

**SME Relationship Banking and Loan Contracting:
Survey-based Evidence from China**

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Abstract

This paper adopts direct measures of firm spending on bank relationship and loan contracting from a recent survey on small and median enterprises (SMEs) in China to systematically examine their inter-connections. Our findings are twofold. First, bank relationship spending significantly alleviates SMEs' financial constraints and such effect is heterogeneous across regions with varying degrees of economic growth but not across industries. Second, while bank relationship spending allows SMEs to access more bank credit and longer maturity loans, it also leads to higher interest rates, guarantee requirement and overall dissatisfaction of loan services. Our findings shed new light on the role of 'Guanxi' in China's micro-credit market and its consequences.

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1. Introduction

Small and medium-sized enterprises (SMEs) are widely perceived as crucial in fostering economic growth and eliminating poverty, especially in emerging market countries (Petersen and Rajan, 1994). It is also well-known that SMEs have difficulty in securing bank credit due to asymmetric information problems, insufficient collateral, and lack of hard (publicly verifiable) information (Degryse et al., 2017). Soft information (information that is not easily quantifiable) underlying relationship banking is often more valuable than hard information (Liberti and Petersen, 2019). Although other innovative lending techniques have developed to fill the information gap in recent years (fintech-related transactional lending), the banking sector worldwide continues to depend on relationship lending to finance SMEs (Berger and Udell, 2006).

The existing literature suggests that relationship banking aids the transmission of soft information about firms that is not easily quantifiable, thereby reducing the likelihood of credit constraints for SMEs (Banerjee et al., 2017; Degryse et al., 2018; Degryse et al., 2021; Zhao et al., 2021; Zhao et al., 2022). In addition, the information advantage of relationship banking mitigates the adverse selection risk and moral hazard associated with SME loan costs (Dell’Ariccia and Marquez, 2004). Banks can efficiently assimilate new information about SMEs and relax loan conditions ex-post (Bolton et al., 2016; Degryse et al., 2017; Beck et al., 2018). However, the literature also suggests that these benefits come with a cost. As soft information about firms is bank-specific, this information monopoly can lead to SMEs being more easily trapped by banks than large firms. Firms may be forced to accept deteriorating loan terms or engage in self-rationing of credit (Agarwal and Hauswald, 2010; Lončarski and Marinč, 2020; Berger et al., 2021; Zhao et al., 2022).

While the effect of relationship banking on SME financing is well-researched in the case of advanced countries, few quantitative studies have been undertaken for developing economies such as China. Indeed, China provides a good context for this research. First, the importance of SMEs to the China economy¹, combined with an undeveloped capital market, ensures the restriction of alternative sources of finance to SMEs constrained by bank credit (Hussain et al., 2006). The lack of substitutability between external funds makes China an appropriate test-case for studying the impact of relationship banking on SME finance.

Second, the literature suggests that relationship banking is most effective in nations with weak contract enforcement, significant corruption, and unstable political environment (Aggarwal and Goodell, 2010). But in China, contractual relationships have historically been on relationship transactions in the form of ‘guanxi’ (Fan, 2002; Li, 2011; Piotroski et al., 2015). The ‘guanxi’ between businesses and banks may be among the most important factors in enabling loan business.

Finally, while relationship banking constitutes a competitive advantage for the firm, it can also easily lead to political interference and corruption (Aggarwal & Goodell, 2010). This situation is more likely to occur in China, where state-owned enterprises predominate. Literature suggests that political ties between SOEs and state-owned banks are China’s most effective form of relationship banking (Yin and Matthews, 2017). State-owned commercial banks still dominate the Chinese banking system, and most bank loans are allocated to SOEs typically at favorable credit conditions (Brandt and Zhu, 2000). However, this benefit may come at the expense of non-SOEs.

In this paper, we bring these issues to the data and pose three questions. First, we investigate if relationship banking relaxes the financing constraints of SMEs, and if this

¹ 60% of GDP in 2017 and 50% of tax revenue (Jia et al, 2020)

benefit comes at a higher cost in terms of lending conditions. Second, relying on a unique and relatively large dataset (28 provinces and 17 industries), we observe for the first time the impact of relationship banking on the financing of actual micro firms in China, with 25% of firms having even less than ten employees. Third, our approach is innovative in that it captures the firm-bank relationship more precisely for the first-time utilizing SME-to-bank relationship spending as a proxy for the measure of the intensity of the relationship, which is a significant difference from earlier relationship banking papers². In a recent study, Liang and Chen (2017) used hospitality spent by Chinese listed firms as a proxy and found that ‘guanxi’ can facilitate more bank loans for firms. However, the concern is that hospitality is also aimed at the government and upstream and downstream businesses.

Our main findings can be summarized as follows. First, SME relationship spending on banks increases the likelihood of securing bank loans to meet their real financing needs. Second, the role of relationship banking in easing SME financing constraints is heterogeneous across regions with varying degrees of economic growth but not across industries. The positive effect of relationship banking in easing SME financing constraints is diminished in economically developed regions. Third, affected by information asymmetries and political preference, Chinese SMEs bear the dark side of relationship banking. While bank relationship spending allows SMEs to access more bank credit and longer maturity loans, it also leads to higher interest rates, guarantee requirements and overall dissatisfaction with loan services.

² The duration of the bank-borrower relationship (Degryse et al., 2017; Matthews and Yin, 2019), business scope (Degryse et al., 2017), credit concentration and geographical distance (Degryse et al. 2018; Zhao et al., 2021) have been widely used as proxies for relationship banking, but these indirect proxies are contaminated by the market power implicit in the bank-borrower relationship (high switching costs and lower of credit market competitiveness) and do not necessarily indicate the frequency of communication and proactive communication that is critical to the value of relationship banking (Degryse et al.,2021).

Our paper contributes to the literature on SME bank financing in several ways. To our knowledge, this is the first study to systematically investigate the impact of relationship banking on Chinese SMEs finance from a quantitative perspective. We differ from other studies in utilizing a survey that is dominated by micro-enterprises rather than the traditional definition of a small business. The survey collects a large amount of information related to enterprise finance, such as the financing constraints, the number of loans, the duration of the loans, the guarantees of finance, the interest rates of the loans, and the entrepreneurs' satisfaction with the loan services. That information provides an opportunity to give insight into the bright and dark sides of relationship banking.

While previous studies have extensively documented the problem of weak political connections and information asymmetries (Sapienza, 2004; Claessens et al., 2008), the reactions of these discriminated firms to their disadvantaged position have not been adequately investigated. Recent literature has found that non-state listed firms (or smaller listed firms) generally spend a higher proportion of their hospitality to enhance their relationships with all external institutions and thereby obtain more loans (Cai et al., 2011; Yang et al., 2012; Liang & Chen, 2017). However, there is a gap in the research on the with regard to SMEs. Allen et al. (2005) find that in China, the economy has maintained high growth rates despite a relatively backward financial system and state-owned enterprises squeezing the survival of SMEs, suggesting an alternative financing mechanism for the private sector. Our study answers this question and provides the first evidence that SMEs that experience credit constraints can mitigate information asymmetries and lack of political connection by spending on bank relationships, thereby easing firms' financing constraints.

Our research also contributes to the literature regarding the financial costs and loan benefits of relationship banking for SME finance. Berger et al. (2021) and Degryse et al.

(2017) discover evidence of the bright and dark sides of relationship banking in the US and UK. We extend this issue for the first time to SMEs in in China. This finding helps to advance our understanding of SME finance to a different geographical region. We again demonstrate that the benefits of relationship banking for SMEs come at a price. Our results suggest that SME bank relationship spending is an effective behavior. However, pressure on relationship banking in the form of interbank competition and customer protection is needed to discipline rent-seeking behavior (Lončarski & Marinč, 2020). Our other contribution is to expand on the impact of relationship banking on corporate finance in China. For the first time, we reveal how the impact of relationship banking on SME financing in China differs from that of large Chinese firms.

Finally, our results may provide some insights for the debate on relationship banking versus transactional banking. The contribution of relationship banking to SME financing is significantly weaker in economically developed regions. One potential explanation is that fintech is more developed in economically developed regions, which may lead to the traditional ‘guanxi’ model being replaced by new structures created by fintech. Our findings suggest that relationship banking and transactional banking appear to be mutually exclusive rather than mutually reinforcing in China. Furthermore, although SMEs in different sectors have different levels of soft information, China’s industrial policy support may have contributed to no significant differences in the role of relationship banking in conveying soft information.

In 2013 and 2014, the China Banking Regulatory Commission (CBRC) issued successive circulars on “Matters Relating to the Establishment of Community and Small and Micro Sub-branches by Small and Medium-sized Commercial Banks” and on “Matters Relating to the Promotion of Simplification and Decentralization of Government and

Improvement of Market Access”. The increased number of bank relationship managers and the decentralization of discretionary powers provided an excellent opportunity for relationship banking to flourish in China.

The rest of the paper is structured as follows. The next section describes the data. Section 3 presents the empirical specification. Section 4 reports the results and discusses the robustness tests. The final section is the conclusion.

2. Data

The primary data source for this paper is the China Micro and Small Enterprise Survey (CMES) conducted by the China Household Finance Research Centre (CHFRC) in 2015. Information is collected through direct interviews with each company’s majority shareholder or chief executive officer (general manager)³. The survey collects information on SMEs performance in 2014, including production and operation, financial situation, human resources, and sources of financing. The original dataset covers 5497 companies across 18 various industries. This data set has been used in previous literature (see e.g., Yao et al., 2022; Zhang et al., 2022; Lin et al., 2022) to explore determinants of firms’ innovation, investment, and involvement in international trade. Yet, to our best knowledge, this is the first paper to utilize this survey for the analysis of the relationship between SMEs’ financial constraints and relationship banking.

The raw data cover more than 5400 companies in 80 countries⁴ and 18 industries available in 2014. However, the availability of the responses varies a lot across companies.

³ The names of companies are not revealed in the survey due to the confidentiality policy.

⁴ The CHFRC research team applied a multi-stage stratified sampling method to randomly select a national sample of SMEs from over 80 counties across all provinces in China except for Hong Kong, Macau, Taiwan, Tibet, Xinjiang, and Qinghai.

For the purpose of comparability, a set of restrictions is applied to the data. First, we keep only companies that can be classified as medium, small, and micro enterprises according to the Classification of Medium, Small, and Micro Enterprises issued by the National Development and Reform Commission and the Ministry of Industry and Information Technology of China in 2011⁵. We focus on enterprises that have existed for less than 20 years by 2015, because old companies tend to accumulate significant social capital, which may affect relationship banking and thus bias our analysis. We remove erroneous observations, i.e., companies with no operating income, no employees, or registered in 2015. Next, we control for outliers by imposing the following restrictions. First, we remove companies that spend more than 1 million RMB on relationship banking or less than 500 RMB. Then, we keep only reasonable bank loan contracts by excluding SMEs with zero loan maturity, with more than 10 bank loans⁶, and with bank loans of less than 10,000 RMB⁷.

We end up with a sample of 685 companies available in 28 provinces and 17 industries. A list of the industries and provinces is presented in Appendix A1. As shown in Table 1, our sample covers mainly small (52%) and micro (41%) companies. Most enterprises are not older than 10 years (72%), have less than 49 employees (69%) and have up to 3 bank loans (91%). Half of the companies in our sample have turnover of less than 5 million RMB (53%). About 20% of companies in our sample spend money on building relationships with banks.

⁵ The official classification could be accessed at http://www.stats.gov.cn/tjsj/tjbz/201109/t20110909_8669.html.

⁶ The relationship spending covered by the survey refer only to the largest bank loan of the company. We drop companies with more than 10 bank loans to ensure that the relationship spending is representative.

⁷ There are several companies that reported that they have loans but the amount of loan is zero. Such companies were removed from the sample.

Finally, the dataset enables us to apply the following self-reported financial constraint: "the extent to which bank loans received by SMEs satisfy the firm's actual financing needs." Identification and interpretation issues frequently arise in empirical work examining the impact of financial constraints. The main difficulty lies in the nature of the phenomenon: both credit demand and credit supply are unobservable (Casey and O'Toole, 2014). The unique data permits simultaneous observation of the link between credit demand and credit supply.

(Insert Table 1 here please)

3. Empirical Specification

While previous studies have explored the effect of relationship banking on SMEs financial constraints using data for Chinese listed companies (Liang and Chen, 2017; Zou and Wang, 2022), we improve the analysis by utilizing a unique survey data solely for Chinese SMEs. First, this allows us to estimate the importance of the relationship banking for small and micro companies rather than for larger-size listed companies. Second, using the survey data we measure the intensity of relationship banking and identify financial constraints of companies more precisely. Measures of relationship banking in the literature have typically been indirect. Proxies for relationship banking have included duration of the relationship (Hernández-Cánovas and Martínez-Solano, 2010) or geographical distance between the borrowing firm and its bank (Zhao et al., 2021). CMES dataset provides a direct measure of relationship spending by asking firms how much extra money they spend on obtaining the largest loan. Moreover, we can directly estimate the firm's credit constraint using their answer to the following question, "To what extent do the obtained bank loans meet the current financing needs of the company?" Thus, the unique survey data allows us

to improve accuracy of the analysis by measuring more precisely the intensity of relationship banking through the firm's expenditure and its financial constraints.

One potential issue with the analysis of survey data is the reverse causality effect (Brancati, 2015). Relationship spending may cause an improvement in SMEs financing, but at the same time SME's financial constraints may lead to extra spending on building relationship with a bank. To overcome this problem, we estimate our baseline model using a simultaneous equation model.

Our baseline model can be presented as follows:

$$FC_{ijrk} = \alpha_1 + \beta_1 RS_{ijrk} + \beta_2 C_{ijrk} + \beta_3 TI_k + \beta_4 GDP_{jr} + \delta_r + \epsilon_{ijrk} \quad (1)$$

$$RSg_{ijrk} = \alpha_1 + \beta_1 FC_{ijrk} + \beta_2 C_{ijrk} + \beta_3 TI_k + \beta_4 GDP_{jr} + \delta_r + \epsilon_{ijrk}, \quad (2)$$

where FC_{ijrk} is the degree to which loan amount satisfies financial needs faced by company i in province j , region r and industry k , it could be understood as the inverse of firm's financial constraints. RS_{ijrk} is the logarithm of the additional expenditure incurred by a company to obtain its largest bank loan. C_{ijrk} is a vector of firm-level control variables, which includes firm level characteristics, such as age, size, profitability, solvency, competitiveness of the firm's products, and expansion plans. TI_k is the industry-specific dummy that takes value 1 if the firm belongs to high-tech industry, and 0 otherwise. δ_r refer to the region-specific fixed effects. Finally, we include provincial GDP per capita, GDP_{jr} , to capture differences in economic development of provinces where companies are located. Detailed descriptions of all variables are given in Appendix A2. Table 2 provides summary statistics for each variable.

(Insert Table 2 here please)

We estimate the baseline model using a simultaneous equation model (SEM) to account for the potential inverse causality problem. In order to estimate the marginal effect of relationship banking on SMEs financial constraints, we also provide estimates from probit model. Furthermore, we check whether this effect is heterogeneous across industries and regions by including various interaction terms in the model.

The second research question of this paper focuses on the impact of relationship banking on bank loan conditions. Some studies point to the dark side (information rents) of relationship banking (Hernández-Cánovas and Martínez-Solano, 2010; Degryse et al., 2017). For instance, SMEs in China are more likely to accept deteriorating credit contracts due to political discrimination. Considering that loan contracts and firm financing constraints are simultaneously affected by relationship banking, we estimate the impact of relationship banking on the firm lending conditions and financing constraints using the following simultaneous estimation model:

$$Y_{ijrk} = \alpha_1 + \beta_1 RS_{ijrk} + \beta_2 C_{ijrk} + \beta_3 TI_k + \beta_4 GDP_{jr} + \delta_r + \epsilon_{ijrk} \quad (3)$$

$$FC_{ijrk} = \alpha_1 + \beta_1 RS_{ijrk} + \beta_2 C_{ijrk} + \beta_3 TI_k + \beta_4 GDP_{jr} + \delta_r + \epsilon_{ijrk} , \quad (4)$$

where Y_{ijrk} is the conditions of the loan contracts, including the loan amount, maturity, financing guarantee, interest rate, and entrepreneur's satisfaction with the bank's services. Equation (3) is estimated using OLS when the loan amount, maturity, and interest rate are used as dependent variables. When dependent variable is financing guarantee and entrepreneur's satisfaction, we use ordered-probit and probit models for estimation, respectively.

Before proceeding with the estimation of the models, we test for potential multicollinearity problems by calculating the variance inflation factor (VIF) for each independent variable of our empirical model. The results show that none of our independent

variables have a VIF value larger than 10 implying no correlation between independent variables. Appendix A3 shows the correlations among our variables.

In what follows, we aim to understand the effect of bank relationship spending on SMEs' financial constraints and on terms of the loan contract.

4. Results

4.1 Relationship banking and financing constraints

Table 3 presents the results of testing the impact of the bank relationship spending on SMEs' financing constraints. Column 1 shows estimation results based on simultaneous equation model (SEM) that accounts for possible inverse causality. Columns 2 and 3 report coefficients and average marginal effects based on probit model estimation of equation (1), respectively.

(Insert Table 3 here please)

In the baseline results presented in column 1 of Table 3, the coefficient for relationship banking is 0.263, which is significant at the 1% level. This finding is statistically significant and economically meaningful. The results suggest that a stronger relationship between SMEs and banks can help firms to access bank credit that meets their real credit needs. The main results remain qualitatively unchanged when estimated using the probit model.

A possible concern is the existence of omitted variables affecting both the dependent and independent variables. Therefore, column 4 uses the size-age (SA) index proposed by

Hadlock and Pierce (2010) to measure financing constraints⁸, which better avoids the endogeneity bias of financial factors (Hadlock and Pierce, 2010; Zhang and Zheng, 2020). Our results continue to hold. The coefficient for relationship banking presented in column 4 where an alternative dependent variable (SA) is used, equals 0.016, suggesting that relationship banking helps to reduce the likelihood of financial constraints⁹.

Finally, we conduct a supplementary analysis to strengthen our reasoning. Our rationale for asking the first question is that SMEs with solid ties to banks have access to more bank loans, which drives the supply of credit available to firms to meet credit demand. Therefore, in Table 4 we estimate the effect of relationship spending on the amount of bank loans. Our results confirm the significant positive relationship between the relationship banking and the total amount of bank loans received by SMEs (0.058), as well as the positive relationship between the total amount of bank loans received by SMEs and satisfaction of their financial needs (0.271).

(Insert Table 4 here please)

4.2 Heterogeneity of relationship banking to SMEs

Next, we assess whether the effect of relationship banking varies significantly across regions and industries. Table 5 reports the results of estimating equation (1) using SEM and including interaction terms that captures heterogeneity in the role of relationship banking across regions with different levels of economic development and across industries. The results suggest that the impact of relationship banking in easing SME financing constraints

⁸ SA index is calculated as $SA = -0.737 * size + 0.043 * size^2 - 0.04 * age$, where size is measured by the logarithm of total asset as suggested by Zhang and Zheng (2020). A larger SA index is associated with a smaller likelihood of financial constraints.

does not vary significantly between high-technology and manufacturing industries. This seemingly contradictory finding may be explained by the fact that the Chinese government usually gives more policy support to high-tech industries (Luo et al., 2021).

Columns 3 and 4 of Table 5 report whether the role of relationship banking differs across regions in terms of GDP per capita or between eastern and other regions, respectively. We find that the impact of relationship banking in easing SME financing constraints is weakened in regions with high levels of economic development. The coefficient on the interaction term between relationship spending and GDP is -0.038. Similarly, the coefficient on interaction term between relationship spending and Eastern region equals -0.023. A potential explanation is that regional economic development may drive up the level of local fintech. Technologies such as artificial intelligence and blockchain have already changed the way banks make lending decisions (Petersen and Rajan, 2002), which leads to lower importance of relationship banking. Lenders can make informed credit decisions by having access to hard information instead of relying on soft information obtained by relationship managers. Appendix A4 further explores these heterogeneity issues using probit model. We show that the results are robust in the choice of estimation model.

(Insert Table 5 here please)

4.3 Relationship banking and loan contracts

Next, we estimate the impact of the relationship spending on SME's loan contracts. The results presented in Table 6 suggest that while SME bank relationship spending allows SMEs to access larger and longer-maturity loans (as suggested by coefficients 0.055 and 0.390 presented in columns 1 and 2, respectively), it also leads to higher interest rates, stricter guarantee requirements, and overall dissatisfaction with loan services (as suggested by coefficients of 0.118, 0.022, and -0.071, presented in columns 3,4, and 5, respectively). Our

results support the dark side findings of Berger et al. (2021). Evidence suggests that SME relationship spending enhances the ability of relationship managers to gather soft information about firms (Uzzi & Lancaster, 2003) and to build a common interest bond between firms and banks, mitigating information asymmetries and political discrimination. However, this behavior ties the customer to the bank and allows the bank to extract rents in the form of higher interest rates and increased security requirements.

(Insert Table 6 here please)

As a robustness test, we estimate models presented in Table 6 using different econometric techniques, such as OLS (for continuous dependent variables) and probit/ordered probit (for binary dependent variables). Columns 1 to 5 of Table 7 show the results of the robustness exercise. Moreover, in the last two columns of Table 7, we use the average amount of loans received by firms as an alternative dependent variable. Our main results remain unchanged.

(Insert Table 7 here please)

5. Conclusion

The lack of external financing for SMEs has long been an important issue in China. In this paper we find evidence that relationship banking generates a better financing environment for SMEs. In particular, bank relationship spending significantly alleviates SMEs' financial constraints and such effect is heterogeneous across regions with varying degrees of economic growth but not across industries. Furthermore, while bank relationship spending allows SMEs to access more bank credit and longer maturity loans, it also leads to higher interest rates, guarantee requirement and overall dissatisfaction of loan services. Our

findings shed new light on the role of 'Guanxi' in China's micro-credit market and its consequences.

There are several limitations to our finding. Firstly, no bank characteristics were observed in the dataset, which may have led us to overlook constraints that emanate from the lenders. There is also another bias in the findings: SMEs that were denied financing or did not need it were not included in the sample. Therefore, the study results are biased toward firms with banking relationships.

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Table 1: Distribution of sample firms

Employee	%	Total assets (million RMB)	%	Operating income (million RMB)	%	Age (years)	%
<=9	25	<=1	24.4	<=0.5	19.88	<=2	18.11
9<x<=15	14.07	1 <x<=5	29.19	0.5 <x<=1	7.83	2<x<=4	20.66
15 <x<=49	29.64	5 <x<=10	13.48	1<x<=5	25.60	4<x<=6	13.33
49 <x<=149	22.61	10 <x<=25	14.37	5 <x<=10	12.96	6<x<=10	20.21
149 <x<=249	5.99	25 <x<=100	14.37	10 <x<=50	25.00	10<x<=15	20.06
>249	2.69	>100	4.19	>50	8.73	>15	7.63
Size	%	Number of loans	%	Region	%	Relationship spending (RMB)	%
micro	40.72	1	55.7	Western	27.99	0	78.98
small	52.25	2	23.73	Eastern	51.05	0<x<=10000	10.95
medium	7.04	3	11.39	Central	16.17	10000<x<=50000	5.84
big	0%	>3	9.18	Northeast	4.79	>50000	4.23

Table 2: Statistical description of the variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
Constraint	685	0.601	0.490	0	1
Size of loan (log)	667	13.658	1.651	9.210	18.198
Maturity (Month)	613	19.488	25.391	1	240
Guarantee	679	2.364	0.814	1	3
Interest cost	203	4.469	4.162	0	20.400
Service	680	0.737	0.441	0	1
SA	685	-1.314	1.035	-3.677	2.380
Rel. spending (log)	685	1.995	3.951	0	13.567
Age	685	7.394	4.981	1	20.000
Employee (log)	685	3.224	1.215	0.693	7.074
Profit	685	0.203	2.295	-2.600	58.333
Solvency	685	0.558	0.497	0	1
Expansion	685	0.499	0.500	0	1
Competitive	685	0.650	0.477	0	1
Tech Industry	685	0.505	0.500	0	1
Manufacture	685	0.476	0.500	0	1
GDP (log)	685	10.285	0.234	9.943	10.773
Eastern	685	0.508	0.500	0	1

Table 3: SME relationship banking and financing constraints

	SEM	Probit	Margins	OLS
VARIABLES	(1) FC	(2) FC	(3) FC	(4) SA
Rel. spending (RS)	0.263*** (22.176)	0.032*** (3.133)	0.011*** (3.196)	0.016*** (4.079)
Age	0.007 (0.955)	0.045*** (4.532)	0.016*** (4.771)	-0.010* (-1.822)
Employee	-0.124*** (-6.184)	-0.021 (-0.295)	-0.008 (-0.295)	0.538*** (8.092)
Profit	-0.046*** (-10.721)	0.072 (0.628)	0.026 (0.630)	-0.067*** (-20.322)
Solvency	0.175* (1.851)	0.160 (0.923)	0.057 (0.928)	0.124 (1.725)
Expansion	-0.184* (-1.671)	-0.171** (-2.007)	-0.061** (-1.967)	0.018 (0.341)
Competitive	0.181*** (3.003)	0.309*** (5.352)	0.110*** (5.125)	0.106 (1.293)
Tech Industry (TI)	-0.048 (-0.372)	0.315* (1.746)	0.112* (1.729)	0.067 (0.697)
GDP	0.375 (1.053)	0.710 (1.488)	0.253 (1.517)	-0.238* (-1.768)
Region FE	Yes	Yes	Yes	Yes
Observations	685	685	685	685
R-squared	0.203	0.072	0.072	0.454

Notes: The results are based on industry-clustered standard errors. T-statistics are shown in brackets. The results in the third column are the average marginal effects. *** p<0.01, ** p<0.05, * p<0.1

Table 4: SME relationship banking and the amount of bank loans

VARIABLES	OLS	Probit	Margins
	(1) Total loan amount	(2) Constraint	(3) Constraint
Rel. spending	0.058*** (4.199)		
Total loan amount		0.271*** (7.131)	0.091*** (8.138)
Age	0.069*** (6.313)	0.028** (2.392)	0.009** (2.366)
Employee	0.731*** (6.936)	-0.214*** (-4.695)	-0.072*** (-4.815)
Profit	0.000 (0.032)	0.096 (0.871)	0.032 (0.883)
Solvency	-0.052 (-0.377)	0.190 (0.994)	0.064 (1.010)
Expansion	-0.076 (-1.469)	-0.142 (-1.614)	-0.048 (-1.617)
Competitive	0.101* (1.829)	0.283*** (4.104)	0.095*** (3.932)
Tech Industry	0.080 (0.318)	0.302** (2.069)	0.102** (2.036)
GDP	0.045 (0.201)	0.760 (1.477)	0.256 (1.519)
Region FE	Yes	Yes	Yes
Observations	667	667	667
R-squared	0.415	0.117	0.117

Notes: The results are based on industry-clustered standard errors. T-statistics are shown in brackets. The third column reports average marginal effects from probit model. *** p<0.01, ** p<0.05, * p<0.1

Table 5: Heterogeneity of SME relationship banking and financial constraints

VARIABLES	(1) FC	(2) FC	(3) FC	(4) FC
Rel. spending (RS)	0.261*** (29.756)	0.262*** (32.016)	0.287*** (14.516)	0.676*** (6.422)
Tech Industry (TI)	-0.030 (-0.290)		-0.039 (-0.321)	-0.034*** (-17.505)
RS*TI	0.002 (0.787)			
Manufacture		0.008 (0.068)		
RS* Manufacture		0.001 (0.879)		
Eastern			0.329*** (3.530)	
RS*Eastern			-0.023** (-2.384)	
GDP	0.172 (0.564)	0.260 (0.911)		0.649*** (12.090)
RS* GDP				-0.038*** (-3.911)
Age	0.007 (0.818)	0.007 (0.797)	0.007 (0.852)	0.008*** (51.840)
Employee	-0.129*** (-3.345)	-0.131*** (-3.355)	-0.129*** (-6.720)	-0.127*** (-102.951)
Profit	-0.028** (-1.990)	-0.043*** (-3.883)	-0.046*** (-9.967)	-0.047*** (-69.145)
Solvency	0.169** (2.020)	0.171** (2.059)	0.179* (1.905)	0.182*** (53.720)
Expansion	-0.196** (-2.345)	-0.193** (-2.313)	-0.199** (-2.186)	-0.192*** (-59.803)
Competitive	0.177** (2.073)	0.180** (2.098)	0.176*** (3.074)	0.176*** (123.766)
Region FE	Yes	Yes	No	No
Observations	685	685	685	685
R-squared	0.205	0.205	0.205	0.206

Notes: Columns 1 and 2 use robust-clustered standard errors. Columns 3 and 4 use industry-clustered standard errors. T-statistics are shown in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 6: SME relationship banking and loan contracts

VARIABLES	(1) Size of loan	(2) Maturity	(3) Interest	(4) Guarantee	(5) Service
Rel. spending	0.055*** (3.745)	0.390** (2.468)	0.118*** (2.845)	0.022** (2.571)	-0.071*** (-7.364)
Age	0.067*** (5.189)	0.028 (0.144)	0.142*** (3.978)	0.040*** (4.973)	0.026*** (2.687)
Employee	0.701*** (8.254)	-2.942*** (-2.915)	0.005 (0.020)	0.170*** (5.371)	0.076 (1.581)
Profit	0.009* (1.717)	-0.008 (-0.172)	0.392 (1.159)	0.015 (1.400)	-0.178*** (-3.068)
Solvency	-0.038 (-0.304)	3.663** (2.186)	-0.812* (-1.764)	-0.149* (-1.808)	0.235*** (4.903)
Expansion	-0.085 (-1.545)	-0.564 (-0.536)	-0.154 (-0.362)	-0.039 (-0.561)	-0.047 (-0.613)
Competitive	0.073 (1.261)	-2.595 (-1.604)	-0.117 (-0.150)	0.045 (0.645)	0.231*** (4.970)
Tech. Ind.	-0.022 (-0.092)	4.365** (2.047)	0.765*** (2.677)	0.017 (0.180)	0.084 (0.677)
GDP	-0.010 (-0.033)	-9.363** (-2.258)	0.245 (0.171)	0.155 (0.556)	-0.695*** (-2.807)
Region FE	Yes	Yes	Yes	Yes	Yes
Observations	667	613	203	679	680
R-squared	0.115	0.014	0.043	0.062	0.075

Notes: The results are based on simultaneous equation model with industry-clustered standard errors. T-statistics are shown in brackets. To ensure accuracy of the estimations, we exclude companies that choose monthly and quarterly interest rates from the regressions presented in column (3), as some respondents incorrectly filled in the interest rate which created many outliers. *** p<0.01, ** p<0.05, * p<0.1

Table 7: SME relationship banking and loan contracts: robustness test

	OLS	OLS	OLS	oprobit	probit	SEM	OLS
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Size of loan	Maturity	Interest	Guarantee	Service	Average loan amount	Average loan amount
Rel. spending	0.054*** (3.581)	0.390** (2.433)	0.109** (2.512)	0.022** (2.533)	-0.072*** (-7.317)	0.055*** (3.363)	0.054*** (3.228)
Age	0.067*** (5.044)	0.028 (0.142)	0.139*** (3.683)	0.040*** (4.981)	0.026*** (2.723)	0.060*** (4.747)	0.061*** (4.636)
Employee	0.701*** (8.139)	-2.942** (-2.887)	0.013 (0.048)	0.172*** (5.541)	0.075 (1.568)	0.646*** (5.767)	0.648*** (5.613)
Profit	0.009 (1.703)	-0.008 (-0.176)	0.471 (1.297)	0.017 (1.302)	-0.174*** (-3.174)	0.009 (0.744)	0.009 (0.711)
Solvency	-0.036 (-0.283)	3.663** (2.159)	-0.866 (-1.691)	-0.148* (-1.885)	0.237*** (4.719)	0.057 (0.367)	0.060 (0.381)
Expansion	-0.085 (-1.470)	-0.564 (-0.527)	-0.170 (-0.366)	-0.044 (-0.605)	-0.042 (-0.524)	-0.074 (-1.336)	-0.084 (-1.358)
Competitive	0.072 (1.228)	-2.595 (-1.578)	-0.024 (-0.031)	0.041 (0.597)	0.232*** (4.975)	0.012 (0.167)	0.008 (0.105)
Tech Industry	-0.025 (-0.101)	4.365* (2.026)	0.810** (2.606)	0.016 (0.163)	0.080 (0.646)	0.066 (0.233)	0.062 (0.214)
GDP	-0.003 (-0.009)	-9.363** (-2.226)	-0.029 (-0.018)	0.155 (0.546)	-0.694*** (-2.760)	-0.253 (-0.938)	-0.231 (-0.835)
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	667	613	203	679	680	639	639
R-squared	0.404	0.044	0.113	0.045	0.078	0.105	0.375

Notes: The results are based on industry-clustered standard errors. T-statistics are shown in brackets. To ensure accuracy of the estimations, we exclude companies that chose monthly and quarterly interest rates from the regressions presented in the column (3), as some respondents incorrectly filled in the interest rate which resulted in many outliers. *** p<0.01, ** p<0.05, * p<0.1

Appendix

Appendix A1: Distribution of firms across provinces and industries

Province	%	Industry	%
Anhui	4.53	Manufacturing	47.59
Beijing	1.75	Construction	4.38
Chongqing	3.65	Wholesale	11.53
Fujian	1.75	Retail	10.66
Gansu	4.82	Accommodation	0.73
Guangdong	4.23	Catering	0.88
Guangxi	3.36	Software and IT services	1.31
Guizhou	3.8	Transportation	0.88
Hainan	0.44	Mining	0.73
Hebei	2.19	Property development and operation	0.58
Heilongjiang	1.46	Storage	0.29
Henan	4.09	Leasing and business services	4.53
Hubei	3.21	Property Management	0.44
Hunan	2.48	Information transmission	0.88
Jiangsu	9.2	Electricity, heat, gas and water production and supply	0.73
Jiangxi	1.17	Agriculture, forestry, livestock and fisheries	13.72
Jilin	1.61	Financial Services	0.15
Liaoning	1.61		
Neimenggu	0.44		
Ningxia	1.75		
Shaanxi	1.46		
Shandong	8.61		
Shanghai	5.11		
Shanxi	1.02		
Sichuan	5.26		
Tianjin	2.92		
Yunnan	3.5		
Zhejiang	14.6		

Appendix A2: Definition of variables

Name	Description
Dependent variables	
Constraint (FC)	Binary variable that takes value 1 if the company believes that the bank loan can “fully” or “mostly” meet its financial needs, and 0 otherwise.
Size of loan	Logarithm of the largest bank loan amount.
Maturity	Maturity of the largest bank loan. (Month)
Guarantee	1 - if the enterprise does not need to provide the guarantee for its largest loan; 2 - if the enterprise needs to provide a guarantor; 3 - if the enterprise needs to provide collateral.
Interest cost	Interest rate for the largest bank loan.
Service	The degree of SME’s satisfaction with the loan services associated with the largest bank loan. It takes value 1 if the firm is "very satisfied" or "satisfied", and 0 otherwise.
SA	Size-age (SA) index proposed by Hadlock and Pierce (2010) and calculated as $SA = -0.737 * size + 0.043 * size^2 - 0.04 * age$, where size is measured by the logarithm of total asset as suggested by Zhang and Zheng, 2020. A larger SA index is associated with a smaller likelihood of financial constraints.
Independent variables	
Rel. spending (RS)	The logarithm of the additional expenditure incurred by a company (in addition to interest payments) to obtain its largest bank loan.
Control variables	
Employee	The number of employees (in logs).
Age	Age of the company, calculated as the year 2015 minus the registration year of the company
Profit	Profitability of the company calculated as before tax profit divided by total assets
Competitive	1 if the entrepreneur considers the competitiveness of the company’s main product (service) in the market to be "very strong" or "relatively strong", and 0 otherwise.
Solvency	Binary variable that takes value 1 if the company is currently "fully capable" of repaying the amount owed for production and operational projects, and 0 otherwise. (self-reported)
Expansion	1 if the company has plans to hire employees in the coming year, and 0 otherwise.
Tech. Industry (TI)	1 if the enterprise belongs to "manufacturing", "software and information technology services", "information transmission" or "electricity, heat, gas and water production and supply", 0 otherwise.
Manufacture	1 if the enterprise belongs to "manufacturing", 0 otherwise.
GDP	Logarithm of provincial GDP per capita
Region	Location of the company. 1 - Eastern provinces; 2 - Central provinces; 3 - Western provinces; 4 –Northeast provinces.

Appendix A3: Correlation table

	Rel. spending	Age	Employee	Profit	Solvency	Expansion	Competitive	Tech. Industry	GDP
Rel. spending	1								
Age	0.00700	1							
Employee	0.157*	0.292*	1						
Profit	0.107*	0.0410	0.0450	1					
Solvency	-0.071	0.0300	0.099*	0.0520	1				
Expansion	0.120*	-0.0320	0.259*	-0.0270	0.072	1			
Competitive	-0.0430	-0.0210	0.126*	0.0470	0.135*	0.127*	1		
Tech. Industry	0.080*	0.218*	0.433*	0.0210	-0.0110	0.072	0.00800	1	
GDP	-0.100*	0.241*	0.077*	-0.0380	0.0550	-0.095*	-0.0300	0.199*	1

Appendix A4: Heterogeneity of SME relationship banking and financial constraints using probit model

VARIABLES	(1) Constraint	(2) Constraint	(3) Constraint	(4) Constraint
Rel. spending (RS)	0.036* (1.799)	0.037** (1.979)	0.045*** (3.849)	1.370*** (3.170)
Tech Industry (TI)	0.330*** (2.646)		0.304* (1.748)	0.292* (1.697)
RS * TI	-0.008 (-0.284)			
Manufacture		0.297** (2.340)		
RS * Manufacture		-0.011 (-0.418)		
Eastern			0.256*** (2.723)	
RS * Eastern			-0.033** (-2.145)	
GDP	0.710* (1.824)	0.691* (1.779)		0.811*** (3.067)
RS * GDP				-0.047*** (-3.205)
Age	0.045*** (4.059)	0.046*** (4.103)	0.046*** (4.631)	0.045*** (4.540)
Employee	-0.022 (-0.442)	-0.017 (-0.341)	-0.021 (-0.299)	-0.015 (-0.215)
Profit	0.071 (0.644)	0.070 (0.625)	0.069 (0.609)	0.068 (0.584)
Solvency	0.159 (1.539)	0.150 (1.449)	0.159 (0.923)	0.154 (0.918)
Expansion	-0.168 (-1.582)	-0.161 (-1.514)	-0.191** (-2.438)	-0.183** (-2.242)
Competitive	0.310*** (2.884)	0.315*** (2.931)	0.318*** (5.372)	0.325*** (5.624)
Region FE	Yes	Yes	No	No
Observations	685	685	685	685
R-squared	0.072	0.070	0.069	0.076

Notes: Columns 1 and 2 use robust-clustered standard errors. Columns 3 and 4 use industry-clustered standard errors. T-statistics are shown in brackets. *** p<0.01, ** p<0.05, * p<0.1