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## SME relationship banking and loan contracting: Survey-based evidence from China

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# Cardiff Economics Working Papers



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

Shun Lu<sup>1</sup>, Marina Glushenkova<sup>2</sup>(✉), Wei Huang<sup>3</sup>, Kent Matthews<sup>4</sup>

## **Abstract**

This study explores the impact of relationship banking on the financial constraints and loan conditions of small and medium-sized enterprises (SMEs) in China. Our research contributes to the literature in several ways. First, we examine both the financial costs and loan benefits associated with SME relationship banking, extending the scope of existing literature. Second, our study is unique in its focus on micro-enterprises, rather than large-scale listed companies in China. Lastly, we enhance the quality of the analysis by using direct measures of firms' spending on bank relationships and their financial constraints, drawn from a recent survey on SMEs in China. Our findings are twofold. On one hand, bank relationship spending significantly reduces financial constraints for SMEs by facilitating access to loans. On the other hand, while this spending enables SMEs to secure more bank credit and longer-term loans, it also results in higher interest rates, increased guarantee requirements, and overall dissatisfaction with loan services. Our research provides new insights into the role of 'guanxi' in China's credit market and its consequences.

**Keywords:** SME Financing, Relationship Banking, China, Financial Constraints

**JEL Classification:** G21, L140, O53

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## 1. Introduction

Small and medium-sized enterprises (SMEs) play a critical role in fostering economic growth and reducing poverty, especially in emerging market countries (Petersen & Rajan, 1994). However, SMEs often face significant challenges in accessing bank credit due to problems such as asymmetric information, inadequate collateral, and a lack of hard (publicly verifiable) information (Degryse et al., 2018; Wang et al., 2022). In such situations, relationship banking, based on soft information that is not easily quantifiable, can often be more valuable than hard information (Guida & Sabato, 2017; Liberti & Petersen, 2019). Although fintech-related transactional lending has emerged as an innovative lending technique in recent years, the banking sector still heavily relies on relationship lending to finance SMEs (Berger & Udell, 2006; Zhao et al., 2021; Zhao et al., 2022). This highlights the importance of building strong relationships between banks and SMEs to overcome information asymmetry and other barriers to accessing finance.

The literature indicates that relationship banking can be beneficial for SMEs by enabling the transmission of soft information that is difficult to quantify, thereby reducing the probability of credit constraints (Degryse et al., 2018; Zhao et al., 2021; Zhao et al., 2022). This advantage can also mitigate the risks associated with adverse selection and moral hazard in SME lending (Dell'Ariccia & Marquez, 2004). Furthermore, banks can assimilate new information about SMEs and relax loan conditions post-origination (Bolton et al., 2016; Beck et al., 2018). Long-term cooperative relationships with banks that disclose more information can help SMEs obtain more credit and alleviate financial constraints (Han et al., 2017; Hernández-Cánovas & Martínez-Solano, 2007).

However, there is a trade-off between transactional and relationship banking that banks must consider. Relationship banking requires banks to invest more in obtaining soft information through relationship managers, which can increase the associated costs that are passed on to SMEs through higher debt costs (Liberti & Petersen, 2019). In addition, the bank-specific nature of soft information about firms can create an information monopoly that can trap SMEs more easily than large firms, potentially leading to self-rationing of credit or acceptance of unfavorable loan terms (Agarwal & Hauswald, 2010; Guida & Sabato, 2017; Lončarski & Marinč, 2020; Berger et al., 2021; Wang et al., 2022; Zhao et al., 2022). Therefore, while relationship banking can be beneficial for SMEs, banks must be mindful of the costs and risks associated with it.

Relationship banking, or the practice of banks building long-term relationships with their clients to provide customized financial services, is a well-researched topic in developed countries. However, there is a lack of quantitative studies on the impact of relationship banking on SME financing in developing economies such as China. China's large and diverse SME sector provides a rich opportunity for studying the dynamics of relationship banking and soft information transmission. China's context is distinctive, as the country has a significant reliance on SMEs for economic growth, but an undeveloped capital market restricts alternative sources of finance to SMEs constrained by bank credit. This makes China an appropriate test case for studying the impact of relationship banking on SME finance.

Moreover, the literature suggests that relationship banking is most effective in nations with weak contract enforcement, significant corruption, and an unstable political environment (Aggarwal & Goodell, 2010). China's cultural and institutional context is significantly different from that of Western countries, making it well-suited for our research (Han et al., 2023; Huang et al., 2023). In particular, the role of personal relationships and trust is likely to be more important in China, where 'guanxi' play a significant role in business transactions. According to Chu et al (2019), 'guanxi' in China refers to the development of personal relationships and networks of influence that involve mutual expectations and obligations, with the ultimate goal of exchanging favors and facilitating mutual benefits. The 'guanxi' between businesses and banks may be among the most important factors in enabling loan business (Fan, 2002). This can affect how SMEs and lending banks interact, and the types of soft information that are considered important in credit assessment. Therefore, studying the impact of relationship banking on SME financing in China could provide valuable insights into the effectiveness of 'guanxi' in the context of bank lending.

However, while relationship banking can be a competitive advantage for firms, it can also easily lead to political interference and corruption (Aggarwal & Goodell, 2010; Guida & Sabato, 2017). This situation is more likely to occur in China, where state-owned enterprises predominate (Han et al., 2023; Huang et al., 2023). Literature suggests that political ties between SOEs and state-owned banks are China's most effective form of relationship banking (Yin & 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 & Zhu, 2000; Han et al., 2023). This creates an uneven playing field for non-SOEs, which may limit their access to bank credit. Hence, studying the impact of relationship banking on SME financing in China

can provide insights into the challenges faced by non-SOEs and the effectiveness of relationship banking for SMEs in a state-dominated economy.

In this paper, we address several important questions related to relationship banking and SME financing. Specifically, we seek to determine if relationship banking can alleviate financial constraints for SMEs, and if so, whether there are trade-offs in the form of stricter lending conditions. To answer these questions, we utilize a unique dataset that covers 28 provinces and 17 industries in China. This dataset is particularly valuable because it allows us to examine the financing of actual micro firms, including those with fewer than 10 employees and those that are less than three years old. Additionally, our approach to measuring the intensity of the firm-bank relationship is innovative, as we use SME-to-bank relationship spending as a proxy for this measure. This is a significant departure from earlier studies on relationship banking, which have typically relied on less precise measures. Indirect measures, such as the duration of the bank-borrower relationship, the number of banking relationships, the scope of the relationship, and geographical distance, have been widely used as proxies for relationship banking (Iturralde et al., 2010). However, these measures are contaminated by the market power implicit in the bank-borrower relationship, such as high switching costs and lower credit market competitiveness. Moreover, they do not necessarily indicate the frequency of communication and proactive communication that are critical to the value of relationship banking. In a recent study, Liang & Chen (2017) used hospitality spending by Chinese listed firms to proxy the intensity of the firm-bank relationship. However, this measure may be confounded by other factors, such as relationships with government officials or upstream/downstream businesses. In this paper, we use SME-to-bank relationship spending as it enables us to capture the firm-bank relationship more accurately and avoid these potential confounds.

Our study yields several important findings. Firstly, we demonstrate that SMEs spending more on building relationships with banks are more likely to secure bank loans to meet their financing needs. This suggests that relationship banking can be an effective strategy for easing financial constraints among SMEs. Second, our study highlights some potential downsides of relationship banking for SMEs in China. Specifically, we find that firms engaged in relationship banking can obtain larger loans with longer maturity, but they also tend to face higher interest rates and guarantee requirements, which results in overall dissatisfaction with loan services. This implies that while relationship banking can be a useful tool for SME financing, it also comes at a cost.

The contribution of this paper is threefold. Firstly, our research significantly extends the existing literature on the financial costs and loan benefits of SME relationship banking. While scholars such as Guida & Sabato (2017) and Berger et al. (2021) have examined the positive and negative aspects of relationship banking in Europe and the US, our research expands this inquiry to SMEs in China, providing valuable insights into SME finance in a different geographical region. Our findings demonstrate that, like in other regions, the benefits of relationship banking for SMEs in China come with certain costs. Therefore, we conclude that while SME bank relationship spending is an effective strategy, regulation is necessary to curb rent-seeking behavior due to competition and customer protection pressures on relationship banking (Lončarski & Marinč, 2020).

Secondly, our study enhances the understanding of how cultural and political factors in China impact relationship banking for SMEs. While previous research has documented issues such as weak political connections and information asymmetries (Sapienza, 2004; Claessens et al., 2008), there has been limited focus on how disadvantaged firms respond to these challenges. Recent studies indicate that non-state listed firms or smaller listed firms allocate more resources to improving relationships with external institutions to increase their chances of obtaining loans (Cai et al., 2011; Liang & Chen, 2017). However, there is still a gap in the literature regarding SMEs. To address this gap, our study examines the financing mechanisms available to micro and small firms in China. Despite a relatively underdeveloped financial system and competition from state-owned enterprises, China's private sector has experienced sustained economic growth (Allen et al., 2005; Han et al., 2023). Our research provides valuable insights by demonstrating that SMEs can alleviate credit constraints resulting from information asymmetries and a lack of political connections by investing in bank relationships. It emphasizes the significance of cultivating strong relationships with banks for SMEs in China to overcome financing challenges.

Finally, our study contributes to the literature on SME relationship banking by improving empirical identification. Unlike prior studies, we utilized a survey that primarily focused on micro-enterprises rather than the traditional definition of small businesses. This approach enabled us to provide a more comprehensive analysis of the impact of relationship banking on Chinese SME finance from a quantitative perspective. The survey collected a substantial amount of information on enterprise finance, including financial constraints, loan numbers and durations, guarantees, interest rates, and entrepreneurs' satisfaction with loan services. This

extensive data set provided us with valuable insights into both the positive and negative aspects of relationship banking.

Overall, our study provides a deeper understanding of the role of relationship banking in Chinese SME finance and sheds light on potential areas for improvement. Our results can inform policymakers, lenders, and entrepreneurs to make more informed decisions about relationship banking and its potential benefits and drawbacks. In recent years, the China Banking Regulatory Commission (CBRC) has issued circulars aimed at promoting the establishment of community and small and micro sub-branches by small and medium-sized commercial banks, as well as the simplification and decentralization of government and improvement of market access. These initiatives have led to an increase in the number of bank relationship managers and the decentralization of discretionary powers, providing an ideal environment for the growth of relationship banking in China.

The rest of the paper is structured as follows. The subsequent section outlines the data used in this study, while Section 3 presents the empirical specification adopted in the analysis. In Section 4, we report the results obtained and discuss the robustness tests performed to ensure their validity. Finally, Section 5 concludes the paper and highlights its theoretical and policy implications.

## **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)<sup>5</sup> in 2015. Information is collected from face-to-face interviews with each company's majority shareholder or chief executive officer (general manager). To ensure privacy and mitigate the possibility of respondents providing false information due to concerns like fear of anti-corruption campaigns, the survey strategically omits the disclosure of the company's name and specific geographical details of the respondents. 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 dataset has been used in previous literature (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

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<sup>5</sup> The CHFRC is a non-profit academic research institution independent from any government agency.



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 counties<sup>6</sup> and 18 industries available in 2014. However, the availability of the responses varies a lot across companies. For 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 2011<sup>7</sup>. 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 loans<sup>8</sup>, and with bank loans of less than 10,000 RMB<sup>9</sup>. We end up with a sample of 685 companies available in 28 provinces and 17 industries. The distribution of firms across provinces and industries is presented in Figure A1 and Table A1 of the Appendix.

As shown in Table 1, our sample covers mainly small (52%) and micro (41%) companies. Most enterprises are not older than 10 years (66%), have less than 49 employees (69%) and have up to 3 bank loans (90%). Half of the companies in our sample have operating income of less than 5 million RMB (53%). About 20% of companies spend money on building relationships with banks<sup>10</sup>.

(Insert Table 1 here please)

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<sup>6</sup> 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.

<sup>7</sup> The official classification could be accessed at [http://www.stats.gov.cn/tjsj/tjbz/201109/t20110909\\_8669.html](http://www.stats.gov.cn/tjsj/tjbz/201109/t20110909_8669.html).

<sup>8</sup> 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.

<sup>9</sup> There are several companies that reported that they have loans but the amount of loan is zero. Such companies were removed from the sample.

<sup>10</sup> Financial statements of public companies commonly include provisions for entertainment costs, which are used to proactively cultivate and sustain relationships with external stakeholders (Ben et al., 2020). However, SMEs, due to their limited financial expertise and non-disclosure allowances, may under-report or misreport their relationship-related expenditures (McMahon, 2001). Our data reveal that approximately 80% of SMEs report no relationship expenses, implying possible under-reporting, misreporting, or a lack of awareness of the value of proactive relationship management with banks.

Table 2 shows the distribution of relationship spending across firms, industries, and regions in the sample<sup>11</sup>. We can see that a larger percentage of younger companies spend on bank relationship compared to older companies. For instance, 42.36% of companies five years old or younger spend on relationship banking, while only 7.64% of companies 15 years old and older report relationship spending. At the same time, older companies spend, on average, almost twice the amount of younger companies (CNY 75,364 vs. CNY 42,400 for companies older than 15 years and younger than five years, respectively).

The frequency of relationship spending varies greatly across different-sized companies. While 57.64% (36.11%) of small (micro) companies spend on building relationships with banks, only 6.25% of medium-sized companies report relationship spending. Moreover, the average relationship spending of micro and small businesses (CNY 37,837 and CNY 66,571, respectively) is significantly higher than that of medium-sized companies (CNY 23,000). This may be because micro and small firms face greater information asymmetry and weaker bargaining power when borrowing compared to medium businesses (see, e.g., Zhao et al., 2022), and therefore they rely on relationship banking more often than medium-sized companies, which highlights the importance of our analysis.

Additionally, the average relationship spending in the Eastern region, which is characterized by the highest level of economic development, is significantly lower than in other regions (CNY 30,160 versus the national average of CNY 53,472). This trend may be explained by the idea that the more widespread use of fintech in economically developed regions provides banks an easier access to hard information about enterprises and thus discourages relationship lending (see, e.g., Song & Appiah-Otoo, 2022).

(Insert Table 2 here please)

Finally, the dataset enables us to construct the following self-reported financial constraints variable: ‘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 & O’Toole, 2014). However, the unique data available to us permits simultaneous observation of the link between credit demand and credit supply.

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<sup>11</sup> The regression analysis does not reveal significant heterogeneity in relationship banking across different firm sizes, industries, and regions, therefore, we do not discuss it further in the paper.

### 3. Methods

While previous studies have explored the effect of relationship banking on SMEs' financial constraints using data for Chinese listed companies (Liang & Chen, 2017; Zou & Wang, 2022), we improve the analysis by utilizing a 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 the 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 & Martínez-Solano, 2010) or the 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 "In addition to interest expenses, how much did you spend on other additional costs to obtain the largest bank loan you currently have?"<sup>12</sup> 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 survey data allows us to improve the accuracy of the analysis by measuring more precisely the intensity of relationship banking through the firm's expenditure and its financial constraints.

Our baseline model can be presented as follows:

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

where the  $FC_{irk}$  is the degree to which the total amount of bank loans the company  $i$  in region  $r$  and industry  $k$  holds satisfies its financial needs, and it could be understood as the inverse of firm's financial constraints.  $RS_{irk}$  is the logarithm of the additional expenditure that a company incurs to secure its largest current bank loan, in addition to interest expenses<sup>13</sup>.  $C_{irk}$  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<sup>14</sup>.  $\delta_r$  refer to the region-specific fixed effects<sup>15</sup>. A detailed description of all

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<sup>12</sup> Additional costs refer to costs incurred while dealing with bank/credit union personnel to obtain the loan, including entertainment expenses. To avoid any misunderstandings, the CHFRC research team asks more colloquial questions during interviews, as follows "How much did you spend on favours such as treats and gifts to the loan approver to get this loan?"

<sup>13</sup> As a robustness check, we also scale relationship spending by firm size, captured by number of employees and operating income. This does not affect our main findings. Due to space constraints we do not include the results in the paper, but they are available upon request.

<sup>14</sup> The primary reasons for using  $TI_k$  instead of full industry fixed effects in our analysis are twofold. Firstly,  $TI_k$  typically encompasses more soft information, leading to more pronounced financing constraints. Secondly, given the relatively small sample size of 685

variables is available in Table A2 of the Appendix. Table 3 provides summary statistics for each variable.

(Insert Table 3 here please)

One potential issue with analyzing survey data is reverse causality (Brancati, 2015). Relationship spending may cause an improvement in SME financing, but at the same time SME's financial constraints may lead to extra spending on building relationships with a bank. Moreover, there may be other factors that influence both the bank relationship spending and the financial constraints of the firm. Therefore, it is difficult to establish a clear causal relationship between the two variables. We employ two approaches to address these potential endogeneity concerns.

First, since our dependent variable (financial constraints) is binary taking values 0 and 1, while the relationship spending is the continuous variable, we employ conditional mixed process (CMP) model proposed by Roodman (2011) which adopts the standard seemingly unrelated regression (SUR) model to the case of a non-linear setting. In the CMP model the endogenous independent variable also enters the second equation as a dependent variable via recursive arrangement.

Second, we use a set of exogenous instruments for relationship banking. Our instrumental variables (IV) include industrial experience and the importance of relationships for hiring. The measures are chosen based on the idea that entrepreneurs' industry experience ( $IV_1$ ) can shape their attitude towards relationship building. This attitude could be also reflected in the desire to hire top managers suggested by friends and colleagues ( $IV_2$ ). In general, entrepreneurs who value relationships are likely to see the benefits of referral hiring and relationship banking. We estimate our baseline model using the conditional maximum likelihood method applied to probit regression with instrumental variables.

Finally, as a robustness check we combine these two approaches and estimate our baseline model using instrumental variables in the CMP framework, i.e. we simultaneously estimate a treatment and an outcome equation using the CMP procedure based on the IV probit model<sup>16</sup>.

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-

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observations, employing full industry fixed effects would substantially reduce degrees of freedom, thereby affecting the accuracy and reliability of inferences and predictions.

<sup>15</sup> Due to degrees of freedom constraints, we control for the region fixed effect rather than the province fixed effect. Our main results remain unchanged when we add both full industry fixed effect and the province fixed effect. Results are available on request.

<sup>16</sup> Note that it is impossible to estimate fully simultaneous Probit model. Therefore, we follow the procedure discussed in Roodman (2011) and include linear predictors of financial constraints and relationship spending as independent variables in the simultaneous regressions.

Cánovas & Martínez-Solano, 2010). For instance, SMEs in China are more likely to accept deteriorating credit contracts due to political discrimination. Considering that loan contracts and firm financial constraints are simultaneously affected by relationship banking, we estimate the impact of relationship banking on the firm lending conditions and financial constraints using the following simultaneous estimation model:

$$Y_{irk} = \alpha_1^1 + \beta_1^1 RS_{irk} + \beta_2^1 C_{irk} + \beta_3^1 TI_k + \delta_r + \epsilon_{irk} \quad (2)$$

$$FC_{irk} = \alpha_1^2 + \beta_1^2 RS_{irk} + \beta_2^2 C_{irk} + \beta_3^2 TI_k + \delta_r + \epsilon_{irk} , \quad (3)$$

where  $Y_{irk}$  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. The system of equations is estimated using the CMP framework. OLS (Ordinary Least Squares) estimator is used for equations where the loan amount, maturity, and interest rate are dependent variables. Ordered-probit and probit models are used for the regressions with financing guarantee and entrepreneur satisfaction as dependent variables, respectively<sup>17</sup>.

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. Table A3 of the Appendix shows the correlations among our variables.

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

## 4. Results

### 4.1 Relationship banking and financial constraints

Table 4 presents the results of testing the impact of bank relationship spending on SMEs' financial constraints.

(Insert Table 4 here please)

First, we estimate our baseline model presented in equation (1) using probit regression. Columns 1 and 2 of Table 4 report coefficients and average marginal effects for this exercise, respectively. The

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<sup>17</sup> Given that one of the challenges associated with the CMP model is inconsistent estimates under heteroscedasticity, particularly when there are relatively few observations (Roodman, 2011), we conducted both the Breusch-Pagan and White tests. We found that the null hypothesis of no heteroscedasticity is rejected at a 5% significance level. The main results remain consistent with the following outcomes, provided we use robust standard errors in our regression analysis.

coefficient for relationship spending is 0.031. This finding is statistically significant at the 1% level and economically meaningful, yet it may be biased because of a potential reverse causality problem. To account for this issue, columns 3 and 4 present the estimations from the CMP model. The magnitude of the coefficient on relationship spending is significantly larger in CMP model than in probit estimation (0.263 vs 0.031) and still significant at the 1% level. To further address endogeneity concerns, we report the results for the probit model with different instruments in columns 5-10 of Table 4. The results are robust regardless of the choice of instruments. The coefficient on relationship banking is still significant and varies between 0.163 and 0.220<sup>18</sup>. Finally, columns 11 and 12 present the results of the CMP model with two instrumental variables as a robustness check.

Overall, we find that the main results remain unchanged after using CMP model and an IV. The coefficients on the CMP and IV specifications are much larger than those on the Probit model. For example, the coefficients of the IV probit are about 6-8 times larger than those of the probit regression. The difference in the magnitude of the coefficients might be attributed to the corrective endogeneity<sup>19</sup>, a concept widely discussed in financial literature, see, e.g. Wei (2017).

Our findings show that spending on building a relationship with banks help SMEs to access bank credit that meets their financial needs. The results are robust regardless of the estimation method. Controlling for endogeneity allows us to find an even stronger positive effect of relationship spending on SMEs' finance. These findings are consistent with those of Liang and Chen (2017) and Yin and Matthews (2017). The aforementioned literature shows that relationship banking can alleviate financial constraints for Chinese listed companies. Yet, our analysis provides new insights into the impact of relationship banking on Chinese small and micro-enterprises, indicating that despite these enterprises facing political discrimination and greater information asymmetry, relationship banking can still have a positive effect on them.

One possible concern about our model is the existence of omitted variables affecting both the dependent and independent variables. In the last column of Table 4, we use the size-age (SA) index proposed

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<sup>18</sup> The F-statistic for the first-stage regression is 1146 for the case of two instrumental variables (column 9) and the coefficients of Referral and Industry Experience are 0.946 and 0.739, respectively, and significant at the 1% level. This indicates that there is no weak instrumental variable problem. In addition, our regressions pass the Wald test, rejecting the null hypothesis of exogeneity at the 1% significance level.

<sup>19</sup> In the situation of 'corrective endogeneity', the correlations between sample outcomes and treatment variables may undervalue the actual effect. Specifically, when regressing relationship spending on SME financing constraints, the benefits of 'guanxi' and the subtleties behind it could be significantly underestimated. This is because firms might primarily engage in relationship spending due to their financial constraints. For instance, firms with weak financial conditions may spend more on relationship expenses, which could lead to an artificially low (or even negative) correlation between relationship expenses and financing constraints.

by Hadlock and Pierce (2010) to measure financial constraints<sup>20</sup>, which avoids the endogeneity bias of financial factors (Hadlock and Pierce, 2010). The coefficient for relationship banking is still positive and significant (0.016), suggesting that relationship banking helps to relax firms' financial constraints.

Another concern is that if a company gets loans from different banks or gets the largest loan at the end of the process it could lead to a bias in our results. This information was not available to us due to limitations in the dataset. However, as Table 1 shows, more than half of the firms have only one bank loan and about 80% have less than three loans suggesting that the largest loan plays a key role in meeting the financial needs of the company. Moreover, the results are robust when we focus on companies that have only one bank loan.<sup>21</sup>

## 4.2 Relationship banking and total amount of loans

Next, 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, columns 1 and 2 of Table 5 report the effect of relationship spending on the total amount of bank loans received by SMEs and the impact of the total amount of bank loans on financial constraints, respectively.

(Insert Table 5 here please)

Our results confirm the significant positive effect of relationship banking on 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). Columns 3 and 4 of Table 5 report the impact of relationship spending on total outstanding bank loans to SMEs and the impact of total outstanding bank loans on financial constraints, respectively. Relationship banking may enable SMEs to obtain more bank loans with longer maturities, thereby increasing the total amount of outstanding bank loans and easing financial pressure. Our findings show that relationship spending significantly contributes to SMEs having more total outstanding bank loans (0.068). Furthermore, the increase in outstanding bank debt significantly reduces the financial constraints (0.225). To test the potential simultaneity issue, we estimate the effect of relationship spending on the total (outstanding) loan amount and the effect of the total (outstanding) loan amount on financial constraints using the CMP framework. The results are presented in columns 5-8 of Table

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<sup>20</sup> 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 assets. A larger SA index is associated with a smaller likelihood of financial constraints.

<sup>21</sup> These robustness results are available on request.

5. We find that the correlation between the two equations in the CMP framework is not significant suggesting that we can use a standard single equation approach instead of system estimation.

### 4.3 Relationship banking and loan contracts

Finally, we estimate the impact of the relationship spending on SME 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 0.034 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 0.117, 0.022, and -0.070, presented in columns 3, 4, and 5, respectively). Our results support the existence of the dark side of relationship banking recorded by Berger et al. (2021) for US firms. 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)

While the dark side of relationship banking was recorded for the US firm, existing literature on Chinese enterprises is silent about it. For instance, Yin and Matthews (2017) found evidence only for the positive effects of relationship banking on Chinese listed companies, such as larger loan amounts, longer maturities, and lower collateral requirements. Our findings reveal that the effect of relationship banking is different for SMEs and listed firms. While relationship banking can bring benefits to SMEs, these enterprises are often forced to accept deteriorating loan conditions. Our evidence demonstrates the dual nature of the impact of relationship banking on financing for Chinese small and micro-enterprises.

We also try to address the potential endogeneity problem in equation (3) by using the fitted value of relationship spending,  $\widehat{RS}_{irk}$ , obtained from the following equation:

$$RS_{irk} = \alpha_1 + \beta_1 Z_{irk} + \beta_2 C_{irk} + \beta_3 TI_k + \delta_r + \epsilon_{irk}, \quad (4)$$

where  $Z_{irk}$  is a vector of instrumental variables discussed above. The results of this exercise are presented in Table 7. This adjustment of the estimation technique only slightly affects the magnitude of the coefficients, while our key findings remain unchanged.



(Insert Table 7 here please)

In addition, we adopt alternative dependent variables including the average amount of loans received by firms, the outstanding amount of the largest loan provided, and the various forms of guarantees and satisfaction with bank services. The results are presented in Table A4 of the Appendix. Finally, Table A5 of the Appendix shows the results for models presented in Table 6 estimated using standard econometric techniques, such as OLS (for continuous dependent variables) and probit/ordered probit (for binary dependent variables). Our findings remain unchanged regardless of the choice of proxies for the loan conditions or the estimation techniques.

## **5. Conclusion**

The inadequate external financing for small and medium-sized enterprises (SMEs) in China has been a persistent issue, and this study highlights the benefits of relationship banking as a means of addressing this problem. Our research provides empirical evidence that building relationships with banks can help significantly ease the financial constraints of SMEs. Additionally, while bank relationship spending enables SMEs to access more credit and obtain longer-maturity loans, it comes at the cost of higher interest rates, guarantee requirements, and overall dissatisfaction with loan services. These findings shed light on the significance of ‘guanxi’ in China’s credit market and its consequences for SMEs.

Our study provides further evidence to support the idea that relationship banking plays a crucial role in mitigating information asymmetry and transaction costs between banks and SMEs. This finding reinforces the notion that trust-based relationships between banks and SMEs can improve access to credit and reduce financial constraints.

Furthermore, our findings provide new insights into the role of ‘guanxi’ in China’s credit market. The concept of ‘guanxi’ refers to the informal social networks that facilitate business transactions and personal relationships in China. Our study suggests that these informal relationships can play a significant role in facilitating access to credit for SMEs in China. Consequently, we demonstrate that relationship banking has both positive and negative effects on SMEs’ access to credit, including longer maturity loans and higher interest rates. This trade-off highlights the importance of considering multiple dimensions of bank lending when studying the impact of relationship banking.

Policymakers should recognize the importance of ‘guanxi’ in China’s credit market and seek to create an environment that supports the development of trusted relationships between firms and banks. This could involve promoting networking opportunities between SMEs and banks or encouraging banks to build relationships with SMEs through targeted lending programs. Furthermore, policymakers should consider ways to mitigate the potential negative consequences of bank relationship spending, such as higher interest rates and unfavorable loan terms. This could involve promoting transparency in loan terms or regulating bank practices to ensure that SMEs are not exploited.

## **Statements and Declarations**

**Competing Interests:** The authors declare that they have no competing interests.

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**Table 1: Distribution of firms**

Employee (people)	%	Total assets (million CNY)	%	Operating income (million CNY)	%	Age (year)	%
<=9	24.82	<=1	24.67	<=0.5	19.97	<=2	17.96
9<x<=15	13.87	1 <x<=5	29.05	0.5 <x<=1	7.49	2<x<=4	20.14
15 <x<=49	30.07	5 <x<=10	13.14	1<x<=5	25.99	4<x<=6	13.87
49 <x<=149	22.63	10 <x<=25	14.31	5 <x<=10	12.78	6<x<=10	20.44
149 <x<=249	5.98	25 <x<=100	14.60	10 <x<=50	24.96	10<x<=15	20.00
>249	2.63	>100	4.23	>50	8.81	>15	7.59
Size	%	Number of loans	%	Region	%	RS (CNY)	%
Micro	41.46	1	55.35	Western	28.03	0	78.98
Small	51.68	2	23.10	Eastern	50.80	0<x<=10000	10.95
Medium	6.86	3	11.78	Central	16.50	10000<x<=50000	5.84
Big	0	>3	9.77	Northeast	4.67	>50000	4.23

Notes: According to the Micro, Small and Medium Enterprise Classification, size is determined by the number of employees, operating income, and total assets. RS refers to Relationship spending.

**Table 2: Distribution of relationship spending across firms, industries, and regions**

	No RS		Existence of RS			Total	
	Row	Column	Row	Column	RS (Mean)	Row	RS (Mean)
<b>Age (year)</b>							
<=5	80.32%	46.03%	19.68%	42.36%	42400	100%	8343
5<x<=10	74.19%	25.51%	25.81%	33.33%	49058	100%	12660
10<x<=15	82.48%	20.89%	17.52%	16.67%	80404	100%	14085
>15	78.85%	7.58%	21.15%	7.64%	75364	100%	15942
Total	78.98%	100.00%	21.02%	100.00%	53472	100%	11241
<b>Size</b>							
Micro	81.69%	42.88%	18.31%	36.11%	37837	100%	6928
Small	76.55%	50.09%	23.45%	57.64%	66571	100%	15609
Medium	80.85%	7.02%	19.15%	6.25%	23000	100%	4404
Total	78.98%	100.00%	21.02%	100.00%	53472	100%	11241
<b>Region</b>							
Western	75.00%	26.62%	25.00%	33.33%	81725	100%	20431
Eastern	82.47%	53.05%	17.53%	42.36%	30160	100%	5349
Central	74.34%	15.53%	25.66%	20.14%	50307	100%	12911
Northeast	81.25%	4.81%	18.75%	4.17%	76117	100%	14272
Total	78.98%	100.00%	21.02%	100.00%	53472	100%	11241
<b>Industry</b>							
TI	75.72%	48.43%	24.28%	58.33%	58698	100%	14250
Non-TI	82.30%	51.57%	17.70%	41.67%	46155	100%	8169
Manufacturing	75.77%	45.66%	24.23%	54.86%	55666	100%	13490
Construction	70.00%	3.88%	30.00%	6.25%	48889	100%	14667
Wholesale	72.15%	10.54%	27.85%	15.28%	118446	100%	15214
Retail	82.19%	11.09%	17.81%	9.03%	36546	100%	6508
Leasing and business service	87.10%	4.99%	12.90%	2.78%	73925	100%	9539
Agriculture, forestry, livestock and fisheries	93.62%	16.27%	6.38%	4.17%	14233	100%	909
Others	78.85%	7.57%	21.15%	7.63%	73109	100%	15465
Total	78.98%	100.00%	21.02%	100.00%	53472	100%	11241

Notes: "Row" is the ratio of the number of observations to the total number of rows. "Column" represents the proportion of the number of observations to the total number of the column. The unit of the average relationship spending is CNY. According to the Micro, Small and Medium Enterprise Classification, size is determined by the number of employees, operating income, and total assets. TI refers to Technology Industry.

**Table 3: Statistical description of the variables**

<b>Variable</b>	<b>Obs.</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Financial constraints	685	0.601	0.490	0	1
Size-age index (SA)	685	-1.314	1.035	-3.677	2.380
Total loan amount (million CNY)	667	4.471	11.800	0.010	200
Total outstanding loan amount (million CNY)	662	4.103	10.500	0.010	158
Size of loan (million CNY)	667	2.915	5.740	0.010	80
Maturity (year)	613	1.624	2.116	0.083	20
Guarantee	679	2.364	0.814	1	3
Interest rate (%)	203	4.469	4.162	0	20.400
Service	680	0.737	0.441	0	1
Relationship Spending (CNY)	685	11241	56235	0	780000
Age (year)	685	7.394	4.981	1	20
Employee (people)	685	50.997	81.509	1	1180
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
Technology Industry (TI)	685	0.505	0.500	0	1
Referral	683	0.126	0.332	0	1
Experience	622	0.402	0.491	0	1

Notes: The detailed description of each variable is presented in Table A2 of the appendix.



**Table 4: SME relationship banking and financial constraints**

Variables	Probit		Margins		CMP		IV Probit					CMP IV		OLS
	FC	FC	FC	RS	RS	FC	RS	FC	RS	FC	FC	RS	SA	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	
Rel. spending	0.031*** (0.010)	0.011*** (0.003)	0.263*** (0.012)			0.220*** (0.048)		0.163*** (0.047)		0.188*** (0.028)	0.188*** (0.029)		0.016*** (0.004)	
Referral					0.813** (0.399)				0.946*** (0.303)			0.713*** (0.227)		
Experience							0.844*** (0.162)		0.739*** (0.132)			0.558*** (0.154)		
Fin. Constr.†				0.733*** (0.213)								1.305*** (0.384)		
Age	0.047*** (0.010)	0.017*** (0.004)	0.007 (0.008)	-0.028 (0.031)	-0.016 (0.032)	0.034*** (0.012)	-0.004 (0.026)	0.036*** (0.012)	-0.003 (0.026)	0.033*** (0.011)	0.033*** (0.011)	-0.045 (0.030)	-0.010* (0.005)	
Employee	-0.023 (0.072)	-0.008 (0.026)	-0.126*** (0.021)	0.481*** (0.090)	0.436*** (0.081)	-0.113** (0.057)	0.459*** (0.095)	-0.085 (0.058)	0.417*** (0.092)	-0.099* (0.058)	-0.099* (0.058)	0.444*** (0.126)	0.538*** (0.067)	
Profit	0.066 (0.114)	0.024 (0.041)	-0.047*** (0.004)	0.179*** (0.010)	0.186*** (0.010)	0.006 (0.088)	0.185*** (0.012)	0.022 (0.090)	0.187*** (0.012)	0.011 (0.084)	0.011 (0.084)	0.126 (0.116)	-0.067*** (0.003)	
Solvency	0.162 (0.174)	0.058 (0.062)	0.176* (0.096)	-0.670* (0.373)	-0.632* (0.351)	0.237 (0.151)	-0.488 (0.362)	0.234 (0.173)	-0.479 (0.343)	0.238 (0.165)	0.238 (0.165)	-0.673 (0.440)	0.123 (0.075)	
Expansion	-0.185** (0.083)	-0.066** (0.030)	-0.199* (0.103)	0.755* (0.406)	0.705* (0.388)	-0.266** (0.117)	0.609 (0.456)	-0.279** (0.129)	0.608 (0.445)	-0.284** (0.128)	-0.284** (0.128)	0.829 (0.504)	0.024 (0.054)	
Competitive	0.312*** (0.058)	0.112*** (0.021)	0.180*** (0.060)	-0.683*** (0.230)	-0.522** (0.228)	0.312*** (0.059)	-0.765*** (0.218)	0.389*** (0.048)	-0.683*** (0.218)	0.373*** (0.051)	0.373*** (0.051)	-1.003*** (0.190)	0.105 (0.082)	
Tech Industry	0.316* (0.181)	0.113* (0.065)	-0.047 (0.129)	0.182 (0.485)	0.281 (0.522)	0.150* (0.090)	0.356 (0.490)	0.264* (0.148)	0.372 (0.486)	0.227** (0.113)	0.227** (0.113)	-0.016 (0.347)	0.066 (0.096)	
Region FE	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	
Atanhrho			-4.762***									-1.128***		
Obs.	685	685	685	685	683	683	622	622	620	620	620	620	685	
Wald chi <sup>2</sup>						4.80**		4.05**		10.92***				
R <sup>2</sup>	0.068	0.068	0.205		0.072		0.080		0.085		0.116		0.453	

Notes: Industry-clustered standard errors are shown in brackets. The results in the second column are the average marginal effects. In columns 11 and 12, we use Referral and Experience as instrumental variables. The degree of correlation between the two equations (Atanhrho) in CMP framework is informative about the quality of the estimated model. Specifically, significant Arhanhrho parameter confirms the cross-equation interdependence and thus justifies the use of system estimation. † Linear predictor of financial constraints is used as an independent variable in the CMP model. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 5: SME relationship banking and the amount of bank loans**

VARIABLES	OLS	Probit	OLS	Probit	CMP			
	(1) Total loan amount	(2) FC	(3) Total outstanding loan amount	(4) FC	(5) Total loan amount	(6) FC	(7) Total outstanding loan amount	(8) FC
Rel. Spending	0.058*** (0.014)		0.068*** (0.014)		0.058*** (0.014)		0.068*** (0.014)	
Total loan amount		0.271*** (0.037)				0.491*** (0.139)		
Total outstanding loan amount				0.225*** (0.044)				0.477*** (0.111)
Age	0.069*** (0.011)	0.029** (0.012)	0.079*** (0.012)	0.028** (0.012)	0.069*** (0.011)	0.012 (0.014)	0.079*** (0.012)	0.006 (0.012)
Employee	0.731*** (0.105)	-0.216*** (0.045)	0.737*** (0.086)	-0.182*** (0.045)	0.731*** (0.104)	-0.384*** (0.124)	0.737*** (0.085)	-0.377*** (0.112)
Profit	0.000 (0.008)	0.090 (0.109)	-0.001 (0.007)	0.081 (0.128)	0.000 (0.008)	0.084 (0.108)	-0.001 (0.007)	0.074 (0.125)
Solvency	-0.052 (0.138)	0.191 (0.192)	-0.161 (0.152)	0.233 (0.185)	-0.052 (0.137)	0.202 (0.196)	-0.161 (0.151)	0.271 (0.183)
Expansion	-0.078 (0.051)	-0.160* (0.086)	-0.065 (0.060)	-0.151* (0.083)	-0.078 (0.051)	-0.142 (0.095)	-0.065 (0.060)	-0.136 (0.097)
Competitive	0.102* (0.056)	0.285*** (0.068)	0.079 (0.077)	0.283*** (0.067)	0.102* (0.055)	0.257*** (0.078)	0.079 (0.077)	0.256*** (0.066)
Tech. Industry	0.080 (0.250)	0.304** (0.147)	0.106 (0.216)	0.291* (0.162)	0.080 (0.248)	0.269** (0.108)	0.106 (0.214)	0.238** (0.111)
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Athanrho						-0.328		-0.400
Observations	667	667	662	662	667		662	
R-squared	0.415	0.113	0.417	0.100	0.122		0.122	

Notes: Industry-clustered standard errors are shown in brackets. The degree of correlation between the two equations (Atanhrho) in the CMP framework is informative about the quality of the estimated model. Specifically, the significant Arhanrho parameter confirms the cross-equation interdependence and thus justifies the use of system estimation. \*\*\* 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*** (0.015)	0.034** (0.013)	0.117*** (0.041)	0.022** (0.009)	-0.070*** (0.010)
Age	0.067*** (0.013)	0.001 (0.017)	0.142*** (0.036)	0.041*** (0.008)	0.025** (0.010)
Employee	0.701*** (0.085)	-0.243*** (0.083)	0.005 (0.240)	0.170*** (0.032)	0.075 (0.047)
Profit	0.009* (0.005)	-0.001 (0.004)	0.390 (0.318)	0.015 (0.010)	-0.170*** (0.060)
Solvency	-0.038 (0.127)	0.300** (0.137)	-0.810* (0.459)	-0.149* (0.082)	0.232*** (0.054)
Expansion	-0.085* (0.051)	-0.029 (0.087)	-0.159 (0.425)	-0.043 (0.071)	-0.031 (0.078)
Competitive	0.073 (0.058)	-0.221* (0.134)	-0.117 (0.781)	0.046 (0.070)	0.224*** (0.047)
Tech. Industry	-0.022 (0.243)	0.356** (0.180)	0.765*** (0.286)	0.018 (0.096)	0.077 (0.130)
Region FE	Yes	Yes	Yes	Yes	Yes
Atanhrho	0.314***	0.020	0.136**	0.215***	0.188***
Observations	685	685	685	685	685
R-squared	0.114	0.025	0.041	0.051	0.071

Notes: The results are estimated using the CMP framework. Industry-clustered standard errors are shown in brackets. To ensure the 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. The regressions are estimated using CMP framework. The degree of correlation between the two equations (Atanhrho) in the CMP framework is informative about the quality of the estimated model. Specifically, the significant Arhanrho parameter confirms the cross-equation interdependence and thus justifies the use of system estimation. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 7: SME relationship banking and loan contracts (endogeneity test)**

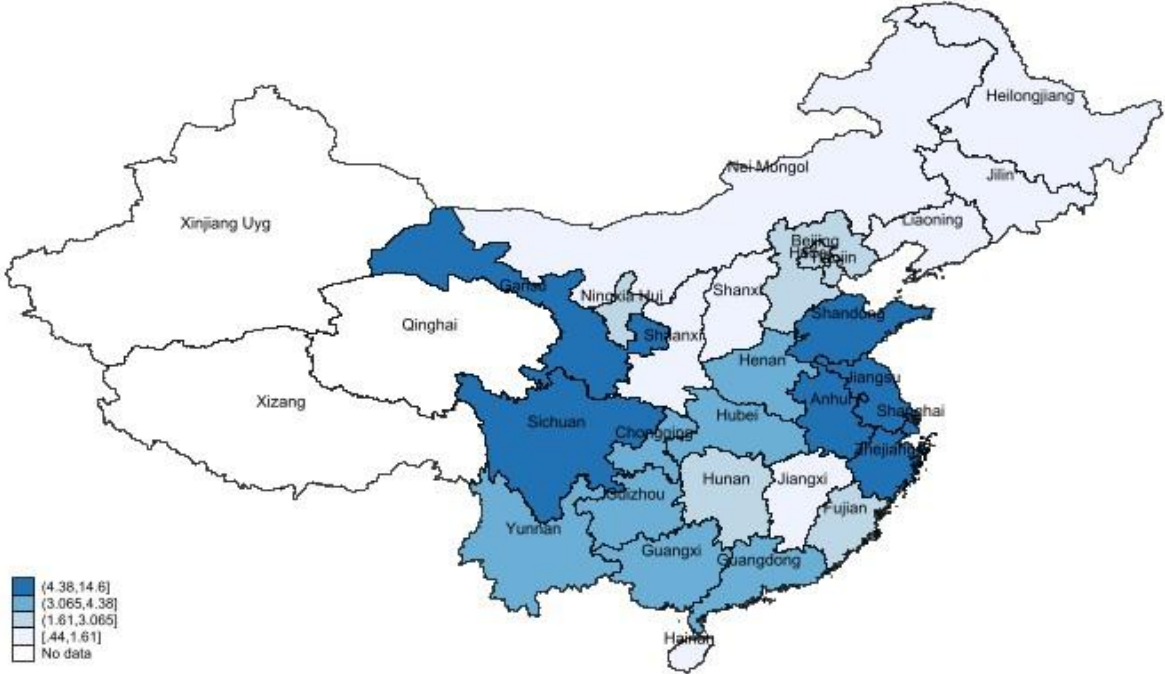
VARIABLES	(1) Size of loan	(2) Maturity	(3) Interest	(4) Guarantee	(5) Service
Rel. spending	0.048*** (0.014)	0.033** (0.013)	0.108** (0.043)	0.018* (0.009)	-0.073*** (0.010)
Age	0.067*** (0.014)	0.001 (0.017)	0.141*** (0.035)	0.040*** (0.008)	0.025** (0.010)
Employee	0.704*** (0.085)	-0.243*** (0.083)	0.012 (0.242)	0.172*** (0.032)	0.076 (0.046)
Profit	0.010* (0.005)	-0.001 (0.004)	0.405 (0.323)	0.016 (0.011)	-0.170*** (0.059)
Solvency	-0.041 (0.126)	0.301** (0.137)	-0.822* (0.463)	-0.150* (0.080)	0.233*** (0.054)
Expansion	-0.078 (0.050)	-0.028 (0.087)	-0.156 (0.426)	-0.040 (0.071)	-0.029 (0.078)
Competitive	0.069 (0.058)	-0.223* (0.134)	-0.110 (0.775)	0.041 (0.070)	0.223*** (0.047)
Tech. Industry	-0.021 (0.246)	0.356** (0.179)	0.792*** (0.276)	0.021 (0.099)	0.077 (0.129)
Region FE	Yes	Yes	Yes	Yes	Yes
Atanhrho	0.345***	0.003	0.128**	0.219***	0.179***
Observations	607	557	190	618	618
R-squared	0.138	0.047	0.079	0.086	0.116

Notes: The results are estimated using the CMP framework. Industry-clustered standard errors are shown in brackets. To address potential endogeneity issue in equation (3), we use the fitted value of relationship spending,  $\widehat{RS}_{irk}$ , obtained from the following equation:  $RS_{irk} = \alpha_1 + \beta_1 Z_{irk} + \beta_2 C_{irk} + \beta_3 TI_k + \delta_r + \epsilon_{irk}$ , where  $Z_{irk}$  is a vector of instrumental variables discussed in the paper. To ensure the 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. The regressions are estimated using the CMP framework. The degree of correlation between the two equations (Atanhrho) in the CMP framework is informative about the quality of the estimated model. Specifically, the significant Arhanhrho parameter confirms the cross-equation interdependence and thus justifies the use of system estimation \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

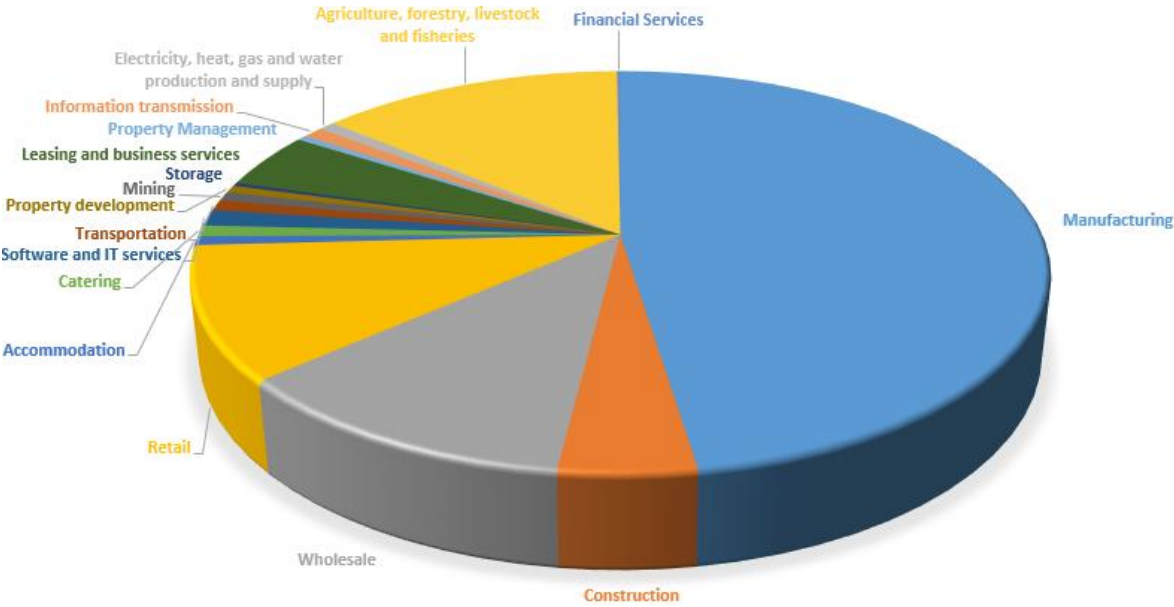
Appendix

Figure A1: Distribution of firms across provinces and industries

(a) Distribution of firms across provinces



(b) Distribution of firms across industries



*Table A1: Distribution of firms across provinces and industries*

<b>Province</b>	<b>%</b>	<b>Industry</b>	<b>%</b>
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		

**Table A2: Definition of variables**

<b>Name</b>	<b>Description</b>
<b>Dependent variables</b>	
Constraint (FC)	The binary variable that takes value 1 if the company believes that the total amount of bank loans it holds can “fully” or “mostly” meet its financial needs, 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 assets. A larger SA index is associated with a smaller likelihood of financial constraints.
Total loan amount	The logarithm of the total bank loan amount.
Total outstanding loan amount	The logarithm of the total outstanding bank loan amount.
Size of loan	The logarithm of the largest bank loan amount.
Maturity	Maturity of the largest bank loan. (Year)
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	The 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.
<b>Independent variables</b>	
Rel. spending (RS)	The logarithm of the additional costs incurred by a company (in addition to interest expenses) to obtain its largest current bank loan. Additional costs refer to costs incurred while dealing with bank/credit union personnel to obtain the loan, including typically gifts, hospitality and entertainment expenses. To avoid any misunderstandings, the CHFRC research team asks more colloquial questions during interviews, e.g., “How much did you spend on favours such as gifts, hospitality and entertainment to the loan approver to get this loan?” Below is the original Chinese version: 除利息支出外，您为获得尚未还清的最大一笔银行贷款而花费其他额外支出有多少？ 名词解释：额外支出是指为获得贷款与银行/信用社人员打交道的支出，通常包括礼品、招待、娱乐方面费用。 通俗问法：为获得这笔贷款，对贷款审批人请客吃饭、送礼等人情支出大概有多少钱？
<b>Control variables</b>	
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	The 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.
Region	Location of the company. 1 - Eastern provinces; 2 - Central provinces; 3 - Western provinces; 4 –Northeast provinces.
<b>Instrumental variables</b>	
Referral	1 if the top management was hired via introduction by friends or colleagues, and 0 otherwise.

Experience	1 if the principal owner's last job before joining this company was in the same or related industry to which this company belongs, and 0 otherwise.
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**Table A3: Correlation table**

	FC	RS	Age	Employee	Profit	Solvency	Expansion	Competitive	TI	Referral	Experience
FC	1										
RS	0.074*	1									
Age	0.207*	0.007	1								
Employee	0.102*	0.157*	0.292*	1							
Profit	0.038	0.107*	0.041	0.045	1						
Solvency	0.067*	-0.071*	0.030	0.099*	0.052	1					
Expansion	-0.046	0.120*	-0.032	0.259*	-0.027	0.072*	1				
Competitive	0.096*	-0.043	-0.021	0.126*	0.047	0.135*	0.127*	1			
TI	0.160*	0.080*	0.218*	0.433*	0.021	-0.011	0.072*	0.008	1		
Referral	0.056	0.112*	0.024	0.191*	-0.017	-0.034	0.079*	-0.073*	0.066*	1	
Experience	0.070*	0.115*	0.063	0.092*	-0.028	0.010	0.041	0.004	0.026	0.090*	1

Notes: Pearson's correlation coefficients. \*  $p < 0.05$

**Table A4: SME relationship banking and loan contracts (alternative variables)**

VARIABLES	(1) Average loan amount	(2) Outstanding loan amount	(3) GuaranteeB	(4) ServiceB
RS	0.048*** (0.015)	0.059*** (0.015)	0.022** (0.011)	-0.046*** (0.013)
Age	0.060*** (0.013)	0.075*** (0.015)	0.046*** (0.006)	-0.026*** (0.007)
Employee	0.649*** (0.112)	0.691*** (0.085)	0.184*** (0.030)	0.049 (0.054)
Profit	0.011 (0.012)	0.005 (0.010)	0.016* (0.009)	-0.067 (0.098)
Solvency	0.059 (0.158)	-0.117 (0.145)	-0.062 (0.082)	0.317*** (0.112)
Expansion	-0.061 (0.053)	-0.081 (0.072)	0.001 (0.079)	0.008 (0.044)
Competitive	0.005 (0.074)	0.041 (0.077)	0.068 (0.064)	0.121 (0.138)
TI	0.072 (0.284)	0.065 (0.243)	0.029 (0.128)	-0.019 (0.120)
Region FE	Yes	Yes	Yes	Yes
Atanhrho	0.356***	0.321***	0.241***	-0.015
Observations	584	602	618	618
R-squared	0.218	0.217	0.277	0.278

Notes: The results are estimated using the CMP framework. The degree of correlation between the two equations (Atanhrho) in the CMP framework is informative about the quality of the estimated model. Specifically, the significant Arhanhrho parameter confirms the cross-equation interdependence and thus justifies the use of system estimation. Industry-clustered standard errors are shown in brackets. In columns 1 and 2, we used the average amount of loans received by firms and the outstanding amount of the largest loan provided by the bank as alternative dependent variables, respectively. In column 3, we included a binary variable (GuaranteeB) that takes a value of 1 if the enterprise needs to provide collateral for its largest loan and 0 otherwise. In column 4, we included a binary variable (ServiceB) that takes a value of 1 if the enterprise is "very satisfied" with the bank lending service associated with the largest bank loan and 0 otherwise. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table A5: SME relationship banking and loan contracts (basic regressions)**

	OLS	OLS	OLS	oprobit	probit
	(1)	(2)	(3)	(4)	(5)
VARIABLES	Size of loan	Maturity	Interest	Guarantee	Service
RS	0.054*** (0.015)	0.033** (0.013)	0.109** (0.043)	0.022** (0.009)	-0.071*** (0.010)
Age	0.067*** (0.014)	0.001 (0.017)	0.139*** (0.037)	0.040*** (0.008)	0.025** (0.010)
Employee	0.701*** (0.087)	-0.243** (0.084)	0.013 (0.262)	0.172*** (0.031)	0.075 (0.047)
Profit	0.009 (0.005)	-0.001 (0.003)	0.472 (0.337)	0.016 (0.012)	-0.167*** (0.057)
Solvency	-0.036 (0.129)	0.301** (0.138)	-0.867 (0.504)	-0.148* (0.078)	0.234*** (0.056)
Expansion	-0.084 (0.053)	-0.028 (0.088)	-0.169 (0.461)	-0.048 (0.072)	-0.026 (0.080)
Competitive	0.072 (0.059)	-0.223 (0.136)	-0.024 (0.782)	0.041 (0.068)	0.225*** (0.047)
TI	-0.025 (0.246)	0.355* (0.181)	0.810** (0.311)	0.017 (0.098)	0.074 (0.130)
Region FE	Yes	Yes	Yes	Yes	Yes
Atanhrho					
Observations	667	613	203	679	680
R-squared	0.404	0.041	0.113	0.045	0.074

Notes: Industry-clustered standard errors are shown in brackets. To ensure the accuracy of the estimations, we exclude companies that chose monthly and quarterly interest rates from the regressions presented in 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