Rise of Bank Competition: Evidence from Banking Deregulation in China*

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Abstract

Using proprietary loan-level data and detailed bank branch data in China, this paper investigates the effects of the 2009 bank branch entry deregulation on competition dynamics between new and incumbent banks and on real economic activities. Tracing out each of the loans firms borrowed, we find that new entrant banks target mostly the firms borrowing from incumbent banks. After deregulation, new entrant banks tend to lend significantly more to SOEs, low efficient firms, and relationship borrowers. Although bank entry deregulation makes credit allocation worse at macro level, it has significantly positive effects on firms with bank credit access at micro level. Increased interbank competition leads to lower interest rates, better internal ratings, more third-party guarantees, and lower delinquency rates of the loans from new entrant banks. These better loan contract terms lead to increases in firm investments, employments, sales, and efficiency, especially for private firms.

Keywords: Bank Competition; China; Credit Allocation; Growth; Efficiency

1. Introduction

Banks are the most important financial intermediaries and play an important role in economic growth, whereby banking sectors are often heavily regulated across the globe (e.g., Barth et al. (2013)). A central question in debate is whether bank competition help economic development or not. On the one hand, highly developed financial markets and higher bank competition could lower borrowing costs and improve lending efficiency to fuel economic growth (e.g., King and Levin (1993 a, b); Jayaratne and Strahan (1996); Smith (1998); Rajan and Zingales (1998)). On the other hand, competition would encourage banks to seek risks (e.g., Keeley (1990); Hellman, Murdoch, and Stiglitz (2000); Jiang, Levin, and Lin (2016)) and discourage relationship lending and the efforts on loan screening and monitoring (e.g., Ramakrishnan and Thakor (1984); Peterson and Rajan (1995); Allen and Gale (2000); Marquez (2002)). Due mainly to data limitation, many empirical studies use aggregate market structure indicators to estimate overall net effects of increased bank competition. These studies show mixed evidence since they hardly capture the full dynamics of competition at micro level and can't disentangle the benefits and costs of bank competition.[1]

Using comprehensive loan-level data from the China Banking Regulatory Commission (CBRC), this paper aims to document detailed competition dynamics between new entrant and incumbent banks after the deregulation on bank entry and to separate the countervailing effects of bank competition by tracing out each loan to firms. The CBRC data record detailed loan-level information for 17 largest commercial banks in China between 2006 and 2013. The data cover approximately 80% of the total bank loan market in China. This paper makes three main findings: First, new banks lend mainly to the firms that have been borrowing from incumbent banks. Moreover, new entrant banks lend significantly more to SOEs, low efficient firms, and relationship borrowers after deregulation. Second, new banks provide more competitive loan contracts with lower interest rates, better internal ratings, and more third-party guarantees. These loans also have lower delinquency rates. Third, when the firms have bank credit access, the better loan terms from increased competition help these firms expand in assets, hire more

[1] See, for example, the survey papers; Berger el al. (2003) and Allen et al. (2001).

workers, and become more efficient. These positive effects are significantly more prominent for private firms and transaction borrowers. In sum, although increased competition would lower down borrowing costs and help individual firms grow more efficiently, it could make overall credit allocation worse. This paper, for the first time, disentangles bank competition's positive effects on firms at micro level and its negative effects on credit allocation at macro level. This sheds lights on the inconclusive results of previous studies which explore mainly aggregate effects of bank competition.

To establish causal effects of increased bank competition, we use the 2009 partial bank entry deregulation in China as an exogenous shock. China has the biggest bank loan market across the globe, whereby the banking system is heavily regulated. [2] The banking system has been dominated by the big five state-owned commercial banks and the twelve joint equity banks were severely suppressed since they were allowed to apply for only one branch in each city. In April 2009, the CBRC partially lifted this restriction and allow joint equity banks to open branches freely in a city where they have already had branches in this city or in the province capital of this city. This deregulation led to increased competition between the incumbent big five banks and joint equity banks in certain areas. We use this partial deregulation to perform the Difference-in-Difference analysis.

Our first analysis concerns how new banks compete with incumbent banks. We show that the 2009 deregulation led to an increase of 14% on number of new opened bank branches and an increase of 38.7% on loans outstanding from joint equity banks in deregulated cities. On the other hand, big five banks were crowded out and decreased their loans outstanding by approximately 18.9% after the 2009 deregulation. Moreover, at the firm level, the 2009 deregulation led to an increase of approximately 16.7% in joint equity banks' share in firms' bank loan debt. At the aggregate level, joint equity banks' share in total bank loan debt increased dramatically from 22.4% in 2007 to 40% in 2012. The 2009 deregulation hugely increase the market shares and competitiveness of joint equity banks in China. We further look into how new bank branches target borrowers. In

[2] Total credit in China amounted to 104.2 trillion RMB in November 2016. Please see the statistics for details: http://www.pbc.gov.cn/diaochatongjisi/116219/116225/3211313_/index.html. In China, we can mainly categorize banks into three groups: the big five commercial banks, twelve joint equity banks, and 131 local municipal banks. See detailed discussion in Section 3.1.

particular, we find that, when new joint equity banks enter into a city, approximately 88% of their loans go to firms that have been borrowing from incumbent banks. Only 12% loans go to new firms that have never borrowed from banks before.

Furthermore, surprisingly, joint equity banks issue approximately 23.7% of their loans to SOEs which is higher than big five banks (18.5%). After 2009 deregulation, joint equity banks lend even more to SOEs, low efficient firms, and relationship borrowers. Compared with big five, joint equity banks target SOEs with smaller assets, fewer workers, and lower political hierarchy. In China, SOEs are normally much less efficient than private firms and reply more on relationship borrowing. Moreover, banks normally prefer to lend to SOEs which typically have explicit or implicit government guarantees. New entrant joint equity banks would compete for these "safe" assets from big five. Because of the soft budget constraint of SOEs, deregulation could lead to less efficient credit allocation.

Second, we look at the differences in loan contract terms and differences in loan performance between new and incumbent banks. In particular, after the 2009 deregulation, loans from joint equity bank branches have significantly better internal ratings, more guarantees, and lower delinquency ratio. On the other hand, for big five banks, the 2009 deregulation led to better internal ratings, fewer guarantees, and higher delinquency ratio. This means the big five commercial banks tried to compete with the newly entered joint equity banks by providing better loan terms, giving them better credit rating, and requiring fewer guarantees. Subsequently, the performance of their loans deteriorated. In sum, more competition leads to better loan contract terms for firms that borrow from both new and incumbent banks.

Third, we explore how firms have reacted to higher bank competition following the 2009 deregulation. We match the CBRC loan-level data into the CIC firm-level data. This allows us to trace each loan a firm took out and how firms reacted in terms of investments in assets, employment, sales, ROA, and total factor productivity (TFP). We find that on average the 2009 deregulation led to increases in firm assets, liabilities, and number of employees by 7.2%, 17.7 %, and 15.3%, respectively and led to decreases in firm loan interest rates by 37.4%. Greater bank competition after 2009 also led to improvements in

firms' efficiency, particularly in ROA and TFP. We find that there are no significant changes of these firm activities and performance in deregulated cities in one and two years prior to 2009 deregulation (i.e., we pass the parallel trend's test). Moreover, we find that private firms can benefit from bank competition significantly more than SOEs can. Furthermore, we also find that the positive effects of increased bank competition largely come from the transaction lending. If the firm only borrows relationship loans, deregulation leads to decreases in firms' assets and sales.[3] Moreover, the loan interest rates for firms borrow transaction loans decrease significantly more than relationship loans. This is in line with the prediction of Boot and Thakor (2000) which argues that interbank competition might lead to lower added value of relationship lending for borrowers which mainly rely on relationship lending prior to the increased interbank competition. In sum, we find that increased competition from bank entry deregulation lead to potentially worse credit allocation across firms but better loan contracts (e.g., lower interest rate) which make individual firm with bank credit access grow and become more efficient.

Our paper adds to the literature on the nexus of financial market development and economic growth. Findings on this question are still inconclusive. Prior studies have shown either positive or negative overall effects of financial market development on economic growth at macroeconomic level.[4] Due mainly to data limitation, many previous findings are based on aggregate market indexes to measure bank competition (e.g., Herfindahl-Hirschman Index (HHI)).[5] By using loan-level data, this paper captures the loan-to-loan competition dynamics. For the first time, we disentangle the positive effects of increased bank competition on individual firms at micro level and the negative effects on credit allocation at macro level which is a novel channel of the costs of bank

[3] We follow the method of Ioannidou and Ongena (2010) to distinguish relationship and transaction loans. We also tried other definitions in the literature and find similar patterns.

[4] Many studies have shown the positive relationship between financial market development and economic growth. See for example, King and Levine (1993); Demirguc-Kunt and Maksimovic (1998); Levine and Zervos (1998); Rajan and Zingales (1998); Levine, Loayza, and Beck (2000), Barth et al. (2001 and 2004). There are also opposing views and contrary evidence in the literature. See for example, Peterson and Rajan (1994) and Cetorelli (2001).

[5] Many previous studies use the HHI to measure competition level. See for example, Berger and Hannan (1989); Hannan (1991); and Neumark and Sharpe (1992). The main criticism of these measurements is that they might not capture real competition levels (e.g., Claessens and Laeven (2004)).

competition. This sheds light on mixed evidence from previous empirical studies and provides microeconomic foundation of the literature on finance-growth nexus.

Another contribution of this paper is to establish the causal effects of bank competition on firm activities and performance. Bank expansion decision is not random. For example, it could depend on the ownership of a bank (e.g., Assunçao et al. (2012)) and on the potential cost and benefit of the region (e.g., Keniston et al. (2012)). Moreover, indexes to measure bank concentration (e.g., HHI) are endogenously determined by prices and firm performance (e.g., Bresnahan (1989)). The 2009 partial deregulation in China provides us an ideal empirical setting for Difference-in-Differences analysis since different banks could have different exposures to the shock even in the same city. The exogenous variation is across 12 banks and across 340 cities which is hardly confounded with common economic growth trends in individual cities.

This paper also has huge policy implications. China is the second largest economy worldwide whereby its credit allocation is far from being efficient which is mainly distorted by SOEs (e.g., Hsieh and Klenow (2009); Hsieh and Song (2015); Song and Wu (2015)). The major reason is the soft budget constraint of SOEs which have implicit or explicit government guarantees (See for example, Song and Xiong (2017)). This leads to the adverse effects of banking deregulation on credit allocation in China (i.e., new entrant banks also prefer SOEs). Besides China, the consolidation of banks is a global phenomenon eliciting many public policy debates (See for example, Berger et al. (2004)). Policy makers' decisions on banking reforms rely heavily on fully understanding the real economic consequences of bank competition, especially the potential adverse effects. For example, in China, banking deregulation might need to be paired with other economic reforms (e.g., harden the budget constraint of SOEs) to avoid the negative effects on credit allocation.

The rest of this paper is organized as follows. In Section 2 reviews the literature. Section 3 describes the institutional background of the banking system in China. Section 4 presents the data and summary statistics. Section 5 provides the empirical results regarding bank competition and its economic consequences. Section 6 concludes.

2. Literature Review

A long debate exists in the literature on whether competition in the banking system helps or hurts economic growth. On the one side, the "market view" argues that deeper financial markets would improve efficiency and fuel future economic growth. For example, King and Levin (1993 a, b) explore the relationship between financial development and growth. They find that lower development in financial markets is associated with lower growth of GDP, capital stock, investment, and lower efficiency. Rajan and Zingales (1998) find the fraction of domestic credit going to the private sector is strongly correlated with market capitalization to GDP.[6] The banking sector is one of the most important financial markets. Smith (1998) argues that increased competition in banking tends to increase the level of economic activity by reducing the severity of business cycles. Moreover, regulations designed to stabilize the banking system could impede competition, which leads to slower growth (Barth et al. (2001 and 2004)).

On the other side, many studies argue that bank competition may have negative effects on economic outcomes. Peterson and Rajan (1995) argue that firms can have better access to finance when they have relationships with banks, which lower asymmetric information. It is costly for the bank to establish relationship with firms to obtain soft information.[7] Bank competition would harm a particular relationship between a firm and a bank, which could lead to deteriorating asymmetric information problems. Marquez (2002) shows that in the presence of information asymmetries increasing the number of competing banks may push interest rates up, as it leads to less efficient screening by banks. Hakenes and Schnabel (2010) argue that a bank's ability to transfer risk depends on whether the bank grants loans based on public or private information. This informational asymmetry leads to a moral hazard at the originating bank, and causes insurers to demand a lemons premium. Increasing bank competition with private information would increase access to finance only for bad borrowers.

Boot and Thakor (2000) studies the bank competition effects on both relationship lending and transaction lending. In particular, they argue that interbank competition

[6] Other earlier works also support the "market view." See, for example, Goldsmith (1969); Gurley and Shaw (1955); McKinnon (1973); Demirguc-Kunt and Maksimovic (1998); Levine and Zervos (1998); Levine, Loayza, and Beck (2000).

[7] The seminar paper Townsend (1979) argues that it is costly to monitor and verify the contingent event of a debt contract.

would lower down the profits from transaction lending more than the profits from relationship lending. This causes banks to switch to relationship lending after increasing in interbank competition. Moreover, borrowers who are used to borrow transaction loans would be better off in higher interbank competition. This effect is ambiguous for borrower who mainly rely on relationship loans. Most of our evidence supports this view.

The empirical evidence on whether bank competition leads to better economic growth is also inconclusive. Jayaratne and Strahan (1996) find that after bank branch deregulation in the U.S. in the early 1970s, rates of real per capita growth in income and output increased significantly. Claessens et al. (2001) find that, in the long run, foreign bank entry can render national banking markets more competitive, thereby forcing domestic banks to operate more efficiently and leading to positive welfare implications for banking customers. Cetorelli (2003) finds that higher bank competition tends to promote job creation among industrial establishments at the start-up stage and to permit them to prosper in the immediate wake of their entry into the market. Concurrently, higher bank competition accelerates the exit of more mature establishments from the market. Cetorelli and Strahan (2006) find that high bank competition increases the proportion of establishments in the smallest size group, and increases the total number of establishments. However, changes in bank competition have no effect on the largest establishments. Bertrand et al. (2007) show that, after the 1985 banking deregulation in France, banks improved their monitoring and screening technology. Moreover, this deregulation led to an overall improvement in firm-level ROA; such improvement was mostly concentrated among firms that were already good performers. Correspondingly, the poorer performing firms became more likely to exit after the banking reform.

Many empirical works show the negative impact of bank expansion on growth. Berger et al. (1998) find that although large holding company acquisitions in bank mergers tend to increase small business lending, smaller acquisitions decrease small business lending. Cetorelli and Gambera (2001) show evidence that bank concentration has a heterogeneous effect across industries. Sectors that are more dependent on external finance enjoy a beneficial effect from increased bank concentration. This positive effect may more than compensate the direct negative effect on quantities of credit. Bonaccorsi and Dell' Ariccia (2004) find a "bell-shaped" relationship between bank market power

and firm creation. Moreover, bank market power is relatively more beneficial to highly opaque firms.

In this paper, the analysis on detailed loan-level data unveils micro evidence on the competition dynamics among banks. In particular, the lending strategy of newly entered banks vs. responses from incumbent banks provide us with a deeper understanding of this issue. Furthermore, we use the 2009 deregulation on bank entry to establish the causal effects of different forces from bank competitions on economic activities.

3. Background

3.1. Banking System in China

The banking sector in China started from a centralized system in 1949 when the People's Bank of China (PBOC) was in charge of all commercial bank businesses (e.g., deposits, lending, and foreign exchange) and central bank functions. Along with the economic opening by Deng Xiaoping in 1978, the banking system entered a period of reform. In 1983, the PBOC, as China's central bank, began to focus on national macroeconomic decision making, maintaining monetary stability and promoting economic development. At the same time, the big four commercial banks (i.e., ICBC, ABC, BOC and, CCB) started to take over commercial bank businesses and each of them were specialized in a certain area.[8] In 1987, the Bank of Communications (BoCom) was formally established and became the first national shareholding commercial bank. We classify ICBC, ABC, BOC, CCB, and BoCom as the big five commercial banks in China which are directly controlled by the state. The two main shareholders of these big five commercial banks are the Ministry of Finance and China Investment Corporation.[9]

The Bank of Communications' experience in reform and development has paved the way for the development of shareholding commercial banks in China and exemplifies banking reform in China. Between 1988 and 2005, twelve joint equity banks were

[8] The Industrial and Commercial Bank of China (ICBC) was specialized in the credit business, the Agriculture Bank of China (ABC) specialized in supporting economic development in the rural areas, the Bank of China (BOC) specialized in the foreign exchange business, and the China Construction Bank (CCB) was responsible for the management and distribution of government funds allocated to construction and infrastructure projects.

[9] China Investment Corporation is a sovereign wealth fund which manages the foreign exchange reserves of China.

established, mostly as SOEs or institutions transformed from local financial companies. Although joint equity banks are also banks on a national level, unlike the big five commercial banks, they usually focus their business locally and operate on a much smaller scale. One of the reasons is that these joint equity banks can't open branches freely in the cities other than their headquarters. Although, the joint equity banks are still smaller than the big five commercial banks, they are catching up very quickly. In particular, in 2006, the total assets of the big five banks amounted to 24.4 trillion RMB, and the total assets of joint equity banks amounted to 5.4 trillion RMB. In 2013, the total asset amount of the big five banks was 65.6 trillion RMB and the total asset amount of the joint equity banks was 27.0 trillion RMB.

3.2. CBRC Regulations on Bank Branches

As in many other countries, the banking sector in China is highly regulated. In March 2003, CBRC was founded to supervise and regulate the banking sector. The CBRC put strict restrictions on the twelve joint equity commercial banks, especially for the branch opening. For example, in 2006, CBRC announced that the twelve joint equity banks, along with local commercial banks, in each single application to the CBRC, could apply to establish only one branch in one city.[10] To be precise, banks can't submit another application until the current one was rejected or approved by the CBRC. The bank need to submit the application to CBRC's local province offices for the initial review. If the application passes this local review, the case would be transferred to the CBRC's headquarter for the final review. The application, on average, takes approximately a year to achieve the verdict. Some of these applications could take years, depending on the review time of the local CBRC offices. Moreover, the total number of branches allowed to be opened in each city were capped by the CBRC. In the end of 2005, big five bank branches covered approximately 90% of the cities in China. For the twelve joint equity banks, they only covered approximately 7% of the cities. The bank entry regulation of CBRC in 2006 hugely limited the twelve joint equity banks to compete fairly with the big

10 Please refer to CBRC Order [2006] No.2, titled "The implementation of administrative licensing items on Chinese commercial banks"

five commercial banks who had already established branches almost in all the cities and counties of China.

In April 2009, "Adjustment comment on the market access policy of setting up branches for small- and medium-sized commercial banks" was introduced by the CBRC as a significant and important deregulation of the Chinese banking system. [11] This adjustment aimed to free joint equity banks and city commercial banks to set up new branches in new cities. This deregulation removes any entry restrictions for new branches in a city if the joint equity commercial bank had already set up branches in this city or in their capital city. Specifically, for these deregulated cities, the joint equity banks can open branches freely without any restrictions on number of branches. Moreover, for each application, joint equity banks can apply for multiple branch openings and don't need to get approval from the central CBRC office. Instead, banks only need approval from a local CBRC office which makes the application process much easier and quicker, typically within four months. Besides, there was no specific requirement on capital amounts for the new branches. However, if the bank didn't have any branches in the city or in the provincial capital city, it was still strictly regulated by the old rules of the CBRC. Taken together, this bank entry deregulation enacted in April 2009 will reduce the cost and time of new branch entry applications dramatically. As one of the senior officers in the CBRC commented, this deregulation shock is one of the milestones in the development of commercial banks and the growing level of competition in the whole banking sector.[12] On October 15, 2013, in CBRC Order [2013] No.1, an updated version of CBRC Order [2006] No.2, the CBRC fully relaxed the entry restrictions on commercial banks.

In this paper, we focus on this 2009 partial deregulation and use it as an exogenous shock to bank competition. This policy shock led to the significant growth of joint equity market share and increased competition pressure to incumbent commercial banks, and provides an ideal empirical setting to establish the causal effects of bank expansion.

11 Please refer to CBRC Order [2009] No. 143;
http://www.cbrc.gov.cn/govView_E38927D9D67E4FA4904E7E580DDFFAFD.html

12 In response to this deregulation, China Merchants Bank, one of the twelve joint equity banks, decided to open another 20 new branches by the end of 2009. As reported in the Announcement of 39th Meetings of the Seventh Sections of The Board of Directors, the China Merchants Bank would expand in Jiangsu, Guangdong, Henan, Sichuan, Shandong, Zhejiang, Jiangxi, Liaoning, Fujian, Yunnan, Hunan, Hubei, Anhui, and Guangxi.

Specifically, the 2009 deregulation only applies to certain regions and banks, we can use this cross-sectional heterogeneity to perform the Diff-in-Diff regressions.[13] This allows us to establish the causal effects of bank competition on economic activities.

4. Data and Summary Statistics

We utilize three datasets for our empirical analyses, including two proprietary datasets on major Chinese bank loans and all Chinese bank branch information, and Chinese Industry Census (CIC) firm-level data.

4.1. CBRC Loan Level Data

The first dataset includes all major bank loans that the CBRC compiled for monitoring and regulatory use, which consists of over 7 million loan contracts granted by 19 largest Chinese banks to firms with unique organization codes. This monthly frequency dataset covers all borrowers with an annual credit line over RMB 50 million (approximately US$8 million) and spans from October 2006 to June 2013, which accounts for over 80% of the total bank credit in China. The data cover over 160,000 borrowing firms located in all 31 provinces in China across all 20 different sectors in accordance with the Economic Industrial Classification Code in China. In addition to the comprehensive coverage, the data also contain detailed loan-level information, i.e., the unique firm identifier, firm-level fundamentals (e.g., size, leverage and location), banks' information (e.g., the names and location of branches), and loan-level characteristics (e.g., loan amount, loan maturity, credit guarantee providers, internal ratings, issuing date, maturity date on contracts, and loan delinquency status).[14]

4.2. CBRC Branch Data

The second dataset includes all bank branch information in China, which is also collected by the CBRC. This dataset contains over 200 thousands branches from around 2,800 banking financial institutions and spans from 1949 to 2016. The data record details

[13] Table A2 in Appendix shows the distribution of branch numbers of different banks across provinces before the 2009 deregulation.
[14] However, the data do not record loan interest rates. In China, the lending rate was fully liberalized after July 20, 2013. During our sample period, the bank lending rates were still highly regulated.

of branch level information, such as full names, branch IDs, branch addresses, and the exact opening and closing dates. Based on this data, we can observe how many new branches that a specific bank set up during a given period in a specific region (provinces, cities, or counties). For our analyses, we restrict our bank branch sample to 17 commercial banks, i.e. big five banks and twelve joint equity banks.

To validate the quality of this bank branch data, we cross check it with the public branch information for Bank of China (BOC) in 2016. We chose BOC because we can find all its branches with name, address, branch level, and operating status on the bank's website. We constructed BOC's branch list in September 2016 from CRBC dataset and check each of these branches with BOC's website. In total, BOC's website records 10,714 operating branches. This number is close with the number of branches 10,686 disclosed in BOC 2015 annual report and is also similar with the CBRC dataset which includes 10,678 branches. Then, we compare the names of branches between CBRC and BOC website and there are 9,900 branches have the exact the same names in these two dataset. This means 92.71% of the branches from CRBC dataset are as the same as the ones listed on BOC website. For these 7.29% unmatched branches, we manually check their names at the city level. Approximately, we can match another 3.58% of the branches. In sum, 96.29% of BOC branches in CBRC dataset could be matched with the branches listed with BOC website. The quality of CBRC bank branch dataset is very good.

4.3. Chinese Industry Census Data

The other dataset we use in this paper is Chinese Industrial Census (CIC) from 1998 to 2013.[15] The Chinese Industry Census (CIC) was collected by The Chinese National Bureau of Statistics (NBS). It includes all the manufacturing firms in China with annual sales more than 5 million RMB (increases to 20 million RMB in 2011). The CIC appears to be the most detailed database on Chinese manufacturing firms, and the content and quality of the database are sufficient. CIC data has detailed firm level accounting information (e.g., balance sheet, income statement, and cash flow statement) as well as other firm characteristics (e.g., number of workers, location, industry, shareholder type,

[15] We obtained the CIC data between 1998 and 2013, except for 2010. The data quality of CIC in 2010 is very bad. To our knowledge, all the available data sources of CIC don't have good quality for 2010.

and registration type). Although we don't have loan level interest rate information from CBRC data, we have the annual amount of interest payment for each firm in CIC data to calculate the firm borrowing interest rate. Using firm registration type from CIC data, we classify firms as SOE and Non-SOEs. In total, there are 635,709 firms. To investigate the impact of bank credit access on firm activities, we merge the CBRC data with CIC from 2007 to 2013. Moreover, we also obtain the census data on all firms in China in 2008. This cross-sectional dataset records firm ID, total assets, ownership, number of workers, and operating income of 9,212,411 firms in total. Approximately 75% of the firms in CBRC dataset can be matched to the 2008 census data (i.e. twelve thousands out of sixteen thousands). [16] Based on this, we are able to stratify the CBRC borrowers by ownership (i.e., SOEs vs. private firms) and performance (e.g., high vs. low efficiency).

4.4. Summary Statistics

Figure 1 shows two heat maps of the number of outstanding joint equity bank branches in 2008 and 2013, respectively. In the heat map, the darker color means larger number of joint equity bank branches in the province. Over the last two decades, joint equity commercial banks grow very fast. As displayed in Panel A of Figure 1, there are still several provinces with less than 20 joint equity bank branches (they are Jilin, Inner Mongolia, Gansu, Qinghai, Ningxia, Guizhou, Guangxi, Hainan and Tibet). On average, by the end of 2008, there are over 1,600 branches for big five banks in each province while the number is only around 150 for joint equity banks. Since the 2009 deregulation, joint equity banks have been expanding rapidly. Panel B of Figure 1 shows that 13 out of 31 provinces have over 200 joint equity branches in the end of 2013. Particularly, there are five provinces that reached to over 500 joint equity branches, i.e., Guangdong, Zhejiang, Shandong, Shanghai, and Jiangsu.

[Place Figure 1 about here]

Besides the growth of number of branches, joint equity banks also grow rapidly in terms of their lending market shares. In particular, the market share of joint equity banks,

[16] We cross checked the variables between CIC and 2008 census data and 95% of them are consistent. Moreover, in CBRC data, we compared the differences of firm characteristics (e.g., total assets) between firms that are matched to the census and unmatched. The t-tests show no significant differences.

which is measured by the percentage of total amount of assets of joint equity banks over assets of all banks in China, increased from 10.7% in 2003 to 18.6% in 2015. The average of annual growth rate for the assets of joint equity banks is around 25% while the number is only 15% for big five banks.

The 2009 deregulation contributes a lot to this fast catching up of joint equity banks in China. In Figure 2, we plot the time trend of gaps in amount of loans outstanding between the treatment (i.e., deregulated bank-cities) and control groups (i.e., regulated bank-cities). We take out the city*bank fixed effects and year fixed effects. The solid line represents this gap. Before April 2009, the loans outstanding of treatment group is slightly lower than the loans outstanding of control groups. Moreover, the gap was flat before April 2009. This suggests that the amount of loans outstanding moved in parallel between treatment and control groups. After the shock in April 2009, the gap has been increasing over time since banks can freely open new branches in treatment groups. The pattern in Figure 2 suggests that the increased lending after April 2009 is mainly due to the deregulation. There are no significant changes of differences between the treatment and control cities prior to 2009.

[Place Figure 2 about here]

Table 1 presents summary statistics of the data. As discussed above, we employ the 2009 bank entry deregulation as an exogenous shock on interbank competition which is mainly between joint equity banks and the big five. This policy provides an ideal setting of Diff-in-Diff regressions to exam the causal impact of bank expansions. Our main variable of interest is the Diff-in-Diff dummy *After2009.4*Treatment*, where *After2009.4* equals one for observations after the policy shock in April 16, 2009 and zero before that. *Treatment* equals one for treated bank-cities and zero for controlled bank-cities. Based on this 2009 deregulation, bank *k* free to open branches in city *j* is the bank that have existing branches in city *j* or in the capital city of the province of city *j*. The mean of *Treatment* is 0.385 which means that, on average, joint equity bank can open branches without restrictions in 38.5% of the cities. Moreover, among the pair of cities-joint equity banks with *Treatment*=1, 18.7% of them had joint equity bank branches before April 2009. In other words, for the remaining 82.3% of the cities, the unrestricted branch opening is

due to the existing branches in the provincial capital cities instead of the city itself. This mitigates the concern that government endogenously targeted several specific cities to perform the deregulation in 2009.

Panel A of Table 1 reports the number of branches at bank-city-year level from 2006 to 2013. Overall, the big five banks dominate the market. In specific, the average number of branches for big five banks is 31.25 while it is 1.25 for joint equity banks. Panel B presents the summary of loan contract terms. The average amount of loan is around 15 million RMB with short-term maturity. Approximately one fifth of loans have third party guarantee, which provides a credit enhancement scheme for lenders. The default rate defined as over 90 days delinquency is 1.1% and it is comparable to the non-performing loan rate disclosed in banks' annual reports in China. Moreover, for each loan, we define it as a relationship loan if the firm has outstanding loans from the same bank over the past 12 months. The rest are transaction loans. On average, 85.9% of loans are classified as relationship loans. For each loan, we also know the borrower characteristics such as total assets, leverage, ownership, and efficiency. The mean of borrowers' total assets is 1046 million RMB. The median leverage ratio is 54.9%. 13.6% borrowers are SOEs. Moreover, we measure the firm efficiency by dividing operating income over the total assets and use the median level in Census data to classify efficient and inefficient firms. Panel C of Table 1 shows firm level characteristics. The median size of firms equals 20 million RMB while the standard deviations are large. And on average the sample firms have a moderate leverage level. We calculate the firm level interest rate by dividing the total amount of interest payment by the total amount of outstanding loans at the end of prior year. On average, the interest rate is 14.16%. We describe all variables' definitions in Table A1 in Appendix.

[Place Table 1 about here]

5. Empirical Analysis and Results

5.1. Expansion of Joint Equity Bank Branches under 2009 Deregulation

We start by analyzing how joint equity banks expand into new cities and in terms of new branches and loan issuances after the 2009 deregulation. In other words, do joint

equity banks actually expand and compete with incumbent big five banks in the lending market when the restriction on branch openings is lifted. As we described before, after the 2009 deregulation, joint equity banks can freely open branches in the cities where they already have branches or in all cities in the province where they have branches in the capital city of that province. After this partial deregulation, different joint equity banks have different access to different cities depending on their branch distributions before 2009. At the city-bank-year level, we study the joint equity bank expansion patterns in response to the 2009 deregulation using Diff-in-Diff regression on the number of branches and outstanding loan amounts for each bank in each city. Formally, the regression can be represented as follows:

$$\mathrm{Y}_{ijt} = \beta_1 After2009.4_t * Treatment_{ij} + \beta_2 After2009.4_t$$

$$+\beta_3 Treatment_{ij} + \phi X_{it} + \alpha_i + \delta_j + \eta_t, \qquad (1)$$

where Y is the logarithm of one plus the number of outstanding branches or the logarithm of one plus the total amounts of outstanding loans for city i, bank j at the end of year t. We control for the observable city level characteristics, such as Log*(Local GDP), Fixed Investment/Local GDP*, and *Fiscal Revenues/Expenditures*. We also control for city (α_i), bank (δ_j), and year (η_t) fixed effects. Standard errors are clustered at the city level.

Table 2 Panel A shows the regression results. Samples are restricted to joint equity banks. Column (1) is for 3 months before and after Diff-in-Diff by restricting the sample to January 2009 to June 2009. Column (2) is for 6 months before and after, Column (3) is for one-year, Column (4) is for two years, and Column (5) is for the whole sample period. In Column (1) to (5), the coefficients β_1 of *After2009.4**Treatment are all positive and are statistically significant at the 1% level. For example, in Column (1), the coefficient is 0.007 with a t-statistic of 4.73. This means the number of joint equity bank branches increase by 0.7% in the deregulated cities (i.e., Treatment=1) than in the still regulated cities (i.e., Treatment=0) after the 2009 deregulation shock. Additionally, the β coefficients increase monotonically from Column (1) to (5). For example, in Column (5), the coefficient is 0.14 with a t-statistic of 12. This means the number of joint equity bank branches increase by

14% in the treatment cities than in the control cities after the 2009 deregulation shock. This suggests that the long-term effect of the deregulation on joint equity banking sector expansions is larger since it takes time to open branches in a new city. This also mitigates the concern that for still regulated cities (i.e., Treatment=0), the joint equity banks can simply open one branch in order to qualify for the deregulation. We find that if a joint equity bank didn't have any branches in a city (nor in the provincial capital city) before April 2009, even this bank opens a branch later on, it is not qualified in the deregulation. There is a concern that our deregulation shock in April 2009 could be confounded with RMB4 trillion stimulus package initialed in November 2008. Specifically, the 4-trillion program could grand more credit to deregulated cities than regulated ones. The results in column (1) can mitigate this concern (i.e., restrict sample between January 2009 and June 2009 which is post 4-trillion) since there is still a significant increase of branches in treatment group within 4-trillion period.

In Panel B of Table 2, the independent variable is the logarithm of one plus the outstanding loan amounts.[17] Consistent with Panel A, the deregulation led to a significant increase in lending from the joint equity banks in deregulated cities. For example, the coefficient estimated from whole sample period is 0.387 (*t*-statistic=15.17) statistically significant at 1% level, which means the total amount of outstanding loans increases by 38.7% due to the deregulation. The effects are huge. Furthermore, in the robustness test, the results are still there even after controlling for the city*year fixed effects and bank*year fixed effects. Again, in Column (1), we restrict our sample between January 2009 and June 2009 and find similar results. This means that, within the 4 trillion period, we can still find that the deregulation in April 2009 helped joint equity banks expand in deregulated cities. To further distinguish the deregulation shock with 4 trillion, in Appendix A3, we calculate the growth rate of loans outstanding from November 2008 to March 2009 (i.e., after the 4 trillion but before the 2009 bank entry deregulation). There are no significant differences of growth rates between regulated cities and deregulated cities. This further suggests that the increases of loans between the treatment and control

[17] For big five bank loans, firms borrow approximately 90% of their loans from the branches in the same city. This ratio is approximately 83% for joint equity banks. Sometimes, firms borrow from bank branches in the neighbor cities or in the provincial branches.

groups in our Diff-in-Diff analysis don't confound with the 4 trillion program. In sum, these results confirm that the effects of the 2009 deregulation are in-line with the purpose of it which aims to increase the interbank competition in the lending markets. Moreover, in Appendix Table A4, we repeat the regressions on the loans outstanding from big five banks which show that, after the deregulation, big five banks significantly decrease their lending to deregulated cities.

[Place Table 2 about here]

Next, we explore how joint equity banks target firms. Table 3 shows the results. Panel A, Column (1) shows the percentages of loans from new entrant branches of joint equity banks go to the new firms which have never borrowed from banks. This number is approximately 12% which means that joint equity banks issue loans mainly to the old firms which have been borrowing from incumbent banks (88%). Column (2) is for the incumbent joint equity branches. On average, incumbent joint equity branches issue 13% of their loans to new borrowers. Column (1) and (2) suggest that when joint equity banks enter into new cities, instead of developing new clients, they mainly compete with incumbent big five banks on their current clients. Furthermore, column (3) shows the percentage of loans of joint equity banks for SOEs. On average, 25% of the loans from joint equity banks go to SOEs. In contrast, for big five banks, column (4) shows that 19% of their loans go to SOEs which is lower than joint equity banks. This is surprising since the common perception is that big five banks allocate more credit to SOEs in China than joint equity banks which should have been more efficient. We find the opposite in our data. One explanation is that joint equity banks are dominated by big five banks which pushes them to put more efforts on finding good lending opportunities. In China, SOEs have soft budget constraint and are "safe" assets compared with private firms and are more preferred by joint equity banks.

Furthermore, we explore how joint equity banks and big five target firms respectively by looking at the comparative statistics in Table A5 (e.g., firm assets, leverage, number of workers, asset to revenue ratio (ATR)). In terms of assets, before 2009, joint equity banks lend mainly to larger SOEs than big five. After 2009, this pattern reversed as joint equity

banks started to lend to smaller SOEs. Moreover, compared with big five, joint equity banks lend more to SOEs with lower hierarchy (e.g., local SOEs below city level).

Table 3 Panel B shows the percentages of the joint equity banks and big five's shares. Column (1) shows the borrowing shares of joint equity banks with respect to outstanding loans. The percentage jumps a lot at the year of 2009, which confirms that the joint equity banks expands greatly after the deregulation. The number increases from 24.2% in 2008 to 29.1% in 2009, by 21% and continues to become larger as the time goes by (i.e. increases from 25.9% in 2007 to 39.9% in 2012, by around 55%). At the end of year 2012, the firm-year average of borrowing shares from joint equity banks reaches 40%, which is certain a part of the whole banking sector. Also, this pattern is confirmed based on another borrowing share definition using the amount of new loan issuances (as can be seen in column (2)). Column (3) shows that the borrowers can switch completely from big-five banks to joint equity banks and there is a jump before and after the deregulation shock in banking industry (i.e. increases from 0.54% to 0.86%, by around 60%). The magnitude of the complete switch is small which means most of the loans from new banks are "add on". To reveal the growth along the intensive margin, we drop those firm-year observations of which the borrowing shares from joint equity banks in the first year are 100% and calculate the frequency of firm-year observations with expansions in borrowing shares from joint equity banks. As the column (4) shows, there are only 16.0% of firm-year observations with positive change in borrowing shares from joint equity banks in 2007 while 31.4% at year 2012. Column (5) reports the percentage of borrowers in Big-five banks that also borrows from Joint-equity banks for each year. In 2007, there are 10.89% of borrowers in Big-five banks having access to Joint-equity banks and this number increases to 20.22% in 2012.

[Place Table 3 about here]

Besides the analyses on outstanding loans amount in Table 2, Table 4 presents the Diff-in-Diff regression estimates on the impact of deregulation shock on firm's borrowing shares among banks. As shown in equation (2), the dependent variable in the first five columns of Panel A (Panel B) is Borrowing Shares$_{kijt}$, calculated as the ratio of the amount of outstanding loans (new loans) issued by bank j at the end of year t (during the year t)

to the total amount of loans issued by all banks. To examine the expansion effect at the intensive margin, the dependent variable in the equation (3) is the year-to-year change in borrowing shares and the regression estimates are reported in the last two columns of each panel. We also add bank (α_j), firm (δ_k), and year (η_t) fixed effects. Standard errors are clustered at the city level.

$$\text{Borrowing Shares}_{kijt} = \beta After2009.4_t * Treatment_{ij} + \alpha_j + \delta_k + \eta_t, \quad (2)$$

$$\Delta \text{ Borrowing Shares}_{kijt} = \beta After2009.4_t * Treatment_{ij} + \alpha_j + \delta_k + \eta_t, \quad (3)$$

Similarly, the coefficients across all model specifications are positive and statistically significant at 1% level. Particularly, as shown in column (1) Panel A, the coefficient is 0.004 with a *t*-statistic of 10.15. This result implies that the firms' borrowing shares from joint equity banks will increase by around 0.4% for bank-cities with treatment equals one after the deregulation shock, which accounts for 16.7% of the sample mean of borrowing share. Moreover, the coefficients still become larger as the window spans, which suggests that the accumulative effect of joint equity banking sector expansions tends to be stronger. Together with Table 2, the magnitude of expansion of joint equity banks after 2009 deregulation was huge. The expansion is mainly on the intensive margin by adding on new loans to old borrowers and is limited on the extensive margin (i.e., only approximately 12% loans go to the new borrowers).

[Place Table 4 about here]

5.2. Competition between Incumbent Banks and New Banks

In a next step, we explore how new banks compete with incumbent banks in the region by offering different loan contract terms. We also explore how incumbent banks react to the new bank entries and what are the impacts of the competition on loan performance. We first compare the loan contract characteristics between new banks and incumbent banks. Our loan data contains the loan amount, maturity, internal rating, third-party guarantee requirement, and ex-post performance. For each loan contract between firm *k* (e.g. located in city *i*) and bank *j* at month *t*, we introduce a dummy to indicate whether the bank *j* is the new entered one in city *i*. In particular, the dummy

equals one if the opening date of the earliest branch of bank *j* in city *i* is less than 12 months prior to the month *t*.[18]

Table 5 reports the mean difference in loan contract characteristics. The *t*-statistics are provided to show the significance in the last column. Panel A is for all banks in the sample and Panel B is for joint equity banks. The patterns are very similar between Panel A and B. In particular, new-entry banks tend to target borrowers by providing the loan contracts with the following characteristics: larger size, longer maturity, better internal ratings, and higher level of guarantee protections. All these patterns are statistically significant at 1% level. For example, the average amount of loans granted by new entry joint equity banks is 24 million RMB while this number for incumbent joint equity banks is only 14 million RMB. Moreover, over one third of loans from new entry joint equity banks are required to provide the third party guarantee requirement. Incumbent banks require significantly lower guarantee. We also explore the ex-post loan performance. As in Table 5, the credit risk is lower (significant at 10% level) for loans issued by new-entry banks while this effect will become larger and more significant for overall samples. Besides the loan contract characteristics, we also look at the differences on borrowers' characteristics. For example, the mean of firm total assets for incumbent banks is 6.9 billion RMB and the median is 0.8 billion RMB. For new entrant banks, the mean is 4.4 billion RMB and median is 0.9 billion RMB. This means that, compared with incumbent banks, new entrant banks lend to relatively larger firms but avoid the very large firms. We also find that new entrant banks target firms with less financial constraint (i.e. smaller leverage).

[Place Table 5 about here]

Furthermore, we explore the internal loan rating downgrading patterns of the delinquent loans between the big five banks and twelve joint equity banks. Figure 3 shows the distribution of the time differences between the initial loan delinquent date and the

[18] Our results are quite robust to other definitions of new bank entries (e.g. 36 months) and are not reported for brevity.

initial downgrading of the internal rating of that loan.[19] For example, zero means that the first delinquent date of the loan is in the same month as the first downgrading of this loan's internal rating. "-1" means that the bank downgraded the rating of the loan 1 month before the actual delinquency. As shown in Figure 3, big five banks usually downgrade the internal ratings of delinquent loans earlier than joint equity banks. In particular, the distribution of early actions for delinquent loans granted by big five bank is left skewed. On average, the mean value of months between initial downgrade action day and real expired day for delinquent loans granted by big five banks is -1.56 and the median value equals -1.00. In contrast, the numbers are 0.86 and 1.00 for joint equity loans. This means that the loan officers in big five banks have better information than joint equity banks due to past repeated relationships and are more likely to downgrade the delinquent loans in advance.

[Place Figure 3 about here]

Next, we perform the Diff-in-Diff analysis to access the causal impact of joint equity banking sector deregulation shocks on the loan contract terms initiated by the joint equity banks. Formally, the regression is:

$$\text{Loan Terms}_{kijt} = \beta After2009.4_t * Treatment_{ij}$$

$$+Pretrend + \phi X_{kt} + \alpha_j + \delta_k + \eta_t, \qquad (4)$$

where Loan Terms_{kijt} are for the characteristics of a loan borrowed by firm k (located in city i) from bank j in year t. α_j, δ_k and η_t are vectors of bank, firm, and year dummy variables that account for bank-, firm-, and year-fixed effects. X_{kt} is a set of time-varying firm level variables, including the firm size and firm leverage. We also control for the pre-trend dummies for the shock. The coefficient of interest, β, estimates the impact of branch deregulation on loan contract characteristics. The standard errors are clustered at city level.

19 Agarwal and Hauswald (2010) find that physical distance has significant effects on asymmetric information and loan interest rates.

Table 6 shows the results. Column (1) reports the deregulation effect on the percentage of loans for SOEs from joint equity bank. The coefficient of Diff-in-Diff dummy (i.e., After2009.4*Treatment) is 0.2% with significance at 10% level. Joint equity banks issue significantly more loans to SOEs after the 2009 deregulation in the deregulated cities where they can open branches freely. In column (2), the dependent variable is the dummy for whether the efficiency of the borrower is high or low. We use the 2008 cross-sectional survey to define the high efficiency firm if the operating income to asset ratio (i.e., asset turnover ratio) is above the median. The coefficient of After2009.4*Treatment is -2.7% with significance at 5% level which suggests that deregulation leads to more credit allocation to low efficient firms. In column (3), we study whether joint equity banks issue more relationship loans or transaction loans in deregulated cities after the 2009 shock. The coefficient is 0.7% with significance at 5% level. These suggest that when joint equity banks enter into a new city, they would first target SOEs, low efficient firms, and relationship borrowers and increase their lending to these firms. The results in column (1) to (3) are consistent with each other. In China, SOEs are normally less efficient than private firms and they are usually relationship borrowers. Although, SOEs are less efficient than private firms, banks are still willing to lend to SOEs since they have implicit or explicit government guarantees. On the other hand, lending to private firms is much riskier for loan officers who would be punished if the private firms default. This could explain why joint equity banks prefer to lend to SOEs when enter into a new city and why bank entry deregulation could lead to worse credit allocation in China.

In column (4) to (6), we explore the deregulation's effects on loan contract terms. In column (4), for third-party guarantee, the coefficient is 0.002 with significance at 5% level. This suggests that the deregulation push the new-enter joint equity banks to issue loans with more guarantee protections. Column (5) is for internal rating and the coefficient is -0.001 with significance at 10% level. This suggests that loan officers tend to give more favorable ratings after the deregulation shock. This could be due to two reasons; these borrowers are with greater credit quality or banks inflate the borrowers by issuing good internal ratings. To further examine the underlying channels, we turn to the ex-post repayment performance. As shown in column (6), these loans from joint equity banks after the deregulation shock performs better (i.e. the coefficient equals -0.001 with

significance at 10% level). This supports the argument that increased competition from joint equity bank deregulation led to better ex-ante loan screening and better ex-post loan performance. After deregulation, when joint equity banks enter into a new market, they will increase their loan screening standard which leads to lower default.

In Table 6, most of the coefficients on pre-trend dummies are not statistically significant. This again verifies that our findings in Diff-in-Diff are not driven by underlying economic trends other than the deregulation in April 2009. For example, the pre-trend dummy for 6 months prior to the shock (i.e., from Oct 2008 to March 2009) was in the initiation of the 4-trillion program. The insignificant coefficient suggests that the effects of deregulation we find are not driven by the 4-trillion program. Furthermore, we restrict our sample period from January 2009 to June 2009 (3 months before and after the 2009 shock) in Panel B. We find similar patterns as in Panel A. Since the sample is during post 4-trillion, the effects are purely from the deregulation in April 2009.

[Place Table 6 about here]

Due mainly to data limitation, the prior studies have shown limited evidence on the impact of bank deregulation on incumbent bank strategies. Regarding this, we restrict to the subsample of loans granted by big five banks and further investigate how these incumbent banks react to this deregulation shocks. Similarly, the equation (5) is estimated to evaluate the policy effect. The only difference between equation (4) and equation (5) is that $Exposure_i$ in equation (5) is defined as a dummy at city level which equals one when at least one joint equity bank can expand freely in city i based on the 2009 deregulation (i.e. the joint equity banks had already set up branches in this city i or in its capital city prior to the policy enactment).

$$\text{Loan Terms}_{kijt} = \beta Treatment_t * Exposure_i + \phi X_{kt} + \alpha_j + \delta_k + \eta_t, \qquad (5)$$

To control for bank-, firm-, and year-fixed effects, we include α_j, δ_k and η_t, three vectors of bank, firm, and year dummy variables in the diff-in-diff regression estimates. X_{kt} is also a set of time-varying firm level variables, including the firm size and firm

leverage. In column (1) to (3) of Table 7, we don't find significant effects of deregulation on how big five target firms. From column (4) to (6), we find that incumbent big five banks located in treated cities offer significantly different loan contracts after the deregulation shock. In particular, the loan maturity becomes significantly longer, the guarantee requirement becomes significantly lower, and the internal rating becomes significantly better. For example, the coefficient estimated from column (4) is -0.008 and significant at 5% level (with the *t*-statistic of 2.04), which means borrowers provide less credit enhancement through third-party guarantee to the big five incumbent banks after the shock. This suggests that incumbent banks feel the pressure of increasing competitions and offer better loan contracts. Moreover, internal ratings improve significantly after the shock. However, in Column (6), the default ratio increase significantly. Instead of improving the loan screening and monitoring, the incumbent banks choose to lower the hurdle and let more unqualified borrowers in the pool by inflating the credit rating and requiring lower guarantee, which leads to the higher credit risk.

[Place Table 7 about here]

5.3. Impacts of Bank Expansion on Firm Activities

Finally, we want to understand the impacts of the bank competition on firm activities, especially the heterogeneous effects on SOEs vs. private firms. It is well known that, in China, the state-owned commercial banks mainly grant credit to SOEs. There has been a long term relationship between the big five commercial banks and SOEs. Private firms, on the other hand, have very limited access to bank credit and rely heavily on informal lending channels. The 2009 deregulation on bank entry, along with other reforms on banking system, aims to improve the credit allocation in China. By merging the CIC firm level data and CBRC loan data, we select the firms which have borrowed from banks in our sample period. Then, we perform the Diff-in-Diff regressions of firm activities (e.g., expansions on assets, sales, employments, and liabilities), as well as firm performance (e.g., ROA and TFP) on the 2009 deregulation shock. The regression is as follows:

$$Y_{kit} = \beta Treatment_t * Exposure_i + Pretrend + \delta_k + \eta_t, \qquad (6)$$

where Y_{kit} is a vector of firm level activities such as total assets, fixed assets, total liabilities, capital structure, total sales, employment, ROA and TFP. $Exposure_i$ in equation (6) is also defined as a dummy at city level which equals one when the city i is eligible for branching expansion according to the 2009 deregulation (i.e. the joint equity commercial banks had already set up branches in this city i or in its capital city prior to the policy enactment). We also control for the pre-trend dummy for a year and two years before the 2009 deregulation. δ_k and η_t are included to account for firm- and year-fixed effects. Standard errors are clustered at firm level.

Table 8 shows the Diff-in-Diff regression results. In particular, the 2009 joint equity banking sector deregulation does exert significantly positive effect on firms' real economic activities. For example, after 2009 deregulation, firms in the deregulated areas expand in size and employment while relieves the financial distress in terms of lower leverage. Table 8, column (1), shows that total amount of assets, on average, increased by 7.2% after the 2009 joint equity bank deregulation. In column (2), the amount of fixed assets increases by 13.6% with the t-statistic of 1.79. Column (4) is for leverage, the coefficient estimated is negative (-0.031), which demonstrates that the leverage decreases by 3.1% after the joint equity bank expansion shock. In Column (5), the number of employment also increases significantly after the 2009 deregulation.

Moreover, we use TFP to measure firm-level productivity and use ROA to present firm's profitability. The coefficient estimated in Column (7) in Table 8 is 0.022 with the *t*-statistic of 4.02, showing that the ROA increases by 2.2% after the joint equity bank expansion shock. Similar even stronger patterns can be observed in Column (8), i.e. the TFP improves by 14.2%. Both columns on the analyses of firm efficiency consistently confirm that deregulation that expands firm's access to bank credit improves the firm's performance significantly. Last but not least, in Column (9), average interest rates of firm borrowings decreased by 5.3 percentage point which is approximately 37.4% decrease in interest rates. The deregulation significantly reduces the borrowing costs of firms. Moreover, based on the coefficients of two pre-trend dummies, we don't find significant differences in firm activities between deregulated areas and regulated areas (i.e., control group) before the 2009 shock. This eliminate the concern that the results of Diff-in-Diff

dummy is driven by demand side of the economy (e.g., firms in deregulated cities have better investment opportunities). Moreover, instead of the firms with bank loans, we expand our sample to all firms in the CIC data and repeat the regressions in equation (6). Table A6 shows the results. The effects of 2009 deregulation are consistent with the results of Table 8 but generally weaker. This is in-line with our expectation since the firms with bank loans should be affected more by this banking deregulation.

[Place Table 8 about here]

Furthermore, we trace the effect of bank expansions across SOEs and private firms by interacting the Diff-in-Diff dummy with the dummy for private firms. We exclude the firms which were privatized from SOEs since these firms might still keep the relationship with the big five commercial banks. Table 9 shows the results. Overall, private firms can benefit significantly more from the 2009 deregulation than SOEs do. In particular, compared with SOEs, after 2009, private firms in deregulated areas increase significantly more in assets, liabilities, sales, and employments. For example, the coefficient of *After2009.4 * Treatment* in column (1) is -0.064 with the *t*-statistic of -4.03. This suggests that SOEs decrease in assets when interbank competition increased after the 2009 deregulation. On the other hand, in column (1), the coefficient of *After2009.4 * Treatment * Private* is 0.178 with the *t*-statistic of 12.02. This shows that, opposing to SOEs, private firms would increase the assets significantly when the interbank competition increase. Other variables show the similar patterns (e.g., fixed assets, liabilities, sales, and employment). Moreover, for firm performance (i.e., ROA and TFP). The coefficients of the triple interaction terms are 0.006 and 0.275, respectively. Both of them are statistically significant at 1% level. In Column (9), the reduction of interest rate for private firms is significantly larger than SOEs. These findings suggest that expansions of joint equity banks in China generate more positive effect on private firms since these firms are relatively less likely to get access to the bank credit prior to the arrival of intensified competition. SOEs, on the other hand, might even suffer from the better interbank competition.

[Place Table 9 about here]

Finally, we separate the firms who reply more on transaction lending or on relationship lending prior to the 2009 deregulation. As discussed in Section 2, Boot and Thakor (2000) predicts that borrowers who borrow transaction loans prior to the increased interbank competition would be better off. This effect is ambiguous for borrower who mainly rely on relationship loans prior to the deregulation. In Table 10, we construct a new variable *TransactionShare* which is the percentage of transaction loan issuance amounts prior to 2009 (i.e., 2007 and 2008) over the total new issuance loan amounts of each firm. We interact the *After2009.4 * Treatment* with *TransactionShare*. In Table 10, we find that the coefficients of *After2009.4 * Treatment* are significantly negative for firm assets and sales. This means firms with zero transaction loans (100% relationship loans) prior to the deregulation suffer from the higher competition after 2009. On the other hand, the coefficients of *After2009.4 * Treatment* TransactionShare* are significantly positive for assets, liabilities, sales, employments, ROA, and TFP. For example, if the firm borrowed 100% from transaction loans before 2009, the deregulation led to increases in assets, liabilities, sales, and employment by 13.7%, 24.5%, 5.6%, and 34.1% respectively. Moreover, interest rates decrease significantly more for transaction lending loans. These results suggest that firms who mainly borrow transaction loans could benefit from increased competition.

[Place Table 10 about here]

The results in Table 9 and 11 are consistent with the prediction of Boot and Thakor (2000) which shows that relationship lending would have lower added value for borrowers when interbank completion becomes greater. Moreover, the increased interbank competition would have bigger negative effects on transaction lending business by lowering the marginal cost of borrowing more. The loans from new entered joint equity banks to private firms are largely transaction loans which would help private firms grow and become more efficient.

6. Conclusion

This paper exams how new entrant banks compete with incumbent banks and the economic consequences of increased interbank competition. Using unique loan-level data and firm-level survey in China, we trace each loan issued by big five commercial banks

and twelve joint equity banks and find that while new banks tend to target the same firms as incumbent banks. Increased competition leads to more credit for SOEs, inefficient firms, and relationship borrowers. Moreover, new banks usually require more guarantees and have better loan performance. Firms can benefit from the competitions among banks by lowering interest rate, expanding on assets and employments, and improving efficiency.

Whether bank competition is good or bad for economic growth is the central question worldwide. This paper provides the detailed analysis and establishes causal links between bank competition and growth in the context of China. China has been experiencing unprecedented high growth in economy during last decades and is now the second largest economy worldwide. During this economic growth, China has also developed the world largest debt market. However, the inefficient credit allocation has been heavily criticized by researchers, practitioners, and policy makers. The government has been pushing the financial reforms to improve this situation such as deregulations in banking sectors. However, for policy makers, it is important to understand the countervailing effects of banking deregulation, especially the adverse effects. In China, informal lending channel is a key to the development and private firms usually have limited access to formal lending channels such as bank loans (Allen et al. (2005)). On the other hand, several recent papers argue that private sector firms with bank financing in China grow faster than those without (Ayyagari et al. (2010)). There are several ways these findings can be reconciled. First, we find that, at micro level, the banking sector in China has improved over time which might have helped firms grow. Second, bank competition and expansion might have adverse effects on credit allocation at macro level. Other reforms should be implemented together with banking sector, i.e., removing government guarantees for SOEs. This would allow more (private/efficient) firms in China to take different financing strategies, e.g. switching from informal to formal lending channels.

In the future research, it is important to understand how this rapid change in China's banking sector affect the global economy. What are the benefits and risks associated with the reform on banking systems in China? What are the relationships between the banking system and shadow banking system in China? Answering these questions will further help

us understanding the world largest bank debt market as well as its role in the global economy.

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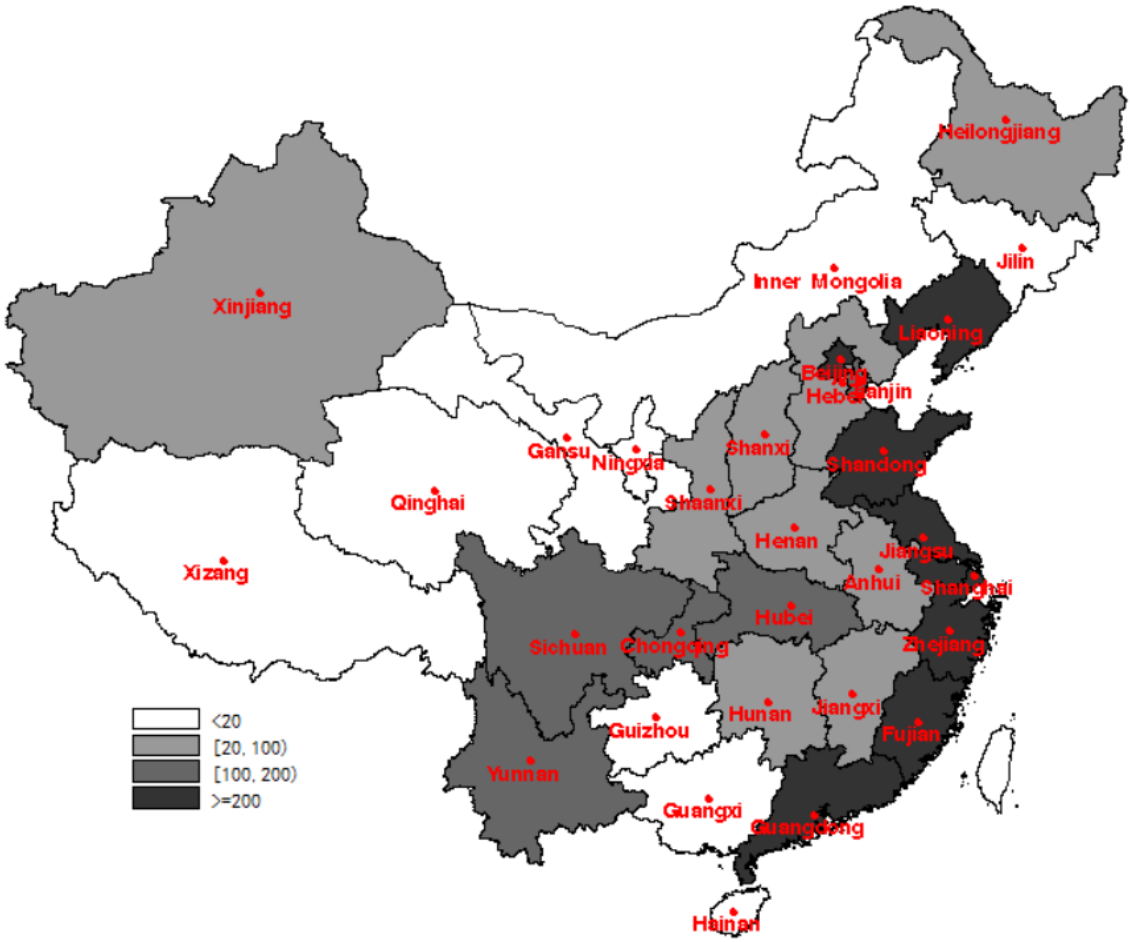
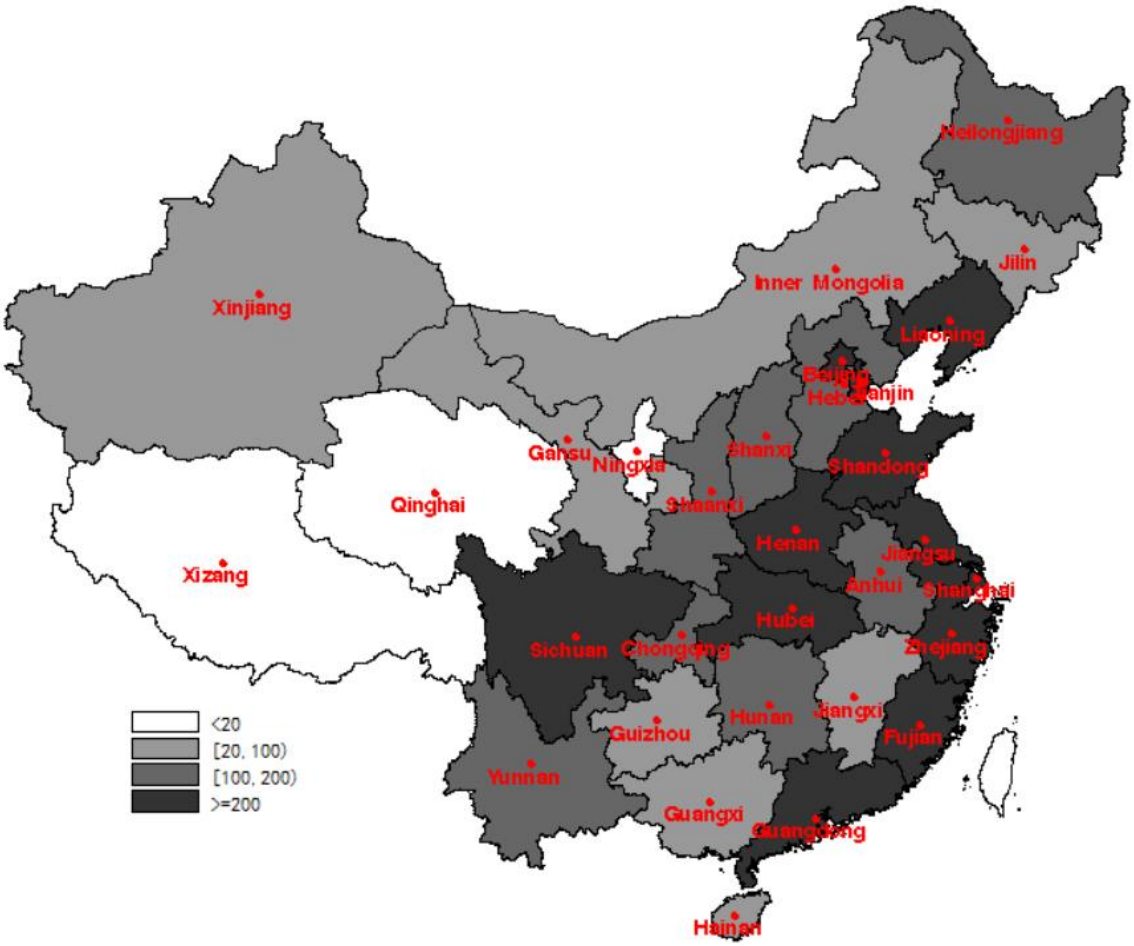


Panel A: By Year 2008



Panel B: By Year 2013

Figure 1: Heat Map of the Number of Joint-equity Branches across Provinces, 2008 versus 2013. This figure illustrates the outstanding number of all twelve joint-equity branches for all provinces in China at the end of 2008 (Panel A) and 2013 (Panel B). It covers 31 provinces including four centrally administrated cities (i.e., Shanghai, Beijing, Tianjin and Chongqing).

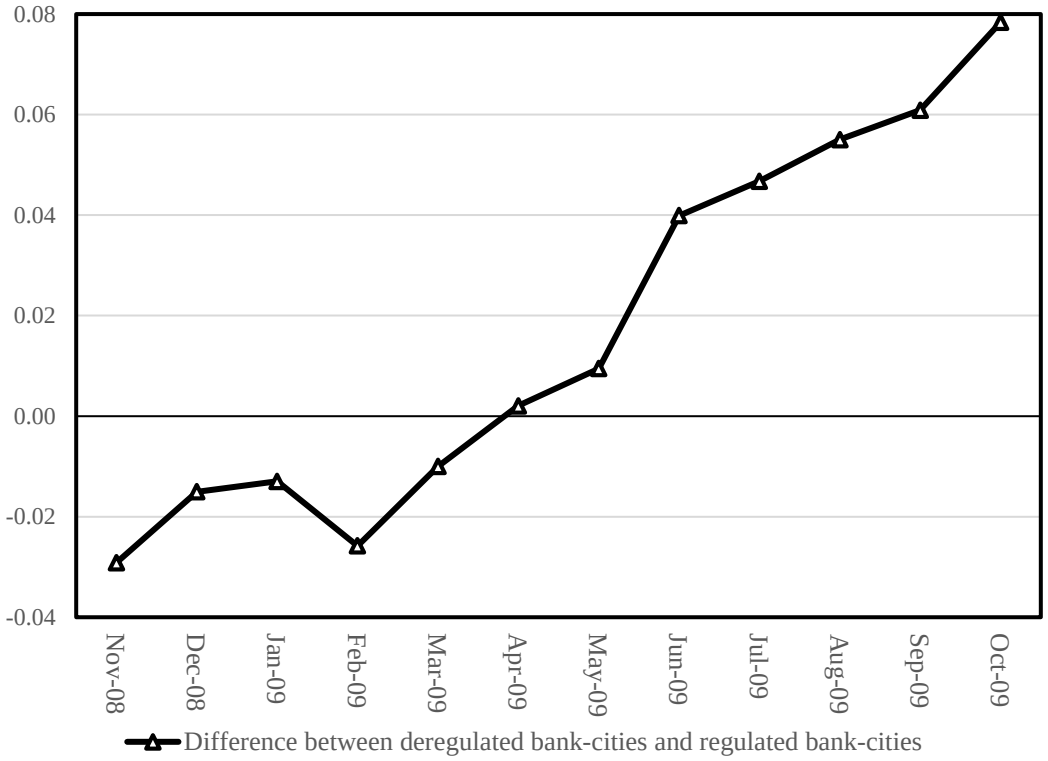


Figure 2: The Evolution of Outstanding Loans: treatment vs. control groups. This figure plots the trend of gaps between the natural logarithm of outstanding loan amounts between treatment and control groups around the April 2009 bank entry deregulation. The solid line with triangles exhibits amount of loans outstanding in deregulated bank-cities minus the amount of loans outstanding in still regulated bank-cities after controlling for city*bank and year fixed effects. The treated city requires that at least one eligible joint-equity bank has outstanding branches in this city or in its capital city of the province prior to the bank expansion policy shock.

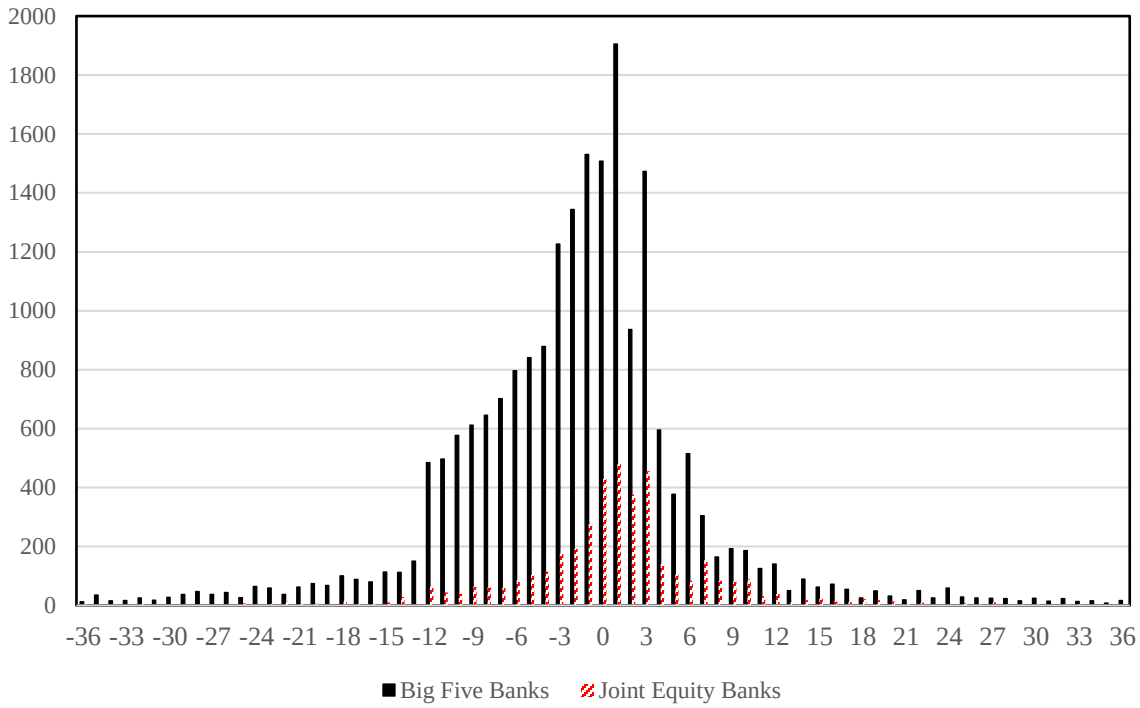


Figure 3: The Distribution of the Initial Downgrade of Delinquent Loans: Big Five Banks versus Joint Equity Banks. This figure plots the distribution of the differences between the month of the first delinquent loan payment and the month of the first downgrade of internal ratings of loans. The black bar is for the big five banks while the red bar is for the joint equity banks. The vertical line reports the frequency and the horizontal line reports the number of months between initial downgrade action date and real loan delinquent day. The data is restricted to all delinquent loans in CBRC sample.

Table 1: Summary Statistics

This table describes the sample characteristics of different samples. Panel A reports the summary statistics of the number of branch entries at city-bank-year level from 2006 to 2013, where the sample is from CBRC branch data set. Panel B reports the summary statistics of loan contract characteristics at loan level from Jan 2007 to June 2013, where the sample is from CBRC loan data set. Panel C reports the summary statistics of firm level characteristics at firm-year level from 2006 to 2012, where the sample is from the Chinese Industry Census. All other variables are defined in the appendix Table A1.

Variables	N	Mean	Median	S.D.	P25	P75
			Panel A: The Number of Branches			
Outstanding Branches	46,512	10.073	0.000	28.379	0.000	9.000
—Big Five commercial banks	13,680	31.250	20.000	45.075	7.000	37.000
—Joint-equity commercial banks	32,832	1.249	0.000	5.445	0.000	0.000
After2009.4	46,512	0.625	1.000	0.484	0.000	1.000
Treatment	46,512	0.385	0.000	0.487	0.000	1.000
New Branches overall sample	46,512	0.293	0.000	1.541	0.000	0.000
—Big Five commercial banks	13,680	0.672	0.000	2.659	0.000	0.000
—Joint-equity commercial banks	32,832	0.135	0.000	0.578	0.000	0.000
New Branches sub-sample	5687	2.394	1.000	3.795	1.000	2.000
—Big Five commercial banks	2847	3.229	1.000	5.073	1.000	3.000
—Joint-equity commercial banks	2840	1.557	1.000	1.284	1.000	2.000
			Panel B: The Loan Contract Characteristics			
Loan Amount (Million RMB)	6,089,830	15.036	4.009	31.012	0.620	13.654
Maturity (in Months)	6,089,830	11.998	6.000	22.249	4.000	12.000
Internal Rating	6,089,830	1.026	1.000	0.181	1.000	1.000
Guarantee Requirement	6,089,830	0.218	0.000	0.413	0.000	0.000
Relationship	6,089,830	0.859	1.000	0.349	1.000	1.000
Default	4,955,168	0.011	0.000	0.106	0.000	0.000
Loan_SOE	416,390	0.135	0.000	0.342	0.000	0.000
Higher ATR	416,387	0.321	0.000	0.467	0.000	1.000
			Panel C: The Firm Characteristics			
Assets (Million RMB)	2,086,333	86.317	20.767	231.757	8.572	57.564
Fixed Assets (Million RMB)	2,078,597	30.131	6.051	87.737	2.051	18.889
Liabilities (Million RMB)	2,084,805	48.364	9.500	138.277	3.320	29.424
Leverage	2,079,898	0.534	0.543	0.283	0.312	0.752
Sales (Million RMB)	2,086,212	111.584	36.898	242.808	15.431	94.920
Employee	2,055,139	216.265	120.000	321.487	55.000	240.000
ROA	2,079,673	0.133	0.054	0.218	0.010	0.166
SOE	2,086,333	0.059	0.000	0.236	0.000	0.000
Interest Rate	99,185	0.145	0.091	0.261	0.053	0.169

Table 2: Policy Shock in Joint-equity Bank Expansions

This table presents the regression estimates of difference-in-difference analysis on the impact of national policy shock in Joint-equity bank expansion. The overall sample includes 267,624 city-bank-month observations with no null values and the dependent variables are *Log(1+No. Branches)* for Panel A and *Log(1+Outstanding Loans)* for Panel B, respectively. The main independent variable is the interaction, *After2009.4*Treatment*, where *After2009.4* equals one for observations after the policy shock in April 16, 2009 and zero before and *Treatment* equals one for treated bank-cities and zero for controlled bank-cities. According to the policy, an eligible bank *k* in city *j* free of regulation on new-branch entry is a bank that have outstanding branches in this city or in the capital city of the province that the city *j* is located in prior to the bank expansion policy shock. For each panel, the column (1) reports the regression estimates for three-month window subsample during Jan 2009 to Jun 2009, the column (2) reports the regression estimates for subsample during Oct 2008 to Sep 2009 (six-month event window), the column (3) reports the regression estimates for subsample during Apr 2008 to Mar 2010 (one-year event window), the column (4) reports the regression estimates for subsample during Apr 2007 to Mar 2011, and the column (5) is for the whole period. All other variables are defined in the appendix Table A1. City-, Bank-, and Year-fixed effects are included across all models. Fixed effects estimates, including the constant, are omitted for brevity. Standard errors are clustered at the city level and the robust *t*-statistics are reported in parentheses across all these model specifications. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Log(1+No. Branches)

	DV: Log (1 + No. Branches)				
	(1)	(2)	(3)	(4)	(5)
Variables	[200901,200906]	[200810,2009009]	[200804,201003]	[200704,201103]	ALL
After2009.4*Treatment	0.007***	0.017***	0.042***	0.085***	0.140***
	(4.73)	(7.75)	(10.04)	(11.20)	(12.00)
Treatment	0.253***	0.246***	0.233***	0.211***	0.181***
	(5.59)	(5.50)	(5.30)	(4.96)	(4.25)
Log(Local GDP)	-	-0.000	-0.011***	-0.036***	-0.068***
	-	(-0.41)	(-5.63)	(-9.23)	(-10.35)
Fixed Investment/Local GDP	-	0.048	-0.021	-0.076	-0.069
	-	(0.91)	(-0.42)	(-1.30)	(-0.74)
Fiscal Expenditure/Revenues	-	-0.036**	-0.093***	-0.114***	-0.089**
	-	(-2.20)	(-3.94)	(-3.94)	(-2.44)
City FE	YES	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Observations	20,592	41,184	82,332	164,592	267,624
Adjusted R-squared	0.605	0.605	0.603	0.602	0.620

(*To be continued*)

Table 2: Policy Shock in Joint-equity Bank Expansions—*continued*

Panel B: Log(1+Outstanding Loans)

	DV: Log (1 + Outstanding Loans)				
	(1)	(2)	(3)	(4)	(5)
Variables	[200901,200906]	[200810,2009009]	[200804,201003]	[200704,201103]	ALL
After2009.4*Treatment	0.085***	0.147***	0.226***	0.318***	0.387***
	(9.90)	(12.01)	(13.95)	(15.17)	(15.17)
Treatment	0.618***	0.586***	0.550***	0.482***	0.422***
	(10.19)	(9.88)	(9.54)	(8.75)	(7.69)
Log(Local GDP)	-	0.001	-0.018*	-0.072***	-0.113***
	-	(0.14)	(-1.94)	(-5.71)	(-7.19)
Fixed Investment/Local GDP	-	0.120	0.079	0.024	-0.001
	-	(1.16)	(0.61)	(0.21)	(-0.02)
Fiscal Expenditure/Revenues	-	-0.101	-0.254***	-0.298***	-0.185**
	-	(-1.49)	(-2.98)	(-3.73)	(-2.34)
City FE	YES	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Observations	20,592	41,184	82,332	164,592	267,624
Adjusted R-squared	0.698	0.698	0.696	0.691	0.708

Table 3: Firm Borrowing Pattern across Years

This table presents the calendar year distributions of borrowing patterns. The column (1) of Panel A reports, for each year *t*, the percentage of loans to new borrowers (i.e. the borrowers that did not get any loans from our sample banking sectors) for new-entry branches and the column (2) reports the percentage of loans to new borrowers for incumbent branches. The column (3) reports the percentage of loans to SOEs in Joint-equity banks while column (4) reports the percentage of loans to SOEs in Big-five banks. The column (1) of Panel B reports the average value of borrowing shares from Joint-equity banks at firm-year level with respect to outstanding loan amount and column (2) reports with respect to new loan issuance. The column (3) reports the percentage of borrowers that switch completely from Big-five banks to Joint-equity banks. The column (4) presents the frequency of firm-year observations with expansions in borrowing shares from joint equity banks. The column (5) reports the percentage of borrowers in Big-five banks that also borrows from Joint-equity banks for each year.

Panel A: New borrowers and SOE borrowers

	(1)	(2)	(3)	(4)
Year	New borrowers in new-entry Branch	New borrowers in incumbent Branch	Loans by SOEs from Joint-equity Banks	Loans by SOEs from Big-five Banks
2007	10.00	10.99	28.89	22.34
2008	11.73	13.53	28.24	21.47
2009	15.92	15.53	27.84	20.71
2010	11.20	12.14	25.05	17.86
2011	12.12	12.35	20.43	16.66
2012	11.72	13.76	18.58	15.52

Panel B: Market share

	(1)	(2)	(3)	(4)	(5)
Year	Outstanding loans from Joint-equity Banks	New loans from Joint-equity Banks	Borrowers with complete switch	Intensive-margin growth in Joint-equity banks	Borrowers in Big-five banks with access to Joint-equity banks
2007	22.42	24.00	0.53	16.01	10.89
2008	24.19	25.78	0.54	18.16	12.02
2009	29.13	30.65	0.86	18.70	13.96
2010	33.59	31.75	0.87	24.28	15.49
2011	37.11	36.09	0.77	27.98	17.87
2012	39.95	37.46	0.83	31.35	20.22

Table 4: The Impact of Bank Expansion on Firms' Borrowing Decisions

This table presents the regression estimates of difference-in-difference analysis on the impact of national policy shock in bank expansion on firms' borrowing decisions. The overall sample includes 19,465,816 firm-bank-year observations. Panel A reports the regression results based on outstanding loans. The dependent variable in Panel A is Borrowing Shares$_{kijt}$, calculated as the ratio of the amount of loans issued by bank *j* at the end of year *t* to the total amount of loans issued by all banks. Panel B presents the coefficients estimates based on new loan issuances. The dependent variable in Panel B is Borrowing Shares$_{kijt}$, calculated as the ratio of the amount of loans granted by bank *j* during the year *t* to the total amount of loans granted by all banks in year *t*. All regressions include the Bank-, Firm-, and Year-fixed effects. In each panel, the column (1) reports the regression estimates for subsample during 2008 to 2009 (one-year event window), the column (2) reports the regression estimates for subsample during 2007 to 2010 (two-year event window), the column (3) reports the regression estimates for subsample during 2006 to 2011 (three-year event window), and the columns (4) reports the regression estimates for all joint-equity banks. All other variables are defined in the appendix Table A1. City-, Bank-, and Year-fixed effects are included across all models. Standard errors are clustered at the city level and the robust *t*-statistics are reported in parentheses across all these model specifications.*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Borrowing shares based on outstanding loans

	Dependent Variable: Outstanding Shares, OLS			
	(1)	(2)	(3)	(4)
Variables	[2008,2009]	[2007,2010]	[2006,2011]	All
After2009.4*Treatment	0.004***	0.006***	0.008***	0.010***
	(10.15)	(12.13)	(14.23)	(16.23)
Treatment	0.004***	0.003***	0.003***	0.003***
	(5.40)	(4.49)	(3.75)	(3.08)
Firm FE	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	3,435,144	6,870,288	10,305,432	13,740,576
Adjusted R-squared	0.006	0.006	0.008	0.011

(*To be continued*)

Table 4: The Impact of Bank Expansion on Firms' Borrowing Decisions—*continued*

Panel B: Borrowing shares based on loan issuances

	Dependent Variable: Outstanding Shares, OLS			
	(1)	(2)	(3)	(4)
Variables	[2008,2009]	[2007,2010]	[2006,2011]	All
After2009.4*Treatment	0.004***	0.006***	0.007***	0.009***
	(11.17)	(10.63)	(11.78)	(13.28)
Treatment	0.004***	0.004***	0.003***	0.003**
	(4.66)	(4.03)	(3.07)	(2.52)
Firm FE	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	3,787,440	7,574,880	9,468,600	13,256,040
Adjusted R-squared	0.006	0.007	0.009	0.011

Table 5: Incumbent banks versus New-entry banks

This table provides the differences in loan- and firm-level characteristics between incumbent banks and new-entry banks. The new-entry banks in a city are defined as those of which their earliest branches in this city are opened up less than 12 months prior to the loan issuing month. *Loan Amount* is loan balance in unit of 100 Million RMB, *Maturity* is in unit of months, *Internal Rating* measures the five-category loan classification, *Guarantee Requirement* is a dummy indicating whether the loan is guaranteed by third-parties, *Delinquent* is a dummy indicating whether the loan is repaid after due date, and *Default* is a dummy indicating whether the loan is repaid three months after due date. *Assets* measures the size of borrowers in unit of 100 Million RMB while *Leverage* for financial conditions. We winsorize each of the above variables at the top and bottom 1% to reduce the effects of outliers. *T*-tests are also performed to show the statistical significance of the mean differences and *t*-statistics are reported in the last column. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Incumbent Banks			New-entry Banks				
	N	Mean	Median	N	Mean	Median	Diff	*t*-statistics
Variables	Overall Sample							
Loan Amount (100 Million RMB)	6,063,386	15.000	4.000	26,444	23.294	10.000	-8.294***	-43.40
Maturity	6,063,386	11.996	6.000	26,444	12.669	7.000	-0.673***	-5.77
Internal Rating	6,063,386	1.027	1.000	26,444	1.007	1.000	0.020***	32.40
Guarantee Requirement	6,063,386	0.218	0.000	26,444	0.325	0.000	-0.107***	-42.03
Delinquent	6,063,386	0.014	0.000	26,444	0.007	0.000	0.006***	12.04
Default	4,933,421	0.011	0.000	21,747	0.006	0.000	0.006***	11.30
Assets (100 Million RMB)	6,017,234	69.313	8.120	26,358	44.414	9.141	24.899***	12.06
Leverage	6,017,234	0.605	0.604	26,358	0.587	0.587	0.019***	3.19
	Joint-equity Bank subsample							
Loan Amount (100 Million RMB)	1,547,757	14.436	3.353	23,032	24.141	10.000	-9.705***	-48.07
Maturity	1,547,757	8.984	6.000	23,032	12.321	7.000	-3.337***	-33.07
Internal Rating	1,547,757	1.009	1.000	23,032	1.004	1.000	0.005***	10.57
Guarantee Requirement	1,547,757	0.248	0.000	23,032	0.338	0.000	-0.090***	-31.27
Delinquent	1,547,757	0.007	0.000	23,032	0.007	0.000	0.001	1.07
Default	1,265,172	0.006	0.000	19,056	0.005	0.000	0.001*	1.68
Assets (100 Million RMB)	1,540,610	76.793	8.545	22,957	43.877	9.575	32.916***	9.42
Leverage	1,540,610	0.631	0.634	22,957	0.586	0.585	0.045***	41.39

Table 6: The Impact of Bank Expansion on Joint-equity Loan Characteristics

This table reports the difference-in-difference regression estimates of the bank expansion effect on Joint-equity loan contract characteristics. The sample covers 1,570,789 loans granted by Joint-equity banks. The dependent variables are non-pricing terms of loan contracts, including the loan maturity, internal ratings, third-party guarantee requirement, the ex-post loan performance (i.e. over 90 days delinquent) and relationship borrowing dummy (i.e. a dummy indicating whether the borrower has a lending relationship with the borrowing bank during the prior 12 months). The main independent variable is the interaction, *After2009.4*Treatment*, where *After2009.4* equals one for observations after the policy shock in April 16, 2009 and zero before and *Treatment* equals one for treated bank-cities and zero for controlled bank-cities. According to the policy, an eligible bank *k* in city *j* free of regulation on new-branch entry is a bank that have outstanding branches in this city or in the capital city of the province that the city *j* is located in prior to the bank expansion policy shock. All other variables are defined in the appendix Table A1. Firm-, Bank-, and Year-fixed effects are included across all models. Standard errors are clustered at the firm level. The robust *t*-statistics for OLS regressions and robust *z*-statistics for Logit regressions are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Bank expansion effect on loan characteristics.

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Loan_SOE	Higher ATR	Relationship	Guaranteed	Rating	Default
After2009.4*Treatment	0.002*	-0.027**	0.007**	0.002**	-0.001*	-0.001*
	(1.75)	(-1.99)	(2.35)	(2.20)	(-1.69)	(-1.92)
Treatment	0.059*	-0.120*	0.041	0.012	0.004	0.005**
	(1.86)	(-1.69)	(0.90)	(0.46)	(1.16)	(2.50)
Log(Assets)	0.033***	-0.055***	-0.051***	0.003	-0.002***	0.000
	(6.03)	(-5.55)	(-14.30)	(1.53)	(-3.72)	(0.41)
Leverage	0.222***	0.388***	0.111***	-0.017	0.007	0.000
	(6.02)	(6.43)	(4.00)	(-0.83)	(1.33)	(0.16)
Pre-Trendt-1	0.009	0.018	-0.015	-0.000	0.004***	-0.002
	(0.79)	(0.88)	(-0.89)	(-0.01)	(3.01)	(-1.60)
Pre-Trendt-1	-0.005	0.021	-0.003	-0.010**	-0.000	-0.002**
	(-0.67)	(1.25)	(-0.29)	(-2.12)	(-0.06)	(-2.05)
Firm FE	No	No	Yes	Yes	Yes	Yes
City FE	Yes	Yes	No	No	No	No
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,261,775	1,261,775	1,563,576	1,563,576	1,563,576	1,277,571
R-squared	0.045	0.067	0.392	0.025	0.002	0.002

(*To be continued*)

Table 6: The Impact of Bank Expansion on Joint-equity Loan Characteristics—*continued*

Panel B: 6-month event window

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Loan_SOE	Higher ATR	Relationship	Guaranteed	Rating	Default
After2009.4*Treatment	0.012*	-0.018	0.102***	0.001	-0.001**	-0.001*
	(1.89)	(-1.36)	(7.14)	(0.23)	(-2.24)	(-1.76)
Treatment	0.157***	0.064	0.432***	0.070	-0.049	0.000
	(3.53)	(0.93)	(4.68)	(0.89)	(-1.06)	(0.23)
Log(Assets)	0.039***	-0.052***	-0.107***	0.005*	-0.001	0.000
	(6.82)	(-3.99)	(-16.82)	(1.76)	(-0.92)	(0.36)
Leverage	0.283***	0.378***	-0.043	-0.039	-0.008	0.011
	(5.89)	(3.48)	(-0.34)	(-0.97)	(-0.57)	(1.14)
Firm FE	No	No	Yes	Yes	Yes	Yes
City FE	Yes	Yes	No	No	No	No
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	156,295	156,295	185,402	185,402	185,402	181,844
R-squared	0.053	0.074	0.057	0.026	0.002	0.006

Table 7: Reactions of Incumbent Banks to Competitions

This table reports the difference-in-difference regression estimates on how big five banks react to the bank expansion caused by new-entries of Joint-equity commercial banks. The sample covers 4,519,041 loans granted by Big-five banks. The dependent variables are non-pricing terms of loan contracts, including the loan maturity, internal ratings, third-party guarantee requirement, the ex-post loan performance (i.e. over 90 days delinquent) and relationship borrowing dummy (i.e. a dummy indicating whether the borrower has a lending relationship with the borrowing bank during the prior 12 months). Our main independent variable is *After2009.4*Treatment*, where *After2009.4* equals one for observations after the policy shock in April 16, 2009 and zero before and *Treatment* equals one for treated cities and zero for controlled cities. According to the policy, an eligible city *j* free of regulation on new-branch entry is the city that have outstanding Joint-equity branches prior to the bank expansion policy shock. All other variables are defined in the appendix Table A1. Firm-, Bank-, and Year-fixed effects are included across all models. Standard errors are clustered at the city level. The robust *t*-statistics for OLS regressions and robust *z*-statistics for Logit regressions are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Bank expansion effect on loan characteristics.

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Loan_SOE	Higher ATR	Relationship	Guaranteed	Rating	Default
After2009.4*Treatment	0.062	0.012	0.015	-0.008**	-0.004**	0.001**
	(1.43)	(0.33)	(1.20)	(-2.04)	(-2.03)	(1.98)
Log(Assets)	0.035***	-0.054***	-0.017***	-0.009	-0.013***	-0.002
	(8.10)	(-9.72)	(-8.09)	(-0.76)	(-7.92)	(-0.93)
Leverage	0.235***	0.327***	0.104***	0.010	0.048***	0.005
	(6.99)	(8.14)	(8.20)	(0.54)	(7.19)	(1.13)
Firm FE	No	No	Yes	Yes	Yes	Yes
City FE	Yes	Yes	No	No	No	No
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,489,419	3,489,419	4,519,041	4,519,041	4,519,041	3,634,230
R-squared	0.051	0.045	0.553	0.010	0.003	0.006

(*To be continued*)

Table 7: Reactions of Incumbent Banks to Competitions—*continued*

Panel B: 6-month Event Window

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Loan_SOE	Higher ATR	Relationship	Guaranteed	Rating	Default
After2009.4*Treatment	0.033	0.005	0.052**	-0.001	-0.013*	0.001
	(1.10)	(0.27)	(1.96)	(-0.15)	(-1.73)	(1.55)
Log(Assets)	0.031***	-0.047***	-0.105***	0.002	-0.002**	0.000
	(4.849)	(-5.892)	(-14.562)	(0.713)	(-2.075)	(0.087)
Leverage	0.244***	0.289***	0.171	0.013	0.020	0.001
	(5.508)	(4.954)	(1.349)	(0.629)	(1.535)	(0.294)
Firm FE	No	No	Yes	Yes	Yes	Yes
City FE	Yes	Yes	No	No	No	No
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	534,280	534,280	662,988	662,988	662,988	633,534
R-squared	0.044	0.035	0.045	0.005	0.005	0.007

Table 8: Bank Expansions Effect on Firms

This table reports the difference-in-difference regression estimates on the effect of 2009 bank entry deregulation on firm activities and performance. We merge the Chinese Industry Census firm level data with the CBRC loan data and restrict our sample to the firms which have had outstanding bank loans between 2006 and 2012. The dependent variable in column 1 is the logarithm of total assets of the firm. Column 2 is the logarithm of fixed assets of the firm. Column 3 is the logarithm of total liabilities. Column 4 is the leverage of the firm. Column 5 is the logarithm of total sales. Column 6 is the logarithm of total number of workers in the firm. Column 7 is the ROA (Return on Assets) of the firm. Column 8 is the TFP (Total Factor Productivity) of the firm. Column 9 is the Interest Rate, measured as the total amount of interest payment divided by the total amount of outstanding loans at the end of prior year. Our main independent variable is *After2009.4*Treatment*, where *After2009.4* equals one for observations after the policy shock in April 16, 2009 and zero before and *Treatment* equals one for treated cities (at least one joint equity bank can open branches freely in that city after the deregulation, i.e., the city that have outstanding Joint-equity branches prior to the bank expansion policy shock) and zero for controlled cities. Pre-Trend$_{t-1}$ and Pre-Trend$_{t-2}$ are for parallel pre-trends, where Pre-Trend$_{t-1}$ equals year dummy for 2008 times dummy *Treatment* and Pre-Trend$_{t-2}$ equals year dummy for 2007 times dummy *Treatment*. All regressions are controlled for firm fixed effect and year fixed effect. Standard errors are clustered at firm level and the robust *t*-statistics are reported in parentheses across all these model specifications. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Variables	Log(Assets)	Log(Fixed Assets)	Log(Liabilities)	Leverage	Log(Sales)	Log(Employee)	ROA	TFP	Interest Rate
After2009.4*Treatment	0.072*	0.136*	0.177**	-0.031***	-0.089	0.153**	0.022***	0.142**	-0.053***
	(1.70)	(1.79)	(2.32)	(-2.87)	(-1.40)	(2.49)	(4.02)	(2.04)	(-3.93)
Pre-Trendt-1	-0.088	-0.007	-0.127*	-0.014	-0.116*	0.080	0.004	0.074	0.002
	(-1.48)	(-0.10)	(-1.74)	(-1.24)	(-1.94)	(1.60)	(0.62)	(0.50)	(0.77)
Pre-Trendt-2	-0.046	-0.033	-0.083	-0.009	0.007	0.033	0.000	0.182	0.005
	(-0.88)	(-0.52)	(-1.33)	(-1.01)	(0.13)	(0.67)	(0.03)	(1.54)	(1.01)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	226,533	226,172	226,504	226,141	226,503	224,728	226,039	224,698	99,185
Number of firms	50,182	50,157	50,181	50,120	50,173	49,839	50,102	49,830	25,470
Adjusted R-squared	0.237	0.082	0.163	0.002	0.200	0.035	0.006	0.002	0.426

Table 9: State Ownership and Bank Expansions Effect on Firms

This table exploits the impact of state ownership on Joint-equity bank expansions using the triple difference regression estimates. We merge the Chinese Industry Census firm level data with the CBRC loan data and restrict our sample to the firms which have had outstanding bank loans between 2006 and 2012. The dependent variable in column 1 is the logarithm of total assets of the firm. Column 2 is the logarithm of fixed asset of the firm. Column 3 is the logarithm of total liabilities. Column 4 is the leverage of the firm. Column 5 is the logarithm of total sales. Column 6 is the logarithm of total number of workers in the firm. Column 7 is the ROA (Return on Assets) of the firm. Column 8 is the TFP (Total Factor Productivity) of the firm. Column 9 is the Interest Rate, measured as the total amount of interest payment divided by the total amount of outstanding loans at the end of prior year. Our main independent variable is *After2009.4*Treatment*Private*, where *After2009.4* equals one for observations after the policy shock in April 16, 2009 and zero before and *Treatment* equals one for treated cities (at least one joint equity bank can open branches freely in that city after the deregulation, i.e., the city that have outstanding Joint-equity branches prior to the bank expansion policy shock) and zero for controlled cities. Pre-Trend$_{t-1}$ and Pre-Trend$_{t-2}$ are for parallel pre-trends, where Pre-Trend$_{t-1}$ equals year dummy for 2008 times dummy *Treatment* and Pre-Trend$_{t-2}$ equals year dummy for 2007 times dummy *Treatment*. Dummy *Private* is for whether the firm is privately owned or not based on its registration type, excluding firms that were privatized from SOEs. All regressions are controlled for firm fixed effect and year fixed effect. Standard errors are clustered at firm level and the robust *t*-statistics are reported in parentheses across all these model specifications. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Variables	Log(Assets)	Log(Fixed Assets)	Log(Liabilities)	Leverage	Log(Sales)	Log(Employee)	ROA	TFP	Interest Rate
After2009.4*Treatment*Private	0.178***	0.116***	0.157***	-0.009***	0.123***	0.288***	0.006***	0.275***	-0.028***
	(12.02)	(6.37)	(8.69)	(-2.77)	(8.12)	(14.34)	(3.02)	(2.67)	(-4.30)
After2009.4*Treatment	-0.064***	0.101***	0.119***	-0.023**	-0.201***	-0.109*	0.016***	-0.108	-0.027*
	(-4.03)	(3.09)	(4.09)	(-2.04)	(-3.07)	(-1.70)	(2.89)	(-0.26)	(-1.83)
Pre-Trendt-1	-0.087	-0.006	-0.126*	-0.014	-0.115*	0.082	0.004	0.076	0.004
	(-1.45)	(-0.09)	(-1.72)	(-1.24)	(-1.92)	(1.64)	(0.63)	(0.51)	(0.93)
Pre-Trendt-2	-0.045	-0.032	-0.082	-0.009	0.008	0.035	0.000	0.183	0.006
	(-0.85)	(-0.50)	(-1.31)	(-1.01)	(0.15)	(0.71)	(0.04)	(1.15)	(1.11)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	226,533	226,172	226,504	226,141	226,503	224,728	226,039	224,698	99,185
Number of firms	50,182	50,157	50,181	50,120	50,173	49,839	50,102	49,830	25,470
Adjusted R-squared	0.237	0.082	0.163	0.002	0.200	0.035	0.006	0.237	0.426

Table 10: Borrowing Relationship and Bank Expansions Effect on Firms

This table exploits the impact of borrowing relationship on Joint-equity bank expansions using the triple difference regression estimates. We merge the Chinese Industry Census firm level data with the CBRC loan data and restrict our sample to the firms which have had outstanding bank loans between 2006 and 2012. The dependent variable in column 1 is the logarithm of total assets of the firm. Column 2 is the logarithm of fixed asset of the firm. Column 3 is the logarithm of total liabilities. Column 4 is the leverage of the firm. Column 5 is the logarithm of total sales. Column 6 is the logarithm of total number of workers in the firm. Column 7 is the ROA (Return on Assets) of the firm. Column 8 is the TFP (Total Factor Productivity) of the firm. Column 9 is the Interest Rate, measured as the total amount of interest payment divided by the total amount of outstanding loans at the end of prior year. Our main independent variable is *After2009.4*Treatment*Transaction Share*, where *After2009.4* equals one for observations after the policy shock in April 16, 2009 and zero before and *Treatment* equals one for treated cities (at least one joint equity bank can open branches freely in that city after the deregulation, i.e., the city that have outstanding Joint-equity branches prior to the bank expansion policy shock) and zero for controlled cities. Pre-Trend_{t-1} and Pre-Trend_{t-2} are for parallel pre-trends, where Pre-Trend_{t-1} equals year dummy for 2008 times dummy *Treatment* and Pre-Trend_{t-2} equals year dummy for 2007 times dummy *Treatment*. *Transaction Share* is the percentage of transaction loan issuance amounts prior to 2009 (i.e., 2007 and 2008) over the total new issuance loan amounts of each firm. All regressions are controlled for firm fixed effect and year fixed effect. Standard errors are clustered at firm level and the robust *t*-statistics are reported in parentheses across all these model specifications. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Variables	Log(Assets)	Log(Fixed Assets)	Log(Liabilities)	Leverage	Log(Sales)	Log(Employee)	ROA	TFP	Interest Rate
After2009.4*Treatment*Transaction Share	0.450***	0.109***	0.104***	0.030***	0.442***	0.341***	0.006***	0.124***	-0.017***
	(53.50)	(42.41)	(51.45)	(14.69)	(46.86)	(31.72)	(4.89)	(2.79)	(-3.19)
After2009.4*Treatment	-0.313***	0.152***	0.141***	-0.050***	-0.386***	-0.078	0.016***	0.076	-0.031**
	(-6.55)	(5.97)	(7.24)	(-4.64)	(-6.20)	(-1.26)	(3.04)	(0.55)	(-2.06)
Pre-Trendt-1	-0.083	0.002	-0.117*	-0.013	-0.113*	0.085*	0.003	0.006	0.003
	(-1.45)	(0.03)	(-1.69)	(-1.19)	(-1.95)	(1.70)	(0.47)	(0.05)	(0.15)
Pre-Trendt-2	-0.034	-0.032	-0.063	-0.009	-0.003	0.031	-0.000	0.090	(0.008)
	(-0.68)	(-0.50)	(-1.04)	(-0.99)	(-0.05)	(0.63)	(-0.09)	(0.94)	(1.09)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	226,533	226,172	226,504	226,141	226,503	224,728	226,039	224,698	99,185
Number of firms	50,182	50,157	50,181	50,120	50,173	49,839	50,102	49,830	25,470
Adjusted R-squared	0.284	0.110	0.205	0.004	0.234	0.044	0.006	0.005	0.425

Appendix

Table A1: Variables' Definition and Construction

Variables	Definitions
After2009.4	A dummy variable that equals one if it is after the deregulation shock and zero
Treatment	A dummy variable at city-bank level takes value of one if the joint-equity
Loan Size (Million RMB)	The balance of each loan contract. The unit is in million RMB.
Maturity	The term of each loan contract. The unit is months.
Internal Rating	The credit score placed by the loan officers in the bank. The larger the number,
Guarantee Requirement	A dummy variable that equals one if the bank requires third-party guarantee
Relationship	A dummy variable that equals one if the bank had a lending relationship with
Delinquent	A loan performance measure that equals one if the loan is not repaid on time
Default	A loan performance measure that equals one if the loan is not repaid over three
Loan_SOE	A dummy indicating whether the borrower is state-owned enterprise.
ATR	Asset turnover ratio, is defined as the total operating income divided by total
Higher ATR	A dummy indicating whether the assets turnover ratio is above the median
Assets (Million RMB)	The total assets of firms. The unit is in million RMB.
Fixed Assets (Million RMB)	The amount of fixed assets. The unit is million RMB.
Liabilities (Million RMB)	The total liabilities of firms. The unit is in million RMB.
Leverage	Book leverage, measured as the ratio of total liabilities over total assets.
Sales (Million RMB)	The total amount of sales. The unit is in million RMB.
Employee	The amount of employment.
ROA	It is calculated by dividing a firm's annual earnings by its total asset in the
TFP	A measure of firm level efficiency, i.e. total factor productivity.
Interest Rate	Amount of firm interest expense in CIC data divide by the total loans in CIC data with bank loans outstanding
Local GDP	It is the city level GDP.
Fixed Investment/Local GDP	The fixed assets investment divided by local gross domestic production.
Fiscal Expenditure/Revenues	The fiscal condition measured as the ratio of government expenditures over

Table A2: Provincial Distributions of Joint-equity Banks

This table shows the snapshot distribution of joint-equity banks on April 2009 (right before the deregulation). The table has 31 rows for 31 provinces respectively. For each province, there are four columns: (1) total number of branches of all 12 joint-equity banks, (2) total number of unique joint equity banks, (3) total number of unique joint equity banks which have branches in its capital city and (4) the number of cities.

	(1)	(2)	(3)	(4)
Province	No. Joint-equity Branches	No. Joint-equity Banks	No. Joint-equity Banks in Capital City	No. Cities
Beijing	332	10	10	1
Tianjin	128	10	10	1
Hebei	49	6	5	11
Shanxi	53	8	8	11
Inner Mongolia	14	4	4	9
Liaoning	206	9	7	14
Jilin	13	4	4	8
Heilongjiang	55	6	5	13
Shanghai	379	10	10	1
Jiangsu	311	11	11	13
Zhejiang	396	12	12	11
Anhui	50	6	6	18
Fujian	237	8	8	9
Jiangxi	29	4	4	11
Shandong	291	10	10	17
Henan	94	7	7	17
Hubei	127	8	8	14
Hunan	72	6	6	14
Guangdong	926	9	9	21
Guangxi	20	6	6	14
Hainan	14	2	2	3
Chongqing	119	8	8	1
Sichuan	117	11	11	21
Guizhou	0	0	0	9
Yunnan	104	9	9	16
Xizang	0	0	0	7
Shannxi	89	8	8	10
Gansu	17	2	2	14
Qinghai	0	0	0	8
Ningxia	0	0	0	5
Xinjiang	26	4	4	15

Table A3: 4T Effect on Deregulated Bank-Cities and Regulated Bank-Cities

This table reports the comparisons of growth rate of outstanding loans from Nov 2008 to Mar 2009 between deregulated bank-cities (i.e. treated groups) and regulated bank-cities (i.e. control groups). The growth rate is for bank-city-month outstanding loan. The *t*-test was employed to show the significance of mean difference and t-statistics are reported in parentheses.

	All-Banks				Only Joint equity Banks			
	Without winsorization		With winsorization		Without winsorization		With winsorization	
From Nov 2008 to Mar 2009	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Regulated Bank-Cities	60.58%	25.31%	31.12%	1.71%	36.51%	9.29%	32.76%	7.91%
Deregulated Bank-Cities	41.12%	6.43%	33.60%	2.32%	37.46%	6.43%	33.61%	2.32%
Mean Difference	-19.46%		2.48%		0.95%		0.85%	
t-statistics	(-0.68)		(-0.88)		(1.01)		(0.12)	

Table A4: Scale Back of Big Five Banks in City Market Share

This table exploits the effect of Joint-equity bank expansions on city level big-five bank market share using the standard difference-in-difference regression estimates. The sample spans from December 2006 to June 2013. The dependent variable is natural logarithm of total amount of loans granted by big five banks at city-month level. Our main independent variable is *After2009.4*Treatment*, where *After2009.4* equals one for observations after the policy shock in April 16, 2009 and zero before and *Treatment* equals one for treated cities (at least one joint equity bank can open branches freely in that city after the deregulation, i.e., the city that have outstanding Joint-equity branches prior to the bank expansion policy shock) and zero for controlled cities. All regressions are controlled for city fixed effect and year fixed effect. Standard errors are clustered at firm level for column (5) to column (8) and the robust *t*-statistics are reported in parentheses across all these model specifications. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	[200804, 201004]	[200704, 201104]	[200612, 201204]	[200612, 201306]	[200804, 201004]	[200704, 201104]	[200612, 201204]	[200612, 201306]
After2009.4*Treatment	-0.079***	-0.135***	-0.158***	-0.189***	-0.079	-0.135	-0.158*	-0.189*
	[-4.574]	[-9.042]	[-11.122]	[-13.502]	[-1.010]	[-1.496]	[-1.710]	[-1.879]
Log(GDP)	0.190***	0.162***	0.156***	0.203***	0.190	0.162	0.156	0.203*
	[4.199]	[6.628]	[8.492]	[13.182]	[1.163]	[1.275]	[1.376]	[1.713]
Fixed Investment/Local GDP	0.055*	0.080***	0.084***	0.088***	0.055	0.080	0.084	0.088
	[1.848]	[4.439]	[5.563]	[6.743]	[0.641]	[0.936]	[0.968]	[1.099]
Fiscal Expenditure/Revenues	0.004	0.010***	0.000	-0.008***	0.004	0.010	0.000	-0.008
	[1.205]	[4.531]	[0.046]	[-4.389]	[0.366]	[0.948]	[0.010]	[-0.964]
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,861	13,716	18,006	22,302	6,861	13,716	18,006	22,302
R-squared	0.990	0.985	0.982	0.980	0.990	0.985	0.982	0.980
No. Clusters	NO	NO	NO	NO	286	286	286	287

Table A5: Characteristics of Targeted Borrowers

This paper reports summary statistics (i.e. the mean and median) on the characteristics of targeted borrowers across years from 2007 to 2013. *# Employee* is the number of employees. *Assets* is the total assets, in unit of billion RMB. *Leverage* is the total liabilities divided by total assets. *ROA*, the efficiency measure, is defined as the ratio of operating incomes over total assets. *Lower Hierarchy* is a dummy indicating whether firms are at city- or county-hierarchy.

	2007		2008		2009		2010		2011		2012		2013	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
SOE Borrowers From Big Five Banks														
# Employee (1000)	1.320	0.136	1.532	0.172	1.359	0.149	1.461	0.176	1.624	0.245	1.573	0.283	1.783	0.246
Assets (Billion RMB)	4.504	1.302	4.309	1.299	5.056	1.187	10.403	1.196	6.190	1.216	6.071	1.135	7.317	1.332
Leverage	0.615	0.624	0.605	0.612	0.606	0.611	0.606	0.611	0.603	0.608	0.598	0.603	0.597	0.606
ATR	1.603	0.350	45.960	0.388	2.053	0.405	2.189	0.452	1.828	0.522	1.696	0.563	9.475	0.521
Lower Hierarchy	0.615	1.000	0.599	1.000	0.613	1.000	0.597	1.000	0.569	1.000	0.567	1.000	0.569	1.000
SOE Borrowers From Joint Equity Banks														
# Employee (1000)	0.483	0.066	0.609	0.068	0.616	0.071	0.651	0.071	0.688	0.081	0.605	0.078	0.671	0.074
Assets (Billion RMB)	9.072	1.470	6.202	1.397	7.632	1.133	4.193	1.061	4.226	0.913	3.199	0.896	4.069	0.879
Leverage	0.651	0.674	0.654	0.667	0.643	0.661	0.615	0.631	0.628	0.642	0.625	0.641	0.619	0.638
ATR	1.041	0.301	1.086	0.321	1.127	0.378	16.585	0.354	1.607	0.429	5.572	0.447	1.436	0.472
Lower Hierarchy	0.500	0.500	0.535	1.000	0.569	1.000	0.593	1.000	0.576	1.000	0.601	1.000	0.608	1.000
Non SOE Borrowers From Big Five Banks														
# Employee (1000)	0.686	0.124	0.781	0.189	0.670	0.141	0.600	0.135	0.597	0.144	0.587	0.149	0.649	0.166
Assets (Billion RMB)	1.747	0.692	1.581	0.604	3.716	0.550	3.423	0.473	3.389	0.419	3.409	0.399	1.264	0.418
Leverage	0.556	0.552	0.547	0.541	0.543	0.536	0.534	0.528	0.524	0.517	0.512	0.506	0.512	0.507
ATR	17.477	0.643	24.381	0.758	19.806	0.738	3.815	0.778	22.135	0.883	21.170	0.930	4.245	0.958
Lower Hierarchy	0.918	1.000	0.921	1.000	0.930	1.000	0.939	1.000	0.941	1.000	0.943	1.000	0.940	1.000
Non SOE Borrowers From Joint Equity Banks														
# Employee (1000)	0.366	0.050	0.382	0.065	0.303	0.065	0.275	0.061	0.278	0.062	0.253	0.060	0.280	0.068
Assets (Billion RMB)	2.380	0.625	1.827	0.570	1.206	0.374	1.925	0.312	0.703	0.296	0.684	0.280	0.738	0.303
Leverage	0.589	0.588	0.584	0.585	0.561	0.554	0.544	0.535	0.535	0.529	0.532	0.527	0.533	0.527
ATR	40.320	0.665	31.121	0.741	30.581	0.921	48.994	0.969	51.122	1.030	110.932	1.034	117.960	1.042
Lower Hierarchy	0.899	1.000	0.908	1.000	0.930	1.000	0.948	1.000	0.952	1.000	0.956	1.000	0.952	1.000

Table A6: Bank Expansions Effect on All Firms

This table reports the difference-in-difference regression estimates on the effect of Joint-equity bank expansions on firms. The sample is restricted to all manufacturing firms in Chinese Industry Census data from 2006 to 2012. The dependent variable in column 1 is the logarithm of total assets of the firm. Column 2 is the logarithm of fixed asset of the firm. Column 3 is the logarithm of total liabilities. Column 4 is the leverage of the firm. Column 5 is the logarithm of total sales. Column 6 is the logarithm of total number of workers in the firm. Column 7 is the ROA (Return on Assets) of the firm. Column 8 is the TFP (Total Factor Productivity) of the firm. Our main independent variable is *After2009.4*Treatment*, where *After2009.4* equals one for observations after the policy shock in April 16, 2009 and zero before and *Treatment* equals one for treated cities and zero for controlled cities. According to the policy, an eligible city *j* free of regulation on new-branch entry is the city that have outstanding Joint-equity branches prior to the bank expansion policy shock. Column 1 to 8 are controlled by firm fixed effect and year fixed effect. Standard errors are clustered at firm level and the robust *t*-statistics are reported in parentheses across all these model specifications. .*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Log(Assets)	Log(Fixed Assets)	Log(Liabilities)	Leverage	Log(Sales)	Log(Employee)	ROA	TFP
After2009.4*Treatment	0.067***	0.093***	0.017	-0.018***	0.110***	0.126***	0.010***	0.638***
	(6.54)	(7.06)	(1.22)	(-6.67)	(10.78)	(12.18)	(6.00)	(7.23)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,086,333	2,078,597	2,084,805	2,079,898	2,086,212	2,055,139	2,079,673	2,055,018
Number of firms	596,278	595,369	595,967	594,434	596,243	588,070	594,400	588,035
Adjusted R-squared	0.223	0.078	0.105	0.006	0.278	0.149	0.023	0.013