

The Bank-firm Relationship: Helping or Grabbing?

Zhiyuan Chen Yong Li Jie Zhang¹

Abstract: This paper asks whether banks help or grab the enterprise in the real economy. Using the firm-level data on Chinese enterprises during 2001-2007, we find that interest payment of private enterprises is negatively related to the return on sales (ROS) and asset growth, which implies a detrimental effect of bank loans on private firms' performance. But this linkage is significantly positive for state-owned enterprises. Focusing on private enterprises, the grabbing impact from banks is strongest for firms without government subsidies, with low production values, with small size, or with low capital intensity. Our results are robust to alternative estimation approach and variable specifications. To conclude, the bank-centered financial system in China has assisted in the development of state-owned enterprises, while the development of private enterprises has been impeded by Chinese banks.

JEL classifications: G30, L0, C26

Keywords: Bank-centered financial system, Helping, Grabbing, Firm performance, China

1. Introduction

Banks help firms. It is Karl Marx who was perhaps the first to argue that the revenue of financial capital is a part of the return of industrial capital, implying that financial system and real economy are in essence symbioses (Karl Marx, 1848). Later studies tried to understand the inherent relationship between these two by investigating the relationship between financial system and economic growth. Earlier research by Goldsmith (1969), Shaw (1973), and McKinnon (1973) and recent literature by Stiglitz (1985), Mayer (1990), King and Levine (1993), and Levin (1997) have all found that the financial system plays an important role in economic development. To some extent, these studies did find a positive impact of the financial system on the real sector (Buera et al., 2011).

But banks can also grab the real economy. In many transition economies, financial system itself is a pursuer of profit maximization and can easily turn into an interest group (Rajan and Zingales, 2003). In particular, for developing countries under financial repression, a bank-centered financial system is established because of the pervasive governmental interference in the economy and the lack of sufficient control over the risks in developing the financial system. In such circumstances, on one hand, these banks can easily take advantage of their monopolistic power to exhibit their grabbing hand in the loaning game with enterprises: monopolistic banks often request high interest payments that are beyond enterprises' paying capability, force numerous bank charges on firms, or even encourage banking staffs seek bribes from enterprises. On the other hand, as the result of undeveloped financial system, informal finance replaces the formal finance. Some private small and middle-sized enterprises (SMEs) suffering from credit rationing are unable to obtain a sufficient amount of loans from formal financial institutions. They therefore have to resort to informal institutions by paying higher loaning costs and being exploited by the usurer. These factors may all intensify the grabbing

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effect of financial institutions on enterprises.

Using firm-level data on Chinese enterprises during 2001–2007, this study examines whether the Chinese bank-dominated financial system grabs real-economy enterprises. Our main findings are as follows. First, the relationship between interest payment and firms' performance, which are measured by ROS (return on sales) and asset growth rate, are found only negative for private firms. This implies that bank loans restrict private firms' development. In contrast, this linkage is positive for state-owned firms (SOEs hereafter), collective enterprises and foreign owned enterprises. Second, to private enterprises without government subsidies, of small size, of low production value, and with intensive labour, coefficients of the interest payment have larger economic significance, which indicates a stronger grabbing effect from banks. The results are robust to various variable specifications and alternative econometric techniques. Third, as an extension of our study, we find that the financial reform has not mitigated the grabbing effect of banking system on enterprises in our sample period.

Our study contributes to the existing literature in three respects. First, it complements the previous literature on the interplay between financial development and economic growth. Most of previous studies have found a symbiotic connection between finance development and economic growth although the causality remains uncertain (Green et al., 2005; Trew, 2006). Recent studies have examined the nexus between these two from the firm-level perspective (Ang, 2008). These studies, however, have ignored that, in a transition economy, financial repression may encourage banks to grab from enterprises and hence hamper their development. Employing the micro-level data of Chinese enterprises, this study provides a relatively comprehensive evaluation on the deprivation of the financial system to private enterprises. Our article therefore provides a micro perspective for a better understanding of the relationship between the financial system and economic development in developing countries.

Second, this study enriches the existing literature on the nexus between government intervention and the development of Chinese enterprises, which has become an increasing concern among researchers (Calomiris et al., 2010). Chinese private enterprises have been suffering from discrimination on governmental supporting policy and market entry. Such discrimination instigates enterprises to rely on political connections and rent-seeking activities, which in turn discourages private enterprises to improve their sustainability, resulting in constraining the economic development. This study provides new empirical evidence on the governmental interference in financial institutions and its negative influence on private enterprises.

Third, this study also contributes to former studies on financial reforms in developing countries. For developing countries with less developed financial systems characterized by financial repression, appropriate reform on financial institutions will spur the economic development (Greenwood and Jovanovic, 1990). But our findings nevertheless indicate that a reform focusing solely on creating more competitive financial institutions can aggravate the grabbing effect of banks on enterprises instead of preventing the banks from extracting rents from private enterprises. This reminds us that designing the financial reform in developing countries, such as China, has to target the integrity and systematization of the financial system and real economy.

The remainder of this paper is organized as follows. Section 2 provides a theoretical framework; we also propose several hypotheses to be tested. Section 3 discusses the empirical

strategy. Section 4 describes our data source and the data cleaning process. Section 5 reports the empirical results. Section 6 extends to investigate the impact of Chinese financial reform. The last section concludes.

2. Theory and Hypotheses

In this section, we analyse the incentive of bank managers under the Chinese institution, which enables us to theoretically analyse the bank-firm relation. This section divides into 3 parts. In the first part, we discuss the incentive of bank managers who offer bank loans; we then propose a baseline hypothesis regarding different ownership structures. The second part looks deeper into the relation between banks and private firms. We make another three hypotheses describing the relationship between different types of private firms and banks.

2.1 Incentives of bank managers

The financial system in China is a typical bank-centered financial system. In the banking sector, four large state owned banks¹ play a deterministic role. For example, in 2012, Industrial and Commercial Bank of China, which provides working capital loans to industrial firms, reached the market value of 236.422 billion dollars, ranking first among all banks in the world. China Construction Bank, which specializes in construction finance and fixed asset investment, ranked second with a market value of 200.014 billion dollars. Banks have the dominative market power in the credit market. The amount of bank loans that firms can receive are determined by bank managers' incentives. To understand the incentive of a bank manager, we need to look into the utility function of a representative bank manager.

One dimension of the utility function is the benefit of lending to firms. Profits of lending to firms include the bonus and perks. Cull and Xu (2003) pointed out that bank employee compensation was linked to the quality of lending portfolio after 1990s. Bank managers enjoy a much higher income than government employees, because bank managers received bonuses that are related to the profitability of banks. Perks from bank-lend involves promotion, political connection and bribes. A bank manager cares for promotion because they will enjoy higher incomes, larger power and higher prestige when promoted. In China, local government officials often intervenes in selecting and promoting bank manager. This encourages bank managers to lend money to the borrower with better political connections (Brandt and Li, 2003). Political connections are valued high because Chinese government still controls a variety of key resources, which creates many opportunities for rent-seeking. Those who have wider political connections actually are in possess of a tool of rent-seeking. In addition, bank managers will seek for bribe from lending when financial constraint is prevailing, which is the case of China. When the demand for credit exceeds the credit supply, credit rationing happens. Bank managers usually charge a price higher than usual interest payment to eliminate the excessive demand for credit. In order to obtain bank loans, credit constrained firms even have to offer bribes.

The other dimension of the utility function is the cost of lending. The major cost comes from the examining effort before lending and the monitoring effort after lending. The examining cost before lending includes the effort of analysing an information set that indicates a firm's repayment ability. For example, the information set includes a firm's financial status, the products it produced, its business relationships with other firms, its geographic market and its past, current and projected profitability and so on (Cull and Xu, 2003). Bank managers also have to

monitor a firm's performance and the status of repayment after loaning. After the repeated loaning game between banks and firms, firms with higher reputation of repayment, which includes firms owned by the government and firms with large amounts assets to pledge, are easier to borrow from banks because of the low monitoring cost. Usually, the risk of lending is measured by the possibility of defaulting. Private firms are perceived riskier than SOEs because government will help SOEs repay their loans in the event of default. This is called "paternalism" by Kornai et al. (2003), which vividly tells that Chinese local governments spare no effort to support SOEs.

2.2 The status of different firms in obtaining bank loans

Based on the discussion in previous subsection, now we are able to analyse the status of different firms in obtaining bank loans. This boils down to discuss the benefit and cost of offering bank loans to firms of different ownership structures. Since the bank-enterprise relationship is determined by the incentives of bank-lending, we can analyse the relationship between banks and enterprises of various ownership structures through discussing the lending incentives of a bank manager.

SOEs are in a favourable place to obtain bank loans (Che, 2002; Cull and Xu, 2003; Brandt and Li, 2003; Li et al., 2008). Local governments usually take advantage of the financial system to partially support SOEs (Kornai et al., 2003). The development of SOEs is important to local officials because of following reasons. First, the ideology of the Communist Party places SOEs under a favourable environment in developing the economy. The operating and profitability of SOEs play an important role in the evaluation and promotion of Chinese local officials (Li and Zhou, 2005). Second, SOEs are irreplaceable in stabilizing the economy in the transition of Chinese economy. Li et al. (2008) pointed out that local officials sometimes strongly encourage banks to extend "stabilization loans" to SOEs that lacked the money to pay employees' wage.

The discussion above predicts that lending to SOEs generates larger benefits and lower cost. The larger benefit mainly comes from alluring perks resulting from better political connection and bonus received after the repayment. Chinese government still controls most of the key resources, which makes the political connection a valuable investment that generates a steady flow of incomes. Not only will bank manager get promotion through political connection maintained through lending to local SOEs, but the bank managers' relatives can benefit from political connection (Li et al., 2008). Examples abound. Local officials usually use their political power to help managers' relatives find a job, circumvent some red tape, or obtain certain economic resources. The lower cost is because of lower examining cost and monitoring cost. SOEs faces soft budget and never worry about the defaulting of SOEs. When default occurs, local government will do everything to help SOEs repay the debt.

In contrast, private firms are discriminated against when borrowing from banks. Private firms in China have been facing social and political discrimination since the foundation of the People's Republic of China; they also have to deal with the unfavourable economic environment (Che, 2002; Brandt and Li, 2003; Gordon and Li, 2003). Private firms are perceived as riskier borrowers than firms of other types. Without sufficient amount of collateral, private firms can hardly obtain bank loans. Lending to private firms not only generates little perks associated to political connection, but the monitoring cost after lending to private firms is much higher than SOEs, because no one will repay the bank loans for private firms as the local government will do

for SOEs.

Foreign-invested enterprises differs from SOEs and private firms in that they rely little on China's financial system, for they can obtain funds from their headquarters. In addition, local governments usually offer foreign-invested enterprises favourable conditions to attract foreign direct investment (FDI).

With the total amount of bank loans given, a representative bank manager will maximize his utility by generating equal net marginal benefits from distributing loans among SOEs and private enterprises². Since banks are the only formal source of external finance, the monopolistic position of banks give bank managers great bargaining power when distributing loans to private firms. To compensate for the high risk of lending to private firms, banks often charge an interest rate as high as possible only if private firms are affordable. This pricing strategy enables banks to extract a large share of private firms' rents, which do harm to private firms' development³. In sharp contrast, banks are willing to set a low interest rate for SOEs because implicit benefits are large enough to cover the cost of lending. Hence banks cannot extract rents from SOEs through the lending process. The grabbing effect of the monopolistic banking system on private firms can also act through another more subtle way--distorting the market structure. Privates firms and SOEs compete in the market, and private firms are more productive (efficient) than SOEs (Song et al, 2012). But private firms operate with a much higher cost of external finance, which gives them disadvantages when competing with SOEs. As a consequence, the advantage of lower external finance enables SOEs to gain a larger market share and higher profits, and squeezes down private firms' profits. This eventually hampers private firms' growth, and helps SOEs. To conclude, we have shown that banks may grab private firms' profits and do harm to their performance. Thus we have the following proposition.

Hypothesis 1: in China's bank-centered financial system, banks help SOEs and improve their performance; banks extract excessive rents to grab private firms and worsen their performance; banks neither help nor grab foreign-invested firms.

2.3 A deeper view on the relationship between banks and private enterprises

In this subsection, we use the theoretical framework proposed above to analyse the relationship between banks and private firms with different characteristics. Note that the core of our theory is the utility function of the representative bank manager. Figuring out the relationship between firms of different types and banks requires measuring the net marginal benefit banks can obtain from lending. We will discuss several factors that affect the marginal benefit and marginal cost of lending. The discussion is in the order of government subsidies, production value and capital intensity, corporate governance, and property rights; 3 hypothesis are proposed accordingly.

2.3.1 Effect of government subsidies

In many developing countries, private enterprises tend to resort to informal finance to support their development due to the presence of a variety of institutional barriers (McMillan, 1997; McMillan and Woodruff, 2002; Allen et al., 2005, 2006). For example, private firms tend to build up political connection to acquire financial resource (Bai et al., 2005; Li et al., 2006; Li et al., 2008). In regions with undeveloped political and financial institutions, enterprises are more motivated to circumvent institutional obstacles by building a political relationship with local

governments (Bartels and Brady, 2003; Faccio, 2006). Hence, in regions with less developed financial systems, more government regulations, more unofficial tax burdens, and more vulnerable law systems, private enterprises are more inclined to participate in politics (Chen et al., 2005; Li et al., 2006). In China, private enterprises having political connections with the local government are able to obtain more financial subsidies, thus making governmental subsidies a good indicator of political connections. Moreover, the governmental subsidy also alleviates the financial constraint facing the firm; government subsidies endow the private firms more market power in the credit market, which discourages banks to extract rents from them. Thus we propose the following hypothesis:

Hypothesis 2: for private enterprises that received more governmental subsidies, banks grab less from them and do less harm to their performance.

2.3.2 Effects of production value and capital intensity

During the process of China's economic transition, local governments usually intervene in the economy by interfering with local enterprises' business activities (Zhou, 2007), which is reflected by the following two aspects. One is local governments' policy-induced burdens. In the transition from the planned economy to the market-oriented economy, while local governments obtain some power such as fiscal autonomy and economic management, they also bear heavy social burdens, such as employment, retirement pensions, and social stability (Lin et al., 1998). The other is the career concern of Chinese local officials empowered by the performance-based promotion scheme (Maskin et al., 2000; Blanchard and Shleifer, 2001; Whiting, 2001; Li and Zhou, 2005). Since the early 1980s, the criteria for appointments and promotions of local officials have changed from pure political indicators to GDP (or GDP growth)-oriented indicators. Local governors have engaged in fierce competition for spurring GDP growth (Li and Zhou, 2005). Under the dual driving forces of policy burdens and political promotion targets, private enterprises that are able to bring higher GDP growth, more tax revenues, and more employment opportunities, are more likely to enjoy favourable loan terms. These private enterprises are usually large enterprises with high production values and capital intensity, which also implies that they can meet the requirements of mortgage-secured loans and obtain low-cost loans more easily (Bester, 1985; Manove et al., 2001). With higher net marginal benefit received, banks are more willing to provide bank loans and less motivated to grab from these firms, thus we have following hypothesis:

Hypothesis 3: for large private enterprises with high production values and capital intensity, the grabbing effect of banks on these enterprises is relatively weak.

2.3.3 Effects of corporate governance and property rights

In the transitional economy with incomplete institutions, the complete structures of property rights and governance in enterprises are signals of good enterprises. These enterprises are regarded as creditworthy (Grossman and Hart, 1980; Stiglitz, 1985). To a bank manager, the problem of information asymmetry in the loaning game can be attenuated if private enterprises have a clear structure of property rights and governance (Bhide, 1993; Allen and Gale, 2000). Because this reduces the examining cost before lending and the monitoring cost after lending, banks are more willing to provide loans to these good enterprises. In China, private firms with independent legal entities have more complete structures of property rights and

governance. Since the net marginal benefits banks received from lending to them is high enough, these firms are less likely to be grabbed. Accordingly, the following hypothesis is proposed:

Hypothesis 4: for private enterprises with independent legal entities, the grabbing effect of banks on these enterprises is relatively weak.

3. Empirical Strategy

In this section, we specify several econometric models to test the hypotheses we proposed in the previous section. We first introduce the baseline econometric equation which can test our hypotheses by using the firm performance as dependent variables and the bank loans as the independent variable with related variables controlled. Then we specify the model by choosing certain indicators that can be obtained from our data.

3.1 Model specification

The baseline econometric model is a reduced form model which tests our hypotheses by linking the firms' performance with the cost of bank loans they received. It can be written as following.

$$Firm\ performance = a_0 + a_1 Bank\ loan\ cost + \beta Z + error\ term$$

We expect that $a_1 > 0$ when there is a helping relationship between banks and firms and $a_1 < 0$ when banks grab from firms. To specify the econometric model, we need to find indicators for firm performance and bank loans. Existing empirical literature has used a set of variables to measure the performance of firm. The measurement for profitability usually includes return on equity (ROE), return on assets (ROA), and return on sales (ROS). ROA and ROE are used for listed firms, but listed firms are unlikely to face financial constraint because they have access to the equity market. For the purpose of our study, we choose non-listed Chinese firms to test our hypothesis and choose ROS as the measurement of firms' current performance. We also use asset growth as the measurement of firms' growth potential so as to ensure the robustness of our study. Specifically, we run two regressions for each group of firms. One is using ROS as the dependent variable, while the other is using asset growth as the dependent variable. Following Cull et al. (2009), we use the interest payment as the proxy for bank loans.

3.1.1 ROS as the dependent variable

Our first model is a performance equation using ROS as the dependent variable and interest payment and other control variables as the independent variables.

$$ROS_{ijkl} = a_0 + a_1 INTEREST_{ijkl} + \beta Z_1 + \gamma_j + \gamma_k + \gamma_t + \varepsilon_{ijkl} \quad (1)$$

Where ROS_{ijkl} is defined as the ratio of the enterprise's net profit amount to its total sales. Subscripts i , j , k , and t represent the enterprise, three-digit industry, province, and time respectively. $INTEREST$ is the major explanatory variable indicating the borrowing interest rate when a firm borrows from financial institutions, which is calculated as the net interest payment divided by the difference between its total debts and accounts payable. The reason for removing accounts payable from the firm's liability is that accounts payable does not include interest if it is

paid on time. γ_j , γ_k , and γ_t are unobservable industry-, province-, and year-specific effects, and $\varepsilon_{ijk\ell}$ is the disturbance term.

In equation (1), Z_t is a vector of several control variables. Based on the existing literature, the following variables are controlled: (1) firm size (*size*), which is defined as the logarithm of the net value of the enterprise's fixed assets; (2) firm age (*age*); (3) R&D intensity (*rd*), measured as the enterprise's total R&D expenditure divided by total sales; (4) productivity (*tfp*), the firm's total factor productivity (TFP hereafter) calculated by using the semi-parametric LP method (Levinsohn and Petrin, 2003); detailed calculation procedures can be found in Li et al. (2010)); (5) advertisement intensity (*adver*), measured by the ratio of total advertisement expenditure to total sales; (6) versatility (*multi*), which is represented by the total number of different activities undertaken by the enterprise; (7) exports (*ex*), defined as the firm's total export delivering value divided by total sales; (8) liability leverage (*leverage*), measured as the firm's long-term liability plus short-run liability (including accounts payable) divided by its total assets; (9) industrial investment (*investindus*), calculated as the industry-location⁴ averages of the firm's growth rate of investment⁵, i.e., we average the investment growth rate for each firm in each industry for every province, which represents the impact of the industry's investment opportunity on the profit of the firm in that industry; (10) factor market distortion (*factdisto*). Under the pressure of GDP competition, Chinese local governments are encouraged to control the distribution and price of the key factors to attract FDI, which causes variations among firms' factor input's cost and profits in different regions. *factdisto* is measured using the marketization index constructed by Fan et al. (2010), which is the ratio of the difference between the degree of marketization of product markets and that of factor markets to the degree of marketization of product markets; and (11) ownership structures (*ownership*) are classified into six categories based on the ratio of the firm's registered investment capital to total registered capital: state-owned, collective, independent legal entity, private, foreign-invested enterprises in Hong Kong, Macau, and Taiwan (HMT), and foreign-invested enterprises not by HMT. As Guariglia et al. (2011), we define all firms from Hong-Kong, Macao, Taiwan, and other parts of the world as *foreign*; all firms owned by legal entities, and individuals into a single category as *private*. Furthermore, following Cull et al. (2009), Ayyagari et al. (2010), and Guariglia et al. (2011), we classified our firms into state owned, private, foreign-invested, and collective based on the shares of paid-in-capital contributed by these four types of investors over the period 2001-2007. Specifically, we classify firms according to majority average ownership shares. If the capital of a certain type of ownership amounts up to at least 50% in that year, then this firm belongs to this ownership structure. For example, if the share of its capital owned by private investors in a given year is no less than 50%, then this firm is a private firm in this year.

3.1.2 Asset growth as the dependent variable

The second econometric model uses asset growth as the dependent variable to test our hypotheses. It can be represented as following,

$$ASSETGROWTH_{ijk\ell} = a_0 + a_1 INTEREST_{ijk\ell} + \beta Z_2 + \gamma_j + \gamma_k + \gamma_t + \varepsilon_{ijk\ell} \quad (2)$$

where *ASSETGROWTH* indicates the firm's growth rate of assets, which is measured by the difference between the firm's total assets in the current year and that in the last year⁶; the

difference is deflated by the firm's current total assets. In equation (2), Z_2 is a vector of several control variables as identified by the existing literature: (1) cash flow (*cashflow*), defined as the sum of the firm's profit plus the current depreciation deflated by its total assets in the same period. Guariglia et al. (2011) have showed that cash flow, as an indicator of internal financing ability, contributes much to the asset growth of Chinese private firms; (2) industry demand (*saleindus*) is the industry-province (4-digit industry) averages of sales growth of firms. This allows us to control the impact of the variations in the demand on the firm's profit. Since our indicator is calculated by averaging within each industry in any province, we are able to avoid its collinearity with the firm-level characteristic variables. Other control variables include those in equation (1) such as firm size, firm age, R&D, productivity, liability leverage, exports, industrial investment level, and ownerships.

3.2 Estimation Methodology

Given our econometric equations above, endogeneity problems may arise for three reasons: the first reason is that the error term may contains idiosyncratic component that are correlated with the regressors; the second reason is that some variables that affect the firm's loan costs and performance are omitted from the model. For instance, industrial policies may cause firms in industries with governmental support to borrow more from the bank (and hence pay more interest) and obtain more profits. The third possibility is the simultaneity between bank loans and firm performance: on one hand, the more loans the enterprise can obtain, the better the firms' performance is; on the other hand, an enterprise with a higher ROS or asset growth rate is more likely to pay more interest than other firms in order to obtain bank loans.

To address these concerns, we apply the IV approach developed by Fisman and Svensson (2007) to estimate the first-difference equations (FS-IV approach hereafter). This approach tackles the endogeneity problem by using industry-location-year averages as instruments. The idea is that if the endogeneity problem is specific to firms, but not to industries or locations, then removing this firm-specific component yields a measure of loan costs that only depends on the characteristics of particular industries and locations. Following Fisman and Svensson (2007), we use industry-province-year averages as an instrument for the firm-level borrowing interest rate. This not only allows us to remove the bias resulting from unobservables that are correlated with the firm-level borrowing interest, but not with the industry-location-year level, but also to mitigate the effects of measurement errors that are largely idiosyncratic to the firm.

It is reasonable to believe that there is a persistent time series relationship between the current term and lagged terms of dependent variables. This implies that dynamic panel data models for ROS and asset growth are required. To this end, we apply the system GMM estimator as a robustness check.

4. Data

Our data comes from the 2001–2007 annual surveys on China's non-listed manufacture enterprises conducted by China's National Bureau of Statistics (NBS). The survey covers all SOEs and large-scale non-SOEs with annual sales of RMB 5 million or above. Our data cleaning process mainly follows Guariglia et al. (2011), though adjustments are made according to our econometric models. Specifically, we delete the observations if any of the following conditions is satisfied: (i) there are missing values or negative values for any of the variable such as sales, total

assets, advertisement fees, and R&D expenditures; (ii) firms whose employees are less than 8; (iii) gross fixed assets are smaller than net fixed assets; (iv) industrial value-added or intermediate input is greater than total output; (v) firms that did not have complete records on our main regressions. Finally, we disregard the lowest and highest 1% observations and only keep firms with consecutive observations more than 3 years.

The rigorous process of data cleaning ensures the reliability of our estimation. To fully employ the dataset, we complete the variables of the initial year by using the data at year 2000. These variables include asset growth, and *investindus*, which require us to calculate the growth rate. We end up with a representative unbalanced panel dataset of 510,304 observations. In order to weaken the impact of inflation on our estimation, we choose the year 1998 as the base year and employ the products price index and fixed capital investment index at each sample period as the deflators for total sales and fixed assets respectively.

Table 1 reports the summary statistics of the major variables used in this study. It is noteworthy that the borrowing interest rate (*INTEREST*) of SOEs is only 1.4%, which is far lower than the 2.3% of private enterprises. Foreign-invested enterprises have the lowest interest payment ratio with only 1.2%. Figure 1 serves as a comparison of the interest payment for different types of firms, from which we know that the loan costs for private enterprises were lower than those for collective enterprises before 2004, but rose sharply afterwards and turned to be higher than collective enterprises after 2004. Foreign-owned firms remains to have the lowest interest payment ratio over the sample period; the interest payment ratio of SOEs is only larger than foreign-owned firms, which shows a steady decreasing trend from 2001 to 2006. Although SOEs averagely have higher investment, cash flow, R&D expenditures, and liability leverage than private or foreign-invested enterprises, they are lower in ROS, asset growth, TFP, and exports. From Table 1, we also note that SOEs tend to be located in regions with higher level of factor market distortion. These, to some extent, support the hypothesis that SOEs are of lower efficiency than private firms (Kornai, 1986).

Table 1. Statistical description for the major variables

		whole sample	State-owned	Collective	Private	Foreign
ros	Mean	0.006	-0.151	0.022	0.032	0.018
	Sd	0.62	1.23	0.42	0.77	0.35
assetgrowth	Mean	0.132	0.064	0.098	0.169	0.135
	Sd	0.21	0.17	0.20	0.22	0.22
INTEREST	Mean	0.019	0.014	0.024	0.023	0.012
	Sd	0.28	0.35	0.24	0.28	0.023
rd	Mean	0.0008	0.0011	0.0005	0.0008	0.0007
	Sd	0.00	0.00	0.00	0.00	0.00
tfp	Mean	6.757	6.301	6.610	6.767	7.096
	Sd	1.07	1.36	1.00	1.00	1.07
leverage	Mean	0.582	0.605	0.593	0.592	0.509
	Sd	0.23	0.23	0.23	0.23	0.22
cashflow	Mean	0.301	1.011	0.279	0.185	0.257
	Sd	1.86	3.78	1.02	1.12	2.76
size	Mean	8.363	8.924	8.254	8.233	8.695

	Sd	1.29	1.40	1.23	1.24	1.33
age	Mean	15.703	24.964	20.167	14.298	14.027
	Sd	7.80	11.31	8.36	6.72	4.31
adver	Mean	0.00015	0.00015	0.00011	0.00016	0.00014
	Sd	0.00	0.00	0.00	0.00	0.00
multi	Mean	1.014	1.142	0.995	1.009	0.974
	Sd	0.38	0.67	0.47	0.33	0.30
ex	Mean	0.141	0.034	0.067	0.107	0.418
	Sd	0.31	0.14	0.21	0.27	0.42
investindus	Mean	0.565	0.559	0.567	0.570	0.547
	Sd	0.18	0.20	0.19	0.18	0.18
saleindus	Mean	0.414	0.359	0.384	0.431	0.393
	Sd	0.16	0.17	0.17	0.16	0.14
factdisto	Mean	0.658	1.046	0.788	0.647	0.402
	Sd	0.56	0.66	0.60	0.55	0.36
Number of Obs.		510,304	55,476	70,751	287,512	96,565

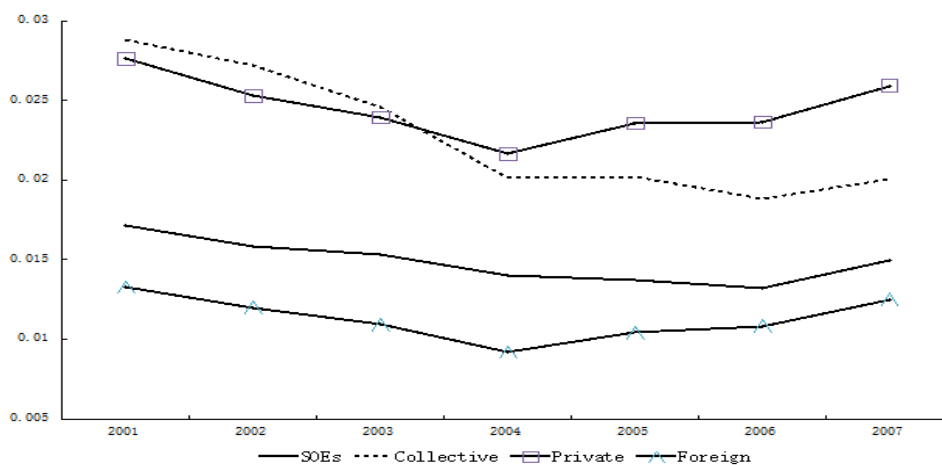


Figure 1. The comparison of the interest payments of firms of different ownerships

5. Empirical Results

5.1 Testing results for hypothesis 1

This subsection divides into two parts. In the first part, we test hypothesis 1 by investigating the relationship between bank loans and ROS, while we use the asset growth as the dependent variable in the second part. Combining together, these results consistently verify hypothesis 1.

5.1.1 Borrowing interest rate and profits

In this subsection, we test hypothesis 1 by examining the relationship between interest payment and ROS. Table 2 reports the results estimated by using the FS-IV approach. Model 1 reports the results for the whole sample. We can see that the interest payment and ROS are negatively correlated but not statistically significant. To test hypothesis 1, we separate the whole sample into four subsamples by types of ownerships, i.e. SOEs, private firms, collective firms and foreign-owned firms. The regression results for each group are presented in Models 2 to 5 respectively. For SOEs, the coefficient of *interestpay* is significantly positive (at the 1%

significance level), indicating a helping relationship between banks and SOEs. While for private enterprises, the coefficient is significantly negative (at the 1% significance level), implying a grabbing relationship between banks and private firms. The results of foreign-invested firms shows there is no significant relationship between interest payment and ROS. These results verify our hypothesis 1. Moreover, the economic significance of the coefficient shows that the helping effect of bank loans on SOEs' performance is much stronger than the grabbing effect on private firms' performance. With others holding constant, one unit increase in the *interestpay* will cause 15.35 units increase in SOEs' ROS and 2.215 units decrease in private firms' ROS.

As for the control variables, R&D expenditures have a negative impact on firms' ROS and TFP has a positive impact on firms' ROS though they are not significant for SOEs. This shows that R&D has not been a source of profits for most of Chinese firms. Note that the coefficient estimates, signs, and significance levels exhibit some variations across different types of enterprises. This result indicates that in China, types of ownership are indeed one of the major reasons for variations in enterprises' profits. Meanwhile, this finding also suggests that the whole sample be classified into subsamples according to types of ownership before implementing the econometric analysis.

It is worth noting that the endogeneity issue in equation (1) might arise due to the omission of favourable policy tools that a local government implements aimed to promote local GDP growth. The enterprises that bribe local governmental officials can not only enjoy low factor costs, but also acquire higher profits by increasing its productivity and enhance its market power. To promote local economic development, Chinese local governments are engaged in attracting FDI, most of which are through controlling the price and quantities of the factor inputs required by enterprises. This encourages enterprises to obtain low costs of factor inputs by bribing local government officials and building up political connections. Unfortunately, there is no datum on rent-seeking activities in our dataset. We therefore have to use the index of regional market distortion to proxy the rent-seeking opportunities for bureaucrats. A high degree of distortion in the regional factor market motivates the local governments to interfere with the factor market and to spur the GDP growth. In regions with severer market distortion, the motivation of an enterprise to acquire cheap inputs through bribery is stronger. Following this logic, the inclusion of the market distortion variable in the econometric model allow us to control for the enterprise's rent-seeking possibility. Table 2 shows, except in the SOEs subsample, all other subsamples indicate a positive relationship between the market distortion and profit variables, which implies that enterprises located in regions with higher market distortion are more likely to obtain higher profits through cheaper factors by committing bribery.

The endogeneity problem in equation (1) may also originate from the omission of variables that reflect an enterprise's investing behaviour. The negative relationship between the loan costs and ROS may be caused by its investing behaviour, because the enterprise's investment requires internal financing as well as banking loans. Enterprises with more investment not only have more loans borrowed and more interest to pay, but have more yields converted into investments and thus resulting a lower ROS. To deal with this concern, we include the industry investment variable (*investindus*) in all regressions. In the private enterprises subsample, the effect of loan costs on the enterprise's profit remains negative and statistically significant.

Table 2. Empirical results on the relationship between firms' interest payment and ROS (FS-IV approach)

	Hypothesis 1				
	Whole Sample	State-owned	Collective	Private	Foreign
INTEREST	-1.064 (0.14)	15.35*** (6.10)	-0.717* (1.71)	-2.125*** (28.32)	-0.201 (0.23)
rd	-1.005 (1.43)	-0.305 (0.06)	-0.511*** (7.12)	-15.50*** (286.71)	-0.416*** (5.54)
tfp	0.206* (1.69)	1.942 (1.57)	0.0276*** (13.85)	0.0148*** (13.53)	0.0417*** (15.81)
leverage	-1.397*** (3.22)	-3.864 (1.11)	-0.0412*** (11.43)	-0.0362*** (9.22)	-0.0688*** (11.19)
size	0.0132 (0.10)	0.4872 (0.29)	0.0007 (0.58)	0.0059*** (5.74)	-0.0014* (1.81)
age	-0.0017** (2.10)	0.0045 (0.03)	-0.00004** (2.30)	0.0001 (0.98)	-0.0007** (2.39)
adver	-1.036 (0.16)	-1.151 (0.01)	-3.680*** (68.65)	1.317*** (28.02)	-0.470*** (6.71)
herfind	2.730 (0.72)	-0.407 (0.01)	0.0171 (0.53)	0.0204*** (2.63)	-0.117*** (3.38)
multi	0.0280 (0.45)	-0.0026 (0.01)	-0.0011** (1.97)	-0.0020** (2.26)	-0.0026*** (3.53)
ex	0.422 (1.59)	0.181 (0.09)	-0.0015** (2.57)	0.0276*** (9.71)	-0.0035* (1.66)
investindus	0.000003 (0.02)	0.00004 (0.06)	-0.00000** (2.15)	-0.000003** (2.34)	-0.000006 (0.56)
factdisto	1.1912*** (3.18)	3.2010 (0.30)	0.1000*** (11.29)	0.0057*** (2.69)	0.0695*** (7.13)
constant	-1.430 (0.95)	-15.804 (0.84)	-0.151*** (9.33)	-0.0410*** (3.41)	-0.206*** (10.75)
F test of instruments	67.12(0.000)	82.34(0.000)	73.28(0.000)	65.76(0.000)	85.18(0.000)
N	479,470	45,920	62,743	281,626	89,181

Notes: All equations are taken the first difference before using the IV approach introduced by Fisman and Svensson (2007). *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively. Absolute z statistics are reported in parentheses.

5.1.2 Testing hypothesis 1

In the previous sub-subsection, we found that banks only grabs from private firms by examining the nexus between the enterprise's loan costs and profit. In this subsection, we test hypothesis 1 by estimating the coefficient of interest payment with respect to the asset growth.

The estimating results of asset growth models are reported in Table 3. Consistent with the results of ROS models, the coefficient of *INTEREST* for SOEs is significantly positive (at the 5% level), and the coefficient of *INTEREST* is significantly negative (at the 1% level). In addition, interest payment has no significant impact on foreign-owned firms' asset growth. These results ensure the creditability of hypothesis 1 and the robustness of our approach. The coefficient of cash flow is significantly positive only for private firms, which is consistent with Guariglia et al. (2011) who documented that internal finance contributes much to the asset growth of private firms.

Table 3. Empirical results on the relationship between firms' interest payment and asset growth (FS-IV approach)

	Hypothesis 1				
	Whole Sample	State-owned	Collective	Private	Foreign
INTEREST	0.0559 (0.13)	0.0524** (2.23)	0.403 (0.10)	-1.201*** (2.72)	2.242 (0.11)
age	-0.0023* (1.96)	-0.0025 (0.39)	-0.0016** (2.31)	-0.0012** (2.24)	-0.0086*** (2.66)
size	0.243*** (27.07)	0.685*** (9.30)	0.229*** (22.64)	0.199*** (46.20)	0.211*** (4.97)

tfp	0.0696*** (8.15)	0.243*** (4.57)	0.0620*** (3.27)	0.0290*** (6.39)	0.0882 (1.51)
ex	-0.0109 (1.14)	-0.000334 (0.01)	-0.0650*** (2.99)	-0.0756*** (6.44)	-0.0285 (0.56)
rd	0.0264 (1.01)	0.00510 (0.08)	-0.496 (0.78)	-0.165 (0.81)	-0.545 (0.25)
cashflow	0.0001 (0.45)	0.0002 (0.36)	0.0001 (0.07)	0.0002** (2.37)	0.0372 (0.52)
leverage	-0.0220 (0.76)	-0.179 (1.18)	-0.0911*** (2.59)	-0.0686*** (4.32)	0.277* (1.77)
herfind	0.478** (2.00)	-0.403 (0.29)	0.131 (0.50)	-0.0646** (2.52)	1.920** (2.32)
saleindus	-0.000003 (0.10)	0.0000003 (0.01)	-0.00001** (2.16)	0.000004 (0.02)	0.00006*** (2.65)
factdisto	0.529*** (7.67)	-0.804* (1.67)	0.326*** (4.58)	0.770*** (22.49)	0.619** (2.55)
constant	-0.117** (2.50)	0.239** (2.05)	-0.334** (2.14)	-0.269*** (4.15)	-0.209*** (6.66)
F-test of instruments	56.18(0.000)	43.66(0.000)	52.05(0.000)	60.23(0.000)	43.16(0.000)
N	510,304	55,476	70,751	287,512	96,565

Notes: All equations are taken the first difference before using the IV approach introduced by Fisman and Svensson (2007). *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively. Absolute z statistics are reported in parentheses.

5.1.3 Discussions on the testing results

It may be doubted that whether our findings can be interpreted into the grabbing or helping effect of Chinese banking system on firms. Myers (1977) points out that excessive debt may reduce the firm's investment incentives. Under “debt overhang”, part of the return from current new investment makes existing debt more valuable, so there is a reduced incentive to undertake profitable projects when agents seek to maximize equity. Although the debt overhang effect seems to be related to our research, we have reasons to believe that the debt overhang effect is not likely to be the right explanation of our empirical results. Firstly, our data contain only unlisted Chinese manufacturing firms. Without participating in the equity market much, the incentive of maximizing equity value is not realistic in the context of our research. In contrast, decision makers still have incentives to choose profitable investments in order to earn profits and pay back the loans. Secondly, the SOEs are not generally quite profitable. According to the statistics of China's National Bureau of Statistics (NBS), only 57% of SOEs have positive benefits, the other 43% often have negative profits. Despite of this, almost all the SOEs have access to the banking loans at lower costs. Thirdly, note that, empirical literature on detecting the debt overhang effect primarily linked the leverage level or ratio and firm performance (Lang et al., 1996; Cai and Zhang, 2011). Since for each firm we have controlled the leverage, the collateral, we have considered the debt overhang effect to some extent. The coefficients of leverage of private firms and collective firms are negative and significant, negative but not significant for SOEs, and positive and significant for foreign firms. This implies that leverage plays a role in determining the firm's profits, which could be interpreted as a sign of debt overhang effect. Lastly, our measure of the variable *INTEREST* is the ratio of total interest payment to the difference between the total debts and accounts payable. This variable measures the borrowing interest cost rather than the amount of total interest payment. Instead of the debt overhang effect, our paper focus on the grabbing effect resulting from prohibitively high borrowing interest rate. As we have indicated in our paper, private firms have to pay a higher

interest rate in order to borrow from the bank. By charging high interest rate, banks are able to extract rents from private firms.

5.2 Testing results for hypothesis 2 to hypothesis 4

Results presented in previous sections confirm that bank loans have a negative impact on both the profitability and asset growth. In this subsection, we present the testing results for hypothesis 2 to hypothesis 4. This actually requires us to estimate our models for different types of firms mentioned in hypothesis 2 to hypothesis 4. To this end, we separate the private firms into following subsamples: (i) firms with government subsidies and firms without subsidies; (ii) firms with high production value when their production value is over the average value of all the private firms, and the rest are firms with low production value; (iii) capital intensive private firms when their capital intensity is above the average capital intensity, and the rest are labor intensive private firms; (iv) large firms which are defined as firms with total assets over the average total assets, and the rest are small firms; (v) firms with independent legal entities and firms without independent legal entities. The subsampling are implement in the order of occurrence in the hypotheses. (i) is prepared for hypothesis 2, (ii) (iii) (iv) are used to test hypothesis 3, and (v) is mentioned in hypothesis 4.

We run the regressions for all the subsamples mentioned above. The regression results using ROS as dependent variables are presented in Table 4, and Table 5 is the results of models using asset growth as dependent variables. Columns 1 and 2 of Table 4 show that the grabbing effect is stronger in private firms without subsidies. Columns 1 and 2 of Table 5 represent findings that are consistent with Table 4, thus proving hypothesis 2. From Columns 3-8 in Table 4 and Table 5, we find that for low production value, labour-intensive, or small private enterprises, loan costs have a statistically significant and negative effect on profitability or asset growth, while there is no significant effect for high production value, capital-intensive, or large private enterprises. The empirical findings support hypothesis 3 and provide comprehensive empirical evidence for the grabbing effect of the Chinese banking system on private enterprises.

Furthermore, private enterprises with clearer structures of property rights are easier to mitigate the problem of asymmetrical information happened during the loaning game with financial institutions. Banks pay lower costs of examining and monitoring when lending to these firms. They therefore are less likely to be grabbed by banks. We have shown these firms are private firms with legal entities. The testing results for hypotheses 4 are reported in Columns 9 and 10 in Table 4 and Table 5. We can see that for private enterprises without legal entities, loan costs have a statistically significant and negative effect on the enterprise's profitability or asset growth. This finding verifies hypothesis 4 which predicts that private enterprises without legal entities suffer more from banks' grabbing.

Table 4. Further analysis on the relationship between private firms' interest payment and ROS (FS-IV approach)

	With subsidies	No subsidies	High prod. value	Low prod. value	Intensive capital	Intensive labour	Large	Small	independent legal entities	Non-independent legal entities
INTEREST	-1.7932 (0.90)	-2.3194*** (15.40)	0.1845 (0.44)	-2.0492*** (28.57)	-1.3110 (1.57)	-3.0614*** (7.65)	0.2459* (1.69)	-1.0302*** (26.08)	-0.2643 (0.66)	-2.1307*** (28.83)
rd	-0.108 (1.40)	-16.36*** (150.38)	0.0206 (0.70)	-16.22*** (299.96)	-15.4508*** (3.13)	0.0933 (1.40)	-18.1635*** (148.24)	-0.976*** (17.65)	-17.092*** (275.21)	-0.0963*** (3.33)
tfp	0.0171*** (6.51)	0.0142*** (11.40)	0.0152*** (9.09)	0.0197*** (15.84)	0.0191** (2.53)	0.0051*** (2.62)	0.0677*** (20.70)	0.0224*** (26.56)	0.0236*** (8.79)	0.0188*** (10.07)
leverage	-0.0797*** (6.75)	-0.0290*** (7.26)	-0.0485*** (10.69)	-0.0359*** (8.31)	-0.0486* (1.88)	-0.0175** (2.18)	-0.190*** (17.11)	-0.0839*** (32.42)	-0.0498*** (5.01)	-0.0411*** (11.42)
size	-0.0046 (1.64)	0.0054*** (5.17)	-0.00113 (1.00)	0.00643*** (5.58)	0.0127* (1.67)	0.0071*** (4.80)	-0.0147*** (4.43)	0.0037*** (5.16)	0.0067** (2.38)	0.00003 (0.03)
age	-0.0001 (0.41)	-0.0001 (0.40)	0.00006 (0.76)	0.00006 (0.35)	0.0002 (0.44)	0.00007 (0.84)	-0.0002 (0.99)	-0.0002*** (2.85)	-0.00008 (0.20)	0.000004 (0.07)
adver	-0.0287 (0.46)	2.570*** (42.33)	-0.219*** (6.32)	1.413*** (27.47)	1.147 (0.86)	0.0203 (0.96)	1.212*** (6.68)	0.128 (1.51)	1.709*** (15.61)	0.0364 (1.45)
herfind	0.0520 (0.67)	0.0163 (0.48)	-0.0419** (2.14)	0.0324 (0.88)	0.155 (1.50)	-0.0206 (1.28)	0.2980*** (3.41)	-0.0091 (0.37)	0.0109 (0.14)	0.0224 (1.51)
multi	-0.0014 (1.10)	-0.0031*** (2.89)	0.00001 (0.04)	-0.0043*** (2.82)	0.00004 (0.03)	0.0002 (0.68)	0.0022 (1.50)	0.0003 (0.42)	-0.0035* (1.84)	-0.0021*** (4.55)
ex	0.0155* (1.86)	0.0185*** (6.33)	-0.0011 (0.34)	0.0155*** (4.29)	0.0219 (1.03)	-0.0033*** (2.65)	-0.0175** (2.17)	-0.0062*** (3.04)	0.0153* (1.85)	-0.0041** (2.04)
investindus	0.000005 (0.30)	-0.00004*** (3.39)	0.000008** (2.09)	-0.00004** (2.39)	0.00001* (1.84)	0.000004 (0.98)	-0.00003 (0.89)	-0.0001*** (2.69)	-0.00001 (0.69)	-0.00003*** (2.69)
factdisto	0.0274** (2.41)	0.0094 (1.11)	0.0142** (2.53)	0.0270*** (2.94)	0.0054 (0.19)	0.0185*** (2.87)	0.1110*** (9.68)	0.0168*** (5.33)	0.0373* (1.70)	0.0352*** (8.79)
F-test of instruments	51.29 (0.000)	58.91 (0.000)	69.02 (0.000)	48.70 (0.000)	64.22 (0.000)	53.47 (0.000)	77.50 (0.000)	53.91 (0.000)	62.39 (0.000)	68.15 (0.000)
N	43,153	238,406	40,647	240,979	73,502	208,124	126,373	155,253	104,212	177,414

Notes: All equations are taken the first difference before using the IV approach introduced by Fisman and Svensson (2007). *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively. Absolute

Z statistics are reported in parentheses.

Table 5. Further analysis on the relationship between private firms' interest payment and asset growth (FS-IV approach)

	With subsidies	No subsidies	High prod. value	Low prod. value	Intensive capital	Intensive labour	Large	Small	Independent legal entities	Non-independent legal entities
INTEREST	-0.0610 (0.28)	-1.126*** (5.29)	2.191* (1.73)	-2.199*** (4.82)	0.218** (2.31)	-1.544*** (3.87)	0.224* (1.88)	-2.157*** (6.12)	0.0143* (1.76)	-0.9814** (2.11)
age	-0.0009 (0.89)	-0.0014** (2.15)	0.0008 (0.45)	-0.0013** (2.25)	-0.0008 (0.48)	-0.0011** (1.98)	-0.0003 (0.44)	-0.0017** (2.13)	-0.0009 (0.79)	-0.0014* (1.78)
size	0.0441*** (4.72)	0.229*** (45.11)	0.128*** (4.96)	0.209*** (47.87)	0.234*** (11.70)	0.136*** (29.77)	0.151*** (14.86)	0.135*** (21.78)	0.200*** (23.40)	0.188*** (15.31)
tfp	0.0436*** (5.04)	0.0278*** (4.96)	-0.0774** (2.09)	0.0342** (7.39)	-0.0624*** (4.74)	0.0525*** (11.69)	-0.0260*** (3.69)	0.0697*** (9.21)	0.0282*** (3.54)	0.0305 (1.17)
ex	-0.0712*** (2.62)	-0.0724*** (5.26)	-0.0829 (1.09)	-0.0787*** (5.92)	-0.0766** (2.04)	-0.0989*** (7.95)	-0.0685*** (3.91)	-0.0850*** (5.56)	-0.117*** (4.67)	-0.0579** (2.32)
rd	-0.321 (1.18)	-0.0819 (0.25)	-0.281 (0.41)	-0.154 (0.83)	-0.171 (0.35)	-0.242 (0.88)	-0.182 (0.99)	0.619* (1.68)	-0.0154 (0.09)	-0.527 (1.46)
cashflow	0.0382** (2.51)	0.0002 (0.45)	0.155** (2.04)	0.0002 (0.40)	-0.0004 (0.16)	0.0002** (2.35)	-0.0004 (0.26)	0.0003*** (2.62)	0.0003 (0.47)	0.0031** (2.24)
leverage	0.265*** (7.06)	-0.0897*** (4.88)	0.0212 (0.18)	-0.0692*** (4.43)	0.00722 (0.14)	-0.0391** (2.53)	-0.0605** (2.14)	-0.0121 (0.64)	-0.0532* (1.82)	-0.0871* (1.93)
herfind	0.133 (0.57)	0.0625 (0.42)	-0.143 (0.34)	-0.0235 (0.19)	0.0598 (0.18)	-0.0254 (0.21)	0.112 (0.57)	0.0134 (0.09)	0.114 (0.52)	0.00498 (0.03)
factdisto	0.767*** (12.10)	0.768*** (18.70)	0.862*** (6.52)	0.721*** (20.98)	1.089*** (11.61)	0.607*** (17.84)	0.916*** (16.96)	0.521*** (12.32)	0.642*** (9.80)	0.855*** (17.01)
saleindus	-0.00003 (0.62)	0.00002 (0.54)	0.000008 (0.08)	0.000008 (0.20)	-0.00001 (0.20)	-0.000005 (0.14)	0.00001 (0.29)	-0.00002 (0.39)	-0.000005 (0.09)	-0.000006 (0.12)
F-test of	62.07	58.29	81.45	65.29	88.10	72.33	70.12	64.32	71.28	67.09
instruments	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N	45,565	241,845	43,153	244,359	74,749	212,763	134,959	152,553	108,050	179,462

Notes: All equations are taken the first difference before using the IV approach introduced by Fisman and Svensson (2007).*, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively. Absolute $\bar{\kappa}$ statistics are reported in parentheses.

5.3 Alternative Tests and Robustness

To ensure the robustness of our study, we explore a different estimation and a variety of alternative specifications. The baseline results remain unchanged in these regressions, which confirms the validity of our findings. This subsection summarizes these results.

5.3.1 Alternative estimating methods

Firms' performance may have a strong time series relationship. Therefore it is reasonable to include the lagged terms of ROS and asset growth in the right hand side of equation (1) and equation (2) respectively. To estimate the dynamic panel data model, we employ the system-GMM approach (Arellano and Bover, 1995; Blundell and Bond, 1998) to address endogeneity problem. Although the first-difference GMM are widely used in panel data regressions, the weakness of lagged levels as instruments is still a major concern in applying first-difference GMM. The weak instrument problem occurs when the regression variables are close to AR(1) time-series process. We therefore employ the system-GMM estimator to make use of possibly stronger instruments. The system-GMM estimator, which is designed for small- T large- N panels, uses the levels equation to obtain a system of two equations: one differenced and one in levels.

To test whether the instruments are orthogonal to the errors, we use the Hansen J-test. Hansen J-test is superior than the Sargan J-test in the sense that no assumption is made on homoscedasticity among the errors. We also use the serial correlation test in the differenced residuals to help us find the appropriate lagged periods used for instruments. In the presence of n order serial correlation in the difference residuals, instruments need to be lagged $(n+1)$ periods or further for the difference equation, and instruments need to be restricted to n -th lag of difference variables as instruments for the equation in levels (Roodman, 2009).

Table 6 and Table 7 report the estimating results for testing hypothesis 1 applying the system GMM approach. We can see the results are consistent with FS-IV approach except the economic significance of the coefficients. This confirms the correctness of hypothesis 1. The results of robustness check on hypotheses 2 to 4 are presented in Table 8 and Table 9 (see appendix). It is clear that private firms with the characteristics described in hypotheses 2 to 4 have a negative relationship between bank loans and firm performance, which confirms our previous analysis.

Table 6. Robustness check on the relationship between firms' loan costs and ROS (two-step system GMM approach)

	Whole Sample	State-owned	Collective	Private	Foreign
L.ros	0.2473* (1.68)	0.5356 (0.63)	0.5671*** (5.46)	0.0952 (1.03)	0.2781*** (2.78)
INTEREST	-0.0228 (0.01)	2.0928** (2.55)	-0.9097 (1.25)	-2.0101*** (3.36)	-0.6746 (1.02)
rd	0.1570 (0.52)	0.1157 (0.07)	-0.1632 (0.45)	-14.7812*** (6.15)	-0.2290* (1.82)
tfp	0.0459*** (2.81)	0.257 (1.51)	0.0210*** (4.19)	0.0200*** (5.60)	0.0267*** (10.01)
leverage	-0.1092*** (2.71)	-0.3421 (0.72)	-0.0210* (1.68)	-0.0609*** (7.73)	-0.0603*** (5.05)
size	-0.0125 (1.17)	-0.135 (1.31)	-0.0009 (0.29)	0.0117*** (3.48)	-0.0055*** (3.13)
age	-0.0009* (1.71)	0.0010 (0.28)	-0.0003** (2.36)	0.0001 (0.96)	-0.0007*** (4.06)
adver	-0.522 (1.58)	-0.127 (0.22)	-3.883** (2.40)	1.452** (2.50)	-0.325*** (4.00)
herfind	-0.0365 (0.39)	2.983 (1.19)	-0.0040 (0.16)	0.1062*** (3.06)	-0.0877** (2.27)
multi	0.0003 (0.10)	0.0008 (0.06)	-0.0009** (2.20)	-0.0004* (1.84)	-0.0005** (2.14)
ex	-0.0078 (0.07)	0.0147 (0.02)	-0.00348* (1.78)	0.0103 (1.21)	-0.0087*** (6.04)
investindus	-0.00002 (0.05)	0.000002 (0.34)	-0.00012*** (4.46)	-0.00004** (2.25)	0.00001 (1.27)
factdisto	0.0099** (2.24)	0.0374 (1.05)	0.0070*** (3.55)	0.0103*** (2.84)	0.0014** (2.13)
ownership	yes	no	no	no	no

province	yes	yes	yes	yes	yes
industry	yes	yes	yes	yes	yes
year	yes	yes	yes	yes	yes
Hansen test	0.238	0.418	0.371	0.299	0.525
AR(1)-test	0.003	0.007	0.006	0.005	0.001
AR(2)-test	0.328	0.541	0.308	0.446	0.874
N	402,552	38,640	52,114	234,523	77,275

Notes: Absolute χ statistics are reported in parentheses. GMM-SYS estimates are obtained using the 3rd lags of the dependent variable and regressors as instruments for the equation in differences, additionally GMM-SYS uses the 2nd lags of the differenced variables for the equation in levels. Hansen test is the Hansen J-test. AR(1) and AR(2) are the first order and second order serial correlation test on the differenced residuals respectively. *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Table 7. Robustness check on the relationship between firms' loan costs and asset growth (two-step system GMM approach)

	Whole Sample	State-owned	Collective	Private	Foreign
L.assetgrowth	0.301 (1.28)	-0.0141 (0.10)	-0.0669 (0.52)	0.178 (0.91)	-0.0049 (0.07)
INTEREST	0.150 (1.17)	0.2512** (2.31)	2.517 (1.10)	-0.553*** (2.73)	-1.597 (0.90)
age	-0.0024** (2.32)	-0.0013*** (3.39)	-0.0024*** (4.36)	-0.0036*** (3.43)	-0.0084*** (4.18)
size	0.0396*** (11.12)	0.0135** (2.23)	0.0317*** (2.63)	0.0564*** (16.06)	0.0340* (1.86)
tfp	0.0213 (1.44)	0.0143** (2.42)	0.0701*** (3.31)	0.0247* (1.78)	0.0448*** (4.11)
ex	-0.0187 (1.43)	-0.0013 (0.74)	-0.0478*** (2.82)	-0.0688*** (7.42)	-0.0669*** (2.94)
rd	0.0440 (1.28)	-0.0014 (0.31)	-0.953*** (3.11)	0.322 (1.39)	-0.615 (1.58)
cashflow	-0.00007 (1.03)	-0.00003 (0.76)	-0.0019 (0.55)	0.0006** (2.07)	-0.0111 (1.10)
leverage	-0.0603*** (2.81)	-0.1292 (1.57)	-0.1385*** (3.29)	-0.0605*** (3.48)	0.1453*** (2.75)
herfind	-0.1090 (1.63)	-0.0179 (0.24)	-0.1991 (1.37)	-0.2572* (1.67)	0.0662** (2.03)
saleindus	-0.000001 (0.41)	-0.000001 (0.43)	-0.000002* (1.79)	0.000004 (0.12)	0.0001*** (2.57)
factdisto	0.0297*** (2.76)	-0.0034 (0.07)	0.1542** (2.26)	0.0299*** (3.74)	0.1175*** (3.42)
ownership	yes	no	no	no	no
province	yes	yes	Yes	yes	yes
industry	yes	yes	Yes	yes	yes
year	yes	yes	Yes	yes	yes
Hansen test	0.39	0.47	0.36	0.40	0.56
AR(1)-test	0.00	0.00	0.00	0.00	0.00
AR(2)-test	0.65	0.73	0.68	0.53	0.77
N	412,450	46,389	57,391	228,077	80,593

Notes: Absolute χ statistics are reported in parentheses. GMM-SYS estimates are obtained using the 3rd lags of the dependent variable and regressors as instruments for the equation in differences, additionally GMM-SYS uses the 2nd lags of the differenced variables for the equation in levels. Hansen test is the Hansen J-test. AR(1) and AR(2) are the first order and second order serial correlation test on the differenced residuals respectively. *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

5.3.2 Alternative specifications

To assure the reliability of the aforementioned results, we have also implemented the following alternative specifications: (1) re-define the enterprise's loan costs. In China, where financial institutions usually request enterprises provide collateral security as a prerequisite for loans, the enterprise's own scale of fixed assets affects lending amount and costs. We re-estimate the regression models using the enterprise's net interest expenses divided by net fixed assets as the proxy for the bank loans; (2) re-classify enterprises according to the type of registrations in the dataset; (3) exploit different indicators of asset growth. The enterprise's total assets include intangible assets, which are seriously subject to measurement error and hence may not reflect a firm's actual investment behaviour and its expansion. We therefore replace the growth of the enterprise's total assets with the growth of its net fixed assets. In general, the regression results obtained in the main models are found to be robust to these new definitions.

6. Extension: Evaluating China's Financial Reform

In previous sections, we have verified the grabbing effect of banks on private firms in China. Since China is a transition economy experiencing a series of market-oriented reforms in various sectors⁷, one may naturally ask whether China's financial market reform has alleviated the grabbing impact of banks on Chinese private firms. As an extension of our analysis, this section discusses the influence of the financial reform in China on the bank-firm relationship. To this end, we construct the following econometric model:

$$Firmperformance_t = a_0 + a_1 Firmperformance_{t-1} + a_2 INTEREST_t + a_3 financialreform_t + a_4 (financialreform_t INTEREST_t) + \beta Z + error\ term \quad (3)$$

As we have introduced before, firm performance are measured using ROS and asset growth. The core variable on the right hand of equation (3) is *financialreform*. To measure the process of the financial market reform, we use the marketization index of Chinese financial market from 1999-2007 developed by Fan et al. (2010). This index is a weighted average of two indicators that reflect the outcome of Chinese financial reform. The first indicator is the competition intensity among financial institutions, which is calculated as the ratio of deposits in non state-owned financial institutions⁸ to that in all financial institutions. The second indicator measure the dominance of market in allocating the credit. Since non state-owned firms and state-owned firms are faced with unequal loaning conditions, Fan et al. (2010) used the percentage of bank loans received by non state-owned firms in the total amount of bank loans. The larger the percentage is, the more equivalent the loaning conditions are for the non state-owned firms, and the higher the level of marketization is in the credit market. The financial marketization index is widely used in the study on Chinese financial market because of its well description on the situation of Chinese financial market. The interaction term of *interestpayment* and *financialreform* captures the impact of financial reform on the relationship between banks and private firms. If China's financial reform had alleviated the grabbing effect of banks on private firms, a_4 should be positive; a_4 will be negative if the financial market reform has worsen the status of private firms in credit market. To address the concern on endogeneity, we use the system GMM approach to estimate equation (3).

Table 10 reports the estimation results on equation (3) (specific results are in appendix). The first three columns in Table 10 are the results using ROS as the proxy of firms' performance, while the last three columns are the outcomes using asset growth to measure firms' performance. To the whole sample of private firms, the coefficients of the interaction terms are statistically significant and negative no matter we use ROS or asset growth to measure firms' performance, which indicate that in regions with higher level of financial marketization the grabbing effect has been intensified. As for the regression results on the subsamples, the coefficients of interaction terms in the equation of using ROS as the dependent variable are statistically significant and

negative. More specifically, the coefficients of the interaction term in the subsample of higher level of financial marketization is larger than that in the group of lower level of financial marketization. This implies an intensified exploitation on private firms in the more developed financial market. The last two columns of Table 10 present the results on the subsamples using asset growth as the responding variable. In regions with more developed financial market, the coefficient of the interaction term is statistically significant and negative. But the coefficient of the interaction term is not significant in the subsample of firms in regions with lower level of financial marketization. On the whole, the regression results in both subsamples indicate that for private enterprises in regions with higher market degrees of credit distribution, loan costs impose a more serious restraining effect on the enterprise's performance.

Why has the financial market reform in China intensified the banks' deprivation of private enterprises? Of course, this question cannot be fully answered in this article, but we tend to provide one explanation here. China's credit market reform initiated in 1996 focused on the market-based reform of interest rates, which aimed at clarifying the relationship between local governments and state-owned banks. But the reform on the credit market since 2004 has targeted joint-stock reform for state-owned commercial banks, whereas the liberalisation process of loaning interest rates has been almost stagnant. Moreover, China retains a ceiling on deposit rates as well as a floor on lending rates.

Accompanied by interest rate regulations is the obvious underdevelopment of China's financial market. Financial repression are energized by the bank-dominant financial system (Wang, 2011). In such circumstances, the financial reform has strengthened the monopolistic power of the giant banks rather than transformed the structure of the credit market, which has indulged Chinese banks, allowing them to exploit private enterprises. In addition, regulations on bank deposits and loan interest rates has directly caused the divergence between official interest rate and the market interest rate, resulting in a double-track interest rate system. This has cut off the nexus between investment and financing, and has shaped the dual structure of China's credit market, which has provided space for capital arbitrage and opportunities for creating economic bubbles. This in turn widens the gap between market and official interest rates, spurring the growth of the market interest rate. As a consequence, SOEs can receive bank loans from the formal financial institutions at low costs, foreign enterprises are able to obtain external finance easily from domestic formal financial institutions and foreign financial institutions, but private firms suffering from financial constraint have to resort to informal financial institutions at a prohibitively high loaning cost.

Table 10. The impact of financial market reform on the relationship between banks and private firms

	Dependent variable: ROS			Dependent variable: assetgrowth		
	All private firms	High financial marketization	Low financial marketization	All private firms	High financial marketization	Low financial marketization
l.ros (l.assetgrowth)	0.3220 (1.25)	0.6813*** (7.29)	-0.155** (2.24)	0.560** (2.46)	0.0203*** (3.76)	-0.0018 (-0.02)
INTEREST	-0.0852* (1.92)	-2.152*** (5.63)	-0.155** (2.24)	-0.0724* (1.74)	-1.3267*** (-3.82)	-0.0827 (0.71)
Financialreform	-0.0018*** (2.82)	-0.0040*** (5.07)	-0.0001 (0.10)	-0.0755*** (12.26)	-0.0543*** (-6.21)	-0.0284*** (6.49)
INTEREST× financialreform	-0.0683*** (8.14)	-0.263*** (6.91)	-0.120*** (8.56)	-0.353* (1.71)	-0.0786*** (-5.70)	-0.0232 (0.80)
Z	yes	yes	yes	yes	yes	yes
province	yes	yes	yes	yes	yes	yes
industry	yes	yes	yes	yes	yes	yes
year	yes	yes	yes	yes	yes	yes
Hansen test	0.34	0.56	0.44	0.22	0.45	0.38
AR(1)-test	0.00	0.00	0.00	0.00	0.00	0.00
AR(2)-test	0.43	0.27	0.69	0.48	0.21	0.46
N	207,200	148,289	199,982	199,940	58,911	63,721

Notes: Regions with higher level of financial marketization are regions whose credit marketization index is higher than the mean value; regions of which the credit market index is lower than the mean value are defined as regions with lower level of financial marketization. The models are estimated using the system GMM approach. GMM-SYS estimates are obtained using the 3rd lags

of the dependent variable and regressors as instruments for the equation in differences, additionally GMM-SYS uses the 2nd lag of the differenced variables for the equation in levels. Hansen test is the Hansen J-test. AR(1) and AR(2) are the first order and second order serial correlation tests on the differenced residuals respectively. *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively. Absolute t or z statistics are reported in parentheses.

7. Conclusions

Using micro-level data on Chinese enterprises from 2001–2007, this study examines whether banks help or grab enterprises, especially the private enterprises, using different methods to tackle the endogeneity issues. We have found significant differences in the relationship among banks and different types of registration enterprises. Specifically, for private enterprises, bank loans show a negative effect on the enterprise's profitability or asset growth, indicating Chinese banks grab private firms' profits and hence impede their development. In SOEs, loan costs show a positive impact on the enterprise's profitability or asset growth, which implies that banks help SOEs' development. In foreign invested firms, neither of these effects is found.

Second, we have found that for private enterprises that without government subsidies, with low production values, with small size, or with low capital intensity, the grabbing effect is stronger. To firms with government subsidies, with high production values, with big size, or with high capital intensity, however, the bank-lending can be observed as a helping hand in certain cases.

Third, as an extension of our study, we have examined the impact of financial reform on the relationship between banks and private enterprises. We find that China's financial market reform has strengthened the grabbing effect rather than mitigated the bank's deprivation to private enterprises.

This study has important policy implications. A growing body of evidence shows that private enterprises in China have become the vital channel for ensuring employment, main forces of technological innovation, and the engine of economic growth. The Chinese government should continually undertake the market-oriented reform on the financial system to promote the efficient distribution of financial resources, make operations in financial markets transparent, reduce the government intervention, and minimise interference in the distribution of financial resources. These endeavours are constructive not only to the development of private enterprises, but also to the efficient allocation of financial resources, and eventually to the rapid and sustainable development of the national economy.

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Notes

1. They are the Industrial and Commercial Bank of China, the China Construction Bank, the Bank of China and China Agricultural Bank.
2. As we have discussed, foreign-invested firms have little loaning relationship with Chinese banks.
3. Weinstein and Yafeh (1998) showed that in return for providing capital and other services, banks are able to extract rents from their client firms in order to offset any gains they may have over other firms.
4. 4-digit industries and provinces are used here.
5. We used the traditional way of calculating the firm's investment, which is, $I_{it} = K_{it} - (1 - \delta) K_{it-1}$ where I_{it} ($I_{it} > 0$) and K_{it} respectively represent firm i 's investment and fixed capital in year t . δ is the depreciation rate for Chinese firms. Scholars hold different views on the value of the depreciation rate. Following Wu (2008), and Wang and Yao (2003), we chose 15%. The reason for controlling the industry level investment is explained in greater detail in section 4.1.
6. The asset growth at year 2001 is calculated by exploiting the complementary asset data from year 2000.
7. Since the 1990s, China's final market reform has undergone a process of the joint-stock reform of state-owned banks and of gradual reform by introducing new competitive commercial banks. These reforms have increased the competition and efficiency of the banking system, resulting in a more competitive financial market.
8. Financial institutions, except Industrial and Commercial Bank of China, the China Construction Bank, the

Bank of China, China Agricultural Bank, Postal Savings Bank of China, and other policy banks, are defined as non state-owned banks.