Large creditors and corporate governance: the case of Chinese banks

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Abstract

Purpose – Banks are the major suppliers of external funds for companies in China. The purpose of this paper is to examine whether Chinese banks exercise effective monitoring over borrowers in two lending decisions, including loan interest rates and loan renewals.

Design/methodology/approach – Using a sample of Chinese public industrial firms from 2000 to 2005, the authors perform multivariate regression analysis to investigate whether banks adjust their loan interest rates and consider loan renewal decisions in response to borrowers financial performance. The authors also examine these bank lending decisions before and after 2003, when the major banking reforms started to take place in China.

Findings – A negative relation was found between the loan interest rate spread and the financial performance of borrowers. However, a negative relation was found between loan renewals and the financial performance of borrowers, consistent with firms in financial difficulties being in need of more funding and hence more likely to get its bank loans renewed. Additionally, it was found that the factors banks consider when making loan decisions vary before and after 2003.

Originality/value – The authors' findings suggest that Chinese banks play a limited role in monitoring and disciplining borrowers through adjustments of loan interest rates, and that their loan renewal decisions for firms with poor financial performance highlight banks' financing, instead of monitoring role in this transition economy. These findings provide empirical evidence on bank governance in a transition economy dominated by state-owned enterprises. The paper contributes to the literature by constructing an alternative loan renewal measure using financial statement information.

Keywords China, Corporate finances, Banks, Loans, Interest rates, Creditors, Transition economies, Bank monitoring, Loan renewals

Paper type Research paper

1. Introduction

A country's financial development is shown to be significantly associated with its economic growth (Rajan and Zingales, 1998). Among the many essential roles that

financial institutions play in an economy, the monitoring and disciplining functions have been viewed particularly important in developing countries. Banks, as large creditors, have a special cost advantage as a result of economies of scale and their superior information-gathering technology; and the superior inside information gained from their ongoing lending relationships also enables banks to better monitor borrowers' actions (Diamond, 1984; Ramakrishman and Thakor, 1984; Fama, 1985). This advantage, combined with the confluence of underdeveloped stock markets, highly concentrated ownership structure, weak legal protections for minority shareholders, and the dominance of state banks in the financial system, have together made banks "the only logical candidate to supply much needed corporate governance" in transition economies such as China (Cull and Xu, 2000, p. 3).

The financial system in China has long been characterized by the dominance of the state banking sector. According to the Chinese Banking Regulation Committee (CBRC), the four state-owned commercial banks alone have total assets of about 22.5 trillion Yuan at the end of 2006, accounting for more than half of the total assets of major financial institutions in China[1]. Further, despite the recent growth of the stock markets, state banks are the major source of external funds for the state-owned enterprises (SOEs). During the period of 2000-2005, bank loans accounted for about half of total liabilities for publicly listed companies in China (Figure 1). The continuous policy support of SOEs through banking credit in the event of poor financial performance have long been blamed for the notorious non-performing loans in the state-owned banks (Brandt and Zhu, 2000). In fact, over one quarter of the bank loans in China are classified as non-performing at the end of 2002 (Yi, 2003).

Beginning in the mid-1990s, the Chinese government has implemented a series of financial reforms with the major objective of commercializing the banking sector. Reforms such as establishing policy banks, adopting the new Commercial Bank Law, and restructuring and listing state-owned banks in the stock market have improved banks' commercial incentives and credit allocation efficiency[2]. Questions, however, still remain. Would Chinese banks effectively perform their monitoring and disciplinary
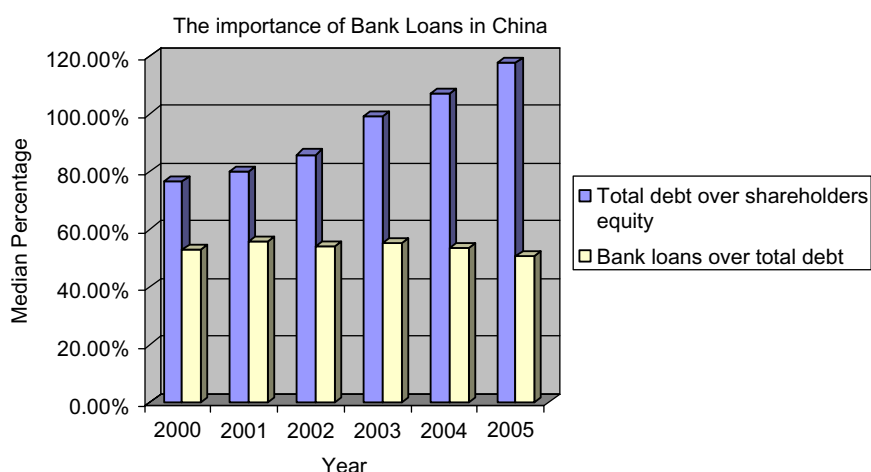
Source: Based on authors' calculations from the sample dataset

Figure 1.
Median values of total debts over shareholders equity and bank loans over total debts of non-financial A-share public companies in China: 2000-2005

roles in a situation where "the receipts of finance are largely predetermined and borrowers and lenders alike expect bailout rather than closure in the face of poor economic performance?" (Cull and Xu, 2000, p. 3). More specifically, do banks consider the economic fundamentals of borrowers when making decisions on specific loan terms?

Prior research suggests that banks can exercise effective governance over borrowers by providing favorable lending terms such as lower interest rates, larger credit line, longer loan terms, or higher probability to renew credit to borrowers with better performance (Machauer and Weber, 1998). In China, however, the evidence so far is mixed. For example, Hu and Xie (2005) find a positive relation between loan interest rates and borrowers' financial performance. Hu and Zhou (2006), on the other hand, suggest that there are insignificant or even negative relations between terms of lending (such as credit line, loan term, and the form of collateral) and borrower performance. That is, banks sometimes offer more favorable loan terms to worse performing firms. Thus, it is unclear whether Chinese banks as large creditors effectively monitor borrowers; if so, which loan terms reflect this monitoring and disciplining role.

Using a panel dataset of Chinese publicly listed non-financial firms from 2000 to 2005, we explore the above questions by investigating whether banks adjust their loan interest rates and consider loan renewal decisions in response to borrowers' financial performance. Our multivariate regressions find that firms with better financial performance, i.e. an increase in return on equity or a higher asset turnover ratio, enjoy lower bank loan spreads. The results also suggest that firms in financial difficulties, i.e. an increase in leverage ratio and a decrease in asset turnover ratio, or a higher leverage ratio and a lower asset turnover ratio, are in need of more funding and thus have a better chance of getting their bank loans renewed. We interpret these results as indications that the financial reforms beginning in the mid-1990s have made some but limited progress in commercializing the banking sector. In particular, after the reforms in the banking industry, banks have began to act as monitors but their monitoring roles are only evident in determining loan interest rates based on borrowers' economic fundamentals. Credit renewal decisions, however, are rather consistent with banks being the major supplier of external funds in this transition economy, instead of banks' governance roles.

Our study contributes to the literature by providing empirical evidence on the issue of bank governance in a transition economy dominated by SOEs. Prior studies on bank monitoring have focused on developed countries such as Japan and Germany (Kaplan and Minton, 1994; Gorton and Schmid, 2000). Our results show that Chinese banks play a limited role in monitoring and disciplining borrowers at least at the current stage of the reform.

We also contribute to the literature by constructing an alternative loan renewal measure using financial statement information. Prior research on loan renewals typically relies on corporate voluntary disclosures of credit agreements or non-public loan application information from banks to identify new or existing loans (Lummer and McConnell, 1989; Slovin et al., 1992). As a result, this line of research is significantly constrained by the limited number of companies voluntarily disclosing credit information and the difficulty of obtaining proprietary bank loan information. We overcome this data limitation by using financial statement information to construct loan renewal measures and therefore contribute to the understanding of banks' decisions to renew loans in settings where related information is not publicly available.

The rest of the paper proceeds as follows. Section 2 reviews the related literature and discusses recent studies on Chinese banks. In Section 3, we describe the sample and research design. The empirical tests and results are reported and discussed in Section 4. Finally, Section 5 concludes the paper.

2. Related literature

2.1 Theoretical background

Large creditors, including banks, play an important role in effective corporate governance systems (Shleifer and Vishny, 1997). These significant creditors typically obtain considerable cash flow rights as well as various control rights in cases where a firm Figures or violates debt covenants (Smith and Warner, 1979). Sometimes financial institutions can even invest in a firm's equity (e.g. in Germany and Japan) or sit on the board of directors. Thus, effective monitoring and governance by banks and other large creditors would reduce agency costs stemmed from the separation of ownership and control.

Theoretical studies in economics and finance have examined the unique monitoring role of banks. For example, in the context of informational asymmetry between entrepreneurs/borrowers and lenders, monitoring has been shown to be critical in solving agency problems (Jensen and Meckling, 1976; Leland and Pyle, 1977). Diamond (1984) develops a theory of financial intermediations based on minimum costs of monitoring. Specifically, banks enjoy a significant information cost advantage as a result of economies of scale and their superior information-gathering technology, and thus are able to perform a superior task of "delegated monitoring" on entrepreneurial projects with publicly unobservable profits. Similarly, Ramakrishnan and Thakor (1984) provide an economic rationale for the emergence of financial intermediaries based on their ability to lower information production costs in the presence of information asymmetry. Fama (1985) further argues that compared to other debt-holders with only public information, banks are inside lenders and have access to inside information which are valuable for efficiently making and monitoring repeating short-term loans. In addition, Besanko and Kanatas (1993) endogenize a bank's monitoring activities and study the moral hazard problem related to the inability of banks to contractually commit to monitoring. The resulting equilibrium is that entrepreneurs will optimally finance their projects with both bank credits and external capital.

Research on the cross-monitoring hypothesis further extends this line of inquiry. Bank debts in a firm's capital structure create cross-monitoring benefits in the sense that the information produced through bank monitoring reduces the duplicative monitoring and bonding costs by other claimants (Booth, 1992). This argument is supported by empirical evidence such as Datta *et al.* (1999), who find that the existence of bank debts lowers the at-issue yield spread for first public straight bond offers by about 68 basis points.

In essence, the theoretical premise discussed above focuses on banks' special monitoring ability. Given information imperfections, banks can monitor borrowers' actions with a comparative information advantage as well as directly interfere in their major decisions. Although its effectiveness depends on the specific legal arrangements, bank monitoring is critical to addressing agency problems (Shleifer and Vishny, 1997).

2.2 Empirical evidence

Prior studies have provided extensive empirical evidence on the effectiveness of bank governance. The first stream of empirical research examines the valuation effects

of bank credit agreements on borrowers. Specifically, Mikkelson and Partch (1986) and James (1987) find a positive stock price reaction to the announcement of new bank credit agreements. Later studies further refine the research design and provide additional evidence. Lummer and McConnell (1989), for example, document that bank credit agreement renewals rather than new bank loans convey positive news to the market about the borrower's credit worthiness. Slovin *et al.* (1992) distinguish large from small-capitalized firms and show that only small firms experience significantly positive price reaction at the time of loan agreement initiations and renewals. This indicates that banks' screening and monitoring functions are more effective for small firms who suffer the most from asymmetric information problems. Furthermore, there are significant price reactions to announcements of corporate sell-off decisions and seasoned common stock issues for firms with a significant portion of bank debts in their financial structure, therefore implying that the presence of bank debt adds to the credibility of management's decisions (Hirschey *et al.*, 1990; Slovin *et al.*, 1990). In addition, Slovin and Young (1990) demonstrate that the presence of a bank lending relationship enhances a firm's valuation at the time of an initial public offering by lessening the degree of expected underpricing. More recently, Anitablian *et al.* (2007) show that market reaction to the announcement of bank debt to Canadian firms in polluting industries is more positive and significant than that to firms in other industries, indicating the important role of bank monitoring as an effective screen for environmental risk. In sum, this line of research provides evidence consistent with the view that the financial market regards banks as an important monitoring and control mechanism.

The second stream of research examines how banks actually perform their monitoring functions by using accounting information. Zimmer (1980) suggests that accounting information is useful for loan officers to assess loan failure predictions. Chen and Wei (1993) report that creditors often consider the bankruptcy probability and leverage ratio in making debt waiving decisions when a firm faces debt covenant violation. Chung *et al.* (1993) find that for oil and gas companies, accounting information including reserve recognition accounting explains a large variation of their outstanding debts.

The third stream of research investigates whether a bank-borrower relationship is significant in the process of gathering and using information to adjust the contract terms. The general findings are that borrowers with longer banking relationships have lower interest rates and are less likely to pledge collateral (Petersen and Rajan, 1994, 1995; Boot and Thakor, 1994; Berger and Udell, 1995). This is consistent with the view that banks acquire information through the relationship and monitor borrower's performance over time.

The fourth stream of research examines the firm-level economic consequences of effective bank screening and monitoring. Banks, for example, screen prospective clients and adjust loan terms based on borrowers' financial performance and risk. Blackwell *et al.* (1998) report that audited firms have lower interest rates on revolving bank loans than unaudited firms, which is consistent with the idea that audit assurance reduces lenders' monitoring costs (Watts and Zimmerman, 1986). Machauer and Weber (1998) use banks' internal risk ratings to proxy for borrower risk and find that riskier borrowers pay higher loan rate premiums. Studies on Japanese banks document that appointments of bank directors increase significantly with poor stock market performance and earnings losses. Additionally, firms are also more sensitive to poor performance when they have ties to a main bank (Kaplan and Minton, 1994;

Kang and Shivdasani, 1995). In Germany, banks gain control rights through equity ownership which significantly improve firm performance (Gorton and Schmid, 2000). Interestingly, the number of bankers on a firm's board is much lower in the USA than in Germany and Japan. It is shown that having bankers on boards largely depends on the trade-off between the benefits of direct monitoring and the costs of active bank involvement in firm management (Kroszner and Strahan, 2001). In the case of bankruptcy, however, US bank lenders frequently assume much of the control rights and increase their monitoring by becoming major stockholders or appointing new directors (Gilson, 1990). Finally, Choi (2007) documents that conservatism and value relevance of income statements increase with the degree of bank dependence for relatively small firms, highlighting the role of a bank relationship in financial reporting.

In summary, the empirical evidence from developed markets largely supports the monitoring and disciplinary role of banks.

2.3 Evidence on Chinese banks
The current Chinese financial system is characterized by the dominance of four state-owned commercial banks and three policy banks (Park and Sehrt, 2001)[3]. According to the *China Financial Yearbook 1998*, these seven major banks accounted for two-thirds of total deposits and three-fourths of total lending in 1997. By 2006, the four state-owned commercial banks had total assets of about 22.5 trillion Yuan, accounting for more than half of the total assets of China's major financial institutions. In contrast, other national and regional commercial banks, despite their rapid growth in recent years, accounted for only 16 percent of the total assets[4].

While the stock markets in China have undergone substantial development since the establishment in the early 1990s, the state banking system remains to be the major financing channel of the state economy. During the period of 2000-2005, non-financial A-share publicly listed companies in China had on average more than 50 percent of their total debts borrowed from banks (Figure 1). The SOEs, in particular, have long been supported financially by the government with cheap credit through the state banking system and money creation (Brandt and Zhu, 1995). Private and privatized firm in rural areas of China, on the other hand, have been discriminated against in the formal loan market despite their rapid growth (Brandt and Li, 2003; Cull *et al.*, 2006). Banks' lending decisions are heavily influenced by government policies and both the lenders and borrowers, especially when they are state-controlled, expect government bailout when they face poor economic performance (Cull and Xu, 2000). As a result, China's current lending policy is often blamed for the high percentage of non-performing loans in the four major state banks, i.e. about 25 percent until 2002 and around 9 percent at the end of 2006 (Lardy, 1998; CBRC, 2007).

Beginning in the mid-1990s, a series of financial reforms have been implemented with the objective of commercializing the banking system. According to Park and Sehrt (2001), the new Commercial Bank Law took effect in 1995 in order to improve managerial incentives and the quality of bank loan portfolios by establishing capital adequacy ratios and bank director responsibility systems. Other policy reforms included centralizing the re-lending from the People's Bank of China and establishing three policy banks. More dramatic transformation in the banking sector has taken place since 2003. The CBRC, for example, was formed in April 2003 to strengthen financial regulation and supervision. The four major state-owned banks have also

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begun to list their shares in the Hong Kong and Chinese stock markets, including the listing of Bank of China in the Hong Kong Stock Exchange in 2006, which was the fourth largest IPO in the world. In 2007, the Shanghai Interbank Offer Rate System was established to create a more stable benchmark rate system. Meanwhile, long-term strategic investors have been allowed to take significant stakes in these state-owned banks. Compared to the old centralized state banking system, the financial reforms aim at improving banks' risk management and internal control, giving banks more autonomy in allocating regional credit and having their lending decisions based more on commercial basis.

Progress has been made on reforming the banking sector in China, but questions still remain. Have Chinese banks become more efficient as a result of these reforms? Do we observe an effective screening and monitoring role for Chinese banks?

Despite the banking reforms, commercial bank lending rates are still subject to government regulations and the lack of complete interest rate liberalization is widely believed to have distorted the behavior of lenders and borrowers[5]. Empirical evidence so far has also provided mixed evidence. For instance, Cull and Xu (2005) report that in 2000-2002 better performing private firms are more likely to receive loans. Hu and Xie (2005) document a negative relation between firms' financial performance and loan rates. In contrast, Hu and Zhou (2006) find no significant relation between firms' financial performance and bank loan terms such as line of credit, terms and collaterals. Park and Sehrt (2001) show that the lending decisions by financial institutions did not correspond well with borrowing firms' economic fundamental statistics during 1991-1997. Tian (2004) finds that publicly listed SOEs have a negative price reaction to an increase in their bank loans, especially when both the lender and borrower are state-controlled. Therefore, it is unclear and ultimately an empirical question whether Chinese banks' lending decisions are determined by market forces.

In this study, we explore the questions above by examining the associations between bank loan terms and borrowers' financial performance. Specifically, we examine whether banks' decisions on loan interest rates and loan renewals respond to borrowers' financial performance. To the extent that Chinese banks play an effective screening and monitoring role after the reform, we shall observe that the better a borrower's financial performance, the lower loan interest rate it will receive, and the more likely it will obtain a loan renewal. If, however, banks still operate with limited freedom to set loan terms according to market conditions, we would observe an insignificant or even opposite relation between loan interest rates (and loan renewals) and borrowers' financial performance.

3. Data and research design

Our sample consists of all A-share non-financial companies listed in the Shenzhen and Shanghai Stock Exchanges from 2000 to 2005 with sufficient financial data from the CSMAR database, JULIN database, and HEXUN (www.hexun.com). We also examine the sample separately in 2000-2003 and 2004-2005, as greater efforts have been made to strengthen the banking reforms in China since 2003. Table I provides the sample distribution by year and by industry. Panel A shows that the loan renewal sample has more observations than the loan spread sample, i.e. 1,795 firm years compared to 673 firm years. The number of observations varies from year to year, ranging from 97 in 2002 to 142 in 2000 for the loan spread sample and from 194 in 2000 to 371 in 2005

	Loan spread sample			Loan renewal sample		
	Panel A: sample distribution across years					
Year	No. of obs.	*No. of listed companies*	*Percentage*	*No. of obs.*	*No. of listed companies*	*Percentage*
2000	142	1,054	13.47	194	1,054	18.41
2001	120	1,136	10.56	267	1,136	23.50
2002	97	1,192	8.14	365	1,192	30.62
2003	109	1,255	8.69	330	1,255	26.29
2004	107	1,343	7.97	268	1,343	19.96
2005	98	1,342	7.30	371	1,342	27.65
Total	673	7,322	9.19	1,795	7,322	24.52
	Panel B: sample distribution across industries					
Industry	No. of obs.	Percentage		No. of obs.	Percentage	
IND1	5	0.74		37	2.06	
IND2	89	13.22		177	9.86	
IND3	27	4.01		71	3.96	
IND4	26	3.86		55	3.06	
IND5	82	12.18		173	9.64	
IND6	48	7.13		181	10.08	
IND7	94	13.97		282	15.71	
IND8	46	6.84		113	6.30	
IND9	37	5.50		81	4.51	
IND10	60	8.92		147	8.19	
IND11	22	3.27		60	3.34	
IND12	42	6.24		177	9.86	
IND13	24	3.57		64	3.57	
IND14	49	7.28		131	7.30	
IND15	22	3.27		46	2.56	
Total	673	100		1,795	100	

Notes: The sample includes 673 firm-year observations for the loan spread model and 1,795 firm-year observations for the loan renewal model for the period of 2000-2005; to be included in the sample, a firm must have detailed disclosure of bank loan terms on financial statements and sufficient financial data on CSMAR database, JULIN database and HEXUN database; we only include A-share non-financial public companies in Shenzhen and Shanghai Stock Exchanges in our sample; we classify our sample firms into 15 industries based on the *Guidance on Public Firm Industry Classifications* published by the Chinese Securities Regulation Commission (CSRC); these 15 industries are: IND1-A agriculture, forestry, fishing, hunting and trapping; IND2-B mining, C6 metal and non-metal; IND3-C0 food and drinks; IND4-C1 apparel, textile and leather; IND5-C4 petroleum, chemicals, plastics and rubber; IND6-C5 electronics, G information technology, L communications and media; IND7-C7 industrial and commercial machinery and computer equipment; IND8-C8 pharmaceutical and biological products; IND9-D electric, gas and water services; IND10-E architecture, J real estate; IND11-F transportation and storage; IND12-H wholesale and retail; IND13-K business services; IND14-M general business; IND15-C2 lumber and furniture, C3 paper products and printing, C9 other industrial manufacturing

Table I.
Sample distribution

for the loan renewal sample. Panel B shows a sample variation across 15 different industries. For example, industrial and commercial machinery and computer equipment (IND7) has the largest number of observations for both the loan spread and loan renewal samples, while agriculture, forestry, fishing, hunting and trapping (IND1) has the smallest for both samples. These final samples are obtained after trimming observations at the top and bottom three standard deviations in order to reduce the influence of outliers.

The two dependent variables are loan spreads and loan renewals. We use information from the footnotes of firms' financial statements and calculate loan spread as the weighted long-term loan interest rate minus the benchmark rate, which is the interest rate on medium- and long-term fixed asset investment loans published by the National Bureau of Statistics of China. We use the loan interest spread rather than the raw interest rate to control for economy-wide interest rate fluctuations over time. Specifically[6]:

$$SPREAD = \sum_{i=1}^{n} \text{int}_i \times \frac{loan_i}{total\ loan_t} - Benchmark_t$$

where, for a particular firm, int_i is the interest rate on a specific long-term bank loan i, $loan_i$ is the total loan amount for this particular long-term loan i, and $total\ loan_t$ is the total amount of all long-term bank loans during a year[7].

Very few public companies in China voluntarily disclose detailed information on their bank loans. We therefore measure loan renewal using the change in current maturities of long-term debt obtained from financial statements. That is, a decrease in the ending balance of this item is used to proxy for loan repayment, and an increase is for loan renewal. Specifically:

$$LONG_{t-1} + NEW_t + INTEREST_t - NEWDUE_t = LONG_t \quad (1)$$

$$DUE_{t-1} + NEWDUE_t - REPAYMENT_t = DUE_t \quad (2)$$

Where, $LONG_{t-1}$ and $LONG_t$ are the beginning and ending balances of long-term debt, respectively. DUE_{t-1} and DUE_t are the beginning and ending balances of current maturities of long-term debt, respectively. $INTEREST_t$ is the interest expense accrued at yearend. $NEWDUE_t$ is the proportion of long-term debt which becomes the current maturities of long-term debt at yearend. $REPAYMENT_t$ is the repayment of long-term debt during the year[8]. From equations (1) and (2), we have the following:

$$NEW_t = (LONG_t + DUE_t) - (LONG_{t-1} + DUE_{t-1}) + REPAYMENT_t \\ - INTEREST_t \quad (3)$$

We assume that the beginning balance of the current maturities of long-term debt is paid off at the yearend, i.e. $DUE_{t-1} = REPAYMENT_t$. Therefore, we have:

$$NEW_t = (LONG_t + DUE_t) - LONG_{t-1} - INTEREST_t \quad (4)$$

We measure loan renewals using a dummy variable with a value of 1 when NEW_t is greater than 0, and a value of 0 if NEW_t is equal to or less than 0.

To capture the relation between firms' performance and loan spread (and loan renewals), we have the following multivariate regression models:

$$\begin{aligned} Y = &\beta_0 + \beta_1 \times DEBTRT + \beta_2 \times CASH + \beta_3 \times ROE + \beta_4 \times TURNTA \\ &+ \beta_5 \times GROWSALE + \beta_6 \times LNTOAT + \beta_7 \times EXFU + \beta_8 \times RECUA \\ &+ \beta_9 \times RELI + \beta_{10} \times COLLA + \beta_{11} \times STATE + \beta_{12} \times TOBIN'Q \\ &+ \beta_{13} \times BETA + \sum_{i=1}^{3} YEAR_i + \sum_{j=1}^{14} IND_j + \sum_{k=1}^{5} AREA_k \end{aligned} \quad (5)$$

$$Y = \beta_0 + \beta_1 \times DEBTRTCH + \beta_2 \times CASHCH + \beta_3 \times ROECH$$
$$+ \beta_4 \times TURNTACH + \beta_5 \times GROWSALECH + \beta_6 \times LNTOAT$$
$$+ \beta_7 \times EXFU + \beta_8 \times RECUA + \beta_9 \times RELI + \beta_{10} \times COLLA$$
$$+ \beta_{11} \times STATE + \beta_{12} \times TOBIN`Q + \beta_{13} \times BETA$$
$$+ \sum_{i=1}^{3} YEAR_i + \sum_{j=1}^{14} IND_j + \sum_{k=1}^{5} AREA_k \qquad (6)$$

where:

Y   the loan spread variable *SPREAD* or the loan renewal variable *NEW*;

Level variables

DEBTRT	the firm's leverage ratio (total liabilities over total assets) at year $t-1$;
CASH	the firm's return rate on total assets based on cash flows (net cash flows from operating activities over average total assets) at year $t-1$;
ROE	the firm's return on equity (net income over net assets) at year $t-1$;
TURNTA	the firm's asset turnover ratio (net sales over average total assets) at year $t-1$;
GROWSALE	the firm's growth rate in net sales at year $t-1$;

Change variables

DEBTRTCH	an indicator set to 1 if leverage (total liabilities over total assets) at year t is smaller than year $t-1$, and set to 0 otherwise;
CASHCH	an indicator set to 1 if return rate on total assets based on cash flows (net cash flows from operating activities over average total assets) at year t is smaller than year $t-1$, and set to 0 otherwise;
ROECH	an indicator set to 1 if return on equity (net income over net assets) at year t is smaller than year $t-1$, and set to 0 otherwise;
TURNTACH	an indicator set to 1 if asset turnover (net sales over average total assets) at year t is smaller than year $t-1$, and set to 0 otherwise;
GROWSALECH	an indicator set to 1 if growth in net sales at year t is smaller than year $t-1$, and set to 0 otherwise;

Other control variables

LNTOAT	the natural logarithm of the firm's total assets (in 10,000 Yuan) at yearend;
EXFU	an indicator set to 1 if the firm has a new equity or debt issuance at year t, and set to 0 otherwise;

RECUA	the firm's other receivables over current assets at year t;
RELI	the firm's other payables over current liabilities at year t;
COLLA	an indicator set to 1 if the firm provides guarantee to other firms, and set to 0 otherwise;
STATE	an indicator variable set to 1 if the firm is state-controlled and set to 0 otherwise;
TOBIN'Q	the sum of the market value of equity plus net debt, of which the market value of non-tradable shares is calculated using the market price of tradable shares, divided by total assets (net of intangible assets);
BETA	the CAPM beta, where the market index is the Shanghai Stock Exchange composite index for firms listed in the Shanghai Stock Exchange, and the market index is the Shenzhen Stock Exchange composite index for firms listed in the Shenzhen Stock Exchange;
YEAR	dummy variables for years;
IND	dummy variables for industry classifications based on *Guidance on Public Firm Industry Classifications* published by the Chinese Securities Regulation Commission (CSRC)[9]; and
AREA	dummy variables for five geographical areas based on the *China Statistical Yearbook*.

The primary independent variables are in two categories. The first category consists of level-based financial ratio variables. Specifically, we use a firm's leverage (*DEBTRT*), net cash flow over total assets (*CASH*), return on equity (*ROE*), asset turnover rate (*TURNTA*) and growth rate in net sales (*GROWSALE*) in year $t - 1$. The second set of variables consists of the changes in those five financial ratios. Specifically, we use dummy variables with a value of 1 if the ratio is smaller in year t than in year $t - 1$, and a value of 0 otherwise. These variables are the change in leverage from year $t - 1$ to year t (*DEBTRTCH*), the change in net cash flow over total assets from year $t - 1$ to year t (*CASHCH*), the change in return on equity from year $t - 1$ to year t (*ROECH*), the change in asset turnover ratio from year $t - 1$ to year t (*TURNTACH*), and the change in growth rate from year $t - 1$ to year t (*GROWSALECH*).

If Chinese banks assume an effective monitoring role, we predict a negative relation between financial performance and loan spread as well as a positive relation between financial performance and loan renewal. That is, for the loan spread model, we expect a positive (negative) coefficient on *DEBTRT* (*DEBTRTCH*), a negative (positive) coefficient on *CASH* (*CASHCH*), a negative (positive) coefficient on *ROE* (*ROECH*), a negative (positive) coefficient on *TURNTA* (*TURNTACH*), and a negative (positive) coefficient on *GROWSALE* (*GROWSALECH*). For the loan renewal model, we expect a negative (positive) coefficient on *DEBTRT* (*DEBTRTCH*), a positive (negative) coefficient on *CASH* (*CASHCH*), a positive (negative) coefficient on *ROE* (*ROECH*), a positive (negative) coefficient on *TURNTA* (*TURNTACH*), and a positive (negative) coefficient on *GROWSALE* (*GROWSALECH*). If, on the other hand, banks continue

to be the major fund supplier for companies that have existing bank loans but are in financial difficulties, we predict a negative relation between financial performance and loan renewals. That is, for the loan renewal model, we expect a positive (negative) coefficient on *DEBTRT* (*DEBTRTCH*), a negative (positive) coefficient on *CASH* (*CASHCH*), a negative (positive) coefficient on *ROE* (*ROECH*), a negative (positive) coefficient on *TURNTA* (*TURNTACH*), and a negative (positive) coefficient on *GROWSALE* (*GROWSALECH*).

We also include control variables that are expected to affect loan spreads and loan renewals. Specifically, we include *LNTOAT* to control for the size effect because larger firms are more likely to enjoy lower interest rates and greater frequencies of loan renewals because of lower risk, economies of scale in loan production costs, or greater reputation in debt markets (Blackwell *et al.*, 1998; Diamond, 1989; Petersen and Rajan, 1994; Sinkey, 1998). We control for new equity or debt issuance (*EXFU*) because the firm's capital raising activities are regarded as a favorable signal to the market which lowers its borrowing cost and increases the likelihood of renewals. We include *RECUA* because a firm's other receivables over current assets can be a proxy for the outright control and expropriation by large shareholders (Li *et al.*, 2004). Banks are expected to respond to these private benefits by increasing the loan interest rates and reducing loan renewals. *RELI* is included because a firm's other payables over current liabilities can be a proxy for its financing capability from related parties and are viewed positively by banks with lower loan interest rates. On the other hand, financing through related parties could also indicate financial difficulty and a greater need of bank loan renewals (Li *et al.*, 2004). We also include *COLLA* to control for risks related to external assurance or guarantee. In addition, we control for whether the firm is state-controlled (*STATE*) because of the differential treatment of loan decisions among SOEs and private firms (Cull *et al.*, 2006; Brandt and Li, 2003). We include Tobin's Q (*Tobin'Q*) to control for firms' growth opportunities and beta (*BETA*) to control for firm risk. Finally, we include industry, area and year dummies to control for the variation in loan terms by industry, area and year.

4. Empirical results
4.1 Descriptive statistics
Table II provides descriptive statistics for samples used in the loan spread model (in Panel A) and loan renewal model (in Panel B). It shows that there has been a significant fluctuation in bank loan interest rates despite the tight credit control in China. For example, the raw loan interest rate varies from a minimum value of 1.98 percent to a maximum of 9.97 percent with a standard deviation of 1.01 percent in Panel A. After taking into account recent changes in the benchmark rate (rate on medium- and long-term fixed asset investment loans, 6.03 percent in 2000 and 2001 and 5.58 percent in 2002 and 2003), it still indicates that to some extent bank loan spreads fluctuate within a wide range. Panel B also indicates that over 40 percent of our sample has their bank loans renewed. Furthermore, the mean leverage ratio (*DEBTRT*) is above 40 percent (i.e. 46 percent in the loan interest rate sample and 44 percent in the loan renewal sample). This high leverage ratio, combined with the fact that over 50 percent of the total liabilities in public firms come from bank loans during 2000-2005 (Figure 1), speaks directly to the dominance of the banking industry in the Chinese financial system.

Table III provides the Pearson correlation coefficients and the corresponding *p*-values among the variables in loan spread and loan renewal models. For example,

Variable	n	Mean	SD	Min.	Max.
Panel A: descriptive statistics of variables used in the loan spread sample					
INTEREST[a]	673	0.05839	0.01011	0.01977	0.09966
DEBTRT	673	0.46028	0.15719	0.06349	0.99636
CASH	673	0.04926	0.08407	− 0.42999	0.30941
ROE	673	0.06262	0.13525	− 1.12994	1.3357
TURNTA	673	0.54053	0.33068	0.04257	1.75667
GROWSALE	673	0.21735	0.50446	− 0.83922	5.69946
LNTOAT	673	12.06426	0.83722	9.96062	14.43885
EXFU	673	0.10401	0.3055	0	1
RECUA	673	0.01919	0.07099	0	0.63777
RELI	673	0.10126	0.08386	0.00021	0.61949
COLLA	673	0.36701	0.48235	0	1
STATE	673	0.79049	0.40726	0	1
TOBIN' Q	673	2.19893	1.42727	0.70928	16.5673
BETA	673	1.06385	0.23508	0.0582	1.8582
Panel B: descriptive statistics of variables used in the loan renewal sample					
NEW	1,795	0.40167	0.49037	0	1
DEBTRT	1,795	0.44004	0.17667	0.01168	0.99636
CASH	1,795	0.05043	0.08917	− 0.59733	0.61631
ROE	1,795	0.05577	0.14714	− 1.53608	1.3357
TURNTA	1,795	0.56977	0.38675	0.00379	2.34247
GROWSALE	1,795	0.24463	0.62918	− 0.97339	8.63785
LNTOAT	1,795	11.86126	0.84747	9.32407	14.81699
EXFU	1,795	0.06741	0.2508	0	1
RECUA	1,795	0.01426	0.06457	0	0.63777
RELI	1,795	0.10747	0.09133	0	0.84297
COLLA	1,795	0.4234	0.49424	0	1
STATE	1,795	0.76045	0.42693	0	1
TOBIN' Q	1,795	2.36435	1.66649	0.68966	16.5673
BETA	1,795	1.06457	0.25024	0.0969	1.809

Notes: [a]The variable *INTEREST* in this table is the raw interest rate before adjusted for the benchmark rate, which is the rate of medium- and long-term fixed asset investment loans; the interest rate of medium- and long-term fixed asset investment loans in 2000, 2001, 2002, 2003, 2004 and 2005 are 6.03 percent, 6.03 percent, 5.58 percent, 5.58 percent, 5.58 percent, and 5.85 percent, respectively; this table reports descriptive statistics of the variables used in the loan spread and loan renewal models; *SPREAD* is the loan spread computed as the weighted long-term debt interest rate minus the benchmark rate on medium- and long-term fixed asset investment loans; specifically:

$$INTEREST = \sum_{i=1}^{n} \text{int}_i \times \left(\frac{loan_i}{total\ loan} \right)$$

$$SPREAD = \sum_{i=1}^{n} \text{int}_i \times \left(\frac{loan_i}{total\ loan} \right) - Benchmark_t$$

where, for a particular firm, int_i is the interest rate on a specific long-term bank loan i, $loan_i$ is the total loan amount for this particular long-term loan i, and total loan is the total amount of all long-term bank loans during a year; NEW is the dummy variable for loan renewals with a value of 1 when NEW_t is greater than 0, and a value of 0 if NEW_t is equal to or less than 0; specifically:

Table II.
Descriptive statistics

$$NEW_t = (LONG_t + DUE_t) - LONG_{t-1} - INTEREST_t$$

where, $LONG_{t-1}$ and $LONG_t$ are the beginning and ending balances of long-term debt, respectively; DUE_t is the ending balances of current maturities of long-term debt; $INTEREST_t$ is the interest expense accrued at yearend; *DEBTRT* is the firm's leverage ratio (total liabilities over total assets) at year $t - 1$; *CASH* is the firm's return rate on total assets based on cash flows (net cash flows from operating activities over average total assets) at year $t - 1$; *ROE* is the firm's return on equity (net income over net assets) at year $t - 1$; *TURNTA* is the firm's asset turnover ratio (net sales over average total assets) at year $t - 1$; *GROWSALE* is the firm's growth rate in net sales at year $t - 1$; *DEBTRTCH* is an indicator set to 1 if leverage (total liabilities over total assets) at year t is smaller than year $t - 1$, and set to 0 otherwise; *CASHCH* is an indicator set to 1 if return rate on total assets based on cash flows (net cash flows from operating activities over average total assets) at year t is smaller than year $t - 1$, and set to 0 otherwise; *ROECH* is an indicator set to 1 if return on equity (net income over net assets) at year t is smaller than year $t - 1$, and set to 0 otherwise; *TURNTACH* is an indicator set to 1 if asset turnover (net sales over average total assets) at year t is smaller than year $t - 1$, and set to 0 otherwise; *GROWSALECH* is an indicator set to 1 if growth in net sales at year t is smaller than year $t - 1$, and set to 0 otherwise; *LNTOAT* is the natural logarithm of the firm's total assets (in 10,000 Yuan) at yearend; *EXFU* is an indicator set to 1 if the firm has a new equity or debt issuance at year t, and set to 0 otherwise; *RECUA* is the firm's other receivables over current assets at year t; *RELI* is the firm's other payables over current liabilities at year t; *COLLA* is an indicator set to 1 if the firm provides guarantee to other firms, and set to 0 otherwise; *STATE* is an indicator variable set to 1 if the firm is state-controlled and set to 0 otherwise; *TOBIN' Q* is the sum of the market value of equity plus net debt, of which the market value of non-tradable shares is calculated using the market price of tradable shares, divided by total assets (net of intangible assets); *BETA* is the CAPM beta, where the market index is the Shanghai Stock Exchange Composite Index for firms listed in the Shanghai Stock Exchange, and the market index is the Shenzhen Stock Exchange Composite Index for firms listed in the Shenzhen Stock Exchange

Table II.

Panel A suggests that loan spreads (*SPREAD*) have a significant and negative correlation with financial performance variables, including cash flows over total assets (*CASH*) and asset turnover ratio (*TURNTA*). Panel A also shows that larger firms (*LNTOAT*), firms with less severe outright control and large shareholder expropriation problems (*RECUA*), state-controlled firms (*STATE*), and firms with smaller growth opportunities (*TOBIN'Q*) tend to have a lower loan spread. On the other hand, Panel B shows that the likelihood of getting loan renewals is increasing in firms with higher leverage ratios (*DEBTRT*) and lower cash flows over total assets (*CASH*). Further, larger firms (*LNTOAT*), firms that do not issue equities or debts (*EXFU*), firms with less severe outright control and large shareholder expropriation problems (*RECUA*), firms with fewer funds from related parties (*RELI*), firm that provide guarantees to other firms (*COLLA*), and firms with less growth opportunities (*TOBIN'Q*) are more likely to renew their bank loans. The results in the two panels seem to present conflicting evidence regarding the bank monitoring role. We will investigate this further in the multivariate regressions. Finally, none of the independent variables have correlation coefficients above 0.50 except for firm size and growth opportunities (*LNTOAT* and *TOBIN'Q*).

4.2 Multivariate results: loan spread model
Table IV reports the results of multivariate OLS regressions for the loan spread model for the full sample period of 2000-2005. In Panel A the five financial performance variables are change variables while in Panel B they are level variables.

Panel A: Pearson correlation coefficients among variables used in the loan spread sample

	SPREAD	DEBTRT	CASH	ROE	TURNTA	GROWSALE	LNTOAT	EXFU	RECUA	RELI	COLLA	STATE	TOBIN'Q	β
SPREAD	1													
DEBTRT	0.0265 *0.4931*	1												
CASH	-0.157 *0.0000*	-0.1458 *0.0001*	1											
ROE	-0.0519 *0.1786*	-0.1696 *0.0000*	0.2125 *0.0000*	1										
TURNTA	-0.1723 *0.0000*	0.1267 *0.001*	0.1831 *0.0000*	0.1925 *0.0000*	1									
GROWSALE	-0.0511 *0.1857*	0.1309 *0.0007*	0.1459 *0.0001*	0.1989 *0.0000*	0.1898 *0.0000*	1								
LNTOAT	-0.1974 *0.0000*	0.0444 *0.2503*	0.144 *0.0002*	0.1652 *0.0000*	0.1736 *0.0000*	0.1132 *0.0033*	1							
EXFU	0.0526 *0.1726*	-0.1329 *0.0005*	0.0151 *0.6955*	0.0524 *0.0000*	-0.0168 *0.6638*	0.0015 *0.9695*	0.0758 *0.0492*	1						
RECUA	0.1168 *0.0024*	0.0027 *0.9435*	-0.1395 *0.0003*	0.1748 *0.0000*	-0.0377 *0.3291*	-0.0658 *0.0879*	-0.1047 *0.0066*	0.0947 *0.014*	1					
RELI	-0.0271 *0.4822*	-0.0604 *0.1175*	0.1122 *0.0036*	-0.0443 *0.2511*	-0.1596 *0.0000*	0.0009 *0.982*	-0.0939 *0.0148*	0.0027 *0.9441*	-0.033 *0.3931*	1				
Colla	0.0066 *0.8644*	0.1922 *0.0000*	-0.0758 *0.0494*	-0.103 *0.0075*	-0.0377 *0.3286*	-0.0096 *0.8047*	-0.0011 *0.9765*	-0.0171 *0.6583*	0.0289 *0.4549*	-0.0467 *0.2263*	1			
STATE	-0.0821 *0.0332*	-0.1043 *0.0068*	0.0438 *0.2566*	0.0199 *0.6067*	0.0413 *0.2843*	-0.0429 *0.2659*	0.1454 *0.0002*	0.1036 *0.0071*	0.0065 *0.8671*	0.0618 *0.1092*	-0.0701 *0.0692*	1		
TOBIN Q	0.23 *0.0000*	-0.1801 *0.0000*	-0.0083 *0.8308*	0.1248 *0.0012*	-0.0894 *0.0204*	-0.0828 *0.0317*	-0.4609 *0.0000*	0.0166 *0.6667*	0.1393 *0.0003*	0.0314 *0.416*	-0.0708 *0.0666*	-0.0303 *0.4329*	1	
β	0.0326 *0.3991*	0.0597 *0.1216*	-0.0765 *0.0473*	-0.0741 *0.0545*	-0.0489 *0.2053*	-0.0415 *0.2824*	-0.0796 *0.0389*	-0.0218 *0.5719*	0.0136 *0.7247*	-0.0551 *0.1536*	0.1052 *0.0063*	-0.0329 *0.3938*	-0.2796 *0.0000*	1

(continued)

Table III.
Pearson correlation
coefficients

Panel B: Pearson correlation among variables used in the loan renewal sample

	NEW	DEBTRT	CASH	ROE	TURNTA	GROWSALE	LNTOAT	EXFU	RECUA	RELI	COLLA	STATE	TOBIN' Q	β
NEW	1													
DEBTRT	0.1766 *0.0000*	1												
CASH	−0.0538 *0.0227*	−0.1534 *0.0000*	1											
ROE	−0.0052 *0.8272*	−0.2149 *0.0000*	0.2231 *0.0000*	1										
TURNTA	−0.0105 *0.6578*	0.123 *0.0000*	0.1581 *0.0000*	0.2137 *0.0000*	1									
GROWSALE	−0.0107 *0.6513*	0.0646 *0.0062*	0.0647 *0.0061*	0.2 *0.0000*	0.1729 *0.0000*	1								
LNTOAT	0.2078 *0.0000*	0.108 *0.0000*	0.1051 *0.0000*	0.2173 *0.0000*	0.2037 *0.0000*	0.0581 *0.0138*	1							
EXFU	−0.107 *0.0000*	−0.0714 *0.0025*	0.0685 *0.0037*	0.123 *0.0000*	0.0687 *0.0036*	0.0025 *0.9164*	0.0447 *0.058*	1						
RECUA	−0.057 *0.0156*	0.0268 *0.2563*	−0.0501 *0.0339*	−0.0437 *0.0642*	−0.0539 *0.0224*	−0.0483 *0.0407*	−0.1012 *0.0000*	0.0377 *0.11*	1					
RELI	−0.0766 *0.0012*	−0.088 *0.0002*	0.0314 *0.1837*	−0.1134 *0.0000*	−0.1327 *0.0000*	−0.0625 *0.0081*	−0.1253 *0.0000*	−0.0144 *0.5428*	0.0146 *0.5377*	1				
COLLA	0.0454 *0.0546*	0.2391 *0.0000*	−0.1055 *0.0000*	−0.159 *0.0000*	−0.0751 *0.0014*	−0.0439 *0.063*	0.0249 *0.2915*	−0.091 *0.0001*	0.0381 *0.1068*	−0.0234 *0.3215*	1			
STATE	−0.0087 *0.7115*	−0.0758 *0.0013*	0.0186 *0.431*	−0.0018 *0.9405*	0.0886 *0.0002*	−0.035 *0.1385*	0.094 *0.0001*	0.0312 *0.1869*	0.0251 *0.2882*	0.056 *0.0176*	−0.0421 *0.0745*	1		
TOBIN' Q	−0.2311 *0.0000*	−0.2023 *0.0000*	0.0272 *0.2498*	0.0164 *0.4863*	−0.1129 *0.0000*	−0.0068 *0.7728*	−0.5351 *0.0000*	0.0593 *0.0119*	0.158 *0.0000*	0.0511 *0.0306*	−0.0677 *0.0041*	0.0202 *0.3916*	1	
β	0.0076 *0.7469*	0.0459 *0.0519*	−0.1134 *0.0000*	−0.055 *0.0198*	−0.085 *0.0003*	−0.0341 *0.1483*	−0.0385 *0.1029*	−0.0383 *0.1044*	−0.0143 *0.5442*	−0.0482 *0.0411*	0.0631 *0.0075*	−0.016 *0.4976*	−0.2596 *0.0000*	1

Notes: This table reports the Pearson correlation coefficients among our variables used in both the loan spread model (Panel A, n = 673 firm-years) and loan renewal model (Panel B, n = 1,795 firm-years) along with two-tailed p-values in italics; see Table II for variable definitions

Table III.

Specifically, Model 1 in Panel A reports the baseline regression results without including the control variables. It shows that the change in return on equity (*ROECH*) is significantly correlated with borrowers' loan spreads (coefficient is 0.0021 with *t*-statistic of 2.49), consistent with firms with an increase their ROE from the year before enjoying a lower spread. After including control variables in Model 2, we continue to find significant and positive coefficients on *ROECH*. We further include controls for state-controlled firms (*STATE*) in Model 3 and growth opportunities (*TOBIN'Q*) and risk (*BETA*) in Model 4 and find robust results on *ROECH*.

Among the control variables in Panel A, size (*LNTOAT*) has a significant and negative coefficient in all models (all at $p < 1$ percent). Consistent with Blackwell *et al.* (1998) and Petersen and Rajan (1994), this indicates that larger firms are associated with lower spreads. The variable capturing state ownership (*STATE*) has a significant and negative coefficient (all at $p < 1$ percent), consistent with state-controlled companies in China enjoying a lower loan spread.

Panel B reports the regression results with the financial performance variables being level variables. Specifically, Model 1 reports the baseline regression results without including the control variables. It shows that asset turnover (*TURNTA*) in the prior year has significant and negative coefficients (coefficient is -0.0036 with *t*-statistic of -4.14). After including the control variables, we continue to find significant and negative coefficients on in *TURNTA* Models 2-4. The control variables also exhibit consistent patterns as in Panel A.

We note that the coefficients on the change in return on equity (*ROECH*) in Panel A of Table IV are significantly positive across all four models in Panel A, while the coefficients on return on equity (*ROE*) are insignificant in Panel B. This is consistent with loan spreads being correlated with the change in, rather than the level of ROE.

Thus, the results in Table IV suggest that bank loan spreads are associated with certain aspects of borrowers' financial performance (i.e. the increase in return on equity and the asset turnover ratio in the prior year), and these associations are robust to controlling for other variables that are expected to affect loan spreads. More importantly, out of the five financial performance measures, only one is significantly related to loan spreads in both Panels A and B. This is consistent with Chinese banks taking on a limited role in monitoring corporate borrowers through adjusting loan interest rates in response to borrowers' financial performance.

4.3 Multivariate results: loan renewal model
Table V reports the results of logistic regressions for the loan renewal model for the full sample period of 2000-2005. Similar to Table IV, the changes in financial performance variables are included in Panel A while the level variables are included in Panel B.

Specifically, the baseline regression in Model 1 of Panel A shows that borrowers with an increased leverage ratio (*DEBTRTCH*) (as shown by a negative coefficient) and a decreased asset turnover ratio (*TURNTACH*) (as shown by a positive coefficient) compared to the prior year are more likely to get their bank loans renewed (all at $p < 5$ percent or better). We continue to obtain robust results after including the control variables in Models 2 through 4. Panel B reports similar results: it is more likely for banks to renew the loans if the borrower has a greater leverage ratio (*DEBTRT*) or a lower asset turnover ratio (*TURNTA*) in the previous year (both at $p < 5$ percent). This result suggests that firms facing a worsened financial situation are in need of more bank credit

	Pred. sign	Model 1	Model 2	Model 3	Model 4
Panel A: change variables					
INTERCEPT		0.05341***	0.0793***	0.07943***	0.07802***
		(35.53)	(12.75)	(12.92)	(9.88)
DEBTRTCH	−	−0.00058	−0.00049	−0.00032	−0.00026
		(−0.75)	(−0.64)	(−0.42)	(−0.34)
CASHCH	+	−0.00099	−0.00106	−0.0011	−0.00114
		(−1.32)	(−1.42)	(−1.49)	(−1.54)
ROECH	+	0.00208**	0.00204**	0.00202**	0.00195**
		(2.49)	(2.47)	(2.47)	(2.36)
TURNTACH	+	0.00028	−0.00001	−0.00028	−0.00026
		(0.31)	(−0.01)	(−0.31)	(−0.29)
GROWSALECH	+	−0.00105	−0.00087	−0.00095	−0.00091
		(−1.21)	(−1.02)	(−1.13)	(−1.08)
LNTOAT			−0.0021***	−0.00186***	−0.00185***
			(−4.35)	(−3.88)	(−3.37)
EXFU			0.00038	0.00059	0.00058
			(0.3)	(0.47)	(0.46)
RECUA			0.0051	0.00467	0.00463
			(0.81)	(0.75)	(0.74)
RELI			0.00084	0.00289	0.00306
			(0.18)	(0.61)	(0.64)
COLLA			0.0004	0.00034	0.00029
			(0.52)	(0.45)	(0.38)
STATE				−0.00383***	−0.00383***
				(−3.96)	(−3.95)
TOBIN'Q					−0.00003
					(−0.07)
BETA					0.00111
					(0.64)
n		673	673	673	673
F-value		4.93***	4.90***	5.32***	5.03***
Adj. R^2		0.1449	0.1649	0.1837	0.1818
Panel B: level variables					
INTERCEPT		0.05579***	0.07442***	0.07435***	0.07151***
					(continued)

Table IV.
OLS regressions of loan spread (*SPREAD*) on financial performance variables and controls

Table IV.

	Pred. sign	Model 1	Model 2	Model 3	Model 4
		(28.17)	(11.85)	(11.97)	(8.84)
DEBTRT	+	0.00402	0.00419	0.00396	0.00401
		(1.57)	(1.62)	(1.54)	(1.56)
CASH	−	−0.00734	−0.00585	−0.00559	−0.00573
		(−1.54)	(−1.21)	(−1.17)	(−1.19)
ROE	−	−0.00363	−0.00275	−0.00303	−0.00304
		(−1.2)	(−0.9)	(−1)	(−1)
TURNTA	−	−0.00363 ***	−0.00474 ***	−0.00444 ***	−0.0044 ***
		(−4.14)	(−3.49)	(−3.3)	(−3.26)
GROWSALE	−	0.00053	0.00048	0.00028	0.0003
		(0.69)	(0.63)	(0.37)	(0.4)
LNTOAT			−0.00156 ***	−0.00134 ***	−0.00124 **
			(−3.16)	(−2.72)	(−2.2)
EXFU			0.00055	0.00072	0.00072
			(0.44)	(0.58)	(0.58)
RECUA			0.00252	0.00217	0.00202
			(0.4)	(0.35)	(0.32)
RELI			0.00038	0.00234	0.00255
			(0.08)	(0.49)	(0.54)
COLLA			−0.00008	−0.00015	−0.00019
			(−0.11)	(−0.19)	(−0.24)
STATE				−0.00362 ***	−0.0036 ***
				(−3.79)	(−3.76)
TOBIN' Q					0.00009
					(0.24)
BETA					0.0013
					(0.77)
n		673	673	673	673
F-value		5.91 ***	5.39 ***	5.76 ***	5.45 ***
Adj. R^2		0.1750	0.1817	0.1985	0.1967

Notes: Significance at: $^*p < 10$ percent (two-tailed); $^{**}p < 5$ percent (two-tailed); $^{***}p < 1$ percent (two-tailed); t-statistics are in parenthesis; all year, industry and area controls are included; see Table II for other variable definitions results for the loan spread model; this table reports the OLS regression

and are indeed more likely to get loan renewals. This is inconsistent with our expectation that banks provide governance over borrowers through their loan renewal decisions.

With respect to the control variables, the results in both panels show that firms that are larger in size (*LNTOAT*), have no new equity or debt issuance last year (*EXFU*), have less external funding from related parties (*RELI*), have fewer growth opportunities (*TOBIN'Q*), and are less risky (*BETA*) are more likely to get loan renewals (all at $p < 10$ percent or better). These results are consistent with bank financing being the primary source of external funds in Chinese economy.

Overall, Table V finds a negative relation between a firm's financial performance and the likelihood of bank loan renewals, highlighting the significance of bank credit for firms with financial difficulty[10]. These findings, however, seem to be in conflict with those from Table IV where banks provide governance over borrowers by charging lower interest rates for better performing firms. These seemingly inconsistent findings in Tables IV and V are similar to prior research such as Machauer and Weber (1998), who find that riskier borrowers pay higher loan rate premiums but have larger credit lines. Machauer and Weber (1998, p. 1373) interpret their findings as firms in a worsened financial situation rely more on debt finance with banks:

> Often banks with a higher involvement, and so higher risk of loss, are the ones which are quickest in helping their borrowers. As a consequence, the worse a borrower gets, the more he relies on bank finance from few banks.

This is especially true when borrowers have close ties to or in a relationship with a major bank.

An alternative explanation for the findings in Tables IV and V is the financing and monitoring roles of Chinese banks (Qian, 1995). With the structural changes in the banking sector since the mid-1990s, bank loans have replaced governmental budgetary grants to become the major source for state enterprises' fixed asset funds and working capital funds. As a result, although the financial reforms may have improved banks' responsiveness to firms' economic performance through loan terms such as interest rates, the role of banks as the major fund supplier remains largely unchanged. Thus, the financing role dominates the monitoring role in that banks provide funds before they adjust interest premiums according to borrowers' quality.

4.4 Additional analysis
4.4.1 Difference sample periods. The CBRC was established in April, 2003 to start a series of banking reforms. To investigate whether the results in Tables IV and V are sensitive to different sample periods before and after 2003, we repeat our regression analyses in Tables IV and V separately in 2000-2003 and in 2004-2005.

Table VI reports the regression results for the loan spread model. The changes in financial performance variables are included in Panel A while the level variables are included in Panel B. In addition, the results in Model 1 in both panels are taken from those in Model 4 of Table IV for the full sample period of 2000-2005, while the results before and after 2003 are in Models 2 and 3, respectively.

Panel A of Table VI shows that the association between an increase in return on equity (*ROECH*) and a lower loan spread found in the full sample period holds only before 2003. Similarly, Panel B shows that the association between a higher asset

	Model 1	Model 2	Model 3	Model 4
Panel A: change variables				
INTERCEPT	0.44035**	−3.86592***	−3.88034***	−2.21844*
	(2.36)	(−4.34)	(−4.35)	(−1.91)
DEBTRTCH	−0.4473***	−0.40547***	−0.40695***	−0.4001***
Z-value	(−4.07)	(−3.59)	(−3.6)	(−3.53)
Odds ratio	0.63936	0.66666	0.66568	0.67026
CASHCH	−0.10548	−0.08692	−0.08675	−0.07938
Z-value	(−1)	(−0.81)	(−0.81)	(−0.74)
Odds ratio	0.89989	0.91675	0.91691	0.92369
ROECH	−0.07749	−0.09061	−0.08457	−0.07504
Z-value	(−0.67)	(−0.77)	(−0.72)	(−0.63)
Odds ratio	0.92544	0.91337	0.91891	0.92771
TURNTACH	0.27731**	0.29967**	0.30339**	0.30183**
Z-value	(2.27)	(2.41)	(2.44)	(2.42)
Odds ratio	1.31957	1.34942	1.35444	1.35234
GROWSALECH	−0.08333	−0.06807	−0.0708	−0.06286
Z-value	(−0.7)	(−0.56)	(−0.59)	(−0.52)
Odds ratio	0.92005	0.93419	0.93165	0.93907
LNTOAT		0.34734***	0.34181***	0.25297***
Z-value		(4.96)	(4.86)	(3.08)
Odds ratio		1.4153	1.4075	1.28784
EXFU		−0.43325*	−0.43211*	−0.4907*
Z-value		(−1.71)	(−1.71)	(−1.92)
Odds ratio		0.6484	0.64914	0.6122
RECUA		−0.16496	−0.16302	−0.06274
Z-value		(−0.16)	(−0.16)	(−0.06)
Odds ratio		0.84793	0.84958	0.93919
RELI		−1.45721**	−1.4934**	−1.57666**
Z-value		(−2.29)	(−2.34)	(−2.46)
Odds ratio		0.23289	0.22461	0.20666
COLLA		0.2583**	0.26126**	0.26139**
Z-value		(2.34)	(2.37)	(2.36)
Odds ratio		1.29473	1.29857	1.29874
STATE			0.10823	0.12319
Z-value			(0.83)	(0.94)
Odds ratio			1.11431	1.13109
TOBIN' Q				−0.10937*
Z-value				(−1.88)
Odds ratio				0.8964
BETA				−0.41701*
Z-value				(−1.76)
Odds ratio				0.65901
n	1,795	1,795	1,795	1,795
LR χ^2	281.82***	323.74***	324.42***	329.54***
Pseudo R^2	0.116	0.1339	0.1341	0.1363
Panel B: level variables				
INTERCEPT	−0.30694	−4.70425***	−4.71773***	−3.01683**
	(−1.21)	(−5.22)	(−5.23)	(−2.54)
DEBTRT	1.4534***	1.19319***	1.20666***	1.16759***
Z-value	(4.3)	(3.36)	(3.39)	(3.28)
				(*continued*)

Table V.
Logistic regressions of loan renewals (*NEW*) on financial performance variables and controls

	Model 1	Model 2	Model 3	Model 4
Odds ratio	4.27761	3.2976	3.34229	3.21424
CASH	− 0.77829	− 0.90171	− 0.8909	− 0.87524
Z-value	(− 1.23)	(− 1.39)	(− 1.37)	(− 1.34)
Odds ratio	0.45919	0.40587	0.41029	0.41676
ROE	0.5161	0.09909	0.12116	0.16957
Z-value	(1.31)	(0.24)	(0.29)	(0.41)
Odds ratio	1.67547	1.10417	1.12881	1.18479
TURNTA	− 0.18621	− 0.35631**	− 0.37089**	− 0.38823**
Z-value	(− 1.2)	(− 2.19)	(− 2.26)	(− 2.36)
Odds ratio	0.8301	0.70026	0.69012	0.67826
GROWSALE	− 0.10944	− 0.10772	− 0.10502	− 0.10935
Z-value	(− 1.13)	(− 1.08)	(− 1.05)	(− 1.08)
Odds ratio	0.89634	0.89788	0.9003	0.89642
LNTOAT		0.3892***	0.38337***	0.29609***
Z-value		(5.32)	(5.22)	(3.46)
Odds ratio		1.47579	1.46722	1.34459
EXFU		− 0.51675**	− 0.51421**	− 0.56377**
Z-value		(− 2.07)	(− 2.06)	(− 2.23)
Odds ratio		0.59646	0.59797	0.56906
RECUA		− 0.67529	− 0.67096	− 0.57293
Z-value		(− 0.67)	(− 0.66)	(− 0.56)
Odds ratio		0.5090	0.51122	0.56387
RELI		− 1.62775**	− 1.66912***	− 1.75338***
Z-value		(− 2.53)	(− 2.59)	(− 2.71)
Odds ratio		0.19637	0.18841	0.17319
COLLA		0.0893	0.09196	0.09756
Z-value		(0.78)	(0.8)	(0.85)
Odds ratio		1.09341	1.09632	1.10248
STATE			0.1172	0.13163
Z-value			(0.89)	(1)
Odds ratio			1.12435	1.14068
TOBIN' Q				− 0.10538*
Z-value				(− 1.81)
Odds ratio				0.89998
BETA				− 0.43292*
Z-value				(− 1.82)
Odds ratio				0.64861
n	1,795	1,795	1,795	1,795
LR χ^2	281.31***	324.60***	325.40***	330.43***
Pseudo R^2	0.1163	0.1342	0.1345	0.1366

Notes: Significance at: $^{*}p < 10$ percent (two-tailed); $^{**}p < 5$ percent (two-tailed); $^{***}p < 1$ percent (two-tailed); Z-statistics are in parenthesis; this table reports the logistic regression results for the loan renewal model; all year, industry and area controls are included; see Table II for variable definitions

Table V.

turnover ratio in the prior year and a lower spread in the full sample holds only before 2003. On the other hand, both Panels A and B show a significant and negative coefficient on Tobin's Q only after 2003. This result indicates a change in the way banks exercise their monitoring over borrowers before and after the banking reforms. Before 2003, banks provide governance mostly through adjusting loan spreads

in response to borrowers' financial performance, while after 2003 they focus more on borrowers' growth opportunities[11].

Table VII reports the regression results for the loan renewal model. Panel A shows that the coefficient on the change in the asset turnover ratio (*TURNTACH*) compared to the prior year is significant in both before and after 2003 periods, while the coefficient on the change in leverage (*DEBTRTCH*) is significant only in 2000-2003. Similarly, Panel B of Table VII shows that both the leverage ratio (*DEBTRT*) and the asset turnover ratio (*TURNTA*) in the prior year have a significant impact on the loan renewal decisions only in 2000-2003. Among the control variables, we find that in both Panels A and B the coefficients on firm size (*LNTOAT*) are significantly positive only before 2003, while the coefficients on beta (*BETA*) are significantly negative only after 2003. The significant coefficients on beta in the later period indicate that the likelihood of getting loans renewed is lower for firms with higher risk. In comparison with the results in Table V, the focus on firm risk in credit renewal decisions after 2003 is consistent with a strengthened monitoring role of Chinese banks.

Thus, the results in Tables VI and VII suggest that the factors banks consider when making loan decisions may have varied over time. In 2000-2003, borrowers' financial indicators such as profitability and turnover are significantly associated with loan spreads and credit renewal, while in 2004-2005 growth and risk play a more important role in bank credit decisions. We conjecture that this change could be explained by the major reforms in the Chinese banking industry after 2003. For example, since its establishment in the late 2003, the CBRC has taken measures to improve the capital adequacy of commercial banks and corporate governance and risk management of banking institutions. As a result, the banking industry has made progress in allocating credit on a commercial rather than policy basis. Banks have begun to base their lending decisions on a more diverse list of factors including risk and growth. This pattern is consistent with banks' strengthened monitoring role. We acknowledge, however, that more data in a longer time period is needed in order to test this conjecture.

4.4.2 Short-term interest rates. Our loan spread variable is based on the weighted long-term bank loan interest rate adjusted by the benchmark rate. The use of composite loan interest rates to capture the overall cost of long-term bank loans is consistent with prior studies such as Kim *et al.* (2011), who measure the interest rate as the aggregate interest expenses in year *t* divided by the average of short- and long-term debt at the beginning and end of each year. However, to ensure that our results are not driven by bank loans issued in earlier years, we hand-collect information from financial statements and calculate a measure of short-term loan interest rate (*S-INTEREST*). Specifically:

$$S - INTEREST = \sum_{i=1}^{n} \text{int}_i \times \left(S - \frac{loan_i}{total\,loan_t} \right)$$

Where, for a particular firm, int_i is the interest rate on a specific short-term bank loan i, *S-loan$_i$* is the total loan amount for this particular short-term loan i, and *total loan$_t$* is the total amount of all short-term bank loans during a year.

We replace the *SPREAD* variable with *S-INTEREST* and repeat the analysis in Table IV. The results of this additional analysis are reported in Table VIII[12]. Owing to data availability, the number of observations is reduced to 353 and 354 in the change and level analyses, respectively. While none of the change variables in financial performance

	Model 1 Full sample	Model 2 2000-2003	Model 3 2004-2005
Panel A: change variables			
INTERCEPT	0.0780 ***	0.08462 ***	0.07987 ***
	(9.88)	(8.36)	(5.46)
DEBTRTCH	− 0.00026	0.000119	− 0.00022
	(− 0.34)	(0.13)	(− 1.56)
CASHCH	− 0.00114	− 0.00058	− 0.00203
	(− 1.54)	(− 0.65)	(− 1.45)
ROECH	0.00195 **	0.00235 **	0.00162
	(2.36)	(2.33)	(1.04)
TURNTACH	− 0.00026	− 0.00135	0.00074
	(− 0.29)	(− 1.26)	(0.44)
GROWSALECH	− 0.00091	− 0.00097	− 0.0001
	(− 1.08)	(− 0.97)	(− 0.06)
LNTOAT	− 0.00185 ***	− 0.00192 ***	− 0.00205 ***
	(− 3.37)	(− 2.66)	(− 2.19)
EXFU	0.00058	0.00092	0.00019
	(0.46)	(0.72)	(0.02)
RECUA	0.00463	0.00199	–
	(0.74)	(0.32)	
RELI	0.00306	− 0.00221	0.01231
	(0.64)	(− 0.34)	(1.54)
COLLA	0.00029	− 0.00013	0.00137
	(0.38)	(− 0.15)	(0.95)
STATE	− 0.00383 ***	− 0.00467 ***	− 0.00373 **
	(− 3.95)	(− 3.77)	(− 2.23)
TOBIN' Q	− 0.00003	− 0.00007	− 0.00327 *
	(− 0.07)	(− 0.18)	(− 1.83)
BETA	0.00111	− 0.00077	0.00255
	(0.64)	(− 0.37)	(0.75)
n	673	468	205
F-value	5.03 ***	3.39 ***	2.19 ***
Adj. R^2	0.1818	0.1521	0.1572
Panel B: level variables			
INTERCEPT	0.07151 ***	0.07265 ***	0.07914 ***
	(8.84)	(6.94)	(5.18)
DEBTRT	0.00401	0.00763 **	− 0.00343
	(1.56)	(2.40)	(− 0.70)
CASH	− 0.00573	− 0.00800	− 0.00367
	(− 1.19)	(− 1.35)	(− 0.41)
ROE	− 0.00304	− 0.00522	0.00115
	(− 1.00)	(− 1.55)	(0.15)
TURNTA	− 0.0044 ***	− 0.00546 ***	− 0.00229
	(− 3.26)	(− 3.12)	(− 0.97)
GROWSALE	0.0003	− 0.00011	0.00088
	(0.40)	(− 0.12)	(0.65)
LNTOAT	− 0.00124 **	− 0.00099	− 0.00182 *
	(− 2.2)	(− 1.35)	(− 1.79)
EXFU	0.00072	0.00096	− 0.00066
	(0.58)	(0.77)	(− 0.07)
RECUA	0.00202	− 0.00196	–
			(*continued*)

Table VI.
OLS regressions of loan spread (*SPREAD*) on financial performance variables and controls before and after 2003

	Model 1 Full sample	Model 2 2000-2003	Model 3 2004-2005
	(0.32)	(−0.31)	
RELI	0.00255	−0.00165	0.0091
	(0.54)	(−0.26)	(1.131)
COLLA	−0.00019	−0.00067	0.00169
	(−0.24)	(−0.73)	(1.11)
STATE	−0.0036***	−0.00417***	−0.0035**
	(−3.76)	(−3.45)	(−2.07)
TOBIN' Q	0.00009	0.00015	−0.00345*
	(0.24)	(0.37)	(−1.91)
BETA	0.0013	−0.00043	0.00378
	(0.77)	(−0.21)	(1.12)
n	673	468	205
F-value	5.45***	5.45***	2.03***
Adj. R^2	0.1967	0.1967	0.1393

Notes: Significance at: $^*p < 10$ percent (two-tailed); $^{**}p < 5$ percent (two-tailed); $^{***}p < 1$ percent (two-tailed); t-statistics are in parenthesis; this table reports the OLS regression results for the loan spread model before and after 2003; Model 1 is for the period of 2000-2005; Model 2 is for the period of 2000-2003; Model 3 is for the period of 2004-2005; all year, industry and area controls are included; see Table II for other variable definitions

Table VI.

is associated with short-term interest rate in Panel A, we find a significant and positive coefficient on *DEBTRT* (0.00143 with t-statistic of 4.5) and a significant and negative coefficient on *TURNTA* (−0.00318 with t-statistic of −2.48) in Panel B. These coefficients suggest that banks charge a higher short-term interest rate for borrowers with a higher leverage ratio and a lower asset turnover ratio in the prior year. We find qualitatively similar results in unreported panel data analysis. Therefore, the results using short-term loan interest rates are in general consistent with those using long-term interest rates in Table IV and suggest that banks adjust their loan interest rates in response to certain aspects of borrowers' financial performance.

4.5 Sensitivity tests
To check whether our results are sensitive to alternative research specifications, we conduct the following robustness tests. First, we repeat our analysis in Tables IV and V using panel regressions and report the results in Tables IX (loan spread model) and X (loan renewal model). Specifically, Panel A of Table IX shows that the coefficient on the change in return on equity (*ROECH*) is no longer significant, while the coefficient on the change in cash flows over total assets (*CASHCH*) becomes significantly negative (at $p < 10$ percent), suggesting that firms with a decrease in cash flows enjoy a lower loan spread. In addition, Panel B of Table IX shows that the asset turnover ratio in the prior year (*TURNTA*) continues to be significantly and negatively associated with loan spreads. In Table X, we find that the change in leverage ratio (*DEBTRTCH*) in Panel A continue to be significantly and negatively related to the likelihood of loan renewals (at $p < 10$ percent or better), but that the coefficient on the leverage ratio in the prior year (*DEBTRT*) becomes significantly negative (at $p < 10$ percent) in Panel B. The asset turnover ratio, however, is not significantly correlated with the likelihood of loan renewals (either the change variable *TRUNTACH* in Panel A or the level

	Model 1 Full sample	Model 2 2000-2003	Model 3 2004-2005
Panel A: change variables			
INTERCEPT	−2.21844*	−5.54072***	0.49055
	(−1.91)	(−3.56)	(0.26)
DEBTRTCH	−0.4001***	−0.48114***	−0.29246
Z-value	(−3.53)	(−3.23)	(−1.57)
Odds ratio	0.67026	0.61808	0.74643
CASHCH	−0.07938	−0.10531	−0.04969
Z-value	(−0.74)	(−0.75)	(−0.28)
Odds ratio	0.92369	0.90004	0.95152
ROECH	−0.07504	0.07308	−0.2265
Z-value	(−0.63)	(0.46)	(−1.2)
Odds ratio	0.92771	1.07581	0.79732
TURNTACH	0.30183**	0.26919*	0.37794*
Z-value	(2.42)	(1.65)	(1.84)
Odds ratio	1.35234	1.3089	1.45928
GROWSALECH	−0.06286	−0.08013	0.01354
Z-value	(−0.52)	(−0.51)	(0.07)
Odds ratio	0.93907	0.92299	1.01363
LNTOAT	0.25297***	0.39604***	0.07399
Z-value	(3.08)	(3.49)	(0.6)
Odds ratio	1.28784	1.48593	1.07679
EXFU	−0.4907*	−0.4574*	–
Z-value	(−1.92)	(−1.74)	
Odds ratio	0.6122	0.63292	
RECUA	−0.06274	−0.05106	–
Z-value	(−0.06)	(−0.05)	
Odds ratio	0.93919	0.95022	
RELI	−1.57666**	−1.3674	−1.90633*
Z-value	(−2.46)	(−1.62)	(−1.79)
Odds ratio	0.20666	0.25477	0.14862
COLLA	0.26139**	0.45038***	0.01116
Z-value	(2.36)	(3.09)	(0.06)
Odds ratio	1.29874	1.56891	1.01122
STATE	0.12319	0.02919	0.30917
Z-value	(0.94)	(0.17)	(1.51)
Odds ratio	1.13109	1.02962	1.3623
TOBIN' Q	−0.10937*	−0.05264	−0.24268
Z-value	(−1.88)	(−0.84)	(−1.2)
Odds ratio	0.8964	0.94873	0.78452
BETA	−0.41701*	−0.08916	−0.74711*
Z-value	(−1.76)	(−0.3)	(−1.75)
Odds ratio	0.65901	0.9147	0.47374
n	1795	1156	638
LR χ^2	329.54***	95.13***	44.94*
Pseudo R^2	0.1363	0.0698	0.0534
Panel B: level variables			
INTERCEPT	−3.01683**	−7.28677***	0.75381
			(*continued*)

Table VII.
Logistic regressions of
loan renewals (*NEW*) on
financial performance
variables and controls
before and after 2003

	Model 1 Full sample	Model 2 2000-2003	Model 3 2004-2005
	(-2.54)	(-4.47)	(0.4)
DEBTRT	1.16759^{***}	2.36013^{***}	-0.59563
Z-value	(3.28)	(5.09)	(-0.98)
Odds ratio	3.21424	10.59233	0.55122
CASH	-0.87524	-1.35057	0.38478
Z-value	(-1.34)	(-1.64)	(0.33)
Odds ratio	0.41676	0.25909	1.4693
ROE	0.16957	0.16819	0.06877
Z-value	(0.41)	(0.35)	(0.09)
Odds ratio	1.18479	1.18316	1.07119
TURNTA	-0.38823^{**}	-0.80808^{***}	-0.03634
Z-value	(-2.36)	(-3.36)	(-0.14)
Odds ratio	0.67826	0.44571	0.96431
GROWSALE	-0.10935	-0.0732	-0.1916
Z-value	(-1.08)	(-0.66)	(-0.86)
Odds ratio	0.89642	0.92942	0.82564
LNTOAT	0.29609^{***}	0.51596^{***}	0.08078
Z-value	(3.46)	(4.3)	(0.62)
Odds ratio	1.34459	1.67524	1.08413
EXFU	-0.56377^{**}	-0.53378^{**}	
Z-value	(-2.23)	(-2.05)	–
Odds ratio	0.56906	1.67524	
RECUA	-0.57293	-0.89722	
Z-value	(-0.56)	(-0.85)	–
Odds ratio	0.56387	0.4077	
RELI	-1.75338^{***}	-1.57221^{*}	-2.229^{*}
Z-value	(-2.71)	(-1.81)	(-2.1)
Odds ratio	0.17319	0.20759	0.10764
COLLA	0.09756	0.14129	0.02969
Z-value	(0.85)	(0.92)	(0.16)
Odds ratio	1.10248	1.15176	1.03014
STATE	0.13163	-0.02833	0.30142
Z-value	(1)	(-0.16)	(1.47)
Odds ratio	1.14068	0.97207	1.35178
TOBIN' Q	-0.10538^{*}	-0.04341	-0.25897
Z-value	(-1.81)	(-0.68)	(-1.26)
Odds ratio	0.89998	0.95752	0.77185
BETA	-0.43292^{*}	-0.09712	-0.74441^{*}
Z-value	(-1.82)	(-0.32)	(-1.76)
Odds ratio	0.64861	0.90745	0.47501
n	1795	1156	638
LR χ^2	330.43^{***}	122.31^{***}	39.52
Pseudo R^2	0.1366	0.0898	0.0470

Notes: Significance at: $^{*}p < 10$ percent (two-tailed); $^{**}p < 5$ percent (two-tailed); $^{***}p < 1$ percent (two-tailed); Z-statistics are in parenthesis; this table reports the logistic regression results for the loan renewal model before and after 2003; Model 1 is for the period of 2000-2005; Model 2 is for the period of 2000-2003; Model 3 is for the period of 2004-2005; all year, industry and area controls are included; see Table II for other variable definitions

Table VII.

Panel A: change variables		Panel B: level variables	
INTERCEPT	0.08414***	INTERCEPT	0.07954***
	(8.42)		(8.33)
DEBTRTCH	−0.0004	DEBTRT	0.0143***
	(−0.34)		(4.5)
CASHCH	0.00041	CASH	−0.00083
	(0.35)		(−0.13)
ROECH	0.0005	ROE	0.00095
	(0.39)		(−0.52)
TURNTACH	−0.00064	TURNTA	−0.00318**
	(−0.46)		(−2.48)
GROWSALECH	0.00000	GROWSALE	−0.0006
	(−0.39)		(0)
LNTOAT	−0.00247***	LNTOAT	−0.00249***
	(−3.83)		(3.93)
EXFU	0.00011	EXFU	−0.0001
	(0.04)		(−0.04)
RECUA	0.03158***	RECUA	0.02698**
	(2.84)		(2.54)
RELI	0.01188***	RELI	0.00974**
	(2.76)		(2.35)
COLLA	−0.00045	COLLA	−0.00158
	(−0.37)		(−1.31)
STATE	−0.00143	STATE	−0.00095
	(−0.94)		(−0.65)
TOBIN' Q	−0.00064	TOBIN' Q	−0.00057
	(−1.1)		(−1.01)
BETA	0.00106	BETA	0.00117
	(0.38)		(0.43)
n	353	n	354
F-value	3.70***	F-value	4.72***
Adj. R^2	0.2313	Adj. R^2	0.2931

Notes: Significance at: [*]$p < 10$ percent (two-tailed); [**]$p < 5$ percent (two-tailed); [***]$p < 1$ percent (two-tailed); t-statistics are in parenthesis; this table reports the OLS regression results for the short-term loan interest rate model; all year, industry and area controls are included; short-term interest rate is defined as:

$$S - INTEREST = \sum_{i=1}^{n} \text{int}_i \times \left(S - \frac{loan_i}{total\ loan} \right)$$

See Table II for other variable definitions

Table VIII.
OLS regressions of the short-term loan interest rates (*S-INTEREST*) on financial performance variables and controls

variable *TURNTA* in Panel B). In sum, the panel regressions yield somewhat weaker and sometimes inconsistent results as in OLS and logistic regressions. We note, however, that panel regressions are expected to be less powerful given that our sample consists of an extremely unbalanced panel. We therefore rely on the results from OLS and logistic regressions for our main inferences.

Second, we measure growth opportunities using market-to-book ratio or whether the change in total assets and the change in total sales each exceed the median industry

change (Maksimovic and Phillips, 2008) instead of Tobin's Q, and measure firm risk using the standard deviation of EPS or total assets in the past four quarters instead of beta. The unreported tests using these alternative measures yield qualitatively similar results as before.

Third, we examine the robustness of our results using an alternative measure of leverage ratio measured as the total of short- and long-term bank loans divided by total assets. We repeat our analysis in Tables IV and V and find qualitatively similar results.

Panel A: change variables		Panel B: level variables	
INTERCEPT	0.1178***	INTERCEPT	0.10825***
	(4.59)		(4.21)
DEBTRTCH	0.00014	DEBTRT	0.00155
	(0.17)		(0.27)
CASHCH	−0.0013*	CASH	−0.0038
	(−1.89)		(−0.68)
ROECH	0.00018	ROE	−0.00614
	(0.21)		(−1.58)
TURNTACH	0.00007	TURNTA	−0.00541*
	(0.07)		(−1.77)
GROWSALECH	−0.00018	GROWSALE	0.00155**
	(−0.21)		(2.02)
LNTOAT	−0.00551***	LNTOAT	−0.00453**
	(−2.74)		(−2.16)
EXFU	−0.00016	EXFU	0.00004
	(−0.13)		(0.03)
RECUA	0.01043**	RECUA	0.0110**
	(2.11)		(2.22)
RELI	0.00066	RELI	−0.00144
	(0.09)		(−0.2)
COLLA	−0.00073	COLLA	−0.00037
	(−0.75)		(−0.38)
STATE	0.00023	STATE	−0.00058
	(0.12)		(−0.31)
TOBIN' Q	0.00178***	TOBIN' Q	0.00193***
	(3.71)		(3.98)
BETA	0.00333	BETA	0.00329
	(1.51)		(1.51)
F-value	4.09***	F-value	4.58***
Overall R^2	0.0658	Overall R^2	0.0861
Within R^2	0.1496	Within R^2	0.1647
n	673	n	673
Number of groups	358	Number of groups	358

Table IX.
Panel data regressions of loan spread (*SPREAD*) on financial performance variables and controls

Notes: Significance at: $^*p < 10$ percent (two-tailed); $^{**}p < 5$ percent (two-tailed); $^{***}p < 1$ percent (two-tailed); t-statistics are in parenthesis; this table reports the fixed effects panel data regression results for the loan spread model; the unreported Hausman tests yield significant χ^2 statistics for both panels, indicating that fixed effect model is more appropriate than random effect model; see Table II for variable definitions

Panel A: change variables		Panel B: level variables	
DEBTRTCH	-0.33141^{**}	DEBTRT	-2.40401^{*}
Z-value	(-2.01)	Z-value	(-2.05)
Odds ratio	0.71791	Odds ratio	0.09036
CASHCH	-0.09059	CASH	-2.69594^{**}
Z-value	(-0.63)	Z-value	(-2.35)
Odds ratio	0.91339	Odds ratio	0.06748
ROECH	-0.09944	ROE	0.16989
Z-value	(-0.59)	Z-value	(0.21)
Odds ratio	0.90535	Odds ratio	1.18517
TURNTACH	0.20568	TURNTA	0.72097
Z-value	(1.1)	Z-value	(1.34)
Odds ratio	1.22836	Odds ratio	2.05643
GROWSALECH	0.10042	GROWSALE	-0.32565^{*}
Z-value	(0.61)	Z-value	(-1.85)
Odds ratio	1.10563	Odds ratio	0.72206
LNTOAT	2.76823^{***}	LNTOAT	3.2367^{***}
Z-value	(5.71)	Z-value	(6.16)
Odds ratio	15.93035	Odds ratio	25.44951
EXFU	-0.85567^{**}	EXFU	-0.9134^{**}
Z-value	(-2.39)	Z-value	(-2.51)
Odds ratio	0.4250	Odds ratio	0.40116
RECUA	-1.11003	RECUA	-1.26423
Z-value	(-0.99)	Z-value	(-1.09)
Odds ratio	0.32955	Odds ratio	0.28246
RELI	-0.17931	RELI	0.20351
Z-value	(-0.13)	Z-value	(0.15)
Odds ratio	0.83585	Odds ratio	1.22569
COLLA	0.22336	COLLA	0.21528
Z-value	(1.09)	Z-value	(1.05)
Odds ratio	1.25027	Odds ratio	1.2402
STATE	0.25331	STATE	0.13396
Z-value	(0.72)	Z-value	(0.37)
Odds ratio	1.28828	Odds ratio	1.14334
TOBIN' Q	0.03737	TOBIN' Q	0.03938
Z-value	(0.39)	Z-value	(0.39)
Odds ratio	1.03807	Odds ratio	1.04017
BETA	-0.71008^{*}	BETA	-0.74413^{*}
Z-value	(-1.74)	Z-value	(-1.8)
Odds ratio	0.49161	Odds ratio	0.47515
LR χ^2	87.64^{***}	LR χ^2	93.64^{***}
Pseudo R^2	0.1293	Pseudo R^2	0.1382
n	905	n	905
Number of groups	292	Number of groups	292

Notes: Significance at: $^{*}p < 10$ percent (two-tailed); $^{**}p < 5$ percent (two-tailed); $^{***}p < 1$ percent (two-tailed); Z-statistics are in parenthesis; this table reports the fixed effects panel data regression results for the loan renewal model; the unreported Hausman tests yield significant χ^2 statistics for both panels, indicating that fixed effect model is more appropriate than random effect model; see Table II for variable definitions

Table X.
Panel logistic regressions
of loan renewals (*NEW*)
on financial performance
variables and controls

5. Conclusions

In this study, we investigate whether Chinese banks as large creditors play an effective role in monitoring borrowers and improving firms' corporate governance. Specifically, we examine whether banks adjust their loan interest rates and consider loan renewal decisions in response to borrowers' economic fundamentals. We find that firms with better financial performance, i.e. an increase in return on equity or a higher asset turnover ratio enjoy lower loan spreads. However, firms that have existing bank loans but perform worse economically in terms of leverage ratio and asset turnover ratio have a better chance of getting their bank loans renewed. These seemingly conflicting results on loan spreads and loan renewals indicate that the financial reforms beginning in the mid-1990s have made some progress in commercialized the banking sector. That is, banks have gained some discretion in determining specific loan terms such as interest rates based on borrowers' economic fundamentals. However, as a major channel of providing external funds, banks may have to continue providing credits for firms in financial difficulties. Thus, these findings indicate that the banks play only a limited role in monitoring and disciplining borrowers.

The findings in this study speak to the significance and difficulties of financial reforms in transition economies like China (DeFond *et al.*, 1999). Banks, most of which are state owned, serve as the primary supplier of external funds to the SOEs. They have special cost advantages in collecting information and solving firms' incentive problems. Lacking other governance mechanisms such as legal protection and stock market takeovers, bank governance has been and will be the best substitute in many years to come. However, the banks' unique monitoring ability and the effectiveness of their governance depend on specific legal institutions (Shleifer and Vishny, 1997). Without further reforms on the state's financial management system and fundamentally addressing the SOE problems, China still has a long way to go before achieving an effective financial intermediation and better corporate governance.

This study is subject to several caveats. First, constrained by data availability in relation to Chinese banks, the sample period is limited to year 2000 through 2005 and the sample size is relatively small compared to prior studies. Thus, the paper may not fully capture the dynamic implications of the Chinese financial reforms beginning in the mid-1990s. Second, very few public companies in China voluntarily disclose detailed information on their bank loans. As a result, we indirectly measure loan interest and loan renewal variables using financial statements information. These indirect measures, compared to those constructed based on loan-level information as in prior literature, may contain measurement errors and introduce noise to the empirical analyses. Therefore, we believe that more in-depth studies with more detailed and refined loan data remain a promising avenue for future research.

Notes

1. See the web site of the Chinese Banking Regulation Commission (CBRC), www.cbrc.gov.cn

2. According to the CBRC, the non-performing loan ratio in China's major commercial banks has recently for the first time dropped to a single digit, i.e. 8.9 percent in 2005.

3. The four state-owned commercial banks are Industrial and Commercial Bank of China, Agricultural Bank of China, Bank of China, and China Construction Bank. Established in 1994 and intended to separate policy lending from commercial lending, the three policy

banks are Agricultural Development Bank of China, State Development Bank of China, and Export-Import Bank of China.

4. Examples of these commercial banks are Bank of Communications, China Trust and Investment Corporation Investment Bank, China Everbright Bank, Hua Xia Bank, Min Sheng Bank, Guangdong Development Bank, Shenzhen Development Bank, and Pudong Development Bank. For detailed information, see www.cbrc.gov.cn

5. Interest rates in China consist of a mix of both market determined interest rate and regulated interest rates, which reflect China's gradual process of interest rate liberalization (Porter and Xu, 2009). For example, while ceilings on bank loan rates and floors on deposit rates were removed in 2007, ceilings on deposit rates and floors on loan rates still remain in place. Also see recent regulatory announcements reported in the *Wall Street Journal*: http://online.wsj.com/article/BT-CO-20101217-700033.html

6. For ease of exposition, we suppress the subscript of i for all equations onward.

7. We acknowledge that the weighted long-term bank loan interest rates may reflect rates charged on loans issued in earlier years. We note, however, that these long-term loan interest rates are not entirely fixed once determined; instead, they are expected to be adjusted every year based on market conditions as well as macro-economic factors (Hu and Xie, 2005) and therefore may be correlated with borrowers' financial performance in year $t - 1$ if banks act as effective monitors.

8. We remove the non-bank-related portion of long-term debt and current maturities of long-term debt in equations (1) and (2) to ensure the validity of the measure.

9. We classify our sample firms into 15 industries based on the *Guidance on Public Firm Industry Classifications* published by the Chinese Securities Regulation Commission (CSRC). These 15 industries are: IND1-A agriculture, forestry, fishing, hunting and trapping; IND2-B mining, C6 metal and non-metal; IND3-C0 food and drinks; IND4-C1 apparel, textile and leather; IND5-C4 petroleum, chemicals, plastics and rubber; IND6-C5 electronics, G information technology, L communications and media; IND7-C7 industrial and commercial machinery and computer equipment; IND8-C8 pharmaceutical and biological products; IND9-D electric, gas and water services; IND10-E architecture, J real estate; IND11-F transportation and storage; IND12-H wholesale and retail; IND13-K business services; IND14-M general business; IND15-C2 lumber and furniture, C3 paper products and printing, C9 other industrial manufacturing.

10. By using financial statement information to construct the loan renewal measure, our loan renewal sample effectively include only companies with existing bank loans. Therefore, our results may not apply to companies that fail to pass the loan application process.

11. This result could also be explained by low power resulted from the relatively small sample in the period after 2003 versus before 2003 (205 versus 468).

12. We use the actual short-term interest rates instead of loan spreads in Table IX because the information of when the short-term bank loan is issued is not available from the financial statements and therefore it is difficult to find the benchmark rate in the corresponding period. Instead we use year fixed effects to control for economy-wide interest fluctuations.

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