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

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Abstract

Using proprietary loan-level data and bank branch population data in China, this paper investigates the effects of the 2009 bank entry deregulation on competition dynamics among banks and on economic activities. Tracing out individual loans, we find that new entrant banks target mostly the existing borrowers of the incumbent banks. After the deregulation shock, new entrant banks tend to lend significantly more to inefficient state-owned enterprises (SOEs) that have implicit government guarantees. Although the deregulation makes credit allocation worse across firms, it has significantly positive effects on individual firms with bank credit access. The deregulation 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 firms' assets investments, employments, net incomes, and ROA. These positive effects on loan contract terms and on firm activities are more pronounced for private firms.

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

1. Introduction

Banks are the most important financial intermediaries in many countries and play an important role in economic growth, whereby banking sectors are often heavily regulated across the globe (e.g., Barth, Caprio, and Levine (2013)). A central question in debate is whether bank competition helps economic development or not. On the one hand, high bank competition could lower borrowing costs and improve lending efficiency to fuel economic growth (e.g., Jayaratne and Strahan (1996); Smith (1998); Claessens, Demirguc-Kunt, and Huizinga (2001); Barth, Caprio, and Levine (2001, 2004)). On the other hand, competition could increase the risks in banking system (e.g., Keeley (1990); Allen and Gale (2000); Hellman, Murdoch, and Stiglitz (2000); Jiang, Levin, and Lin (2016)) and discourage loan screening and monitoring in relationship lending (e.g., Peterson and Rajan (1995); Boot and Thakor (2000); Marquez (2002)). The empirical literature has also shown the mixed evidence.[1] Due mainly to data limitation, previous empirical studies do not disentangle these benefits and costs of increased bank competition and estimate only its overall net effects. They often use aggregate market structure indicators to measure bank competition level that hardly captures the full dynamics of competition in reality.

This paper aims to document loan-to-loan competition dynamics after a bank entry deregulation in China and to separate the countervailing effects of bank competition by tracing out each loan to firms. The data are from the China Banking Regulatory Commission (CBRC) which records 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 entrant bank branches lend mainly to the firms that have been borrowing from incumbent banks. After bank entry deregulation in 2009, new entrant banks lend significantly more to SOEs, especially to those inefficient SOEs with higher political hierarchy that gives better implicit government guarantee. Second, the deregulation makes new banks provide more competitive loan contracts (e.g., lower interest rates, better internal ratings, more third-party guarantees) and leads to lower delinquency

[1] See, for example, the survey papers; Berger el al. (2004) and Allen et al. (2001).

rates, especially for private firms. Third, for firms with bank credit access, the deregulation cause firms to expand in assets, hire more workers, and become more efficient. These positive effects are significantly more prominent for private firms. 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 individual firms and its negative effects on credit allocation across firms. This sheds lights on the inconclusive results of previous studies that explore mainly aggregate effects of bank competition.

We use the 2009 partial bank entry deregulation in China as an exogenous shock to establish the causal effects. 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 four state-owned commercial banks while the twelve joint equity banks were severely suppressed. For example, after the bank entry regulation in 2006, joint equity banks were allowed to apply for only one branch in one 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 established branches in this city or in the province capital of this city. This deregulation led to increased competitions between the incumbent big four banks and joint equity banks in deregulated areas. We use this partial deregulation to perform the Difference-in-Differences analysis. Our treatment group contains the joint equity banks in deregulated cities where they can expand freely after 2009. The control group contains the big four banks that were not affected by the 2009 shock. In particular, the big four banks have been dominating the banking industry in China. For example, each of big four banks covered already 97% of the cities before the bank entry regulation in 2006 and open very few branches after that.

[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 four commercial banks, twelve joint equity banks, and 131 local municipal banks. See detailed discussion in Section 2.

Our first analysis concerns how new entrant banks target borrowers after the deregulation. Compared to the big four, joint equity banks in China have been expanding dramatically since the 2009 deregulation. In particular, unconditionally, joint equity banks' share in total bank loan debt increased dramatically from 21.7% in 2007 to 40.1% in 2013. When joint equity banks enter into a new 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 any banks before. In other words, the joint equity banks compete mainly for the existing clients of incumbent big four banks. Moreover, the Diff-in-Diff regressions show that the 2009 deregulation led to an increase of 7% on number of new opened bank branches and an increase of 17.5% on loans outstanding from joint equity banks in deregulated cities. The 2009 deregulation hugely increase the market shares and the competitiveness of joint equity banks in China.

Furthermore, surprisingly, joint equity banks issue approximately 23.7% of their loans to SOEs that is higher than big four banks (18.5%).[3] After 2009 deregulation, joint equity banks lend even more to SOEs. On average, within one year after 2009 deregulation, joint equity banks' loans to SOEs increased by 11.0% in deregulated cities. In our data, SOEs in China (as in many other countries) are much less efficient than private firms and distort the credit allocation. Moreover, among SOEs, the new bank branches lend significantly more to less efficient ones (i.e., lower asset turnover ratio). We also find that these less efficient SOEs typically have larger assets and higher political hierarchy (e.g., central government SOEs) that leads to softer budget constraints (i.e., explicit or implicit government guarantees). Joint equity banks usually do not have the soft information on local firms when they newly enter into a city so that they prefer to lend to the "safe assets" (i.e., SOEs). We find that this preference for SOE start to diminish after 2 years of entry when joint equity banks establish the relationship with local firms and have more soft information. In sum, due to the soft budget constraint of SOEs, bank entry deregulation could lead to less efficient credit allocation,

[3] The big four banks in China have been criticized for their inefficient lending to SOEs which results in large amount of nonperforming loans (e.g., Allen, Qian, and Qian (2005)).

especially in the short-run. This serves to emphasize the potentially unintended general equilibrium consequences for banking reform.

Second, we study how deregulation affect the competition dynamics between new and incumbent banks in terms of loan contract terms and loan performance. Unconditionally, the loans from new entrant banks have more third party guarantees, better internal ratings, longer maturity, and lower default ratio than the loans from incumbent banks. Consistent with these unconditional patterns, the 2009 deregulation leads to significantly more guarantees, better internal ratings, and lower default ratio of joint equity bank loans. These effects are almost muted for SOEs and come mainly from private borrowers. For example, the 2009 deregulation, the percentage of loans to private firms that need third party guarantees increases by 11.5% while the increase is only 3.4% for SOE loans. Moreover, after the deregulation, private firms need significantly better internal ratings to borrow from joint equity banks while this effect is statistically insignificantly for SOEs. These evidences suggest that, when a joint equity bank enters into a new city, the loan screening standard becomes significantly higher for local private firms but not for SOEs which anyway have soft budget constraints. Consequently, the default ratio of private firms decreased by 40% due mainly to the stricter screening standard. Moreover, consistent with the evidence of many previous studies, increased bank competition leads to lower interest rates, especially for private firms. In particular, the 2009 deregulation leads to a decrease of 4.3% on the interest rates for private firms but no significant effects for SOEs' borrowing costs.

Third, we explore the economic consequences of the 2009 deregulation. We match the CBRC loan-level data into the Chinese Industry Census (CIC) firm-level data by firm IDs. This allows us to trace each loan a firm took out and how firms reacted in terms of investments in assets, employment, profitability, and efficiency. We restrict our sample to the firms with bank credit access since the competition should have most direct effects on the firms borrowing from banks. We find that on average the 2009 deregulation led to increases in growth rates of fixed assets and number of employees by 34.1% and 14.8%, respectively. Increased bank competition after 2009 also led to improvements in firms' performance and efficiency. In particular, the 2009 deregulation led to increases in firm's net income growth and ROA by 87.2% and 13.4%,

respectively. Furthermore, we find that private firms can benefit from increased bank competition significantly more than SOEs can. For example, the deregulation leads to increases in private firms' fixed assets, employees, net incomes, and ROA significantly more than SOEs. This is consistent with the previous evidence that increased bank competition would lower down the interest rate significantly more for private firms than SOEs. In China, SOEs have been distorting the credit allocation and private firms have very limited access to bank credit. This is a long-standing issue in China's banking system. Our results suggest that, at the firm level, when a private firm can borrow from banks, it can benefit from increased bank competition via better loan terms, whereby the added value from competition is not so much for SOEs. However, the competition could lead to worse credit distortion toward SOEs would undermine the positive effects of increased competition at individual firm level.

This paper contributes to the literature in three folds. First, this study adds to the literature on the nexus of financial market development and economic growth. Prior studies have shown either positive or negative overall effects of financial market development (e.g., bank concentration and competition) on economic growth.[4] These inconclusive findings are due mainly to data limitation which makes it hard to disentangle the costs and benefits of increased bank competition (e.g., Berger el al. (2004)). For example, many previous studies use aggregate market indexes to measure bank competition level (e.g., Herfindahl-Hirschman Index (HHI)) which might not fully capture the real competition levels (e.g., Claessens and Laeven (2004)).[5] By using novel comprehensive loan and branch data, this paper documents the loan-to-loan competition dynamics. For the first time, we disentangle the positive effects of increased bank competition at individual firm level and the negative effects on credit allocation across firms. The worse credit allocation that is due largely to SOE's soft budget

[4] Many studies have shown the positive relationship between financial market development and economic growth. See for example, Gurley and Shaw (1955); Goldsmith (1969); McKinnon (1973); King and Levine (1993a, b); Demirguc-Kunt and Maksimovic (1998); Rajan and Zingales (1998); Levine and Zervos (1998); Levine, Loayza, and Beck (2000); Cetorelli (2003); Cetorelli and Strahan (2006); Bertrand, Schoar, and Thesmar (2007). There are also opposing views and contrary evidence on the negative effects of financial reform, especially for bank expansion. See for example, Peterson and Rajan (1994); Berger et al. (1998); Cetorelli (2001); Cetorelli and Gambera (2001); Prasad, Rogoff, Wei, and Kose (2003); Hakenes and Schnabel (2010).

[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).

constraint is a novel cost of bank competition. These opposing forces of bank competition documented in the paper shed light on mixed evidence from previous empirical studies and provide microeconomic foundation of the literature on finance-growth nexus.

The second 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, Mityakov, and Townsend (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) could be endogenously determined by prices and firm performance (e.g., Bresnahan (1989)). The 2009 partial bank entry deregulation shock in China provides us an ideal empirical setting for Difference-in-Differences analysis.[6] After April 2009, different joint equity banks have different exposures to the shock even in the same city. This exogenous variation is across 12 banks and across 340 cities. It is hardly confounded with common economic growth trends in individual cities. Moreover, we don't find any significant changes in lending behavior of banks (e.g., targeting SOEs) and changes in firm activities prior to 2009 deregulation (i.e., we pass the parallel trend's tests).

Third, 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 distorted mainly 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 that have implicit or explicit government guarantees (e.g., Qian and Roland (1998); Song and Xiong (2017)). This leads to the adverse effects of banking deregulation on credit allocation in China (i.e., new entrant banks prefer SOEs). Our results suggest that policy makers should consider the interactions among different frictions for the reform policy. Fixing one distortion (bank entry restriction in this paper) might have negative side effects due to the other existing distortions (soft budget constrain of SOEs in this paper). This echoes to the recent studies arguing that reforms in China could have unintended

[6] Jayaratne and Strahan (1996) use the staggered bank branch deregulation across different states in the U.S. to establish the positive effects of bank entry deregulation on rates of real per capita growth in income and output.

adverse consequences (e.g., Hachem and Song (2016, 2017); Chen, Petukhov, and Wang (2017); Wang et al. (2017)). Liu, Wang, and Xu (2017) raise a similar point as this paper and argue that interest-rate liberalization in China improves capital allocations within each sector but could exacerbates misallocations across sectors which is due to SOEs' distorted incentives. Besides China, the consolidation of banks is a global phenomenon eliciting many public policy debates (e.g., Berger, Demsetz, and Strahan (1999)). Policy makers' decisions on banking reforms rely heavily on fully understanding the real economic consequences of bank competition, especially the potential adverse effects as what we find in China.

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

2. Background

2.1. 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 both 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.[7] The big four banks are under directly control of the

[7] 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.

state. The two main shareholders of these big four commercial banks are the Ministry of Finance and China Investment Corporation.[8]

After the big four state-owed commercial banks, China established shareholding banks as well. In 1987, the Bank of Communications (BoCom) was formally established and became the first national shareholding commercial bank.[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 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 four 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 four commercial banks, they are catching up very quickly. In particular, in 2006, the total assets of the big four banks amounted to 23.7 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 four banks was 62.0 trillion RMB and the total asset amount of the joint equity banks was 27.0 trillion RMB.

2.2. 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, the 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

[8] China Investment Corporation is a sovereign wealth fund which manages the foreign exchange reserves of China.
[9] BoCom sometimes is also classified as a state-owned bank and called as "big five" together with ICBC, ABC, CCB, and BOC. Under many circumstances, especially in recent years, CBRC consider BoCom as the same as big four regarding the banking regulation and policy.
10 Please refer to CBRC Order [2006] No.2, titled "The implementation of administrative licensing items on Chinese commercial banks"

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 numbers of branches allowed to be opened in each city were capped by the CBRC. In the end of 2005, big four bank branches on average covered approximately 95% 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 four 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

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

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.[13]

In this paper, we focus on this 2009 partial deregulation and use it as an exogenous shock to perform the Differences-in-Difference. This policy shock led to the significant growth of joint equity market share and increased competition pressure to incumbent big four commercial banks. This provides an ideal empirical setting to establish the causal effects of bank expansion. Specifically, the 2009 deregulation doesn't apply to big four which have already covered most cities in China. The big four commercial banks are the control group in our analysis. Our treatment group contains joint equity banks in the cities where they are free to enter after April 2009. Since this deregulation only applies to certain regions and banks, we can exploit the heterogeneity within a city but across banks.[14] This allows us to establish the causal effects of bank competition on economic activities.

3. 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.

3.1. 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

[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.

[13] In this paper, we exclude the BoCom in our analysis. Compared with big four, the BoCom has much fewer branches before the bank entry regulation in 2006 (i.e., cover only 30.7 %). Also, BoCom is not considered as joint equity bank in the 2009 partial deregulation. It is between the big four and the twelve joint equity banks.

[14] Table A2 in Appendix shows the distribution of branch numbers of different banks across provinces before the 2009 deregulation.

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).[15]

3.2. 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 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 16 commercial banks, i.e. big four 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

[15] 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.

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.

3.3. Chinese Industry Census Data

The other dataset we use in this paper is Chinese Industrial Census (CIC) from 1998 to 2013.[16] 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, 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.[17] Using firm registration type from CIC data, we classify firms as SOE and Non-SOEs. In total, there are 689,407 firms during 2004 to 2013. 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

[16] We obtained the CIC data between 1998 and 2013, except for 2010 which has bad quality. For 2010, we use the Orbis data from the BvD to fill in the firm variables in CIC. We are able to recover approximately 80% of the data in 2010.

[17] We extract and compile the loan-level interest rate information from CSMAR and show robustness on the results of interest rate.

matched to the 2008 census data (i.e. twelve thousands out of sixteen thousands). [18] 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).

3.4. 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 1,803 branches for big four 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. In Figure A1 in appendix, we plot the number of branches in 2008 and 2013 for big four. The numbers didn't change very much during these 5 years which is due mainly to the fact that the big four established branches in most cities before 2009 and haven't opened many branches since then.

[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, 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 12.9% for big four banks.

[18] 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.

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 demeaned amount of loans outstanding in the treatment (i.e., deregulated bank-cities) and control groups (i.e., regulated bank-cities). We take out the city, bank, and year fixed effects. The solid line represents the treatment group and the dotted line represents the control group. Before April 2009, the loans outstanding of treatment group moved parallel with the loans outstanding of 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 April 2009. This is the evidence of parallel trend assumption of the Diff-in-Diff analysis.

[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 four. 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 2009 and zero before that. *Treatment* equals one for treated bank-cities and zero for controlled bank-cities. Based on this 2009 deregulation, joint bank *k* is free to open branches in city *j* if the bank has existing branches in city *j* or in the capital city of the province of city *j*. *Treatment* equals zero for big four banks and the joint equity banks which are still regulated after April 2009. Mechanically, there are no loan observations for the joint equity banks in the regulated cities (where they didn't have branch before April 2009) before the shock. Observations in control group before 2009 come from the big four. In Panel A, there are 430,560 city-bank-month observations in which 322,920 are city-months of Joint-equity banks and the rest 107,640 is from Big-four banks. The mean of *Treatment* is 0.414 which means that, on average, joint equity bank can open branches without restrictions in 41.4% 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 also reports the number of branches at bank-city-year level from 2006 to 2013. Overall, the big four banks dominate the market. In specific, the average number of branches for big four banks is 36.77 while it is 1.18 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. Overall, around 80% of loans are granted to existing borrowers that have prior borrowing relationship in the past one year. For each loan, we also know the borrower characteristics such as total assets, leverage, ownership, and efficiency. The mean of borrowers' total assets is 1,046 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 14.5%. We describe all variables' definitions in Table A1 in Appendix.

[Place Table 1 about here]

4. Empirical Analysis and Results

4.1. 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 four 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 city (α_i), bank (δ_j), and year (η_t) fixed effects. We also control for the city GDP every year. Standard errors are clustered two-way by city and bank.

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 before and after, and Column (4) is for two-year before and after (i.e., four years in total). In Column (1) to (5), the coefficients β_1 of *After2009.4**Treatment are all positive and are statistically significant. For example, in Column (1), the coefficient is 0.004 with a *t*-statistic of 2.13. This means the number of joint equity bank branches increase by 0.4% 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 (4). For example, in Column (4), the coefficient is 0.07 with a *t*-statistic of 12.60. This means the number of joint equity bank branches increase by 7% 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 another concern that our deregulation shock in April 2009 could be confounded with RMB4 trillion stimulus package initialed in November 2008. Potentially, the 4-trillion program could have granted 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.[19] 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 in Column (4) is 0.175 (*t*-statistic=10.95) statistically significant at 1% level, which means the total amount of outstanding loans increases by 17.5% 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. We also single out the twelve joint equity banks and still find insignificant difference of loan growth rate between control and treatment group. This further suggests that the increases of loans between the treatment and control

[19] For big four 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 A9, we repeat the regressions on the loans outstanding and issuance from big four banks which show that, after the deregulation, most effects are statistically insignificant and big four banks slightly 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 CBRC sample 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 12% 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 banks on their current clients. Furthermore, column (3) shows the percentage of loans of joint equity banks for SOEs. On average, 23% of the loans from joint equity banks go to SOEs. In contrast, for big four banks, column (4) shows that 21% of their loans go to SOEs which is lower than joint equity banks. This is surprising since the common perception is that big four 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 four 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. The columns (5) to (8) report the numbers based on outstanding loans as calculated in columns (1) to (4), respectively. Overall, the pattern is similar to that observed in first four columns. That is, both new entrant and incumbent banks are likely to target the old borrowers. Interestingly, the differences in share of SOE borrowing between joint equity banks and big four banks become smaller.

Furthermore, we explore how joint equity banks and big four target firms respectively by looking at the comparative statistics in Table A7 (e.g., firm assets, leverage, number of workers, asset to revenue ratio (ATR)). [20] In terms of assets, before 2009, joint equity banks lend mainly to larger SOEs than big four. After 2009, this pattern reversed as joint equity banks started to lend to smaller SOEs. Moreover, compared with big four, 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 four'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 24.5% in 2008 to 30.3% in 2009, by 24% and continues to become larger as the time goes by (i.e. increases from 21.7% in 2007 to 40.1% in 2013, by around 85%). At the end of year 2012, the firm-year average of borrowing shares from joint equity banks reaches 39%, 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-four banks to joint equity banks and there is a jump before and after the deregulation shock in banking industry (i.e. increases from 0.93% to 1.14 %, by around 23%). 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 average growth of borrowing shares from joint equity banks at firm-year observations. As the column (4) shows, the expansion rate of firm-year observations in 2008 is only 43.41% while 66.81% at year 2009 (i.e. by around 54%). Column (5) reports the percentage of borrowers in Big-four banks that also borrows from Joint-equity banks for each year. In 2007, there are 20.35% of borrowers in Big-four banks having access to Joint-equity banks and this number increases to 29.65% in 2013.

[20] We follow the prior work to define Asset to Revenue ratio (ATR) as the ratio of the value of a company's sales or revenues generated relative to the value of its assets.

[Place Table 3 about here]

Besides the analyses on deregulation's effects on lending activities in Table 2, we also study how these new entrant branches affect the deposit in the local area. The economic consequences can be also from the depositor side. In Table A5, we perform the Diff-in-Diff regressions by using local deposit amount as the dependent variable. The coefficients of *After2009.4*Treatment* are mostly insignificant. The 2009 deregulation has huge impacts on lending activities but not so much on the deposits. Our analysis on deregulation's economic consequences in section 4.3 are largely from the bank lending changes.

4.2. Competition between Incumbent Banks and New Banks

4.2.1. How do New Entrant Joint Equity Banks Choose Borrowers

In a next step, we explore how new banks compete with incumbent banks in the region regarding their targeting behavior. The unconditional patterns in Table 3 shows that joint equity banks lend more to SOEs than the big four and their new entrant branches mainly target the firms which have been borrowing from the big four instead of lending to new firms. We further explore how joint equity banks change their lending strategy after the 2009 deregulation shock. In particular, for each city-bank-month, we calculate the ratio of loans to SOEs to total loan amount and perform the Diff-in-Diff regressions of this SOE ratio on the 2009 regulation shock. Table 4 Panel A shows that joint equity banks issue significantly more loans to SOEs after the 2009 deregulation in the deregulated cities where they can open branches freely. For example, in Column (1), we restrict our sample on 3 month before and after the shock (i.e., 6 month in total). The coefficient of *After2009.4**Treatment is 0.012 with significance at 1% level. As shown in Table 3, approximately 23.7% joint equity bank loans are for SOEs. 0.012 in Column (1) means that, during the first 3 month after the deregulation shock, joint equity banks increase their shares of lending to SOEs by 5.1%. When a joint equity bank opens new branches in a new city, compared to the incumbent big four banks, it usually doesn't have much information of the local firms. These new branches prefer to lend to SOEs which have implicit or explicit government guarantees. In contrast, lending to private firms is much riskier for loan officers who would be punished if the private firms default.

It is well documented that, in general, SOEs are less efficient than private firms.[21] The bank entry deregulation leads to worse credit allocation in China.

Moreover, from Column (1) to (3) in Panel A, the coefficients of *After2009.4*Treatment* are all significantly positive and increase over time. In Column (3), the regression window is one year before and after and the coefficient is 0.026 with significance at 1% level, which is about 11% increase in SOE shares of joint equity banks' lending. This makes sense since it takes time for joint equity banks to open new branches after the deregulation. The effects of increased lending to SOEs are more pronounced in 1 year after the deregulation than 3 month. Furthermore, in Column (4), after 2 years of deregulation, the coefficient of *After2009.4**Treatment is 0.013 with significance at 1% level. This is consistent with our information disadvantage story that the joint equity banks need time to gather the soft information of local firms, especially private firms. After 2 years, the new branches start to increase their lending to private firms. In sum, bank entry deregulation leads to worse credit allocation in short term by lending more to SOEs. These new entrant branches start to increase their lending to private firms after few years when they have more soft information.

In Table 4 Panel B, we further explore how new entrant branches choose firms to lend among SOEs. In Column (1) to (4), among SOEs, we use the ATR to measure the firm efficiency and define the efficient firm if its ATR is above the median. We then calculate the percentage of loans for high ATR SOEs as the independent variable at city-bank-month level and perform the Diff-in-Diff regressions. The coefficients of After2009.4*Treatment are all significantly negative from column (1) to (4). This means that, besides joint equity banks' preference for SOEs, they choose to lend to less efficient SOEs after deregulation. For example, the coefficient in column (4) is -0.031 with significance at 5% level. This is equivalent to a 3.1% increase in lending to inefficient SOEs. We further explore the reason behind that. In Table A4 Panel B, we find that the inefficient SOEs have significantly higher political hierarchy and significantly bigger size. In China, different SOEs have different political hierarchy (e.g., local vs. central SOEs)

[21] In Table A4, Panel A, we show that the efficiency of SOEs significantly lower than private firms in China. In particular, we use asset turnover ratio (sales/assets) and TFP to measure the efficiency and find that these two variables are significantly lower for SOEs than private firms.

and SOEs with higher hierarchy usually have softer budget constraints. Similarly, bigger SOEs also enjoy softer budget constraints due to "too big to fail". In column (5) to (10), we perform the same analysis on private firms and find no significant results since private firms don't have soft budget constraint anyway and banks have no obvious reasons to lend to inefficient private firms. These results further support our story that new entrant joint equity banks tend to lend to SOEs, especially for inefficient ones, since they are safer assets due to the government guarantees.

The key assumption behind the Diff-in-Diff analysis is the parallel trends between treatment and control groups. In both column (4) in Panel A and B, we include three pre-trend dummies to indicate January, February, and March of 2009 (i.e., three month before the deregulation shock). All these three pre-trend dummies have insignificant coefficients. This again verifies that our findings in Diff-in-Diff are not driven by underlying economic trends other than the deregulation in April 2009. Furthermore, in Table A8 in appendix, we perform the same analysis as in Column (4) of Panel A but include dummies $Month_t \times Treatment$ (t is from April 2008 to March 2010). We find that before April 2009, all coefficients of dummies $Month_t \times Treatment$ are statistically insignificant. After April 2009, we have significantly positive coefficients of dummies $Month_t \times Treatment$. This is the strong evidence of parallel trend assumption and the shock did have impacts since April 2009. Our Diff-in-Diff results are directly from the bank entry deregulation in April 2009.

[Place Table 4 about here]

4.2.2. How do Joint Equity Banks Change Contract Terms in Competition

In this subsection, we study how joint equity banks compete with incumbent big four banks in terms of their loan contract terms. 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*.[22]

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, lower leverage, better internal ratings, and higher level of guarantee protections. All these patterns are statistically significant at 1% level. We also explore the ex-post loan performance. The credit risk is lower (significant at 1% level) for loans issued by new-entry banks while this effect will become larger and more significant for overall samples. Similar patterns are observed in Panel B for only Joint-equity subsample. For example, the average amount of loans granted by new entry joint equity banks is 22 million RMB while this number for incumbent joint equity banks is only 14 million RMB. Moreover, over one quarter of loans from new entry joint equity banks are required to provide the third party guarantee requirement. Incumbent banks require significantly lower guarantee. 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]

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:

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

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

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

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 firm level.

Table 6 Panel A shows the results. Column (1) to (4) is for all firms in our sample. Column (1) reports the deregulation effect on loan default ratio and the coefficient of After2009.4*Treatment is -0.003 with significance at 1% level. On average, the default ratio is approximately 0.9% and -0.003 is equivalent to 33% decreases in default. Column (5) is for the SOEs and the coefficient is insignificant. In contrast, column (9) is for the private firms and the coefficient is significantly negative. This suggests that after deregulation, the loan performance of new entrant banks improves for private firms but not for SOEs. This is consistent with our findings in Table 4 that these new entrant banks lend more to inefficient SOEs but not for inefficient private firms. Moreover, in column (2), we find that these new lending require significantly better internal 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. The low default ratio we find in column (1) rule support the first hypothesis that banks raise the screening bar and lend to borrowers with better quality. This effect on ratings is also mainly from private firms. Specifically, column (6) shows no significant changes of ratings for SOEs and column (10) shows that, for private firms, the ratings are significantly better after the shock. This again consistent with Table 4 since SOEs have implicit government guarantees and don't need the strict screening. In column (3), we find that these new entrant banks also require significantly more third party guarantees which is more pronounced for private firms than SOEs. For example, in column (7), the coefficient of After2009.4*Treatment is 0.007 with 1% significant level. The average

third party guarantee ratio is 20.8% which means that the deregulation leads to an increase of third party guarantee by 3.4% for SOEs. Column (11) is for third party guarantees of private firm loans and the coefficient is 0.024 with 1% significant level. This means that the deregulation leads to an increase of third party guarantee by 11.5% for private firms, much higher than SOEs. Moreover, maturity of these loans also increases significantly after the deregulation. Panel B is the robustness tests of loan level analysis and we find very similar results as in Panel A.

In sum, increased competition from joint equity bank entry deregulation led to higher ex-ante loan screening standard and better ex-post loan performance for private firms but not for SOEs. After deregulation, when joint equity banks enter into a new market, they will raise their screening standard, which leads to lower default.

[Place Table 6 about here]

4.3. Impacts of Bank Expansion on Firm Activities

Finally, we want to understand the economic consequences of the increased bank competition from 2009 deregulation, especially the heterogeneous effects on SOEs vs. private firms. It is well known that, in China, the commercial banks (both big four and twelve joint equity banks) prefer to grant credit to SOEs. There has been a long term relationship between the big four commercial banks and SOEs. Private firms, on the other hand, have very limited access to bank credit and rely heavily on informal lending channels (e.g., Allen and Qian (2014)). The 2009 deregulation on bank entry, along with other reforms on financial system, aims to improve the lending efficiency 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. These firms are directly affected by the 2009 entry deregulation. Then, we perform the Diff-in-Diff regressions of firm activities (e.g., expansions on assets and employments), as well as firm performance (e.g., net income and ROA) 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 growth of fixed assets and employment, leverage ratio, ROA, and growth of net incomes. $Exposure_i$ in equation (6) is also defined as a dummy at city level which equals one when the city i is eligible for branching expansion for any joint equity banks 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 one 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-year level.

Table 7 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 fixed assets and employment while relieves the financial distress in terms of lower leverage. In particular, table 7, column (1) shows that, from 2006 to 2011 (i.e., 3 years before and after the shock), the growth rate of fixed assets, on average, increased by 34.1% with the t-statistic of 6.42 after the 2009 joint equity bank deregulation. In column (2), we expand our sample period from 2004 and 2013 (i.e., 5 years before and after the shock), the growth rate of fixed assets increased by 21.3% with the t-statistic of 5.65. Column (3) and (4) are for the growth rates of employments. The 2009 bank deregulation leads to a 14.8% increase in firms' employment growth. On the other side, Column (5) and (6) shows that the leverage ratios decrease after the deregulation. This suggests that besides the higher growth rates in size, firms also lower down their financial distress probability which is consistent with the lower loan default rates in Table 6. Moreover, the dummy $Pretrend_{t-1}$and $Pretrend_{t-2}$ are all statistically insignificant. There are no significant differences in firm activities between deregulated areas and regulated areas (i.e., control group) before the 2009 shock. This is another supportive evidence on the parallel trend assumption which further mitigates 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).

Furthermore, we use net income growth and ROA to measure firm-level profitability and efficiency. The coefficient of $After2009.4\times Treatment$ estimated in Column (7) is

0.872 with the *t*-statistic of 4.27, showing that the net income growth rate increases by 87.2% after the 2009 joint equity bank expansion shock. In column (9), for ROA, the coefficient is 0.019 with the *t*-statistic of 6.45. Since the average ROA of CIC firms is 0.13, based on the coefficient in column (9), the 2009 deregulation leads to an 14.2% increase in ROA. In sum, the firms that can borrow from banks could benefit hugely from the bank deregulation by growing faster and becoming more profitable and more efficient.

[Place Table 7 about here]

Although we don't have loan level information on interest rate, we are able to back it out from the interest payment number in CIC data and the outstanding loan amount in CBRC data. In Table A6 Panel A in appendix, we find that the deregulation significantly reduces the interest rates of borrowers. In Panel B, we interact the Diff-in-Diff dummy with private firm dummy and find that the interest rates drop even more for private firms. In particular, column (2) of Panel B shows that the coefficient of After2009.4*Treatment is -0.610 which is statistically insignificant. Moreover, the coefficient of Private*After2009.4*Treatment is -0.603 with 1% significant level. The average interest rate is 14.3% in CIC data. These suggest that the interest rates on average decrease by 4.3% for private firms after 2009 deregulation. There is no significant effect on SOEs' borrowing costs.

One caveat is that our interest rate extrapolation might not be accurate since the interest payments in CIC could include interests for other types of debt than bank loans or exclude the interest payment for fixed assets. To mitigate this concern, we collect a subsample of loan level interest rate information for listed firms from CSMAR. Panel C shows that the deregulation leads to significant decreases in interest rates of loans based on the smaller sample in CSMAR. The decreases in interest rates could explain why borrowers can benefit from the deregulation in Table 7.

Next, we trace the heterogeneous effects of increased bank competition between SOEs and private firms in Table 8. In particular, we interact the Diff-in-Diff dummy with the dummy for private firms. Overall, private firms can benefit significantly more from the 2009 deregulation than SOEs do. The effects of the 2009 deregulation on SOEs

are almost muted. In particular, compared with SOEs, after 2009, private firms in deregulated have significantly higher fixed asset growth, higher employment growth, lower leverage ratio, higher net income growth, and higher ROA. On the other side, these effects are not statistically significant for SOEs. For example, in column (1), the coefficient of *After2009.4×Treatment× Private* is in column (1) is 0.505 with the *t*-statistic of 4.31. This suggests that, compared with SOEs, the fixed assets growth rates of private firms increase by 50.5% after the 2009 deregulation. On the other hand, the coefficient of *After2009.4 * Treatment* is -0.167 which is statistically insignificant. This shows that, in contrast to private firms, the 2009 deregulation has no impact on SOEs' assets growth. Column (3) and (4) show the similar patterns on employment growth. Moreover, for firm performance (i.e., net income growth and ROA), private firms can benefit significantly more from the 2009 deregulation while the SOEs don't increase their net income and ROA. In particular, for private firms, the 2009 deregulation shock leads to increases in net income growth and ROA by 30.3% and 2.6%, respectively. These findings suggest that expansions of joint equity banks in China have more positive effects on private firms since these firms are more efficient and can better capture the benefits of this reform. This is also consistent with Table A6 which shows that the interest rates drop more for private firm loans after the 2009 deregulation.

[Place Table 8 about here]

In sum, table 7 and 8 shows that, for firms with bank credit access, increased bank competition has positive effects on their growth and performance which are mainly for private firms. These positive effects are both statistically and economically significant. In other words, if a private firm can borrow from banks, bank entry deregulation could hugely improve its performance and profitability which makes it grow faster. On the one hand, for individual firms, increased bank competition makes private firms better rather than SOEs. On the other hand, bank entry deregulation lead to more credit towards inefficient SOEs which should have been granted to private firms. These two opposing forces suggest that, for policy makers, it is very important to fully understand all consequences of the reform, especially for the unintended adverse effects. In China, the soft budget constraint of SOEs could make the credit allocation worse off after the bank entry deregulation.

5. 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 four commercial banks and twelve joint equity banks and find that increased competition leads to more credit allocation toward SOEs, especially the inefficient ones with higher political hierarchy and softer budget constraints. Besides the worse credit allocation across firms, we find that firms with bank credit access can benefit from increased competitions among banks by better loan terms (e.g., lower interest rate). These opposing forces explain the mixed evidence from previous studies on the economic consequences of bank competition.

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, researchers, practitioners, and policy makers have heavily criticized the inefficient credit allocation in China. 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 by this paper. First, we find that, increased competition in the banking sector might have helped firms grow, especially for private firms. Second, bank competition and expansion might have adverse effects on credit allocation across firms. 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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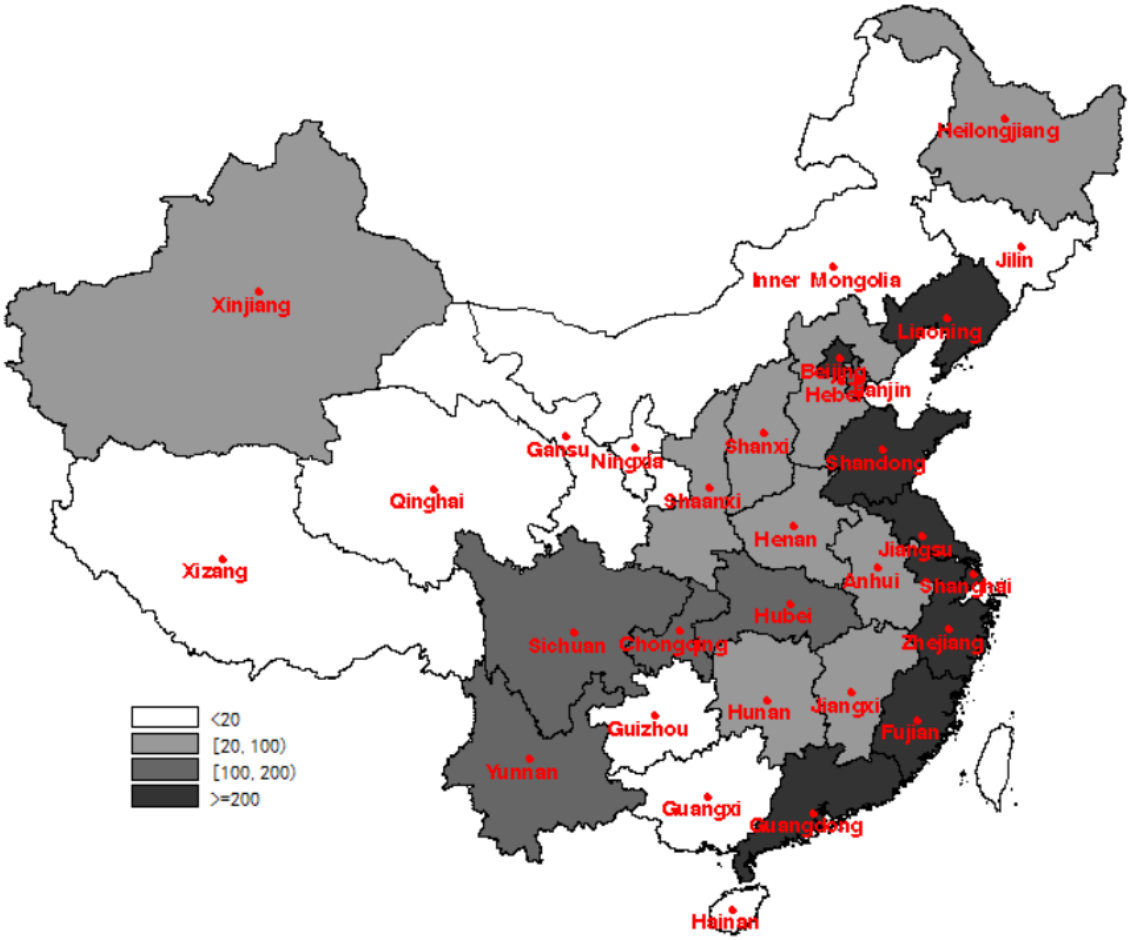
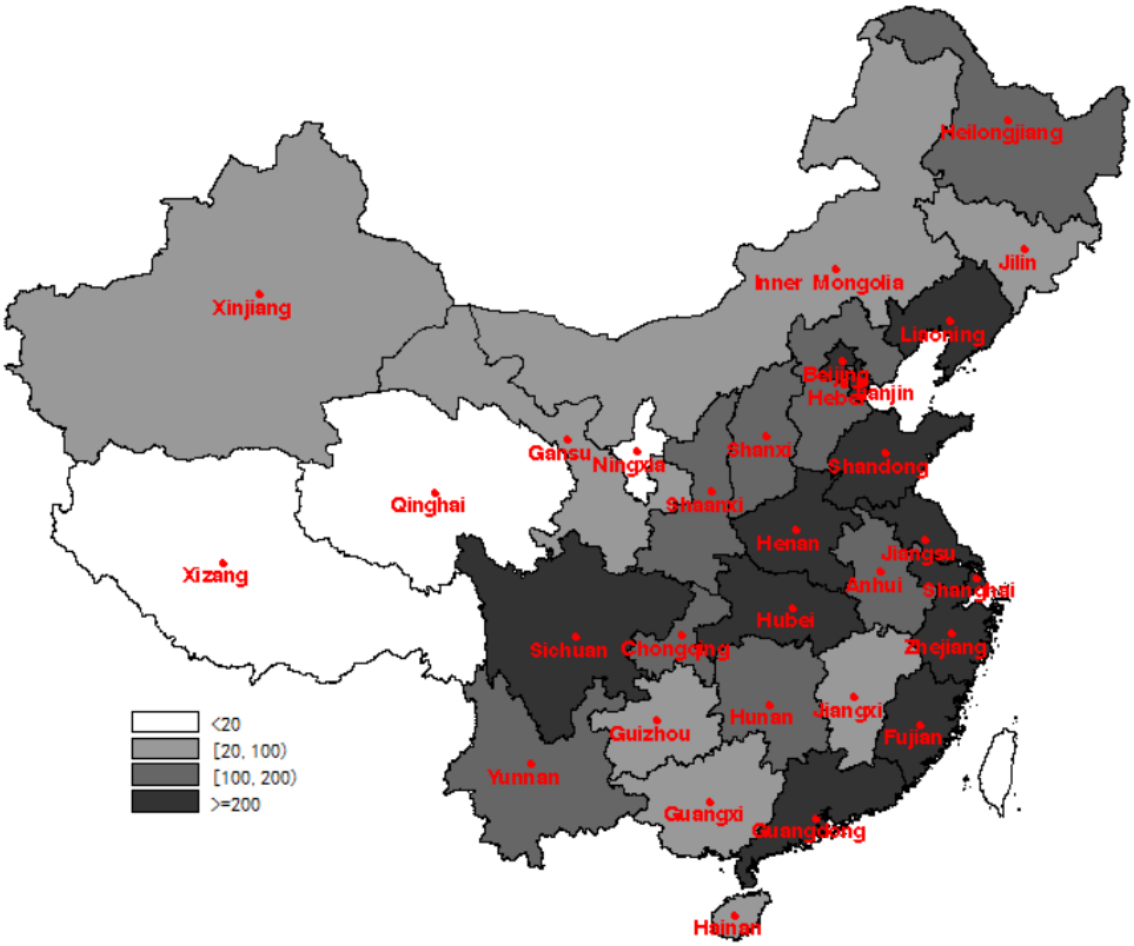


Panel A: By Year 2008



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).

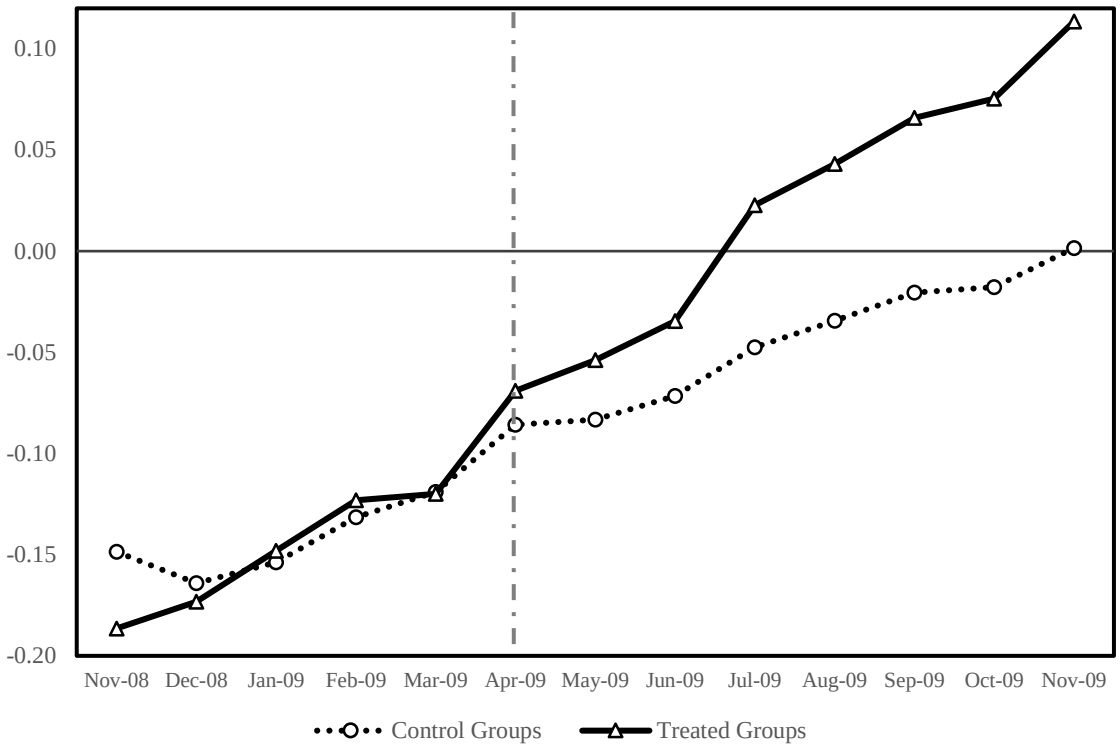


Figure 2: The Evolution of Outstanding Loans: treatment vs. control groups. This figure plots the residuals of outstanding loan amounts from the OLS regression against city-, bank-, and year-fixed effects between treatment and control groups around the April 2009 bank entry deregulation. The solid line with triangles exhibits the deregulated bank-cities while the dash line with circles represents the amount of loans outstanding in still regulated bank-cities. The vertical axis reports the demeaned amount of natural logarithm of loans outstanding. 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 April 2009. For the biggest four state-owned banks, i.e. Industrial and Commercial Bank of China (ICBC), China Construction Bank (CCB), Bank of China (BOC) and Agricultural Bank of China (ABC), the *Treatment* always equals zero since all of them are well established everywhere in China.

Table 1: Summary Statistics

This table describes the sample characteristics of different samples. Panel A reports the summary statistics at city-bank-year level from 2006 to 2013, where the sample is from CBRC branch data set and CBRC loan data set. Panel B reports the summary statistics of loan contract characteristics at loan level from January 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 variables are defined in the appendix Table A1.

	N	Mean	Median	Std. Dev.	P25	P75
Panel A: City-Bank-Month Level						
Outstanding Branches	430,560	10.074	0.000	28.529	0.000	9.000
—Big Four commercial banks	107,640	36.766	23.000	47.135	13.000	41.000
—Joint-equity commercial banks	322,920	1.177	0.000	5.291	0.000	0.000
Outstanding Loans	430,560	29.196	1.190	123.291	0.000	14.546
—Big Four commercial banks	107,640	86.534	24.700	226.056	9.100	61.385
—Joint-equity commercial banks	322,920	10.084	0.000	42.106	0.000	3.620
After2009.4	430,560	0.654	1.000	0.476	0.000	1.000
Treatment	430,560	0.414	0.000	0.493	0.000	1.000
SOE-Share	249,253	0.190	0.086	0.253	0.000	0.292
ATR	249,253	0.283	0.198	0.297	0.025	0.418
Panel B: Loan Characteristics						
Loan Amount (Million RMB)	6,470,267	15.161	4.000	31.405	0.585	13.411
Maturity (in Months)	6,470,267	0.992	0.500	1.876	0.333	1.000
Rating Dummy	6,470,267	0.979	1.000	0.143	1.000	1.000
Guaranteed	6,470,267	0.208	0.000	0.406	0.000	0.000
Default	5,276,910	0.011	0.000	0.103	0.000	0.000
Existing Borrower	6,470,267	0.763	1.000	0.425	1.000	1.000
Panel C: 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 on Bank Expansions

This table presents the regression estimates of difference-in-difference analysis on the impact of deregulation shock in Joint-equity bank expansion at city-bank-month level. 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 Apr, 2009 and zero before and *Treatment* equals one for treated bank-cities and zero for controlled bank-cities. According to the policy, an eligible Joint-equity 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 the biggest four state-owned banks, i.e. Industrial and Commercial Bank of China (ICBC), China Construction Bank (CCB), Bank of China (BOC) and Agricultural Bank of China (ABC), the *Treatment* always equals one since all of them are well established everywhere in China. For each panel, the column (1) reports the regression estimates for six-month window subsample during Jan 2009 to Jun 2009, the column (2) reports the regression estimates for subsample during Oct 2008 to Sep 2009 (one-year event window), the column (3) reports the regression estimates for subsample during Apr 2008 to Mar 2010 (two-year event window), and the column (4) reports the regression estimates for subsample during Apr 2007 to Mar 2011 (four-year event window). All 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. The *t*-statistics in parentheses are based on the two-way cluster-robust standard errors (cluster by city and by bank) across all these model specifications. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Number of Branches

	DV: Log (1 + No. Branches)			
	Shorter Window			Longer Window
	(1)	(2)	(3)	(4)
	[200901,200906]	[200810,2009009]	[200804,201003]	[200704,201103]
After2009.4*Treatment	0.004**	0.010***	0.031***	0.070***
	(2.13)	(3.69)	(8.13)	(12.60)
Treatment	0.193***	0.189***	0.178***	0.160***
	(7.28)	(7.15)	(6.75)	(6.08)
After2009.4	0.005***	0.005***	0.000	-0.017***
	(2.83)	(2.74)	(0.01)	(-6.01)
Log(Local GDP)	-	0.030	-0.021	-0.072***
	-	(0.70)	(-0.60)	(-2.86)
City FE	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	27,456	54,912	109,776	219,456
Adjusted R-squared	0.905	0.904	0.904	0.903

(*To be continued*)

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

Panel B: Outstanding Loan Amount

	DV: Log (1 + Outstanding Loan)			
	Shorter Window			Longer Window
	(1)	(2)	(3)	(4)
	[200901,200906]	[200810,2009009]	[200804,201003]	[200704,201103]
After2009.4*Treatment	0.039***	0.070***	0.125***	0.175***
	(5.37)	(7.14)	(9.79)	(10.95)
Treatment	0.536***	0.520***	0.503***	0.460***
	(14.08)	(14.01)	(13.98)	(13.25)
After2009.4	0.052***	0.071***	0.075***	0.053***
	(13.04)	(13.89)	(11.34)	(6.67)
Log(Local GDP)	-	0.145**	0.124	0.055
	-	(2.15)	(1.62)	(0.87)
City FE	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	27,456	54,912	109,776	219,456
Adjusted R-squared	0.814	0.814	0.815	0.814

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) from new-entry branches and the column (2) reports the percentage of loans to new borrowers from incumbent branches. New-entry branches (incumbent branches) in city *i* at month *t* are those that lasts less than or equal to (more than) 12 months in this city. 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-four banks. The columns (5) to (8) in Panel A replicate the (1) to (4) based on outstanding loan sample, respectively. 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-four banks to Joint-equity banks. The column (4) presents the average growth rate in borrowing shares from joint equity banks at firm-year observations. The column (5) reports the percentage of borrowers in Big-four 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-four Banks
	Loan Issuances			
2007	.	.	29.92	23.86
2008	9.56	10.93	28.97	24.37
2009	13.63	14.23	30.92	25.78
2010	13.05	10.90	24.69	21.57
2011	13.06	10.47	17.78	17.75
2012	11.04	10.52	16.32	16.19
2013	10.48	8.26	14.86	16.27
	Outstanding Loans			
	(5)	(6)	(7)	(8)
2007	11.11	10.31	34.73	31.58
2008	8.78	7.65	31.38	32.30
2009	14.93	13.79	35.45	33.01
2010	10.97	7.78	31.82	31.09
2011	9.78	6.15	28.41	28.65
2012	9.96	7.06	22.62	25.84
2013	6.24	3.78	21.01	24.65

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-four banks with access to Joint-equity banks
2007	21.68	28.44	0.90	51.78	20.35
2008	24.46	30.06	0.93	43.41	22.42
2009	30.28	32.64	1.14	66.81	26.59
2010	33.53	38.19	1.27	53.71	27.11
2011	37.03	43.19	1.04	47.31	28.97
2012	39.18	46.99	1.17	48.68	29.72
2013	40.10	44.13	0.72	26.20	29.65

Table 4: The Impact of Bank Expansion on Targeting Strategy

This table reports the difference-in-difference regression estimates of the bank expansion effect on how banks target borrowers. The dependent variable in Panel A is the percentage of loans to SOEs and in Panel B is the outstanding loan amount value weighted ATRs (i.e. *Asset Turnover Ratios*) at city-bank-month level. The main independent variable is the interaction, *After2009.4*Treatment*, where *After2009.4* equals one for observations after the policy shock in Apr, 2009 and zero before and *Treatment* equals one for treated bank-cities and zero for controlled bank-cities. According to the policy, an eligible Joint-equity 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 the biggest four state-owned banks, i.e. Industrial and Commercial Bank of China (ICBC), China Construction Bank (CCB), Bank of China (BOC) and Agricultural Bank of China (ABC), the *Treatment* always equals zero since all of them are well established everywhere in China. *Pretrend_1*, *Pretrend_2*, and *Pretrend_3* are the interactions between *Treatment* and the time dummies indicating the 1-month, 2-month, and 3-month prior to Apr 2009, respectively. All variables are defined in the appendix Table A1. City-, Bank-, and Year-fixed effects are included across all models. The *t*-statistics in parentheses are based on the two-way cluster-robust standard errors (cluster by city and by bank) across all these model specifications. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Lending to SOEs

	Dependent Variable: Percentage of Loans to SOEs			
	6M	1Y	2Y	4Y
Treatment*After2009.4	0.012***	0.019***	0.026***	0.013*
	(2.60)	(3.65)	(4.13)	(1.67)
Treatment	0.007	0.000	-0.006	0.007
	(0.30)	(0.00)	(-0.34)	(0.42)
After2009.4	0.001	-0.003	-0.008**	0.004
	(0.17)	(-0.94)	(-2.08)	(0.80)
Pretrend_1				0.010
				(1.39)
Pretrend_2				0.007
				(1.09)
Pretrend_3				0.002
				(0.41)
PreDummy	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	18,003	32,868	69,204	142,312
R-squared	0.323	0.322	0.315	0.297

(*To be continued*)

Table 4: The Impact of Bank Expansion on Targeting Strategy—*continued*

Panel B: ATRs

	Dependent Variable: Loan Amount Weighted ATRs							
	For SOEs				For Non-SOEs			
	6M	1Y	2Y	4Y	6M	1Y	2Y	4Y
Treatment*After2009.4	-0.015*	-0.019**	-0.036***	-0.031**	0.003	0.001	-0.002	0.010
	(-1.94)	(-2.03)	(-3.15)	(-2.25)	(0.55)	(0.12)	(-0.28)	(0.95)
Treatment	0.130***	0.117***	0.106***	0.074**	-0.095***	-0.085***	-0.072***	-0.055**
	(2.87)	(2.78)	(2.79)	(2.27)	(-2.79)	(-2.69)	(-2.61)	(-2.41)
After2009.4	0.002	0.003	0.009	0.006	0.003	0.008**	0.013***	0.002
	(0.56)	(0.64)	(1.35)	(0.83)	(0.90)	(2.12)	(2.70)	(0.36)
Pretrend_1				0.002				-0.014
				(0.15)				(-1.37)
Pretrend_2				0.002				-0.009
				(0.20)				(-0.93)
Pretrend_3				-0.009				-0.018**
				(-0.81)				(-2.03)
PreDummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,281	16,925	35,740	73,171	15,771	28,757	60,563	124,655
R-squared	0.521	0.499	0.468	0.436	0.285	0.274	0.257	0.232

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 Million RMB, *Maturity* is in unit of year, *Rating Dummy* measures the five-category loan classification where it takes the value of one if the internal rating equals one and zero if the internal rating is larger than 1, *Guaranteed* is a dummy indicating whether the loan is guaranteed by third-parties, 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
	Overall Sample							
Loan Amount (Million RMB)	6,279,220	15.031	4.000	52,098	22.060	9.798	7.029	50.96
Maturity	6,279,220	0.997	0.500	52,098	0.950	0.583	-0.047	-5.65
Rating Dummy	6,279,220	0.979	1.000	52,098	0.995	1.000	0.016	26.33
Guaranteed	6,279,220	0.206	0.000	52,098	0.294	0.000	0.088	49.06
Default	5,111,093	0.011	0.000	41,780	0.006	0.000	-0.005	-9.31
Assets (100 Million RMB)	6,279,220	40.057	8.030	52,098	52.199	10.554	12.142	30.05
Leverage	6,279,220	0.611	0.609	52,098	0.602	0.610	-0.009	-10.81
	Joint-equity Bank subsample							
Loan Amount (Million RMB)	1,925,172	14.435	3.213	51,375	22.220	10.000	7.785	57.23
Maturity	1,925,172	0.733	0.500	51,375	0.930	0.583	0.197	35.34
Rating Dummy	1,925,172	0.993	1.000	51,375	0.996	1.000	0.003	8.73
Guarantee Requirement	1,925,172	0.233	0.000	51,375	0.295	0.000	0.062	33.28
Default	1,567,829	0.006	0.000	41,175	0.006	0.000	-0.000	-0.51
Assets (100 Million RMB)	1,925,172	44.484	9.269	51,375	52.831	10.864	8.347	19.97
Leverage	1,925,172	0.637	0.640	51,375	0.602	0.610	-0.035	-41.30

Table 6: The Impact of Bank Expansion on Loan Policy

This table reports the difference-in-difference regression estimates of the bank expansion effect on the loan characteristics. Panel A presents the firm-bank-month level regression results, where the dependent variables are loan amount value weighted average of *Default*, *Rating Dummy*, *Guaranteed*, and *Maturity*, respectively. Panel B presents the loan-level regression results, where the dependent variables are *Default*, *Rating Dummy*, *Guaranteed*, and *Maturity*, respectively. The main independent variable is the interaction, *After2009.4*Treatment*, where *After2009.4* equals one for observations after the policy shock in Apr, 2009 and zero before and *Treatment* equals one for treated bank-cities and zero for controlled bank-cities. According to the policy, an eligible Joint-equity 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 the biggest four state-owned banks, i.e. Industrial and Commercial Bank of China (ICBC), China Construction Bank (CCB), Bank of China (BOC) and Agricultural Bank of China (ABC), the *Treatment* always equals zero since all of them are well established everywhere in China. *Pretrend_1*, *Pretrend_2*, and *Pretrend_3* are the interactions between *Treatment* and the time dummies indicating the 1-month, 2-month, and 3-month prior to Apr 2009, respectively. *Log(Assets)* and *Leverage* are included in all model specifications. All variables are defined in the appendix Table A1. Firm-, Bank-, and Year-fixed effects are included across all models. The *t*-statistics in parentheses are based on the cluster-robust standard errors at firm level across all these model specifications. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

(*To be continued*)

Table 6: The Impact of Bank Expansion on Loan Policy—*continued*

Panel A: Firm-Bank-Month Sample

	Overall				SOEs				Non-SOEs			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Default	Rating Dummy	Guaranteed	Maturity	Default	Rating Dummy	Guaranteed	Maturity	Default	Rating Dummy	Guaranteed	Maturity
Treatment*After2009.04	-0.003***	0.005***	0.021***	0.053***	-0.001	0.004	0.007**	0.056***	-0.004***	0.005***	0.024***	0.049***
	(-3.90)	(3.53)	(11.90)	(19.44)	(-0.41)	(1.27)	(2.29)	(6.09)	(-3.97)	(3.11)	(11.50)	(17.71)
Treatment	0.009***	-0.019***	0.015***	-0.032***	0.010***	-0.002	-0.005	-0.030	0.008***	-0.022***	0.019***	-0.030***
	(3.76)	(-5.39)	(3.16)	(-3.07)	(2.70)	(-0.21)	(-0.66)	(-0.99)	(2.93)	(-5.70)	(3.51)	(-2.90)
After2009.04	0.003**	-0.001	-0.006***	0.007**	0.013***	-0.001	-0.003	-0.014	0.002	-0.000	-0.006***	0.006**
	(2.31)	(-0.38)	(-4.14)	(2.15)	(4.95)	(-0.17)	(-1.34)	(-1.16)	(1.62)	(-0.14)	(-4.20)	(1.97)
PreTrend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PreDummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	801,542	859,486	859,486	859,486	99,514	113,275	113,275	113,275	702,028	746,211	746,211	746,211
R-squared	0.012	0.009	0.013	0.016	0.013	0.012	0.006	0.039	0.012	0.009	0.014	0.013

Panel B: Loan Sample

	Overall				SOEs				Non-SOEs			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Default	Rating Dummy	Guaranteed	Maturity	Default	Rating Dummy	Guaranteed	Maturity	Default	Rating Dummy	Guaranteed	Maturity
Treatment*After2009.04	0.000	0.008***	0.013***	0.021***	0.002	0.013	0.003	0.057***	0.000	0.007***	0.014***	0.015***
	(0.48)	(4.17)	(5.95)	(7.01)	(0.92)	(1.56)	(0.56)	(5.90)	(0.23)	(3.97)	(5.92)	(5.39)
Treatment	0.003	-0.015***	0.012***	-0.020**	0.002	-0.021	0.000	-0.052	0.003	-0.015***	0.014***	-0.016*
	(1.49)	(-3.47)	(3.09)	(-2.24)	(0.46)	(-1.06)	(0.05)	(-1.55)	(1.29)	(-3.49)	(3.19)	(-1.77)
After2009.04	-0.001	-0.001	-0.002***	0.003	0.004	-0.005	-0.001	0.005	-0.001	0.002	-0.003***	-0.007**
	(-0.50)	(-1.22)	(-2.60)	(0.76)	(1.34)	(-1.42)	(-0.19)	(0.44)	(-0.63)	(1.25)	(-2.72)	(-2.14)
PreTrend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PreDummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,284,816	3,438,239	3,438,239	3,438,239	282,920	324,450	324,450	324,450	3,001,896	3,113,789	3,113,789	3,113,789
R-squared	0.007	0.006	0.008	0.006	0.011	0.011	0.005	0.021	0.006	0.007	0.008	0.004

Table 7: Bank Expansion 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 and 2 is the growth of fixed assets. Column 3 and 4 are employee growth. Column 5 and 6 characterize the leverage. The dependent variable in Column 7 and 8 is *Net Income Growth*. Column 9 and 10 are *ROA* (Return on Assets) of the firm. Regression results over 6-year window and 10-year window are reported. Our main independent variable is *After2009*Treatment*, where *After2009* equals one for observations after the year of 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., either the city or its capital city has 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.

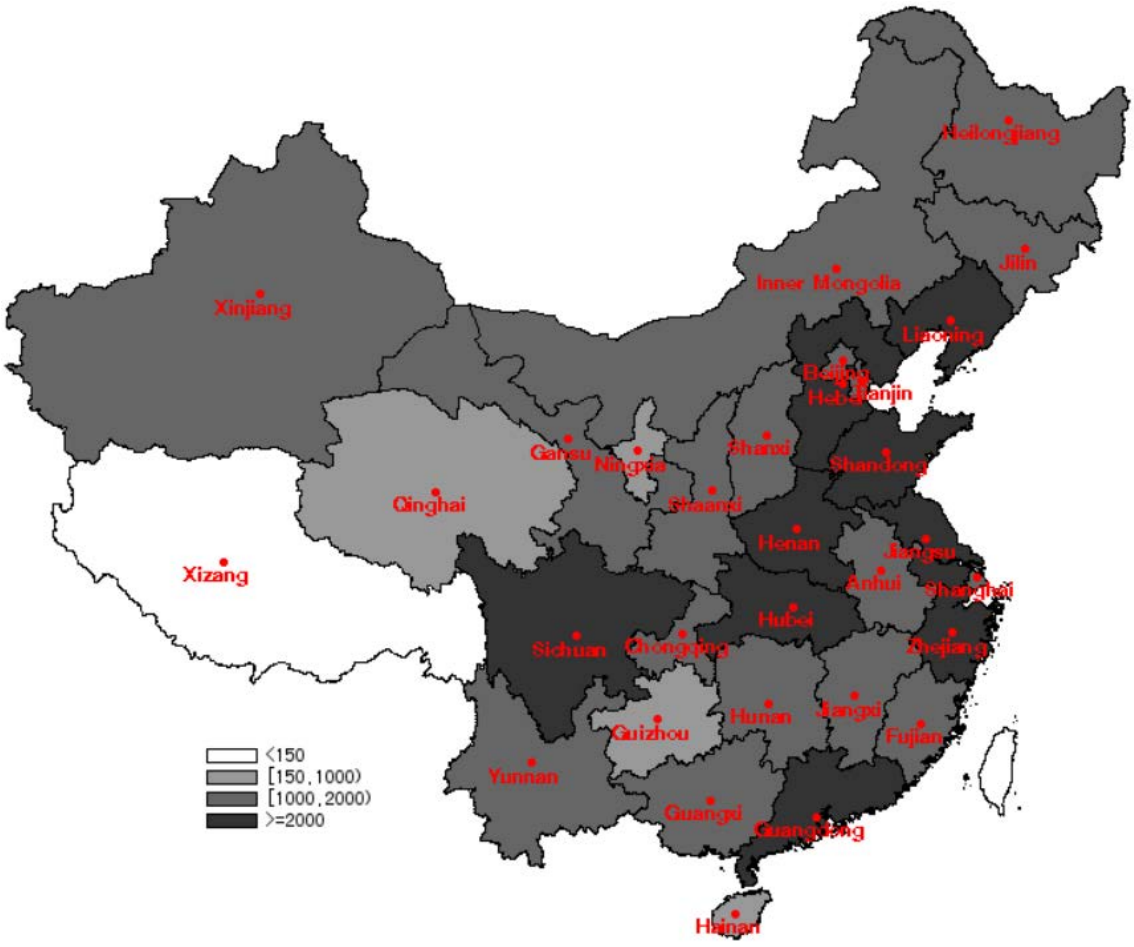
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Fixed Assets Growth		Employee Growth		Leverage		Net Income Growth		ROA	
	[2006, 2011]	[2004, 2013]	[2006, 2011]	[2004, 2013]	[2006, 2011]	[2004, 2013]	[2006, 2011]	[2004, 2013]	[2006, 2011]	[2004, 2013]
After2009*Treatment	0.341***	0.213***	0.148***	0.081***	-0.007	-0.018**	0.872***	0.440***	0.019***	0.018***
	(6.42)	(5.65)	(5.40)	(4.43)	(-0.82)	(-2.19)	(4.27)	(3.48)	(6.45)	(7.24)
Treatment	2.659***	2.625***	0.398**	0.449***	-0.023	-0.023	-1.372***	-1.194***	0.017	0.020*
	(4.95)	(5.16)	(2.17)	(2.65)	(-0.62)	(-0.60)	(-3.44)	(-3.12)	(1.54)	(1.68)
After2009	1.198***	0.095**	0.163***	0.498***	0.001	0.028***	-0.470**	0.171	-0.003	0.004*
	(21.00)	(2.27)	(6.04)	(24.11)	(0.13)	(3.27)	(-2.35)	(1.33)	(-1.03)	(1.65)
Pre-Trendt-1	-0.080	-0.071	0.027	0.007	0.000	-0.003	-0.098	-0.073	-0.004	-0.005
	(-1.48)	(-1.58)	(1.03)	(0.31)	(0.05)	(-0.34)	(-0.54)	(-0.48)	(-1.10)	(-1.43)
Pre-Trendt-2	0.005	0.015	0.039	0.018	0.006	0.002	-0.292	-0.256	-0.004	-0.006*
	(0.10)	(0.37)	(1.43)	(0.80)	(0.77)	(0.24)	(-1.52)	(-1.53)	(-1.26)	(-1.75)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	174,275	293,125	173,104	292,545	181,245	317,731	96,386	188,434	205,658	342,096
Adjusted R-squared	0.053	0.050	0.058	0.051	0.002	0.001	0.006	0.008	0.019	0.015

Table 8: State Ownership and Bank Expansion Effect on Firms

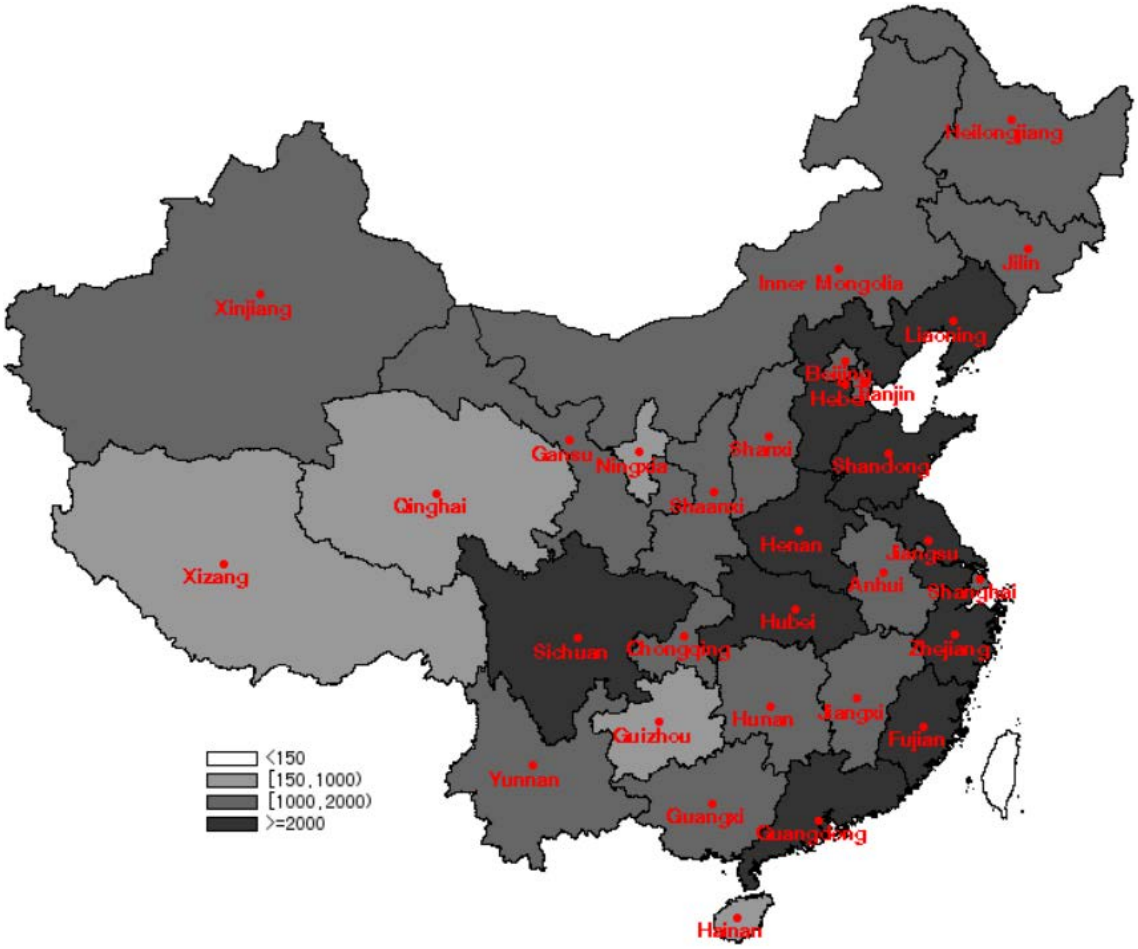
This table exploits the impact of state ownership on Joint-equity bank expansions using the triple difference regression estimates. We merge the Chinese Industry Census firm level data with the CBRC loan data and restrict our sample to the firms which have had outstanding bank loans between 2006 and 2012. The dependent variable in column 1 and 2 is the growth of fixed assets (*Fixed Assets Growth*). Column 3 and 4 are the growth of employees (*Employee Growth*). Column 5 and 6 characterize the leverage. The dependent variable in Column 7 and 8 is earnings growth (*Net Income Growth*). Column 9 and 10 are *ROA* (Return on Assets) of the firm. Regression results over 6-year window and 10-year window are reported. Our main independent variable is *After2009*Treatment*Private*, where *After2009* equals one for observations after 2009 and zero otherwise 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., either the city or its capital city has outstanding Joint-equity branches prior to the bank expansion policy shock. *Private* equals one if the firm is private-owned and zero otherwise. *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)	(10)
	Fixed Assets Growth		Employee Growth		Leverage		Net Income Growth		ROA	
	[2006, 2011]	[2004, 2013]	[2006, 2011]	[2004, 2013]	[2006, 2011]	[2004, 2013]	[2006, 2011]	[2004, 2013]	[2006, 2011]	[2004, 2013]
After2009*Treatment*Private	0.505***	0.336***	0.160***	0.112***	-0.039**	-0.030**	1.099**	0.918***	0.026***	0.026***
	(4.31)	(4.05)	(2.71)	(2.91)	(-2.35)	(-2.05)	(2.22)	(2.85)	(4.39)	(5.02)
After2009*Treatment	-0.167	-0.117	0.020	0.002	0.022	0.005	-0.209	-0.435	-0.004	-0.004
	(-1.56)	(-1.58)	(0.36)	(0.05)	(1.45)	(0.35)	(-0.45)	(-1.45)	(-0.65)	(-0.96)
Treatment	2.141***	2.280***	0.401**	0.436***	-0.063	-0.040	-1.978***	-1.071**	0.037***	0.040***
	(4.10)	(4.57)	(2.27)	(2.65)	(-1.38)	(-0.94)	(-2.89)	(-2.08)	(2.98)	(2.98)
After2009	1.506***	0.319***	0.108*	0.502***	-0.015	0.023*	-0.348	0.421	0.002	0.009**
	(13.80)	(4.29)	(1.95)	(13.76)	(-1.00)	(1.78)	(-0.75)	(1.41)	(0.30)	(1.99)
Pre-Trendt-1	-0.084	-0.072	0.014	0.000	0.001	-0.003	-0.109	-0.072	-0.004	-0.005
	(-1.57)	(-1.61)	(0.62)	(0.00)	(0.08)	(-0.31)	(-0.61)	(-0.48)	(-1.07)	(-1.41)
Pre-Trendt-2	-0.007	0.005	0.033	0.016	0.006	0.003	-0.288	-0.254	-0.004	-0.006*
	(-0.14)	(0.13)	(1.41)	(0.83)	(0.77)	(0.31)	(-1.51)	(-1.53)	(-1.24)	(-1.78)
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	174,067	292,764	172,894	292,180	180,987	317,290	96,249	188,185	205,400	341,654
Adjusted R-squared	0.055	0.051	0.060	0.053	0.003	0.002	0.006	0.008	0.020	0.015

Appendix



Panel A: By Year 2008



Panel B: By Year 2013

Figure A1: Heat Map of the Number of Big-Four Branches across Provinces, 2008 versus 2013. This figure illustrates the outstanding number of all biggest four state-owned commercial bank 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).

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 otherwise.
Treatment	A dummy variable at city-bank level takes value of one if the joint-equity bank has outstanding branches in this city or in its capital city of the province prior to the bank expansion policy shock and zero otherwise.
Loan Amount (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.
Rating Dummy	The credit score placed by the loan officers in the bank. The larger the number, the worse the credit quality of the obligor. It takes the value of one if the rating is at the first category and zero otherwise.
Guaranteed	A dummy variable that equals one if the bank requires third-party guarantee protections and zero otherwise.
Existing Borrower	A dummy variable that equals one if the bank had a lending relationship with the firm during the prior 12 months and zero otherwise.
Delinquent	A loan performance measure that equals one if the loan is not repaid on time and zero otherwise.
Default	A loan performance measure that equals one if the loan is not repaid over three months after due date and zero otherwise.
ATR	Asset turnover ratio, is defined as the total operating income divided by total assets.
Higher ATR	A dummy indicating whether the assets turnover ratio is above the median value of firms' assets turnover ratio in census 2008.
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.
Net Incomes (Million RMB)	The revenues in excess of the cost of doing business, depreciation, interest, taxes and other expenses.
Employee	The amount of employment.
ROA	It is calculated by dividing a firm's annual earnings by its total asset in the same year.
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 outstanding of the firm in year t-1 in CBRC data. Sample is restricted to firms in CIC data with bank loans outstanding
Local GDP	It is the city level GDP.

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	32.14%	125.26%	27.22 %	72.05%	31.09%	234.46%	15.44%	113.61%
Deregulated Bank-Cities	34.42%	236.86%	27.09%	89.56%	34.42%	236.86%	27.34%	90.91%
Mean Difference	2.28 %		-0.13%		0.95%		11.90%	
t-statistics	(0.38)		(-0.04)		(0.20)		(1.48)	

Table A4: Descriptive Statistics of Borrower Targets

This table summarizes the unconditional statistics of borrower characteristics. Panel A reports the mean difference tests of operating efficiency variables, i.e. ATRs (Asset Turnover Ratio) and TFP between SOE borrowers and Non-SOE borrowers. For SOE subsample, Panel B reports the mean difference tests of borrower hierarchy and size between lower-ATR group and higher-ATR group. *T*-tests are also performed to show the statistical significance of the mean differences and *t*-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Panel A: Overall Sample			
	ATRs		TFP	
	N	Mean	N	Mean
SOE=0	4,560,151	2.118	4,560,151	2.401
SOE=1	358,167	1.761	358,167	1.804
Diff (1-0)		-0.357***		-0.597***
t-statistics		(-86.68)		(-124.24)
	Panel B: SOE Subsample			
	Higher Hierarchy		Assets	
Lower ATR	212,825	0.628	212,825	202.993
Higher ATR	145,342	0.594	145,342	24.734
Diff (H-L)		-0.035***		-178.259***
t-statistics		(-21.07)		(-7.67)

Table A5: Deregulation Effect on Local Deposits

This table presents the OLS regression estimates of difference-in-difference analysis of the banking deregulation effect on local deposits. The overall sample includes 1,740 city-year observations with no null values and the dependent variables are *Log(1+ Local Deposit)* and *Local Deposits/Local GDP*. 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 cities and zero for controlled cities. According to the policy, an eligible city *j* free of Joint-equity regulation on new-branch entry is a city that have at least one treated Joint-equity bank after excluding the banks whose headquarter city is city *j*. The column (1) and (4) report the regression estimate only with Year-fixed effect, the column (2) and (5) further include the Province-fixed effects, and the column (3) and (6) report the regression estimates with both City- and Year-fixed effects. All other variables are defined in the appendix Table A1. 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.

	Local Deposits					
	Log(1+ Local Deposits)			Local Deposits/Local GDP		
Variables	(1)	(2)	(3)	(4)	(5)	(6)
After2009.4*Treatment	-0.089	-0.087	-0.151*	0.012	0.017	-0.121
	(-1.20)	(-1.16)	(-1.89)	(0.22)	(0.32)	(-1.48)
Treatment	-0.382**	0.211	3.307***	-0.454	0.443	7.374**
	(-2.24)	(0.93)	(5.00)	(-1.63)	(1.40)	(2.23)
After2009.4	-0.366***	-0.387***	0.371**	-0.431***	-0.480***	1.151
	(-4.79)	(-4.77)	(2.17)	(-7.18)	(-7.40)	(1.50)
Log(Local GDP)	1.176***	1.199***	0.408**	0.192***	0.243***	-1.459*
	(36.92)	(27.75)	(2.55)	(5.32)	(5.75)	(-1.81)
Province FE	NO	YES	NO	NO	YES	NO
City FE	NO	NO	YES	NO	NO	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	1,740	1,740	1,740	1,740	1,740	1,740
Adjusted R-squared	0.852	0.900	0.979	0.150	0.391	0.829

Table A6: Deregulation Effect on Interest Rate

This table presents the OLS regression estimates of difference-in-difference analysis of the banking deregulation effect on borrowing costs. The sample in Panel A restricts to CIC firms with outstanding loans in a given year and covers 124,830 firm-year observations. The dependent variable in Panel A is a proxy for interest rate, the ratio of interest payments over the amount of loans. Panel B reports the interaction analyses between deregulation effect and the firm's state ownership. The sample in Panel C is from CSMAR loan database and includes 457 loan contracts with null values. The dependent variable in Panel C is the interest rate recorded in loan contracts. 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 cities and zero for controlled cities. According to the policy, an eligible city *j* free of Joint-equity regulation on new-branch entry is a city that have at least one treated Joint-equity bank. All other variables are defined in the appendix Table A1. Firm- and Year-fixed effects are included in Panel A and City- and Industry-fixed effects are included in Panel B. 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: CIC Sample

	Nominal Interest Rate (%)	
	(1)	(2)
After2009.4*Treatment	-1.019***	-1.163***
	(-2.92)	(-2.70)
Treatment	0.221	0.366
	(0.60)	(0.75)
Log(Assets)	1.107***	1.107***
	(18.83)	(18.84)
Leverage	2.681***	2.681***
	(9.65)	(9.65)
Private	0.356*	0.356*
	(1.88)	(1.88)
$Pre\text{-}Trend_{t-1}$		-0.159
		(-0.27)
$Pre\text{-}Trend_{t-2}$		-0.220
		(-0.33)
Firm FE	YES	YES
Year FE	YES	YES
Observations	108,580	108,580
R-squared	0.621	0.621

Panel B: Interactions with Private Dummy for CIC Sample

	Nominal Interest Rate (%)	
	(1)	(2)
Private*After2009.4*Treatment	-0.603***	-0.603***
	(-2.91)	(-2.92)
After2009.4*Treatment	-0.460	-0.610
	(-1.19)	(-1.30)
Treatment	0.219	0.369
	(0.59)	(0.75)
Log(Assets)	1.109***	1.109***
	(18.89)	(18.89)
Leverage	2.669***	2.669***
	(9.62)	(9.62)
Private	0.687***	0.687***
	(2.92)	(2.93)
Pre-Trend$_{t-1}$		-0.167
		(-0.28)
Pre-Trend$_{t-2}$		-0.221
		(-0.33)
Firm FE	YES	YES
Year FE	YES	YES
Observations	108,580	108,580
R-squared	0.621	0.621

Panel C: CSMAR Loan Sample

	Nominal Interest Rate (%)			
	(1)	(2)	(3)	(4)
After2009.4*Treatment	-1.044**	-1.069*	-8.005***	-6.083***
	(-2.05)	(-1.89)	(-7.87)	(-2.86)
Treatment	1.231***	1.409***	9.735***	9.080***
	(4.25)	(3.58)	(10.49)	(6.05)
Log(Assets)		-0.440*		-0.317
		(-1.67)		(-1.07)
Leverage		2.770**		1.840
		(2.34)		(1.23)
Private		0.231		-0.484
		(0.83)		(-0.91)
City FE	NO	NO	YES	YES
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	457	457	457	457
R-squared	0.382	0.410	0.660	0.668

Table A7 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. *ATR*, the efficiency measure, is defined as the ratio of operating incomes over total assets. *TFP*, total factor productivity, is the efficiency measure.

	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 Four Banks														
# Employee (1000)	2.593	0.424	2.816	0.419	2.990	0.290	2.059	0.290	2.042	0.240	2.123	0.313	2.054	0.301
Assets (Billion RMB)	7.922	1.289	7.222	1.384	11.860	1.593	19.463	1.890	10.749	1.482	99.837	1.640	13.512	1.718
Leverage	0.632	0.635	0.641	0.643	0.641	0.659	0.654	0.680	0.654	0.687	0.652	0.675	0.645	0.667
ATR	1.318	0.603	1.830	0.899	1.766	0.714	1.505	0.635	1.723	0.939	1.604	0.920	1.546	0.761
TFP	1.805	1.812	2.290	2.142	1.975	1.935	1.797	1.928	2.340	2.423	2.368	2.313	1.974	2.018
SOE Borrowers From Joint Equity Banks														
# Employee (1000)	2.315	0.186	2.066	0.199	1.547	0.166	1.534	0.154	1.637	0.166	1.523	0.133	1.836	0.131
Assets (Billion RMB)	8.936	1.982	8.203	1.940	8.307	1.744	8.638	2.059	17.943	1.875	35.653	1.897	7.700	1.819
Leverage	0.680	0.697	0.703	0.726	0.676	0.692	0.682	0.705	0.695	0.721	0.703	0.730	0.709	0.745
ATR	1.547	0.838	2.170	1.223	1.517	0.869	1.908	1.075	1.845	1.222	1.917	1.222	1.974	1.262
TFP	2.293	2.222	2.906	3.022	2.392	2.400	2.580	2.793	2.626	2.700	2.752	2.945	2.838	2.939
Non SOE Borrowers From Big Four Banks														
# Employee (1000)	1.959	0.530	2.045	0.542	2.353	0.512	1.690	0.403	1.346	0.330	1.403	0.325	1.313	0.310
Assets (Billion RMB)	2.968	0.589	3.760	0.703	3.886	0.638	4.061	0.689	6.480	0.680	12.669	0.739	5.217	0.744
Leverage	0.588	0.588	0.597	0.590	0.614	0.602	0.598	0.596	0.587	0.583	0.587	0.584	0.580	0.578
ATR	1.767	1.088	1.938	1.244	2.011	1.262	1.887	1.149	1.906	1.188	1.965	1.270	2.015	1.270
TFP	2.449	2.287	2.508	2.338	2.434	2.335	2.299	2.287	2.392	2.358	2.490	2.429	2.390	2.396
Non SOE Borrowers From Joint Equity Banks														
# Employee (1000)	2.088	0.516	2.060	0.565	2.046	0.480	1.610	0.376	1.505	0.263	1.217	0.211	1.097	0.200
Assets (Billion RMB)	3.633	1.001	4.320	1.225	4.516	0.974	4.223	0.923	4.434	0.707	4.392	0.666	4.396	0.681
Leverage	0.647	0.651	0.643	0.643	0.617	0.616	0.627	0.625	0.626	0.625	0.625	0.627	0.625	0.631
ATR	2.286	1.477	2.405	1.579	2.216	1.503	2.764	1.638	2.511	1.459	2.444	1.454	2.432	1.481
TFP	3.003	2.890	3.039	3.107	2.887	2.927	3.013	3.010	2.917	2.937	2.903	2.938	2.883	2.885

Table A8: The Impact of Bank Expansion on Targeting Strategy

This table reports the difference-in-difference regression estimates of the bank expansion effect on how banks target borrowers. The dependent variable is the percentage of loans to SOEs at city-bank-month level. The main independent variable is the interaction, *M_j*Treatment*, where *M_j* equals one for observations in month *j* (j is from Apr 2008 to Mar 2010) and zero otherwise and *Treatment* equals one for treated bank-cities and zero for controlled bank-cities. According to the policy, an eligible Joint-equity 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 the biggest four state-owned banks, i.e. Industrial and Commercial Bank of China (ICBC), China Construction Bank (CCB), Bank of China (BOC) and Agricultural Bank of China (ABC), the *Treatment* always equals zero since all of them are well established everywhere in China. All variables are defined in the appendix Table A1. City-, Bank-, and Year-fixed effects are included across all models. The *t*-statistics in parentheses are based on the two-way cluster-robust standard errors (cluster by city and by bank) across all these model specifications. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable: Percentage of Loans to SOEs
	4Y
Treatment	0.004
	(0.23)
After2009.4	0.003
	(0.85)
Treatment*M2008.04	-0.005
	(-1.31)
Treatment*M2008.05	-0.006
	(-1.36)
Treatment*M2008.06	-0.007
	(-1.30)
Treatment*M2008.07	-0.008
	(-1.36)
Treatment*M2008.08	-0.002
	(-0.28)
Treatment*M2008.09	-0.005
	(-0.72)
Treatment*M2008.10	-0.002
	(-0.25)
Treatment*M2008.11	-0.000
	(-0.05)
Treatment*M2008.12	0.004
	(0.49)
Treatment*M2009.01	0.006
	(0.70)
Treatment*M2009.02	0.011
	(1.28)
Treatment*M2009.03	0.012
	(1.33)
Treatment*M2009.04	0.018**
	(1.97)
Treatment*M2009.05	0.013
	(1.35)
Treatment*M2009.06	0.017*
	(1.78)
Treatment*M2009.07	0.023**
	(2.40)
Treatment*M2009.08	0.025**
	(2.49)
Treatment*M2009.09	0.024**
	(2.36)
Treatment*M2009.10	0.029***
	(2.82)
Treatment*M2009.11	0.033***
	(3.20)
Treatment*M2009.12	0.025**
	(2.42)
Treatment*M2010.01	0.027***
	(2.62)
Treatment*M2010.02	0.024**
	(2.30)
Treatment*M2010.03	0.018*
	(1.69)
Pre-Month Dummy	Yes
City FE	Yes
Bank FE	Yes
Year FE	Yes
Observations	142,312
R-squared	0.297

Table A9: Bank Expansion Effect on Big Four Banks

This table presents the regression estimates of difference-in-difference analysis on the impact of deregulation shock in Joint-equity bank expansion on Big Four Banks. The dependent variables are *Log(1+Outstanding Loan)* for Panel A and *Log(1+New Loan)* 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 Apr, 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 where at least one of the Joint-equity banks 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 six-month window subsample during Jan 2009 to Jun 2009, the column (2) reports the regression estimates for subsample during Oct 2008 to Sep 2009 (one-year event window), the column (3) reports the regression estimates for subsample during Apr 2008 to Mar 2010 (two-year event window), and the column (4) reports the regression estimates for subsample during Apr 2007 to Mar 2011 (four-year event window). All 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. The *t*-statistics in parentheses are based on the two-way cluster-robust standard errors (cluster by city and by bank) across all these model specifications. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Outstanding loans

	DV: Log (1 + Outstanding Loan)			
	Shorter Window			Longer Window
	(1)	(2)	(3)	(4)
	[200901,200906]	[200810,2009009]	[200804,201003]	[200704,201103]
After2009.4*Treatment	-0.002	0.013	-0.023	-0.090
	(-0.10)	(0.40)	(-0.48)	(-1.50)
Treatment	0.111***	0.134***	0.200***	0.263***
	(5.24)	(4.19)	(4.28)	(4.57)
After2009.4	1.381***	0.162	0.182	0.104
	(19.42)	(1.27)	(1.16)	(0.83)
Log(Local GDP)		0.013	-0.023	-0.090
		(0.40)	(-0.48)	(-1.50)
City FE	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	6,864	13,728	27,444	54,864
Adjusted R-squared	0.859	0.859	0.860	0.860

Panel B: New loans

	DV: Log (1 + New Loan)			
	Shorter Window			Longer Window
	(1)	(2)	(3)	(4)
	[200901,200906]	[200810,2009009]	[200804,201003]	[200704,201103]
After2009.4*Treatment	-0.192***	-0.005	0.041	-0.090
	(-2.91)	(-0.10)	(1.11)	(-1.50)
Treatment	0.226***	0.016	-0.072*	0.263***
	(3.53)	(0.31)	(-1.95)	(4.57)
After2009.4	0.938***	-0.262	-0.110	0.104
	(29.35)	(-1.51)	(-0.94)	(0.83)
Log(Local GDP)		-0.005	0.041	-0.090
		(-0.10)	(1.11)	(-1.50)
City FE	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	6,864	13,728	27,444	54,864
Adjusted R-squared	0.696	0.704	0.717	0.715