have implications for the relationship between LGFVs and local governments. The theory of "shared/decentralized control" (Aghion and Bolton, 1992; Bennedsen and Wolfenzon, 2000; Gomes and Novaes, 2001), which was originally used to address excessive intervention of large shareholders, is an important theory to understand the effect of the current new round of SOE reforms. The basic idea of this theory is that when outside investors, controlling shareholders, and manager play around the distribution of residual power, the more members there are, the more difficult it is to achieve consistency, and the more likely it is that the funds will be invested in the right direction (Bennedsen, Wolfenzon, 2000). Collectives with multiple shareholders are likely to produce less distortion in the use of funds than those with a single shareholder, and Gomes and Novaes (2001) find that decisions made under such balances of ownership tend to prevent managers from making business decisions that are in the interest of controlling shareholders but detrimental to the interests of minority shareholders. Therefore, the introduction of non-state components in SOEs through mixed ownership reform will reduce the problem of excessive intervention caused by the "dominance" of state-owned components in SOEs, thus reducing the intervention of local governments behind the state-owned components in LGFVs and reducing the problem

of decision errors, including investment errors.

In addition, according to the theory of privatization, Vickers and Yarrow (1991) argue that subsidies towards loss are more common under pubic ownership because the transaction cost is smaller. Therefore, It is possible that government subsidies will decrease after the mixed ownership reform that introduce private equity component.

To summarize, from the theory of decentralization, the introduction of private capital will reduce the control and intervention of local governments on LGFVs, achieve the effect of balancing in control, and reduce the possibility of local government's "underwriting" (giving aid) behaviour, thus making the market expectation of government bailout and implicit guarantee for LGFVs decrease. Besides, from the theory related to privatization and transaction cost, the introduction of private capital may increase the transaction cost of government subsiding behavior, thus lower the government's incentive to give aid to LGFVs, thus may also decrease the level of government implicit guarantee. Therefore, we believe that the mixed ownership reform will reduce the implicit guarantee expectation of the market for the quasi-municipal bonds. The implicit guarantee expectation is closely related to the specific manifestation of the implicit guarantee level of local government - local financial strength (Luo, 2016). If the implicit guarantee expectation decreases, it means that the market perceives that the association between the credit spread of the quasi-municipal bond and the local government financial strength decreases, thus confirming that the mixed ownership reform policy has created a credit separation between the LGFV and local government, and the major purpose of the mixed ownership reform has been successfully achieved. Since empirical studies have shown that the existence of implicit guarantee expectation reduces the credit risk spread of quasi-municipal bonds (Luo, 2016; Walker. et al, 2021), we predict that the credit risk of quasi-municipal bonds will increase to a certain extent under the above mechanism of mixed reform policy that reduce implicit guarantee.

Therefore, we propose the following hypotheses.

H1: The mixed ownership reform will reduce the effect of implicit guarantee expectation by increasing the balance of shares between state-owned and non-state-owned shares within LGFVs, as evidenced by the increase of the credit spread.

One of the biggest reasons for the Chinese central government to implement the mixed reform policy is the long-standing principal agent problems associated with state owned enterprise. The SOE's supervisory process has a major defect: In China, the nominal owners of SOEs are all the people in the country, so the actual owners of SOEs are absent, and the absence of actual owners leads to the lack of supervision towards agents by principals in the principal-agent relationship, which may cause opportunistic behavior of management and increase the possibility of moral hazard under the condition of information asymmetry, leads to more serious insider control problems (Jensen, 1986; Liu,2003; Zheng, 2020).

A large number of Chinese scholars has proved that the mixed ownership reform have positive economic consequences for firms, and most of the existing studies focus on its impact of the improving of economic efficiency and business performance. Among the theoretical studies, Guo (1994) concludes that the shift from state-owned to non-state-owned structures has a positive effect on the productivity of firms: this is because non-state-owned firms promote the marketization of economic development, enhance market competition and internationalization, and thus improve economic efficiency within firms. At the same time, a large number of studies have pointed out that the introduction of non-state components in SOEs will improve the effectiveness of corporate governance through reduce the information asymmetry, and break the industrial monopoly of state capital through the perspective of executive selection mechanisms and the formation of incentive mechanisms (Shleifer et al., 1998; Zhang, 1999; Huang, 2014).

Numerous studies have also demonstrated the effects of mixed ownership reform empirically: (Liu and

Li, 2005; Song and Yao, 2005; Hu et al. 2006) found that the higher the proportion of non-state shares, the better the productivity and operational efficiency of the firm. Chen, Lin, and Tang (2014) point out that SOEs that undergone ownership reforms have lower policy burdens as well as higher resource allocation efficiency. In contrast, Zhang et al. (2015) found that after mixed ownership reform, there was a proportion of state-owned shares or the existence of political affiliation of executives, making SOEs after mixed ownership reform continue to have policy burdens or political attachments, which undermines the investment efficiency of enterprises. Some studies have researched on the mixed ownership reform of LGFVs and its economic effects. Ma et al. (2021) found that the mixed ownership reform of LGFVs could improve the credit rating of the bonds, reduce the over-indebtedness of companies, and mitigate risk. From the perspective of credit spreads, Wang (2022) finds that mixed-ownership reform of LGFVs can improve the efficiency of their financial information transmission to asset prices.

To summarize, the mixed ownership reform of LGFVs affects the internal financial situation of LGFVs, and studies have confirmed that the introduction of private capital makes LGFVs more efficient in investment, improves the internal operational efficiency, and reduces the over-indebtedness by reducing the negative impact of the principal-agent problem and strengthening the internal control and incentives of enterprises. We believe that this effect may reduce the credit risk of quasi-municipal bonds; at the same time, the introduction of the profit-seeking characteristics of private equity will lead the LGFV to consider the rate of return on investment projects, making it possible to invest in riskier projects, which will make the LGFV's risk rise, and these will make the LGFV's ability to repay debt more in line with the level of market-oriented companies, making the LGFV's credit risk closer to that of market-oriented financing entities. Synthesizing the above ideas, we speculate that the reform will lead to a change in the credit risk spread of quasi-municipal bonds, but the direction is still undetermined; key financial indicators can play an

intermediary effect in the transmission process. Based on the overall objective of the market-oriented reform of LGFVs, we propose the following hypotheses:

H2: The mixed ownership reform will bring the credit spreads of LGFVs closer to those of market-oriented companies by improving the operations performance of LGFVs.

It has already been proved that there is a significant difference in credit risk between the bonds of LGFV and the bond of private ownership companies before the mixed reform policy (Walker. et al, 2021). If the above two hypothesis holds, the difference in spreads (credit risk) between the bonds of LGFV and private companies can be partially explained by the implicit guarantee factor and by the difference in the operating conditions of the two companies. If the mixed-ownership reform policy is effective in the maketization sense, it will weaken both of the aforementioned causes of the difference in spreads between the two type of company. Therefore, the mixed reform will make the credit risk of LGFV and the private company closer, and the market expectation for the spread between the two should fall after mixed ownership reform, so we propose that:

H3: The mixed ownership reform will reduce the spread between private company bonds and quasi-municipal bonds.

3. Data and Sample overview

3.1 Sample constructions

In this paper, we selected data of quasi-municipal bonds and private company bonds (private companies are the sum of private enterprises, namely foreign-owned enterprises, and sino-foreign joint ventures under WIND database classification) issued from January 2010 to December 2020 and still in existence today. In consideration of data comparability, we will exclude asset-backed bonds, corporate credit enhancement

bonds, and floating-rate bonds. We retain only the fixed-rate bonds and exclude incomplete data. Finally, we get 5867 sample data.

The data on quasi-municipal bonds and their issuers are mainly from the WIND China Bond Database. For the data related to whether the company has gone through the mixed reform, this paper mainly make judgement based on the presence of non-state capital in the top ten shareholders and the summary of cases of LGFVs that introduced of non-state strategic investors (listed in the Local Government Financial Vehicle Blue Book - China LGFV Development Report). For data related to local government financial strength, we mainly selected data from the CSMAR regional economic database, EPS-data China city database, and local government statistical yearbooks of provinces, prefecture-level cities, and county-level cities. If the financial data of the issuing entity and the data of the shareholding ratio of the mixed shareholders are missing in the wind database, we make up the relevant data from Tian-yan Search and Juchao.

3.2 Variables

3.2.1 Independent variables

（1）Hypothesis 1

Since the local government's financial strength situation affects the level of implicit government guarantees by influencing the local government's guarantee capacity and willingness to guarantee, which in turn affects the credit risk and issue pricing of quasi-municipal bonds (Luo Ronghua et al., 2016), it is an important factor affecting the government's guarantee capacity. We, therefore, use the local government financial situation (LFS) to carve out the level of implicit local government guarantees.

Regarding the implicit guarantee variables, the specific variables chosen by scholars may not be the same, but the overall choice of ideas is more consistent: Wang Li and Chen Shiyi (2015) chose the local

government fiscal surplus and local GDP as the measure of local government implicit guarantee; Luo Ronghua and Liu Jinjin (2016) chose the fiscal deficit per capita, fiscal revenue per capita, fiscal revenue/total debt, fiscal deficit per capita / per capita fiscal revenue seven ratios to measure the implicit guarantee of local governments; Zhong et al. (2016) used three major types of government revenues as the measurement indicators, and Shen et al. (2020) added local government fiscal deficit rate and fiscal self-sufficiency rate as the proxy variables of the implicit guarantee of local governments based on the indicator selection of Luo (2016).

Through the above literature, we can find that the measurement of local government financial strength is mainly focused on three aspects: local government fiscal revenue situation, local economic development situation, and local government indebtedness situation; namely, indicators for the positive determination of local government financial strength, and indicators for the negative determination of local government financial strength. Therefore, based on the above research and data availability, five indicators of "local government debt ratio" and "local government financial self-sufficiency rate" are used to characterize the fiscal level, as shown in the following table.

TABLE 1 : *Variables depict local financial support*

Initial variables	Variable Name	calculation method	Direction
LFS1	GDP per capita of prefecture-level cities	Regional GDP/regional year-end resident population	Positive
LFS2	Per capita fiscal revenue of prefecture-level municipalities	Regional revenues/regional year-end resident population	Positive
LFS3	Local government debt ratio	Annual local government debt balance/regional GDP	Negative
LFS4	Financial self-sufficiency rate	Local government general public budget revenue/local government general public budget expenditure	Positive
LFS5	Local government debt ratio	Annual local government debt balance/local government revenue	Negative

Note: Positive means the greater the variable is, the stronger is the local government financial support; Negative means

the lower the variable is, the stronger is the local government financial support

Regarding whether or not the LGFV have participated in the mixed ownership reform policy and to what extent, we use the dummy of whether being mixed ownership reformed or not (Private) and the degree of equity convergence (Private2) to depict respectively. To determine whether the quasi-municipal bonds have gone through the mixed reform, we draw on the approach of (Huixian Ma, Shanshan Chen, 2021), which uses the presence of non-state capital among the top ten shareholders in the shares of LGFVs to indicate whether the firm had been mixed ownership reformed. For the equity convergence indicator, we refer to the article by (Zhang, Wenkui, 2011; Cao, Yang, 2021), using the relationship between state-owned and non-state-owned equity of the top ten shareholders to indicate the degree of equity convergence. If the share of state-owned equity (E_s) is greater than the share of non-state equity (E_p), the equity convergence degree ($Private_2$) is equal to E_p /E_s and vice versa is equal to E_s /E_p .

Finally, we choose the product of the local government financial situation (LFS: Local Financial Support) and the dummy of whether the LGFV is being mixed ownership reformed or not (LFS*Private), and the product of local government financial situation and the equity convergence of LGFV (LFS*Private2) as the two independent variables.

（2）Hypothesis II

For hypothesis II, we select the relevant financial/accouting indicators (ROA, Turnover Rate, and debt asset ratio) of LGFVs to further explore the mediating effect of the policy that transmitted by LGFVs' operation status. (Acc)

（3）Hypothesis III

For hypothesis III, we use (Type) as the dummy variable to classify whether the bond is issued by LGFV, and use (Private) as the dummy to identify whether the issuer is being mixed reformed. We choose the product of Type and Private as the independent variable. To determine whether the quasi-municipal bonds

have gone through the mixed reform, we draw on the approach of (Huixian Ma, Shanshan Chen, 2021), which uses the presence of non-state capital among the top ten shareholders in the shares of LGFVs to indicate whether the firm had been mixed ownership reformed. We use (Private) to denote this variable.

3.2.2 Dependent variables

For hypotheses 1 and 2, we choose the average annual credit spread between quasi-municipal bonds and Treasury bonds of the same maturity as the explanatory variable: it can reflect the market's financing cost for municipal bonds. For hypothesis III, we choose the annual average credit spread between quasi-municipal\private corporate bonds and Treasury bonds of the same maturity as the explanatory variable.

3.2.3 Control variables

The factors affecting the credit risk spreads of quasi-municipal bonds can be summarized as (macro, regional) factors, issuer specific and bond specific factors. Bond specific factors includes the credit rating, the maturity, the volume and whether having special of the bond. Issuer specific factors includes the asset level, the leverage, the ROA and the turnover rate of the company. Macro-level factors included GDP, CPI, the marketization rate of the province where issuer located. The full list of variables have shown in table below.

TABLE 2: *Variable description*

Variables	**Variable Symbols**	**Variable Definition**
Dependent variable	Spread	Bond credit spread, the difference between bond interest rates and Treasury rates over the same period
Main independent variables	Private	Statistics based on the nature and shareholding data of the top ten shareholders to construct whether there is private shareholding

	Private2	Using the relationship between state-owned and non-state-owned equity in the top ten shareholders, the equity convergence rate (Private2) is equal to Ep/Es if state-owned equity (Es) is greater than non-state-owned equity (Ep), and vice versa, equal to Es/Ep
	Type	Whether quasi-municipal bonds, yes, take 1, non-0
Moderator variables	LFS1	Log regional GDP per capita
	LFS2	Log regional fiscal revenue per capita
	LFS3	Local government debt ratio
	LFS4	Local government financial self-sufficiency rate
	LFS5	Local government debt ratio
Intermediate variables	Acc	Company operations indicators one year before the reform policy (expressed in terms of financial indicators related to solvency, profitability, operating capacity and investment efficiency)
Bond Characteristics Control Variables (Bond)	Maturity	Bond term (years)
	Volume	Bond issue size (billion yuan, taking logarithms)
	Special	Whether it contains special terms such as resale clause and redemption clause. If yes, take the value of 1, if no, take the value of 0.
	Explicit	Whether there is a guarantee, if there is, take the value of 1, if not, take the value of 0
Issuer characteristics control variables (Issuer)	Rating	The issuer's credit rating of AAA is assigned to 4, AA+ to 3, and so on.
	Rating1	Debt rating at the time of issuance, the debt credit rating of AAA is assigned to 4, AA+ is assigned to 3, and so on
	Grade	LGFV's administrative level. Provincial level and above is assigned a value of 3 municipal level is assigned a value of 2, district and county level is assigned a value of 1.
	Area	Whether the LGFV Administration is in the development zone
	Asset	Company Size
	List	Whether the issuer is a public company.
	Leverage	Solvency (gearing ratio)
	Collateral	Fixed assets as a percentage of total assets
	ROA	Profitability
	Turnover	Operating capacity (asset turnover ratio)
Macroeconomic control variables (Macro)	GDP	GDP growth rate
	M2	M2 growth rate
	CPI	CPI growth rate
	Marketization	Marketability Index
	Risk Free Rate	Risk-free rate
	Yield Curve Slope	Yield curve slope

4. Methodology

4.1 Effect of LGFV ownership reform on implicit government guarantee

To examine whether the LGFV ownership reformed may affect the effect of implicit guarantee on LGFV's credit risk, we estimate the below regression model:

$$Spread = \beta_1 Private + \beta_2 LFS + \beta_3 Private * LFS + \beta_4 Macro + \beta_5 Issuer + \beta_6 Bond + \pi + \epsilon$$

where Spread is the difference between LGFV and Treasury rate over the same period, LFS is the strength of local financial support, and Private is the indicator of policy (the dummy of whether undergo mixed reform and the degree of it). Bond and Issuer captures bond and issuer firm's specific characteristics respectively, while Macro proxies for the macro and regional conditions. π are the year effect. It have been proved that implicit government guarantee will mitigate bond specific risk, so Beta2 is assumed to be negative. If the mixed ownership reform reduce the effect of implicit guarantee expectation in the market (Hypothesis I), Beta3 should be positive.

4.2 Mediation effect of LGFV ownership reform on SOE credit spread

$$Acc = \beta_1 Private + \beta_2 Issuer + \beta_3 Macro + \epsilon$$

$$Spread = \beta_4 Acc + \beta_5 Private + \beta_6 Issuer + \beta_7 Macro + \beta_8 Bond + \epsilon$$

We carry out mediation effect model to study whether the mixed ownership reform will bring the credit spreads of LGFVs closer to those of market-oriented companies by improving the operations of LGFVs (Hypothesis II), where Acc is a group of accounting feature of the LGFV. If the mixed ownership reform increase the operational and financial performance of the company and this impact is transmitted to credit risk, beta 1 and beta 4 should be significant.

4.3 Total effect of LGFV ownership reform on its credit spread

$$Spread = \beta_1 Type + \beta_2 Private * Type + \beta_3 Macro + \beta_4 Issuer + \beta_5 Bond + \pi + \epsilon$$

We assume that overall, the reform will make the difference in spread between the private company and the LGFV much closer (Hypothesis III) and estimate above regressions, where Type is the dummy of whether the company is LGFV or private company, Private means whether the firm has gone through the reform policy. According to literature, before the reform, the private firm has a significant higher risk premium, thus it has been proved that Beta1 should be negative, if the policy is effective, then beta2 should be positive.

5. Empirical Result

5.1 Summary statistics

(1) Basic descriptive analysis

TABLE 3 *Descriptive Statistics (Full Sample)*

Panel A: Chengtou Bonds

variable	Sample size	average value	standard deviation	minimum value	maximum value
Spread	5,276	2.34	1.189	-1.955	5.987
Private	5,276	0.028	0.166	0	1
Private2	5,276	0.019	0.127	0	1
Maturity	5,276	5.96	2.081	2	20
Volume	5,276	2.084	0.625	-1.204	4.382
Explicit	5,276	0.286	0.452	0	1
Special	5,276	0.824	0.381	0	1
Rating1	5,276	3.074	0.799	2	4
Rating	5,276	2.609	0.89	0	4
Grade	5,276	1.748	0.646	1	3
Area	5,276	0.132	0.339	0	1
List	5,276	0.002	0.048	0	1
Asset	5,276	24.238	1.233	20.939	27.768
Leverage	5,276	53.087	13.965	1.007	91.331

Collateral	5,276	7.153	13.469	0	85.638
ROA	5,276	1.169	1.082	-7.934	12.842
Turnover	5,276	0.081	0.087	0.0001	1.755
Panel B: POE bonds					
Spread	591	2.545	1.504	-1.867	6.941
Private	591	0	0	0	0
Private2	591	0	0	0	0
Maturity	591	4.528	1.471	2	10
Volume	591	2.364	0.877	-0.693	5.011
Explicit	591	0.117	0.321	0	1
Special	591	0.188	0.391	0	1
Rating1	591	3.521	0.71	1	4
Rating	591	3.354	0.831	1	4
Grade	591	2.259	0.551	1	3
Area	591	0	0	0	0
List	591	0.338	0.474	0	1
Asset	591	25.381	1.36	21.687	29.282
Leverage	591	70.116	13.316	15.28	91.687
Collateral	591	21.148	1.911	12.61	24.99
ROA	591	3.582	4.064	-0.532	48.354
Turnover	591	0.322	0.361	0.012	3.791
Panel C: Macroeconomics variables					
lnGDP	5,867	13.75	0.118	13.098	13.831
lnCPI	5,867	4.629	0.004	4.619	4.658
lnM2	5,867	14.479	0.137	13.655	14.598
Marketization	5,867	8.718	1.752	3.49	12
Risk Free Rate	5,867	2.303	0.821	0.04	4.159
Yield Curve Slope	5,867	0.685	0.674	-0.055	4.071
Type	5,867	0.899	0.301	0	1
Panel D: Government financial support variables					
LFS1	5,276	82,621,131	78,109,978	2,363,300	389,633,000
LFS2	5,276	10,072.93	9,410.07	705.069	66,977.49
LFS3	5,276	470.392	553.472	3.681	4,129.29
LFS4	5,276	60.589	21.872	7.983	112.351
LFS5	5,276	14.297	95.471	0.014	1,948.57

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(2) Subgroup comparison analysis and t-test

The entire sample was grouped according to the 4 level of credit rating of the bond issuer, and a t-test was conducted on the credit spread to show the univariate difference in credit spread between the

quasi-municipal bond and the private corporate bond. From Table 5, we can confirm that there is a significant credit spread difference between private company bond and quasi-municipal bond, which is significant at the 1% level for each credit rating level.

Table 6 presents group statistics and corresponding t-tests to show the univariate difference in credit spread between the bond issued by the mixed-ownership LGFV and by the unmixed LGFV, and it can be found that there is a significant difference in the credit spread between mixed-ownership reformed sample and unmixed sample for AA+ and AA-rated issuer, while for AAA-rated bonds of LGFVs, this difference exists but is not significant. The overall result suggests that there is a correlation between mixed ownership reforms and the credit spreads of quasi-municipal bonds.

TABLE 4 *Univariate Analysis of Yield Spreads.*

	privately-owned		LGFVs		Spread mean difference
	Number of issues	Average spreads	Number of issues	Average spreads	
AAA	335	1.733608	1117	1.277559	0.456049***(0.000)
AA+	141	3.505979	1322	1.972334	1.533645***(0.000)
AA	108	3.81742	2497	2.873674	0.943746***(0.000)

Note: *p<0.1; **p<0.05; ***p<0.01

TABLE 5 *Univariate Analysis of Yield Spreads.*

	mixed reform		Not mixed		Spread mean difference
	Number of issues	Average spreads	Number of issues	Average spreads	
AAA	89	1.282797	1028	1.277105	0.005692 (0.8952)
AA+	30	2.57544	1292	1.959369	0.616071***(0.010)
AA	30	3.670983	2467	2.866495	0.804488***(0.000)

Note: *p<0.1; **p<0.05; ***p<0.01

With the results of the above analysis, we have preliminarily explored the differences in credit spreads that exist between municipal bonds and private corporate bonds, and between reformed and unreformed quasi-municipal bonds.

（3） Correlation analysis

(This section has been removed due to page number limit)

5.2 Meditation effect of SOE ownership reform on implicit government guarantee

In this section, we try to explore whether the mixed ownership reform will reduce the market's implicit guarantee expectations by increasing the balances of control between state-owned and non-state-owned shares in quasi-municipal the LGFVs. Table 8 presents a summary of the regression results, with five local government financial strength indicators corresponding to five sets of regression results.

The regression results (1-1), (2-1) and (4-1) reveal that implicit local government guarantees will reduce the credit spreads of quasi-municipal bonds, as shown by the negative regression coefficients before log GDP per capita, log fiscal revenue per capita, and fiscal self-sufficiency. This represents that the higher the financial strength of local governments, the lower the credit spreads of quasi-municipal bonds, which shows the existence of implicit guarantees and is consistent with the general findings of previous researchers. However, according to results (3-1) and (5-1), the coefficients before the variables of local government indebtedness (LFS3) and local government debt ratio (LFS5) are negative, which means that the higher the local government indebtedness, the lower the credit spreads, which is inconsistent with the findings of the implicit guarantee research findings mentioned in section 2. This may be due to the fact that since 2017, according to the Notice on the Pilot Development of Local Government Special Bond Varieties with Self-balancing Project Revenue and Financing (Cai Wei [2017] No. 89), the scale of local government general debt and special debt is limited by the State Council and the local government can just reported to the National People's Congress or its Standing Committee for approval of debt, and the sub-regional limits of debt are determined by the Ministry of Finance based on factors such as the debt risk and financial capacity

of each region. After the announcement of the policy, local debt levels will be more strictly managed, and at the same time, since the amount of debt that localities are able to issue will be unified and approved and allocated by the Ministry of Finance, this may directly lead to the fact that only regions with higher local government financial strength can obtain more debt quotas, eventually leading to a trend of local government debt levels gradually showing more synchronization with the level of financial strength, and eventually leading to a situation where indicators reflecting local government debt and indicators reflecting the degree of economic development (fiscal revenue, GDP per capita, etc.) both show a trend that makes the credit spread of quasi-municipal bonds decline.

The regression results (1-2), (2-2), (3-2), (4-2) reveal that the coefficients of the interaction terms of the mixed ownership reformed dummy and local government financial strength are basically significant and opposite to the coefficient of the local government financial strength term, indicating that the reformed LGFVs are less rely on the local government financial guarantee, and the effect of government implicit guarantee is significantly reduced, presenting by a significant increase on credit risk. In addition, the regression results (1-4), (2-4), (3-4) and (4-4) show that the coefficients of the interaction terms of the equity convergence variable and the financial strength of local governments have opposite signs to coefficient before the LFS, and the interaction terms of the log of GDP per capita, the log of average fiscal revenue and equity convergence are significant at the 10% level, indicating that to some extent, the mixed reform makes the credit spreads of quasi-municipal bonds upward through the balances of control effect, and hypothesis I holds. It is worth noting that this effect is only significant in the log of GDP per capita and the log of average fiscal revenue, for other indicators reflecting government financial strength, such as fiscal self-sufficiency rate, government debt ratio and government debt ratio, the mediation effect of equity convergence on them is not significant, which may indicate to some extent that (1) there are other transmission channels other than

the balances of control effect of the mixed reform (2) the mixed reform may have a different moderating effect on debt-type indicators than on revenue-type (fiscal, degree of local economic development) indicators.

5.3 Mediation effect of SOE ownership reform on SOE credit spread

In this section, we assume that the mixed ownership reform will bring the credit spreads of quasi-municipal bonds closer to those of market-oriented companies by improving the operating conditions of LGFVs, and this effect can be transmitted to the credit spreads of quasi-municipal bonds; i.e., we assume there is a transmission path of "mixed reform - operational conditions - credit spreads", and thus the stepwise test coefficient method is used to analyze the meditation effect. The first step is to test the existence of the main effect of mixed reform on credit spreads, the second step is to test the effect of mixed reform on the intermediation of three financial/accounting indicators, and the third step to test the effect of intermediation of financial indicators on credit spreads.

Table 9 is a summary of the regression results, where regression results (1), (3), and (5) reflect the impact of the mixed reform policy on the credit spread. The above three main effects of can be seen that the mixed reform has a significant positive effect on the credit spread, the premise that the mediating effect holds, so the test of mediating effect can be conducted. Next, we test the relationship between the independent variables and the mediating variables, through the regression results (2), (4), (6) can be found that there is a significant negative and positive effect of the mixed ownership reform on the asset-liability ratio and the total turnover ratio respectively, implying the mixed ownership reform improve of the indebtedness status of the LGFVs, as well as makes the company's operating efficiency improved. However, it is worth noting that the effect of the mixed reform on the company's return on assets is not significant, indicating that the mixed

reform does not significantly improve the company's profitability. Finally, we examine the mediating effect of financial indicators on credit spreads and find that the coefficients before return on assets and total turnover are not significant, indicating that these two intermediary indicators do not have a significant effect on credit spreads. The coefficient before debt-asset ratio is significant and has a negative sign, indicating that an increase in debt-asset ratio will significantly reduce credit spreads. Generally, high debt implies a higher risk of default, so companies with high gearing generally issue bonds with higher credit spreads, but the opposite is the case here, i.e., for LGFVs, high debt-asset ratio does not signal high risk. This may be related to their overall low level of marketization and therefore does not reflect the characteristics of a market-oriented economic agent.

Due to the insignificance of the coefficients in the second step of the test, we used the bootstrap mediated effects test in an attempt to improve the accuracy of the test. The basic principle of the bootstrap method is to perform a put-back sampling, obtain multiple smaller bootstrap samples and the corresponding coefficient estimates, and finally obtain confidence interval of the coefficients by ranking these estimates from smallest to largest. This method has higher statistical validity compared to other mediating effect test methods (Wen, Zhonglin, and Ye, Baojuan, 2014).

Table 10 shows the results of bootstrap method to test the mediating effect, the results show the mediating effect of return on assets, debt-asset ratio and total turnover ratio respectively after 1000 times of boot-strapping. According to the results, the mediating effects of the three financial indicators only account for 0.46%, 4.959% and 0.44% of the total effect of the mix on credit spreads, where the coefficients of the indirect effects corresponding to return on assets and turnover are not significant, indicating that the two do not play the role of transmission mediator for the effect of the mix on credit spreads. For the debt-asset ratio, the indirect effect is significant, which can indicate that there is a mediating effect of debt-asset variables, i.e.,

the transmission path of "mixed ownership reform - debt-asset ratio - credit spread" exists, but the combined results of the previous regressions show that this transmission path is not "mixed reform - debt asset ratio ratio falls - credit spreads falls", but "mixed reform - debt asset ratio falls - credit spreads rise". We believe that this is mainly because the market signal transmitted by the mixed reform through the decrease in gearing is not a signal that the credit risk of LGFVs is reduced, but a signal that LGFVs are more market-oriented. While the long-standing policy burden of LGFVs has led them to borrow heavily from banks and issue a large number of bonds to over-invest in low ROI projects, the mixed reform will not only bring about a reduction in LGFVs' government intervention and policy burden, but also a reduction in LGFVs' need to raise funds and a rise in LGFVs' need to use internal cash flows for financing. This may be reflected in a decrease in the debt ratio of LGFVs and an increase in LGFVs' credit risk. Thus, the market-based effect of the the reform of LGFVs is a decrease in their debt ratios but an increase in credit spreads.

However, it is worth noting that the direct effect of the mix on credit spreads is more significant and much larger than the indirect effect, and the overall mediating effect is limited.

5.4 Total effect of SOE ownership reform on its credit spread

Finally, we try to test whether the H3 hypothesis (H3: Mixed ownership reform will reduce the spread between private corporate bonds and quasi-municipal bonds) holds. Since after calculating the variance inflation factor (VIF), we find that the VIF coefficients of log GNP (lnGDP) and log consumer index (lnCPI) are 83.289 and 65.096 respectively, which have serious multicollinearity, so in order to ensure the accuracy of the regression results, this paper excludes these two macro control variables. The final regression results are shown in Table 11.

According to regression result (1), there is a significant difference in spread between the

quasi-municipal bonds and private company bonds, as shown by the fact that, all other things being equal, the credit spread of quasi-municipal bond is 0.725% lower than that of non-quasi-municipal bonds (private company bonds) , which is in line with theoretical expectations. And according to regression result (2), the difference in spread between quasi-municipal and private company bonds will be 0.345% smaller if the bond issuer has undergone the reform, reflecting a significant moderating effect. In summary, Hypothesis III holds, that mixed ownership reform narrows the gap between quasi-municipal bonds and private corporate bonds, thus improves the marketization degree of quasi-municipal bonds. If we combine the result from Section 5.2 and Section 5.3, we can prove that the policy improve the maketization degree of LGFVs through the transmission of reducing implicit guarantee and through increasing its ability of debt control.

For other control variables, consistent with corporate bond related literature, regression (1) shows that bond issuer rating, whether the issuer is a listed company, and issuer debt-asset ratio are significantly negatively related to credit spreads, while issuer size is significantly positively related to credit spreads. The presence of significantly and positively relationship suggests that the presence of explicit guarantees will increase the credit spreads of bonds, which is contrary to the previous researchers' findings, but we observe that the current studies where empirical results contrary to ours' use a sample of quasi-municipal bond data as of the end of 2017, which differs from the sample we use here. Also, the implicit guarantee is not considered in the explicit guarantee variable; if we take the implicit guarantee into account it may explain this result, for it is possible that unsecured municipal bonds will set lower interest rates if firms believe that investors have a higher level of trust in the implicit guarantee and will demand a lower risk premium.

TABLE 8 *Regression result (Hypothesis I)*

	(1-1)	(1-2)	(1-3)	(1-4)	(2-1)	(2-2)	(2-3)	(2-4)	(3-1)	(3-2)	(3-3)	(3-4)
private	0.390***	-3.227**			0.423***	-1.281			0.386***	0.214**		
	(0.070)	(1.502)			(0.069)	(0.814)			(0.071)	(0.099)		
Private2			0.596***	-5.178*			0.647***	-2.057			0.583***	0.475***
			(0.094)	(2.989)			(0.093)	(1.478)			(0.094)	(0.167)
LFS1	-0.074***	-0.076***	-0.073***	-0.074***								
	(0.015)	(0.015)	(0.014)	(0.015)								
Private*LFS1		0.196**										
		(0.081)										
Private2*LFS1				0.311*								
				(0.161)								
LFS2					-0.203***	-0.207***	-0.204***	-0.206***				
					(0.017)	(0.018)	(0.017)	(0.017)				
Private*LFS2						0.180**						
						(0.086)						
Private2*LFS2								0.278*				
								(0.152)				
LFS3									-0.00000	-0.00001	-0.0001***	-0.0001***
									(0.00002)	(0.00002)	(0.00002)	(0.00002)
Private*LFS3										0.0004**		
										(0.0002)		
Private2*LFS3												0.0002
												(0.0003)
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,276	5,276	5,276	5,276	5,276	5,276	5,276	5,276	5,177	5,177	5,276	5,276
Adjusted R2	0.572	0.573	0.573	0.573	0.581	0.581	0.582	0.582	0.571	0.571	0.572	0.572

	(4-1)	(4-2)	(4-3)	(4-4)	(5-1)	(5-2)	(5-3)	(5-4)
private	0.387***	0.416			0.377***	0.215**		
	(0.069)	(0.278)			(0.070)	(0.095)		
Private3			0.565***	0.159			0.588***	0.440***
			(0.092)	(0.553)			(0.094)	(0.162)
LFS4	-0.009***	-0.009***	-0.008***	-0.008***				
	(0.001)	(0.001)	(0.001)	(0.001)				
Private*LFS4		-0.0004						
		(0.004)						
Private2*LFS4				0.006				
				(0.008)				
LFS5					-0.0003***	-0.0003***	-0.0003***	-0.0003***
					(0.0001)	(0.0001)	(0.0001)	(0.0001)
Private*LFS5						0.031**		
						(0.012)		
Private2*LFS5								0.027
								(0.024)
Constant	7.115***	7.112***	7.384***	7.395***	6.761***	6.795***	7.048***	7.041***
	(0.506)	(0.506)	(0.507)	(0.508)	(0.508)	(0.508)	(0.515)	(0.515)
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,177	5,177	5,276	5,276	5,276	5,276	5,276	5,276
Adjusted R2	0.585	0.585	0.585	0.585	0.571	0.571	0.571	0.571

Note: *p<0.1; **p<0.05; ***p<0.01

TABLE 9 *Regression results (Hypothesis II)*

	Model 1: ROA - main effect	Model 2: ROA-mediated effects (first step)	Model 3: Gearing ratio - main effect	Model 4: Gearing-mediation effects (first step)	Model 5: Turnover rate - main effect	Model 6: Turnover rate - mediating effect (first step)	Model 7: mediating effects (step 2)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
implicit variable	Spread	ROA	Spread	Leverage	Spread	Turnover	Spread
Private1	0.392***	-0.096	0.413***	-5.093***	0.392***	0.022***	0.390***
	(0.070)	(0.081)	(0.069)	(0.992)	(0.070)	(0.007)	(0.070)
Leverage	-0.004***	-0.022***			-0.004***	0.002***	-0.004***
	(0.001)	(0.001)			(0.001)	(0.0001)	(0.001)
Collateral	0.0002	-0.001	0.0003	-0.035***	0.0001	-0.0001	0.0001
	(0.001)	(0.001)	(0.001)	(0.013)	(0.001)	(0.0001)	(0.001)
ROA			-0.006	-3.347***	-0.017	0.026***	-0.019
			(0.011)	(0.163)	(0.011)	(0.001)	(0.012)
Turnover	0.014	3.406***	-0.044	31.111***			0.078

	(0.129)	(0.150)	(0.132)	(1.887)			(0.135)
Constant	7.700***	7.287***	8.276***	-103.727***	7.871***	0.340***	7.842***
	(0.545)	(0.625)	(0.543)	(7.631)	(0.549)	(0.055)	(0.552)
Observations	5,276	5,276	5,276	5,276	5,276	5,276	5,276
R2	0.574	0.295	0.573	0.363	0.574	0.156	0.574
Adjusted R2	0.572	0.292	0.571	0.360	0.572	0.152	0.572

Note: *p<0.1; **p<0.05; ***p<0.01

TABLE 10 *Mediation Effect Analysis*

ROA

	modulus	95% CI Lower	95% CI Upper	p-value
indirect effect	0.0018	-0.00266	0.00	0.81
direct effect	0.3904	0.24661	0.54	<2e-16 ***
aggregate effect	0.39221	0.24702	0.54	<2e-16 ***
Percentage of intermediary effect	0.0046	-0.00730	0.01	0.81

Note: *p<0.1; **p<0.05; ***p<0.01

Leverage

	modulus	95% CI Lower	95% CI Upper	p-value
indirect effect	0.02037	0.00908	0.03	<2e-16 ***
direct effect	0.3904	0.24318	0.54	<2e-16 ***
aggregate effect	0.41077	0.26387	0.56	<2e-16 ***
Percentage of intermediary effect	0.04959	0.02037	0.09	<2e-16 ***

Note: *p<0.1; **p<0.05; ***p<0.01

Turnover

	modulus	95% CI Lower	95% CI Upper	p-value
indirect effect	0.00172	-0.00367	0.01	0.55
direct effect	0.3904	0.24725	0.53	<2e-16 ***
aggregate effect	0.39213	0.24706	0.53	<2e-16 ***
Percentage of intermediary effect	0.0044	-0.00954	0.03	0.55

Note: *p<0.1; **p<0.05; ***p<0.01

TABLE 11 *Regression Analysis (Hypothesis III)*

	(1)	(2)
Type	-0.725***	-0.725***
	(0.093)	(0.093)
Type*Private		0.345***
		(0.073)

Constant	6.079***	6.429***
	(0.916)	(0.918)
Year	Yes	Yes
Observations	5,867	5,867
Adjusted R2	0.536	0.538

Note: *p<0.1; **p<0.05; ***p<0.01

6. Robustness Check

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7. Conclusion

In this paper, we mainly investigate the marketization impact of the mixed ownership reform policy on SOEs and the two channels that the policy impact transmitted to the asset price. This paper mainly uses data of Chengtou (quasi-municipal) bonds and private ownership enterprise bonds issued by 2020, listed in Shanghai and Shenzhen and the interbank market as the research objects to conducts a multiple regression analysis. We explore three questions, the first is whether the mixed ownership reform reduces the role of implicit local government guarantees plays on the credit spreads of the quasi-municipal bonds, the second is whether the mixed ownership reform affects the credit spreads of quasi-municipal bonds by the way of affecting the operational situation of the company, and the third is whether the policy overall have a marketization effect. The findings are as follows:

(1) The mixed ownership reform will weaken the impact of implicit local government guarantees on the credit spread of the quasi-municipal bonds, while the higher the degree of equity convergence is, the smaller the impact of implicit local government guarantees on the spread of quasi-municipal bond will be. This indicates that the mixed ownership reform makes private ownership capital and government ownership capital reach a certain balance of control. Even though most of the largest

shareholders of LGFV are still local governments, this balance situation tends to reduce the business decisions that are in the interests of controlling shareholders but harm the interests of small and medium shareholders, resulting in less intervention of local governments in LGFVs. At the same time, such balances of control lead to a change in investors' asset pricing expectations for the LGFVs and a decrease in investors' expectations of implicit local government guarantees for quasi-municipal bonds, which finally leads to a credit separation between the local government and the LGFVs. In addition, it is worth noting that the indicators related to the debt of the local government and the indicators related to the financial strength of the local government gradually become more synchronized after the introduction of the policy of fiscal budget [2017] No. 89, and the traditional situation of using the high local debt situation to reflect the low financial strength of the local government may no longer be applicable.

(2) The mixed ownership reform can improve the operational status of LGFVs, and this effect can be transmitted to their credit spreads but may not cause the credit spread to decrease. First, the mixed ownership reform has a significant improvement on the operation situation of LGFVs, as reflected in (1) significantly reducing the debt-asset ratio of LGFVs and improving the over-indebtedness of LGFVs; (2) improving the total turnover rate of LGFVs and improving the operational efficiency of LGFVs; (3) the mixed ownership reform has a significant improvement on the return on asses of LGFVs before the epidemic, but for the full sample (including the epidemic period) the reform does not have a significant boosting effect on ROA. Second, (1) the improvement in turnover brought by the mixed ownership reform is not significantly transmitted to the credit spreads and does not show a significant decrease in risk; (2) the improvement in ROA brought by policy is significantly transmitted to the asset price of LGFVs, causing the credit spread to decreases; (3) the decline in debt

brought by the mixed ownership reform is significantly transmitted to the credit spreads, but the second step of this mediating effect is positive, indicating that the decrease in the debt ratio raises the credit spreads of LGFVs. This anomalies may because the LGFVs have higher policy burdens, and the market signal transmitted by the decline in debt-asset ratio is not a direct signal of lower credit risk for LGFVs, but rather a signal of a decline in the public good burden of LGFVs and a decline in government intervention, which manifests as an increase in credit risk for LGFVs.

(3) The mixed ownership reform will significantly narrow the spread between quasi-municipal bonds and private corporate bonds, and the regression results show that the difference between quasi-municipal bonds and private corporate bonds will narrow by 0.345% compared to non-reformed quasi-municipal bonds. The mixed ownership reform has brought the asset pricing levels of quasi-municipal bonds more closely in line with the bonds of the private ownership enterprises, suggesting that the policy has had significant success. LGFVs are gradually becoming market-based financing agents.

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