
**The role of government intervention in financial development:
micro (firm) evidence from China**

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ABSTRACT

This paper distinguishes between different forms of government intervention upon a firm, including the firm's tax burden, sales to the government and state shares. To the best of our knowledge, we offer a first attempt to explore how these types of government intervention affect the micro-financial development (measured by a firm's change of the current financial access relative to that in the last year). With evidence from China, the analysis confirms that the micro-financial development is promoted by both the firm's tax burden and sales to the government (i.e., government purchases from the firm), but it is constrained by the firm's state shares. The empirical findings remain robust to the endogeneity issue and different samples. Given that governments in most countries explicitly or implicitly dictate financial resources, the results can offer applications for government policies or firm's financing strategy.

Keywords: Government intervention; financial development; China

JEL Classification: G38; G21; P20

1. Introduction

Governments have a very important role to play in promoting well-functioning financial systems (Demirgüç-Kunt, 2010). However, what is the role of governments for financial development? This paper is motivated by this question to distinguish between different functions of government intervention and then to explore how those types of government intervention functions affect financial development. An additional novelty of the paper is that it observes both government intervention and financial development on the micro level. More specifically, it captures the micro-financial development with a firm's change of financial access relative to that in last year (Wang and You, 2012). In addition, it distinguishes between three types of government intervention upon a firm, i.e. redistribution, government purchases and (the public) entrepreneurship (Stiglitz, 1989). The corresponding types of government intervention on a firm are in the forms of the firm's tax burden, sales to the government and state shares, respectively.

With evidence from China, the empirical findings confirm that the micro-financial development is promoted by the firm's tax burden and sales to the government, but it is constrained by the firms' state shares. Considering that the measure of tax burden (i.e., sales to the government) may have a reverse causality with corporate finance, the analysis makes use of the instrumental methodological approach (IV) to remove the presence of any endogenous bias. Precisely, the analysis uses the number of taxation-interaction days to instrument tax burden, whereas it instruments sales to the government with the computerization degree. For one thing, taxation-interaction days

are positively related to the firm's tax burden, but they are irrelevant for corporate finance. For another, the computerization degree is one important reference of the government for contract awarding, but financial institutions only examine the financial state of the firm for their credit extension.¹ Thus, our IVs can only affect micro-financial development through tax burden (i.e., sales to the government). Such estimates confirm the presence of a positive effect of tax burden (or sales to the government) on micro-financial development.

To test the robustness of our estimates, the analysis splits the complete sample for further estimations. First, it repeats the previous estimations with the samples of Small and Medium Enterprises (SMEs) and large enterprises, respectively. Second, it splits the sample into two samples based on the economic development of the city where the surveyed firm is located. More precisely, it uses the medium value of GDP per capita in the complete sample to divide it into two sub-samples. Then, it performs the same estimations with sampled firms located in low- or high-developing cities. The results illustrate that the predicted relationships are significant across different firm sizes (i.e., SMEs and large enterprises) or different geographical locations (i.e., low- vs high-developing cities).

This paper collects evidence from China for the following reasons. First, as the largest developing economy, legal regimes (La Porta et al., 2004) and financial insti-

¹Put it differently, the effect of this IV on financial development for a firm is negligible. In particular, the analysis measures the computerization degree with the ratio of staff regularly using computers in the firm. Financial institutions naturally pay little attention onto the ratio of staff regularly using computers for their decisions on credit extension.

tutions (Linton, 2006) in China are undeveloped. This characteristic is representative for most developing countries. Second, data come from the Investment Climate Survey undertaken by the World Bank in 2005. The survey provides a rich sample of cities (120 cities) with various degrees of government intervention and financial development in a micro economy. The rich sample reveals the relationship between the variables under investigation.

To the best of our knowledge, this paper offers a first attempt to explore different types of government intervention for micro-financial development. We admit a large number of works in the issue of government intervention on corporate finance (see Fan et al. 2011; Cull et al. 2015), but this paper distinguishes different types of government intervention and for the first time it explores their impact on micro-financial development. Therefore, it also contributes to development economics in the issue of government intervention. Since the public choice school, the academic world has viewed government intervention as a ‘grabbing hand’ (Becker, 1983; Alesina et al., 1992; Tanzi and Schuknecht, 2000). However, the view of this ‘grabbing hand’ hypothesis has been challenged (Hopkin and Rodriguez-Pose, 2007). A ‘helping hand’ instead of government intervention has been studied for economic development (Che, 2005; Li et al., 2008). Given that governments in most countries explicitly or implicitly direct financial resources (Ayyagari et al., 2013; Hart, 1997), this paper offers applications in firms’ financial management with response to different types of government invention. Second, this paper contributes to the literature on financial development. The current financial/development economics literature focuses on the macro-financial development

(Aggarwal et al., 2011). Precisely, the existing literature uncovers multiple sources of macro-financial development, including economic growth (La Porta et al., 1997, 1998; Boyd et al., 2001; Beck et al., 2003; Djankov et al., 2007), Foreign Direct Investment (Alfaro et al., 2009), portfolio investment (Bussière and Fratzscher, 2008) and institutional reforms (Haselmann et al., 2010). However, there is a dearth of the literature about the role of governments. Therefore, the various effects of government intervention uncovered in this paper could shed more light on the financial development consequences due to the governments' role.

The rest of the paper is structured as follows. Section 2 provides a theoretical framework to explain how the micro-financial development is determined by government intervention in the form of tax burden, and sales to the government or state shares. Section 3 provides data description, while Section 4 reports the main results to test the relevant hypotheses. Section 5 checks out the robustness of the estimates, and finally, Section 6 concludes.

2. A theoretical framework

This section first illustrates the institutional background of China's financial system. Next, it uncovers why various types of government intervention can affect financial development in a micro economy.

2.1 Government intervention in corporate finance

Government intervention is crucial in China's financial system. First, China's fi-

financial system consists of financial institutions, stocks, bonds and venture capital, all of which are partially or wholly controlled by the government (Linton, 2006; Ayyagari et al., 2010; Allen et al., 2005). China's open-door policy empowers the local governments with three administrative decentralization phases. One of these three phases delegates state-owned-enterprises and financial institutions to local governments. As a result, local governments have the power to intervene in corporate finance. Second, local governments have an incentive to intervene in corporate finance, because in the absence of legal institutions, every chief official of local governments is incentivized to develop economics. Correspondingly, local governments actively create a business-friendly environment for firms (Huang, 1998). Third, financial institutions are also incentivized to allow local governments to intervene in their credit extension activities. If firms are financed with the intervention of local governments and then fall in financial distress, these firms or the corresponding financial institutions can be bailed out by local governments. As one of illustrative clues, banks have to support investments with the pressure from local governments, such that 30-40% of bank loans in China were not recovered in March 2006 (Economist Intelligence Unit, 2006), but only one bank was allowed to file bankruptcy in the People Republic of China's history (Linton, 2006).

The above factors contribute to local governments to build an alliance structure with financial institutions and firms (Wang, 2007). The alliance guarantees the important role of government intervention for corporate finance. In particular, this subsection describes China's investment climate, but the role of government intervention

can be also generalized for other countries.² The effect of government intervention on micro-financial development can be explained in detail in the following subsection.

2.2 Hypotheses tested

In principle, local governments contribute ‘critical inputs’ in financial markets (Bryd, 1990; Chang and Wang, 1994; Naughton, 1992, 1994), such that government intervention can determine corporate finance. Moreover, government intervention can encourage the improvement of information infrastructure (Djankov, et al., 2007), property rights protection, and contract enforcement (Haselmann et al., 2006) to promote corporate finance. Ultimately, financial development promotes economic growth (King and Levine, 1993; Levine and Zervos, 1998) through more-efficient resource allocation and productivity growth (Beck et al., 2000). To uncover the foundations of financial development, the later contents focus on micro-financial development, i.e., financial development for a firm. For expositional ease, we use hereafter the term ‘financial development’ to imply ‘micro-financial development’ or ‘financial development for a firm’. The following will distinguish how the distinct types of government intervention affect financial development.

2.2.1. Financial development and tax burden

In terms of redistribution aspects, governments impose a tax burden on a firm. In comparison with other tax indicators, we choose to focus on the tax burden because it objectively reflects the degree of government expropriation on a firm. Moreover, tax

² Governments in most countries more or less intervene in corporate finance (Hart, 1997).

burdens can be precisely quantified by a firm's accounting report. Due to its objectiveness, tax burdens have been used to explain firms' performance or behavior in the current literature (Cai et al., 2011). We predict a promotion effect of the tax burden on the financial development for a firm (i.e., micro-financial development). First, because the access to finance is a critical mechanism for income equality and economic growth (Demirgüç-Kunt, 2010), governments intervene for micro-financial development. Precisely, when these firms contribute taxes to local governments, local governments are incentivized to support firms' operations and growth (Wang, 2007). For the case of sustainable growth, incentivized local governments (and the corresponding officials) will breed a business-friendly environment for firms (Huang, 1998).

In our research background, China's local governments construct a strategic alliance with financial institutions and firms; as such, local governments more actively intervene in financial institutions' credit extension to guarantee firms' financial access. In fact, this alliance-constructing phenomenon is not only limited in China, but it also occurs in certain developed countries, such as Japan, Singapore and other high-developing economies (Li, 2003). According to Teng and Das (2008), the strategic alliance strategically allocates resources to form a joint competition.

Hypothesis 1: the tax burden of a firm promotes financial development for the firm.

2.2.2. Financial development and government purchases

In the purchase aspect, governments intervene to pay for sales from firms. Gov-

ernment expenditure is always used to capture the size of government intervention in the relevant macro literature (Scully, 1991; Nitzan, 1994; Goel and Nelson, 1998; Mauro, 1998). At the level of micro economies, government intervention in the form of purchases is captured by the government purchases from the firm. To clarify our focus, we do not use the word of ‘government expenditure’ in this paper, which is mainly referred for macro government consumption. Instead, we interchangeably use ‘government purchases’ and ‘sales to the government’ because we use the latter to measure the former (see Section 3).

We predict a promotion effect of government purchases on the firm’s financial development. According to the creditor power theory pioneered by Aghion and Bolton (1992) and Hart and Moore (1994, 1998), when creditors more easily force repayments, grab collaterals or gain the control of firms, they are incentivized to extend more credit. When firms have a direct economic connection, such as sales to the government, financial institutions as creditors can seek for help from the government for debt disputes. For instance, even when governments have no obligation for corporate finance under a Public-Private Participation scheme, the private firms under financial distress are bailed out by the government (European Commission 2004; Fu, 2014). Moreover, according to the creditor information theory pioneered by Jaffe and Russell (1976) and Stiglitz and Weiss (1981), when creditors have more information about borrowers, they require a smaller information rent. If governments choose to purchase from a particular firm, they actually transmit a signal that the firm is trustworthy. Thus, the firm obtains a favorable condition for external finance. Djankov et al. (2007) have already confirmed

that credit is extended by creditors' power and information. Given that firms with sales to the government have advantages described as above, the financial development for a firm is guaranteed by government intervention.

Hypothesis 2: government purchases from a firm promote financial development for that firm.

2.2.3. Financial development and state shares

In the entrepreneurship aspect, governments intervene as the owners of state shares. According to the current literature (e.g., Ales and Di Tella 1997; Tanzi 2000), the standard measure of government intervention in the ownership is the state share. On one hand, state shares can improve financial development for a firm, i.e., governments can intervene in the form of state shares to promote micro-financial development. State shares indicate a firm's political connection (Dong et al., 2016), which fosters firms to obtain government support (Agrawal and Knoeber, 2001; Li et al. 2008) and favorable treatment on financial access (Khwaja and Mian, 2005; Faccio, 2006). On the other hand, because the property rights of state shares are unclearly specified, the state-owned-enterprises have a principal-principal problem (Dharvadkar et al., 2000; Young et al., 2008). Governments need to delegate a particular official to undertake the role of the state-share owner. Even when the government delegation can deal with the principal-principal problem, the government delegator has weak incentives to monitor the corporate governance. Accordingly, the principal-agent problem is inherently unavoidable (Guo, 2015).

We predict that government intervention in the form of state shares constrains micro-financial development. State shares, as a proxy of political connections, may represent an advantage for corporate finance, but governments' financial support must be based on effective corporate governance. Due to the potential presence of weak entrepreneurship, state shares lead into ineffective internal and external monitoring, such that China's firms choose other financing methods, rather than loan borrowing (Liao et al., 2014). In particular, the financial sector dominates trends in the financial system (e.g., Ayyagari et al., 2010). The abandonment of loan borrowing indicates that the weak public entrepreneurship attached in state shares seriously constrains the financial development for a firm.

Hypothesis 3: state shares in the ownership of a firm constrain financial development for the firm.

We do not deny, however, the likelihood that the positive effect of state shares on financial development due to political connections may exceed the negative effect of state shares due to weak entrepreneurship. Accordingly, there is a counterpart hypothesis here yielding:

Hypothesis 3': state shares in the ownership of a firm promote the financial development of the firm.

3. Data

Data come from the Investment Climate Survey, which was undertaken by the

National Bureau Statistics of China in 2005. In this survey, there are 12,400 sample firms located across 120 cities in 30 provinces of China's mainland. Only Tibet is excluded by this survey. This is acceptable, because the institutional background in Hong Kong, Macao, Taiwan or Tibet is clearly different from that in the surveyed provinces. The World Bank provides other surveys for China's investment climate, but we select the survey in 2005, because only this survey provides adequate information on multiple types of government intervention. The survey does not involve listed firms.

3.1. Financial development (dependent variable)

Financial development is measured by how easy the firm is capable of obtaining formal loans (in 2004), given the government's macro policy in 2003. The survey requires the manager to select a response from 5 optional answers. Precisely, 1 represents no access to loans, while 5 indicates the easiest loan access.

The question can reflect the financial development for a firm, because corporate finance theoretically relies on financial loans. As mentioned above, data do not include listed firms. As such, the measure of financial development ignores the stock market. Moreover, the scale of China's bond market (the People's Bank of China, 2006) or its venture capital market (Zero2IPO, 2005) is smaller than 5% of the size of its banking sector before 2005.³ Therefore, either the bond market or the venture capital market is negligible relative to the banking sector. Accordingly, the change of a firm's access to

³ The dataset comes from the World Bank Investment Climate Survey in 2005. Thus, the relevant examples in this paper involve economic variables around 2004.

loans reflects micro-financial development. Our measurement is in agreement with the existing literature. In particular, Wang and You (2012) use the same survey and the same measurement for micro-financial development.

3.2. Various types of government intervention

We measure tax burden of a firm with the firm's tax per capital, based on standard criteria in the current literature (Cai et al., 2011). The survey provides the information of the actual tax and the number of employees. To better fit data, we calculate the tax burden with the natural logarithm of tax per capital.

Next, we measure government purchases from a firm with the ratio of the firm's sales to the government. According to Burguet and Che (2004), government intervention in the form of public purchases can lead to the presence of over-competition in the market. Accordingly, this form of government intervention for a firm cannot be overlooked.

We also measure state shares of a firm through the ratio of state shares in the firm's ownership. The survey provides the information of ownership structure in each surveyed firm. The ratio of state shares is the standard measure of government entrepreneurship in the literature (Tanzi, 2000).

3.3. Control variables

Our control variables involve the relevant characteristics of the firm, the CEO or

the market. At the firm level, we first control the firm's age (Cai et al., 2011). We calculate the logarithmic value of 2004 minus the established year. Second, we calculate the logarithm of employees number to control for the firm size (Lin et al., 2010a). In particular, we select the total employees number in 2003 to lessen any potential reverse causality. Finally, we control whether the firm has exports and control the ratio of the foreign share in the ownership structure, because exporting firms and foreign shares in the firm can gain the support of preferential policies for corporate finance ((Lemoine, 2000).

At the CEO level, we first control the incentive payment of CEOs. Precisely, if CEOs' annual income is directly related to the company's performance, the dummy of CEOs incentive payment equals 1. Incentive payoffs motivate CEOs to seek for better firm treatment (Lin et al., 2010b; Berk et al., 2004). Second, we also control CEOs' education and tenure, respectively. Because these two variables can generate social capitals of CEOs (Narayan et al., 2000; World Bank, 1998), they are expected to promote corporate finance.

At the market level, we first control the severity of anti-competitive behavior because anti-competition constrains information releases, as well as financial institutions' credit extension (Stiglitz and Weiss, 1981). Second, we control the severity of the access to legal information. In principle, the micro-foundation of law rules depends on whether individuals access legal information (Hadfield and Weingast, 2012; 2015). The survey requires managers to indicate how serious is the issue of anti-competition (or the

access to legal information) and whether it affects the firm's operation and growth. The answers are classified in five levels running from 0 (no severity) to 4 (very high severity). The definition of variables is reported in Table 1. We also present descriptive statistics in Table 2, along with a correlation matrix for the main variables in Table 3.

[Insert Tables 1 to 3 about here]

4. Empirical analysis

4.1. Baseline results

We test the relationship between financial development and government intervention by estimating the following equation through the ordinal logit modeling methodology:

$$FD_i = aGI_i + bZ_i + city_i + industry_i + e_i \quad (1)$$

where FD refers to financial development, GI is government intervention (including tax burden, state shares or government purchases) and Z_i represents the matrix of control variables introduced in the previous section. We control for city and industry fixed effects to avoid omitting relevant variables on the city (or industry) level. To estimate Equation (1), we use two types of standard errors. First, we use robust standard errors to avoid the heterogeneity issue and, second, we use cluster standard errors to lessen the heterogeneity issue across different firm groups. Considering that we have controlled the presence of city fixed effects, we control for the cluster standard errors at the level of a county.

Table 4 reports that the coefficients of tax burden and government purchases are positive and highly significant; whereas, the coefficients of state shares are negatively significant. Therefore, these findings confirm Hypotheses 1-3. Moreover, CEO tenure is insignificant and CEO education is partially and weakly significant, while all other control variables are statistically significant. More importantly, all of these significant variables obtain expected theoretical signals, indicating that our control variables include important relevant factors.

[Insert Table 4 about here]

The weak significance and the insignificance in our basic estimates are explainable. The CEO's education is only weakly significant to explain financial development when state shares are controlled (Table 4). The insignificance of the CEO's education with tax burden (or sales to the government) may derive from the fact that the CEO's social capital is much less important when the firm has formal economic links with the government. As showed by Wang (2007) and Li (2003), the majority of the firms with links to the government in emerging countries of East Asia rely on that government for corporate finance, which also explains why the CEO' tenure turns out to be statistically insignificant.

4.2. The endogeneity issue

Our baseline estimates include important control variables and add city and industry fixed effects to lessen the issue of variable-omitting bias. For one thing, our

(exogenous) control variables at the firm level can partially capture the information on endogenous variables. For example, firm's age (or firm's scale) controlled in this paper can partially reflect the firm's profit as an endogenous variable that theoretically affects the decision of financial institutions on their credit extension. For another, the presence of fixed effects actually controls the institutional factors on the city or industry level. The institutional difference that affects firms' behavior or performance is controlled by local governments on the city level (Du et al., 2008) or the regulator in the industry (Levchenko, 2007). Thus, both city and industry fixed effects help addressing the issue of the omitted institutional factors.

However, we admit that the tax burden (or sales to the government) has a potential reverse causality issue with financial development.⁴ Precisely, with better financial development, a firm can obtain higher revenues or profits that can enlarge the firm's tax burden or promote the firm to win public procurements. Therefore, we need to address the reverse causality issue for hypotheses H₁ and H₃, respectively. We estimate the following equation to remove the potential presence of endogenous bias by using the Instrumental Variables (IV) methodological approach:

$$FD_i = a\widehat{GI}_i + bZ_i + city_i + industry_i + e_i \quad (2)$$

$$\widehat{GI}_i = cIV_i + dZ_i + city_i + industry_i + e_i \quad (3)$$

where \widehat{GI} in Equation (2) is the fitted values of GI estimated from Equation (3). In

⁴State shares are politically sensitive (Wang and Chen, 2006); hence, they are exogenous for a firm's financial development.

particular, GI here is the tax burden (or sales to the government). We make use of robust standard errors or cluster standard errors in IV estimations. In particular, our IV estimations use a 2SLS methodological approach for two reasons. First, there is no generally acceptable ordinal Logit methodology in the IV framework, and second, 2SLS is consistent, though it turns out to be inefficient. More practically, as our estimates will show, the variable of interest is still significant even when we use the inefficient 2SLS.

IV in Equation (3) is the instrumental variable used for tax burden (or sales to the government). First, the IV of tax burden is the interaction days for tax issues. Precisely, our survey enquires the manager how many days the firm needs to interact with the taxation department for tax issues. We use the natural logarithm of [1 plus the number of days] to measure tax-interaction days. In principle, tax-interaction days are positively associated with the firm's tax burden.⁵ However, tax-interaction days are irrelevant for corporate finance, because the tax interaction involves only tax issues. Even if the taxation department affects firms' behavior, it can only expropriate firms directly or indirectly. Thus, it is unreasonable to believe that the taxation department can effectively intervene in the business of financial loans.

Second, the IV of sales to the government is the computerization degree. We measure the computerization degree through the ratio of the staff that regularly uses computers. The computerization degree partially reflects the degree of technical

⁵In the relevant literature, interaction is always used to measure the degree of government intervention (Du et al., 2008).

equipment, but the effect of this IV on the financial development for a firm is negligible. Precisely, financial institutions pay little attention onto the ratio of the staff that regularly use computers for their decisions on credit extension.

In sum, the IVs need to affect corporate finance through tax burden and sales to the government, respectively. As Columns 1-2 (Columns 5-6) in Table 5 illustrate, the variable of tax interaction days (or the computerization degree) is positively and significantly related to the tax burden (or sales to the government). The corresponding p-value in the 1st-stage estimates is 0.00, indicating that these IVs have a good explanation on our variables of interest, respectively.

As Columns 3-4 (Columns 7-8) of Table 5 highlight, the coefficient of the tax burden (or sales to the government) is significant and positive. Therefore, the estimates confirm that both Hypotheses 1 and 3 are robust to the potential endogenous bias. Moreover, all control variables in the 2nd-stage estimates carry the same signals as those in Table 4, except that in relevance to the CEO's education. In particular, the CEO's education is insignificant to explain the tax burden or sales to the government. Thus, our estimates (Table 5) do not challenge our baseline estimates (Table 4). In other words, these estimates remain robust to the potential endogeneity issue.

[Insert Table 5 about here]

5. Robustness tests

This section splits our sample to test the robustness of our estimates. More partic-

ularly, we first split the complete sample into two samples to include Small and Medium Enterprises (SMEs) and large enterprises, respectively. Second, we split our sample into two samples according to the economic development of the city where the surveyed firm is located. We make use of the 2SLS methodology for the estimations with the tax burden or sales to the government, whereas we make use of the ordinal logit method to estimate the effect of state shares.

5.1. SMEs vs. large firms

In theory, SMEs heavily rely on external financing and government interventions than large enterprises (Beck et al., 2005; 2006). We test the hypothesis that the effect of government intervention may be unimportant for large enterprises' external financing. To this end, Sample 1 includes only firms whose employees number is less than 300; whereas, Sample 2 includes large firms with the minimum of 300 employees.⁶

The results are reported in Table 6. As showed in Panel A of Table 6 (for SMEs), both the tax burden and sales to the government are positively associated with financial development; whereas, state shares are negatively associated with financial development. Panel B of Table 6 documents the same findings for the case of larger firms, indicating that our estimates for financial development are robust for either SMEs or large firms. In sum, these evidences show that the Hypotheses 1-3 are reliable and consistent across the different types of firm (i.e., SMEs or large firms)

⁶Because the SME definition in China is quite complex (Li and Rowley, 2007), we refer to International Finance Corporation (IFC) and Multilateral Investment Guarantee Agency (MIGA). As defined by MIGA or IFC, SMEs' employer number is less than 300 (Vasak, 2008). Most scholars in China's issues define SMEs or large enterprises with the benchmark of 300 employees (Lin et al., 2010a).

[Insert Table 6 about here]

5.2. *Low-developing vs. high-developing cities*

In principle, high economic development is related to solid economic institutions. Thus, the effect of government intervention may be much smaller for corporate finance when the surveyed firm is located in high-developing cities. Hence, we split our sample into two sub-samples based on the economic development of the city where the surveyed firm is located. Precisely, we use the median value of GDP per capita in our complete sample to divide our sample into these two sub-samples.

As Panel A in Table 7 illustrates, the financial development for a firm located in low-developing cities is significantly promoted by both the tax burden and sales to the government, but significantly constrained by state shares. Panel B in Table 7 provides supporting evidence to those firms located in high-developing cities, indicating that these estimates are robust to different geographical locations where firms are located. Simply speaking, we confirm that Hypotheses 1-3 are reliable across different firm locations (i.e., in low- vs high-developing cities).

[Insert Table 7 about here]

6. Conclusion

The recent literature highlights the important role of government interventions in financial development. To explore the mechanism of government interventions in financial development, this paper distinguished between various types of government

intervention, including tax burden, government purchases (sales to the government) and state shares. The former two types involved the redistribution and public purchases in terms of consumption, whereas the latter referred to the public entrepreneurship in terms of production. In comparison with most existing literature, the analysis focused on the role of financial development on the micro level. Precisely, it measured the micro-financial development through the change of a firm's financial change relative to that last year. With evidence from China, the findings confirmed that the micro-financial development was promoted by a firm's tax burden and sales to the government (i.e., government purchases from the surveyed firm), but it was constrained by the firm's state shares. Thus, government intervention in the functions of a redistribution mechanism and government purchases improved the financial environment of a firm; whereas, government intervention in the function of (the public) entrepreneurship constrains micro-financial development. The estimates remained robust to the potential endogeneity issue, as well as across different samples. In particular, different samples involved different sizes of the firms (SMEs vs. large firms) or different geographical locations (low- vs. high-developing cities).

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Table 1

Definition of variables and samples.

Panel A: Definition of variables

Variable	Definition	Notes
Dependent variable (Y)		
Financial development	“Has it become more or less difficult to apply for loans from the legal financial and banking institutions?”	Five ascending options
The variables of interest (X)		
Tax burden	Log (tax/employee number)	
State shares	The ratio of state shares in the surveyed firm’s ownership structure.	
Sales to governments	The ratio of sales to the government in 2004	
Control variables (Z)		
Firm age	Log of (2004-established year)	
Firm size	Log of employee number	
Exports	Only if the surveyed firm has export sales, the dummy of exports equals 1.	
Foreign shares	The percentage of foreign shares	
CEO’s Incentive payment	Only if CEO’s annual income is directly related to the company’s performance, the dummy of CEO incentive equals 1	
CEO education	The education level of the CEO.	Seven ascending options
CEO tenure	Log of (1+CEO tenure)	
Anti-competition	How serious is the problem of anti-competition	Five ascending options
Access to legal information	How serious is the problem of access to legal and regulatory information	Ditto
Instrumental variable (IV)		
Tax-interaction days	Log(1+tax interaction days)	IV for tax burden
The utilization of computer	The ratio of staff regularly using computers	IV for sales to governments

Panel B: Samples

Small or medium enterprises	If the employee number is less than 300
Large medium enterprises	If the employee number is at least 300
Firms located in	If the GDP per capital of the city where the surveyed firm is located is not larger than the medium level of GDP per capital.
Low-developing cities	
Firms located in	If the GDP per capital of the city where the surveyed firm is located is larger than the medium level of GDP per capital.
high-developing cities	

Table 2

Descriptive statistics.					
Variable	Obs	Mean	Std. Dev.	Min	Max
Financial development	11881	2.936	1.179	1	5
Tax burden	12388	2.524	1.408	-6.043	13.205
Sales to governments	12399	0.023	0.100	0	1
State shares	12400	0.134	0.316	0	1
Firm age	12400	2.128	0.880	0.693	4.934
Firm size	12395	5.553	1.491	0	11.700
Export dummy	12400	0.377	0.485	0	1
Foreign shares	12400	0.146	0.317	0	1
Incentivized CEO	12243	0.668	0.471	0	1
CEO education	12386	5.578	0.998	1	7
CEO tenure	12384	1.591	0.754	0	4.025
Anti-competition	12400	1.128	1.106	0	4
Access to legal information	12400	0.717	0.824	0	4

Table 3

Correlation matrix.

		1	2	3	4	5	6	7	8	9	10	11	12
1	Financial development	1											
2	Tax burden	0.137	1										
3	Sales to governments	-0.094	0.025	1									
4	State shares	-0.003	-0.019	0.102	1								
5	Firm age	-0.057	0.043	0.096	0.332	1							
6	Firm size	0.069	0.129	0.048	0.241	0.303	1						
7	Export dummy	0.131	0.010	-0.048	-0.027	0.052	0.356	1					
8	Foreign shares	0.194	0.030	-0.059	-0.144	-0.063	0.113	0.333	1				
9	Incentivized CEO	0.032	0.092	0.026	0.035	0.028	0.122	0.022	-0.129	1			
10	CEO education	0.060	0.194	0.062	0.160	0.085	0.351	0.179	0.165	0.121	1		
11	CEO tenure	-0.013	-0.041	-0.015	-0.110	0.167	-0.079	0.016	-0.064	-0.014	-0.167	1	
12	Anti-competition	-0.093	0.065	0.059	0.073	0.075	0.078	-0.001	-0.028	0.041	0.075	-0.031	1.000
13	Access to legal information	-0.062	0.071	0.041	0.052	0.048	0.116	0.068	0.055	0.041	0.104	-0.035	0.445

Table 4

Baseline estimates (ordinal Logit method).

Hypothesis:	H1		H2		H3	
	A firm's tax burden promotes financial development		A firm's sales to governments promotes financial development		A firm's state shares constrain financial development	
Tax burden	0.164*** (0.013)	0.164*** (0.015)				
Sales to governments			0.460*** (0.166)	0.460*** (0.165)		
State shares					-0.411*** (0.065)	-0.411*** (0.068)
Firm age	-0.118*** (0.022)	-0.118*** (0.022)	-0.127*** (0.022)	-0.127*** (0.022)	-0.085*** (0.023)	-0.085*** (0.023)
Firm size	0.051*** (0.014)	0.051*** (0.015)	0.056*** (0.014)	0.056*** (0.015)	0.072*** (0.015)	0.072*** (0.015)
Export dummy	0.129*** (0.041)	0.129*** (0.043)	0.112*** (0.041)	0.112*** (0.043)	0.100** (0.041)	0.100** (0.043)
Foreign shares	0.790*** (0.067)	0.790*** (0.073)	0.827*** (0.067)	0.827*** (0.075)	0.766*** (0.067)	0.766*** (0.074)
Incentivized CEO	0.143*** (0.039)	0.143*** (0.041)	0.167*** (0.039)	0.167*** (0.041)	0.165*** (0.039)	0.165*** (0.041)
CEO education	-0.002 (0.020)	-0.002 (0.020)	0.024 (0.020)	0.024 (0.020)	0.034* (0.020)	0.034* (0.020)
CEO tenure	0.006 (0.023)	0.006 (0.025)	0.009 (0.023)	0.009 (0.024)	-0.010 (0.023)	-0.010 (0.024)
Anti-competition	-0.102*** (0.018)	-0.102*** (0.019)	-0.095*** (0.018)	-0.095*** (0.019)	-0.094*** (0.018)	-0.094*** (0.020)
Access to legal information	-0.100*** (0.024)	-0.100*** (0.026)	-0.092*** (0.024)	-0.092*** (0.025)	-0.091*** (0.024)	-0.091*** (0.025)
Constant	-1.918*** (0.226)	-1.918*** (0.268)	-1.984*** (0.225)	-1.984*** (0.271)	-1.869*** (0.227)	-1.869*** (0.273)
City fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Std Errors	Robust	Clustered#	Robust	Clustered#	Robust	Clustered#
R square	0.050	0.050	0.047	0.047	0.046	0.046
No. of obs.	11,734	11,734	11,744	11,744	11,745	11,745

Notes: For these estimations, we use robust standard errors or clustered standard errors. Standard errors of estimate are given in brackets. # Considering that we have controlled for city fixed effects, we control for county cluster standard errors.+ $p < 0.15$; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table 5

IV estimates.

Hypothesis:	H1				H3			
	1 st -stage estimates		2 nd -stage estimates		1 st -stage estimates		2 nd -stage estimates	
Tax intervention	0.061*** (0.012)	0.061*** (0.012)						
Tax burden			1.408*** (0.303)	1.408*** (0.312)				
Computer utilization					0.030*** (0.006)	0.030*** (0.007)		
Sales to governments							14.726*** (3.375)	14.726*** (3.861)
Firm age	-0.029** (0.014)	-0.029** (0.014)	-0.033 (0.024)	-0.033 (0.025)	0.008*** (0.001)	0.008*** (0.001)	-0.192*** (0.035)	-0.192*** (0.038)
Firm size	0.034*** (0.010)	0.034*** (0.012)	-0.011 (0.020)	-0.011 (0.022)	0.001* (0.001)	0.001* (0.001)	0.023+ (0.016)	0.023 (0.017)
Export dummy	-0.145*** (0.028)	-0.145*** (0.031)	0.260*** (0.062)	0.260*** (0.062)	-0.009*** (0.002)	-0.009*** (0.002)	0.193*** (0.053)	0.193*** (0.057)
Foreign shares	0.222*** (0.052)	0.222*** (0.064)	0.175* (0.105)	0.175+ (0.117)	-0.019*** (0.003)	-0.019*** (0.003)	0.755*** (0.081)	0.755*** (0.089)
Incentivized CEO	0.154*** (0.025)	0.154*** (0.027)	-0.115* (0.063)	-0.115* (0.064)	0.001 (0.002)	0.001 (0.002)	0.087** (0.036)	0.087** (0.038)
CEO education	0.165*** (0.013)	0.165*** (0.012)	-0.220*** (0.055)	-0.220*** (0.057)	0.003*** (0.001)	0.003*** (0.001)	-0.050** (0.024)	-0.050** (0.025)
CEO tenure	-0.000 (0.016)	-0.000 (0.018)	-0.001 (0.025)	-0.001 (0.028)	-0.000 (0.001)	-0.000 (0.001)	0.015 (0.024)	0.015 (0.024)
Anti-competition	0.034*** (0.012)	0.034*** (0.012)	-0.104*** (0.021)	-0.104*** (0.021)	0.002* (0.001)	0.002* (0.001)	-0.083*** (0.018)	-0.083*** (0.018)
Access to legal information	0.052*** (0.016)	0.052*** (0.016)	-0.122*** (0.029)	-0.122*** (0.031)	0.001 (0.001)	0.001 (0.001)	-0.069*** (0.025)	-0.069*** (0.024)
Constant	0.190 (0.156)	0.190 (0.150)	-1.869*** (0.227)	-1.869*** (0.273)	-0.042*** (0.007)	-0.042*** (0.007)	3.560*** (0.229)	3.560*** (0.260)
P-value (F-statistics)	0.000	0.000			0.000	0.000		
City fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Std Errors	Robust	Clustered#	Robust	Clustered#	Robust	Clustered#	Robust	Clustered#
No. of obs.	12,153	12,153	11,672	11,672	12,235	12,235	11,744	11,744

Notes: Robust standard errors or clustered standard errors are used. Standard errors are given in brackets. # Considering that we have controlled for city the fixed effects, we control for county cluster standard errors.+ $p < 0.15$; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table 6

Robustness estimates based on firms' size.

Panel A: Small or medium firms

Hypothesis:	H1		H2		H3	
Method:	2SLS		2SLS		Ordinal Logit	
Tax burden	2.185** (0.866)	2.185** (0.868)				
Sales to governments			13.365*** (4.462)	13.365*** (4.619)		
State shares					-0.237** (0.115)	-0.237** (0.118)
Control var.	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes
City fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Std Errors	Robust	Clustered#	Robust	Clustered#	Robust	Clustered#
No. of obs.	6,130	6,130	6,176	6,176	6,176	6,176

Panel B: Large firms

Hypothesis:	H1		H2		H3	
Method:	2SLS		2SLS		Ordinal Logit	
Tax burden	0.891*** (0.234)	0.891*** (0.245)				
Sales to governments			19.988*** (7.127)	19.988*** (7.690)		
State shares					-0.569*** (0.087)	-0.569*** (0.089)
Control var.	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes
City fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Std Errors	Robust	Clustered#	Robust	Clustered#	Robust	Clustered#
No. of obs.	5,542	5,542	5,568	5,568	5,569	5,569

Notes: Robust standard errors or clustered standard errors are used. Standard errors are in brackets. # Considering that we have controlled for city fixed effects, we control for county cluster standard errors.+ $p < 0.15$; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table 7

Robust estimates based on geographic locations.

Panel A: Firms in low-developing cities

Hypothesis:	H1		H2		H3	
Method:	2SLS		2SLS		Ordinal Logit	
Tax burden	1.738*** (0.512)	1.738*** (0.526)				
Sales to governments			21.682*** (7.359)	21.682*** (7.589)		
State shares					-0.453*** (0.088)	-0.453*** (0.094)
Control var.	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes
City fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Std Errors	Robust	Clustered#	Robust	Clustered#	Robust	Clustered#
No. of obs.	5,915	5,915	5,949	5,949	5,949	5,949

Panel B: Firms in high-developing cities

Hypothesis:	H1		H2		H3	
Method:	2SLS		2SLS		Ordinal Logit	
Tax burden	1.163*** (0.390)	1.163*** (0.401)				
Sales to governments			10.872*** (3.322)	10.872*** (3.839)		
State shares					-0.350*** (0.099)	-0.350*** (0.099)
Control var.	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes
City fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Std Errors	Robust	Clustered#	Robust	Clustered#	Robust	Clustered#
No. of obs.	5,757	5,757	5,795	5,795	5,796	5,796

Notes: Robust standard errors or clustered standard errors are used. Standard errors are in brackets. # Considering that we have controlled for city fixed effects, we control for county cluster standard errors.+ $p < 0.15$; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.