Crony Banking and Local Growth in China

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Very Preliminary

Abstract

The invention of city commercial banks (CCB) in some Chinese cities provides a unique opportunity to study the finance and growth nexus at the city level. The presence of these local banks though designed by policymakers to promote local growth by lending to SMEs, had the problem of being influenced heavily by the local governments. This paper develops a model in which firms can bribe local government to obtain credits from these banks, where large firms can offer large bribes due to its size. Credits would instead be channeled to large firms. This firm size distribution change would contrarily lower city growth rate. Using 2001-2010 panel data for all the cities in China, we find that the establishment of CCB significantly reduced local city’s economic growth. Using data on 206,771 firms during 1999-2007, we find that CCB significantly reduced firm’s growth rate in that city, small firms in particular, while the effect turned positive for large firms. The firm size distribution change provides a channel for city’s reduced growth rate.

Keywords: City Commercial Bank; Growth; China
1 Introduction

China’s current banking system is mainly composed of nationwide state-owned banks, nationwide joint-stock banks, and city commercial banks (CCBs). City commercial bank with its first appearance in 1995, as the name indicates, operated only within its own located city before 2006 to meet regulatory requirement, which provides a unique opportunity to study the heavily debated relationship between finance and growth, \(^1\) while nationwide state-owned banks, mainly big four, i.e., Bank of China, China Construction Bank, Industrial and Commerce Bank of China, Agricultural Bank of China, operated in every city in China.

Firstly showing up in 1995, CCBs were founded by merging and restructuring more than 5000 urban credit cooperatives. These CCBs are banks, which differentiated sharply from cooperatives, with details shown in Section 2. Up to the end of 2012, even though only 161 out of 288 cities established their own CCB, the total asset of all CCBs made up 9.24% of all the domestic banks asset. The weight of CCB in its located city is much higher considering they only exist in a partial list of cities.

There is a large number of literature studying the effect of financial development on economic or firm growth, but provided mixed results, as well as using Chinese data. Some research finds that the development of financial sector including banking sector is significantly positively associated with economic growth in China (Ljungwall and Li (2007), Zhang, Wang, and Wang (2012)), while others find that there is no significant relation, or even negative between Chinese financial sector and economic growth (Boyreau-Debray (2003), Chang, Jia, and Wang (2010)). The seemly puzzling negative relation in these papers is explained by the distorted state owned banking system which is unwilling to lend to small and medium enterprises (SMEs), though SMEs are the key driver of current economic growth. For firm level data, Ayyagari, Demirgüç-Kunt, and Maksimovic (2010) and Allen, Qian, and Qian (2005) also have different findings regarding the importance of formal bank finance in China. According to China Banking Regulatory Commission, CCBs were designed to lend to SMEs because of small bank advantage in lending to small firms and CCBs only operating in their own cities for our studied period provides a natural experiment to study whether these newly established CCB have positive

\(^1\)For a few years after 2006, operation outside CCBs located city was rare. Only a few banks had out of city operation, which makes our subsequent analysis robust.

\(^2\)Feldstein-Horioka (1980) test shows that capital mobility among Chinese cities is low, which is good for our city-level finance growth analysis.
effect on local city’s economic growth. Moreover, from the bank competition viewpoint, entries of CCBs in the local banking sector would introduce more competition between banks, which would generate higher growth rate.

Figure 1: Geographic distribution of CCB according to years of establishment

Using a balanced panel data of all the cities except Lhasa from 2001 to 2011 for difference-in-difference estimation, this paper finds that setup of CCB reduced city’s economic growth rate significantly. Moreover, there is also no positive effect on city’s industrial enterprise numbers and real gross industrial output.

We then apply the same estimation methodology to a firm level dataset which includes all the SOEs and all the non-SOEs with sales above 5 million yuan. After keeping firms with four consecutive years of appearance and controlling firms characteristics, we find that for the 206,771 firms, establishment of CCB in firms located city significantly reduced firms growth rate and the negative effect is stronger for smaller firms.

We argue that the establishment of local banks changed local firm size distribution and consequently led to lower economic growth rate. The establishment of these local banks were intended to generate higher growth rates since they should have comparative advantage in lending to small firms. But these local banks were heavily influenced by local government which are more easily captured by large firms, i.e., large firms can pay large bribes to capture local government officials. Similar capture theories for democracy countries were developed by
Bardhan and Mookherjee (2000), where rich voters increase campaign spending to influence campaign outcome. Local banks controlled by local government or heavily influenced by local government will be more inclined to lend to large firms, which are usually less productive considering decreasing return to scale for capital. The seminal work on local banks by Guiso, Sapienza, and Zingales (2004) shows that local financial development can contribute to local growth because local financial development can make small firms easier to obtain loans. This channel thus is totally reversed considering China’s more decentralized government feature.

For possible endogeneity concern, we use the percentage of citys neighboring cities having established CCB as instrumental variable (IV) for our CCB establishment probability in that city. All the initial CCBs were established in politically important cities, which are either provincial capital cities or the four municipalities or the five sub-provincial status cities. So we take the initial CCB establishments as exogenously determined. We adopt this IV by following from the policy diffusion literature, such as Simmons and Elkins (2004), who argue that neighboring regions are more likely to adopt the same policy due to factors including altered payoff, reputation concern, and learning. We can see from Figure 1 that the sequential establishment of CCBs demonstrates this policy diffusion pattern quite obviously. The first stage regression which will be shown below presents a very significant relation which validates our IV choice. We find that both the macro and micro regression still demonstrate that establishment of CCB reduced growth significantly.

We then explore why CCB presence lowered citys growth rate. Applying traditional bank efficiency measures to a subset of CCBs due to data availability, we find that on average, CCBs even have lower efficiency score than the nationwide traditional state-owned big five with big four plus Bank of Communication, which we conjecture is because local city government has its sole power in CCB but for branches of big four, there is a balance of power among local city government, headquarters in Beijing, and provincial level branch.

The rest of this paper will proceed as follows. Section 2 will briefly introduce Chinas banking sector, especially CCBs. Section 3 is literature review. Section 4 will introduce data and methodology. Section 5 will present results. Section 6 will present further discussion of the results. Section 7 concludes.
2 Introduction to City Commercial Banks

The predecessor of CCB is urban credit cooperative, which was firstly established at the city of Zhumadian in Henan Province in 1979. Table 1 shows the number of urban cooperatives from 1987 to 1998. We can see that there were 1615 urban credit cooperatives in China at the end of 1987, and this number increased dramatically to 5229 at the end of 1994 3, as shown in Table 1.

Table 1: Number of urban credit cooperatives in China, 1987-1998

| Year   | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
|--------|------|------|------|------|------|------|
| Number of urban credit cooperatives | 1615 | 3265 | 3409 | 3421 | 3518 | 4001 |

| Year   | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|--------|------|------|------|------|------|------|
| Number of urban credit cooperatives | 4957 | 5229 | 5104 | 4630 | 3716 | 3190 |

Data source: Almanac of Chinas Finance and Banking, 1990-1999.

However, many of these urban credit cooperatives faced various problems on their balance sheet such as large amount of non-performing loans. In 1995, the State Council released a document to set up city cooperative banks, the name of which was later changed to city commercial bank, in 35 major cities by merging and reorganizing urban credit cooperatives. In the same year, the first city cooperative bank was set up in Shenzhen. In 1996, 60 cities established their own CCBs, and 58 in 1997.4 More than 80 cities had set up their CCBs by the end of 1998. For instance, government of Shanghai merged 98 urban credit cooperatives into City Cooperative Bank of Shanghai (now called Bank of Shanghai) in 1995 5. Peoples Bank of China changed the names of all these city cooperative banks into CCBs in 1998 6. Up to the end of 2012, there were 157 out of 284 prefectural-level cities, 4 out of 4 municipalities having their own CCBs set up.

China Banking Regulatory Commission forbade CCBs to operate outside its own located city until 2006. Bank of Shanghai set up its first other city branch in Ningbo in 2006, which is the first cross-city operation among all CCBs. A large number of CCBs began to operate outside their original cities only after 2008. Therefore, our study period to 2007 is quite robust.

3Data source: Almanac of Chinas Finance and Banking, 1990-1999.
4Announcement about setting up city commercial banks in 58 cities, Peoples Bank of China, 1997.
5Almanac of Shanghai, 1996.
6Announcement about changing name of city cooperative banks, Peoples Bank of China, 1998.
We consider city economic growth after 2007 because we want to check out the lagged growth effect of CCB establishment. So cross-city operation won’t affect our main results.

| Year | 2003  | 2004  | 2005  | 2006  | 2007  |
|------|-------|-------|-------|-------|-------|
| All banks | 27658 | 31599 | 37470 | 43950 | 53116 |
| SOBs | 16051 | 17982 | 21005 | 24236 | 28500 |
| Shares | 58%   | 57%   | 56%   | 55%   | 54%   |
| YoY | 12%   | 17%   | 15%   | 18%   |       |
| CCBs | 1462  | 1706  | 2037  | 2594  | 3341  |
| Shares | 5%    | 5%    | 5%    | 6%    | 6%    |
| YoY | 17%   | 19%   | 27%   | 29%   |       |
| CCBs/GDP | 11%   | 11%   | 11%   | 12%   | 13%   |

| Year | 2008  | 2009  | 2010  | 2011  | 2012  |
|------|-------|-------|-------|-------|-------|
| All banks | 63152 | 79515 | 95305 | 113287 | 133622 |
| SOBs | 32575 | 40800 | 46894 | 53634 | 60040 |
| Shares | 52%   | 51%   | 49%   | 47%   | 45%   |
| YoY | 14%   | 25%   | 15%   | 14%   | 12%   |
| CCBs | 4132  | 5680  | 7853  | 9985  | 12347 |
| Shares | 7%    | 7%    | 8%    | 9%    | 9%    |
| YoY | 24%   | 37%   | 38%   | 27%   | 24%   |
| CCBs/GDP | 13%   | 17%   | 20%   | 21%   | 24%   |

Data source: CBRC 2006-2012 annual report. SOB stands for state-owned large commercial bank.

CCBs starkly differentiate from urban credit cooperatives. First, urban credit cooperatives were cooperative financial organizations instead of banks, which are under different regulations. They are under the regulation of Urban Credit Cooperatives. For example, cooperatives have very strict deposit taking and loan issuing limit. According to Regulation of Urban Credit Cooperatives, Deposits from non-cooperative members should not exceed 40% of all deposits, and deposits from any single individual non-cooperative members could not exceed 150,000 RMB. Loans to any single client could not exceed 500,000 RMB, and loans to non-cooperative members could not exceed 40% of all loans. Other regulations include no access to interbank

7Document 54, Regulation of Urban Credit Cooperatives, 1997.
market, no license to government bonds and financial bonds etc. All of these regulations limited urban credit cooperatives function in local banking system.

Second, there is significant increase of balance sheet size after being reorganized into CCB. For example, Bank of Shanghai was founded by merging 98 urban credit cooperatives at the end of 1995. In just one year after Bank of Shanghai was built, total asset increased by 89.3% and total loan increased by 82.8

Therefore, we can conclude that CCB is in stark difference with urban credit cooperatives.

3 Literature review

There is a large literature on finance and growth nexus. Theoretically, the study dates back to ?, who argues that finance contributes to growth because banks can identify and loan to the most innovative and promising firms. Financing to these firms can provide funds for technological innovation and consequently for economic growth. A survey article by Levine (2005) lists channels of finance in contributing to economic growth, which include specifically producing information and allocating capital, monitoring firms and exerting corporate governance, diversifying and managing risk, mobilizing and pooling savings, and easing the exchange of goods and services. However, Robinson (1952) argues that financial sector development follows economic growth. Lucas (1998) points out that the role of finance in economic growth is over-stressed.

Goldsmith (1969) finds a higher financial development level is associated with high growth by investigating 35 countries from 1860 to 1963. The finding is furthermore confirmed by King and Levine (1993), who use four different financial development indicators and expand the number of countries to 77 for the period of 1960-1989. For the concern regarding reverse causality of finance and growth, Levine, Loayza, and Beck (2000) use a countrys legal and accounting system as instrumental variable and still find financial development led to economic growth by using 71 countries data for the period of 1960-1995. Jayaratne and Strahan (1996) use difference-in-difference estimation same as ours to study a wave of bank deregulation in the US and find it positively affects states economic growth.

However, research on China finds mixed results. Some studies find a positive relation between financial sector development and economic growth such as Ljungwall and Li (2007), Zhang, Wang, and Wang (2012). But another strand of literature finds no significant relation
or even significant negative relation between financial sector development and economic growth in China such as Boyreau-Debray (2003), and Chang, Jia, and Wang (2010). In particular, Boyreau-Debray (2003) finds that financial development measured as deposits divided by GDP is negatively related to economic performance by using data from 26 provinces during 1990-1999 and suggests that the negative effect appears to be attributable to the burden of supporting the state-owned corporate sector.

For the studies of CCBs in China, Ferri (2009) finds that the efficiency of CCB strongly depends on provincial economic growth level but unfortunately, the obvious endogeneity problem is not addressed. Zhang, Wang, and Qu (2012) find that the performance and risk taking of CCBs are positively related to the provincial level of law enforcement, which motivates our study on whether CCBs contribute to local city growth considering China’s poor law enforcement.

Che and Qian (1998)

4 A Simple Model

The model is based on Bai, Hsieh, and Song (2014). Firms pay bribes to politicians to obtain credits, as local government controls the bank. Larger firms have the ability to pay higher bribes because of its total asset size. Local bank (government) therefore prefers larger firms. The bribe should be sufficiently large than the risk of being punished for taking bribes. However, due to decreasing return to scale on capital, larger firms are relatively inefficient. Therefore, the existence of a local bank changes the firm size distribution in that city by reducing productive firms’ growth rates and consequently reduces growth rate.

Nationwide banks are more efficient as politicians in central government has a higher risk being punished. There are quite a few evidence showing that local governments are more corrupted than central government. Therefore, nationwide banks, the ”big four” controlled by the central government, only prefer the very few large firms in the country, which makes these nationwide state-owned banks more efficient.

There are a continuum of firms $[0, 1]$. Government $i$’s problem is

$$\max W_i = \varphi \int_{f_\alpha}^1 (K_{ij} + I_{ij})^\alpha df + G(i)^\beta$$

s.t.
\[ I_i + G(i) = B \]
\[ \int_{f_H}^{1} I_{if} df = I_i \]
\[ \varphi(K_{if} + I_{if})^\alpha \geq F_i \]

where

\[ K_{fu} = \arg \min_{K_{if}} (\varphi(K_{if} + I_{if})^\alpha \geq F_i) \]
\[ K_{if} \sim U[0, K] \]

\( i \) denotes city, \( W \) denotes total welfare, \( f \) denotes firms, \( \varphi \) denotes the fraction of output contributed to bribe, \( \alpha < 1 \) denotes decreasing return to scale, \( K \) firm \( f \) in city \( i \)'s total asset, \( I_{if} \) denotes firm \( f \)'s total credit obtained from local bank, \( G(i) \) denotes public goods consumption. \( B \) denotes government’s budget, \( \delta \) denotes the substitutibility between government spending and local bank subsidy and \( \delta >> 1 \) indicating subsidizing local bank is quite costly. The first budget constraint indicates government budget balance. The second indicates total loans obtained by firms in city \( i \) is equal to bank’s total credit. For last constraint, \( F \) denotes punishment risk for bribes. The left hand side is bribe obtained from firm \( f \). The last constraint indicates total bribe must be sufficiently large than the risk of being punished.

FOC solutions are, for \( f \in [f_H, 1], \)
\[ K_{if} + I_{if} = K_{if'} + I_{if'} = \left( \frac{\beta G(i)^{\beta-1}}{\varphi \alpha} \right)^{\frac{1}{\alpha-1}} \]
\[ K_{if} + I_{if} = \left( \frac{F_i}{\varphi} \right)^{\frac{1}{\alpha}} \]

We can get that
\[ I_i = B - \left( \frac{\varphi \alpha (F_i)^{\frac{\alpha-1}{\alpha}}}{{\beta}} \right)^{\frac{1}{\alpha-1}} \]

Proposition: \( \frac{\partial I_i}{\partial F_i} < 0 \). Lower \( F_i \), i.e., higher corruption tolerance level, will lead to more crony lending, i.e., \( I_i \), then more corruption, lower growth level. Nationwide banks which are controlled by the central government have a better performance because of higher \( F \).

Social planner’s problem is
\[
\max W_i = \int_0^{f_L} (K_{if} + I_{if})^\alpha df + G(i)^\beta
\]

s.t.
\[ I_i + G(i) = B \]
\[ \int_0^{1} I_{ij}df = I_i \]

Proposition: Output under social planner’s problem is higher than that under crony lending, \( Y_s > Y_c \). Moreover, \( \frac{Y_s}{I_s} > \frac{Y_c}{I_c} \)

5 Data and Methodology

We mainly use difference-in-difference model to estimate the effect of CCB establishment on city and firm growth. Besides some manually collected data as detailed below, the data we use are mainly from CEIC China premium database for city level data, China Annual Census of Enterprises for firm level data, and various Statistical Yearbooks.

5.1 Macro: City Level Growth

5.1.1 Model and Variables

In this paper, we estimate the following difference-in-difference model,

\[ Economic Growth_{i,t} = c + \gamma \cdot CCB_{i,t} + \phi \cdot X_{i,t} + \alpha_t + \beta_i + \epsilon_{i,t} \]

where \( i \) and \( t \) denote city and year, \( \alpha_t \) and \( \beta_i \) control time and city fixed effects. The dependent variable \( Economic Growth_{i,t} \) will be specified into two measures. One is \( GRGDP_{i,t} \), which measures GDP growth rate for city \( i \) at time \( t \). The other one is \( GRGDPPC_{i,t} \), which measures GDP per capita growth rate. Alternative dependent variables include \( GR\#EN_{i,t} \), which measures growth rate of number of enterprises above designated size in city \( i \) at year \( t \), and \( GRIP_{i,t} \), which measures growth rate of total industrial output in city \( i \) at year \( t \). The key explanatory variable, \( CCB_{i,t} \), is a dummy indicating whether city \( i \) at year \( t \) owns a CCB or not, which is equal to 1 if yes, 0 otherwise. Moreover, following Berger et al. (2005), a dynamic time variable \( CCBYEAR_{i,t} \) is introduced to indicate how many years CCB has been presence in that city, which measures the long term impact of CCB establishment. Control variables \( X_{i,t} \) are as follows. \( LOAN_{i,t} \) is the ratio of total loans in all local financial institutions to GDP. \( LnGDP(PC)_{i,t-1} \) is the logarithm of real local GDP (per capita) in previous year in order to control economic convergence effect. \( FAI_{i,t} \) is fixed asset investment divided by GDP. \( FDI_{i,t} \) is total utilized foreign direct investment divided by GDP. \( FISCAL_{i,t} \) is the ratio of local
government expenditure to GDP. \( GRPOP_{i,t} \) is population growth rate. \( EDU_{i,t} \) is percentage of population with secondary schools education and above. Variables used are summarized in Table 3.

5.1.2 Data

The administrative division in China has 4 levels, from upper to lower level, including provincial level, prefectural level, county level and village level. The provincial level division includes 23 provinces, 5 autonomous regions, 4 municipalities and 2 Special Administrative Regions (SARs). 4 municipalities are Beijing, Shanghai, Tianjin and Chongqing. Provinces and autonomous regions are made up of prefectures. There are 284 prefectural-level cities in China by the end of 2011\(^8\). Excluding Lhasa \(^9\), we have 283 prefectural-level cities and 4 municipalities used in our sample. For convenience, cities are referred to both prefectural-level cities and municipalities. The prefectural-level city economic data is limited before 2001 as data for some of our key control variables are missing. So the sample period chosen begins in 2001 and ends in 2011, the latest year of available statistical data. After 2006, CCBs start to operate nationwide, which are mostly relatively large CCBs established on the first wave. There are only a few CCB operating outside their own cities before 2008, and even after that their main operation is still in their own city. Plus we study the lagged effect of CCB, so its reasonable to extend our study period to 2011.

Data for prefectural-level cities are from CEIC China premium database. Missing values are manually filled up from China Statistical Yearbook for Regional Economy and statistical yearbooks of provinces and prefectural-level cities. The descriptive statistics of macro variables are summarized in Table 5.

157 out of 284 prefectural-level cities and 4 out of 4 municipalities have their CCBs established by the end of 2011. After merging and acquisition, there are 144 CCBs in total. The establishment year of CCBs is manually collected from public information, including local yearbooks, official websites and annual reports of CCBs. Dummy variable CCB is set to be 1 since the next year of CCBs setup because of the possible lag-effect. CCBs establishment time

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\(^8\)China Statistical Yearbook, 2011.

\(^9\)Lhasa is dropped because of limited statistical data.
Table 3: Variables used in macro growth regression model

| Symbol       | Definition                                                                                         |
|--------------|---------------------------------------------------------------------------------------------------|
| **Dependent variables**                      |                                                                                                  |
| GRGDP        | Real growth rate of local GDP                                                                     |
| GRGDPPC      | Real growth rate of local GDP per capita                                                          |
| **CCB variables**                             |                                                                                                  |
| CCB          | Dummy variable indicating whether a city has its own CCB or not, equals 0 before and in the year of setup, equals 1 since the following year, and equals to 0 in all periods for cities that do not have their own CCBs. |
| CCBYEAR      | Number of years since CCB of the city setup, equals to 0 before and in the year of setup, 1 the following year, 2 the second following year etc. and equals to 0 in all periods for cities without their own CCB |
| **Control variables**                         |                                                                                                  |
| LOAN         | Ratio of total loans in all financial institutions to GDP                                         |
| LnGDP(PC)    | Logarithm of real local GDP (per capita)                                                          |
| FAI          | Ratio of fixed asset investment to GDP                                                            |
| FDI          | Ratio of utilized foreign direct investment to GDP                                               |
| FISCAL       | Ratio of government expenditure to GDP                                                            |
| GRPOP        | Population growth rate                                                                           |
| EDU          | Percentage of students in secondary schools in total population.                                  |
| **Alternative Dependent Variables**           |                                                                                                  |
| GR#EN        | Growth rate of number of industrial enterprises above designated size                            |
| GRIP         | Real growth rate of gross output of industrial enterprises above designed size                   |
Table 4: Municipalities and number of prefectural-level cities in China (up to end of 2011)

| Municipalities  | Beijing | Shanghai | Chongqing |
|-----------------|---------|----------|-----------|
| Tianjin         |         |          |           |

| Provinces and # of prefectural cities |
|---------------------------------------|
| Hebei       | 11      | Shanxi   | 11        | Liaoning  | 14 |
| Jilin       | 8       | Heilongjiang | 12        | Jiangsu   | 13 |
| Zhejiang    | 11      | Anhui    | 16        | Fujian    | 9  |
| Jiangxi     | 11      | Shandong | 17        | Henan     | 17 |
| Hubei       | 12      | Hunan    | 13        | Guangdong | 21 |
| Hainan      | 2       | Sichuan  | 18        | Guizhou   | 6  |
| Yunnan      | 8       | Shaanxi  | 10        | Gansu     | 12 |
| Qinghai     | 1       |          |           |           |    |

| Autonomous regions and # of prefectural cities |
|-----------------------------------------------|
| Inner Mongolia                                | 9   | Guangxi | 14      | Tibet     | 1  |
| Ningxia                                       | 5   | Xinjiang| 2       |           |    |

| Total # of prefectural cities                  | 284 |
| Sample size                                   | 283 prefectural cities + 4 municipalities |

Data source: China Statistical Yearbook, 2011; sample is selected as all but Lhasa.
information is summarized in Table 6.

Table 5: Descriptive statistics of macro variables

| GRGDP | GRGDPPC | CCB | CCBYEAR | LOAN |
|-------|---------|-----|---------|------|
| Mean  | 0.1318  | 0.126 | 0.4387  | 3.3392 | 0.7733 |
| Std   | 0.0344  | 0.0409 | 0.4963  | 4.5331 | 0.4301 |
| Median| 0.132   | 0.125 | 0 | 0 | 0.643  |
| Min   | -0.078  | -0.0904 | 0 | 0 | 0.0753 |
| Max   | 0.37    | 0.476 | 1 | 16 | 4.6126 |
| Obs   | 3157    | 3157 | 3157 | 3157 | 3153 |

| LnGDP | LnGDPPC | FAI | FDI | FISCAL |
|-------|---------|-----|-----|--------|
| Mean  | 3.6412  | 9.3338 | 0.4913 | 0.003 | 0.1308 |
| Std   | 1.0225  | 0.7699 | 0.2269 | 0.0038 | 0.0755 |
| Median| 3.5771  | 9.2949 | 0.4598 | 0.0017 | 0.113 |
| Min   | 0.5839  | 7.0309 | 0.0629 | 0 | 0.0206 |
| Max   | 7.2619  | 11.6194 | 1.7467 | 0.0577 | 1.0268 |
| Obs   | 3157    | 3135 | 3154 | 3059 | 3154 |

| GRPOP | EDU | GR#EN | GRIP |
|-------|-----|-------|------|
| Mean  | 0.0086 | 0.0629 | 0.0782 | 0.228 |
| Std   | 0.0147 | 0.0133 | 0.1889 | 0.1647 |
| Median| 0.0065 | 0.0625 | 0.0719 | 0.2222 |
| Min   | -0.0961 | 0.0099 | -0.7366 | -0.6735 |
| Max   | 0.184  | 0.1235 | 1.7164 | 3.2694 |
| Obs   | 3150   | 3143 | 3151 | 3153 |

Data source: CEIC China Premium Database, China Statistical Yearbook for Regional Economy, statistical yearbooks of provinces and prefectural-level cities.
Table 6: Cities with city commercial banks setup each year (1995-2011)

| Year | Cities                                      |
|------|--------------------------------------------|
| 1995 | Shanghai, Shenzhen                         |
|      |                                            |
| 1996 | Anshan, Beijing, Chengdu, Chongqing, Fuzhou, Guangzhou |
|      | Hangzhou, Shijiazhuang, Kunming, Nanjing, Qingdao, Jinan |
|      | Tianjin, Xiamen, Zhuhai, Zhengzhou         |
| 1997 | Anqing, Changsha, Dandong, Foshan, Fushun, Guilin |
|      | Guiyang, Harbin, Hefei, Huzhou, Huangshi, Jilin |
|      | Jiaxing, Jinhua, Jinzhou, Jingzhou, Kaifeng, Lanzhou |
|      | Leshan, Liaoyang, Liuzhou, Luzhou, Luoyang, Maanshan |
|      | Nanchang, Nanning, Nantong, Ningbo, Panzhihua, Qiqihar |
|      | Quanzhou, Shantou, Shaoxing, Shenyang, Suzhou, Urumqi |
|      | Weifang, Weihai, Wuhan, Wuhu, Xian, Xining |
|      | Xiangtan, Xinxian, Yantai, Yangzhou, Yingkou, Yueyang |
|      | Zhuzhou, Zibo                              |
| 1998 | Baotou, Cangzhou, Changchun, Changzhou, Dalian, Deyang |
|      | Jiaozuo, Qinhuangdao, Linyi, Nanyang, Taiyuan, Tangshan |
|      | Wenzhou, Wuxi, Yancheng, Yichang, Yinchuan, Zhanjiang |
|      | Zhenjiang                                 |
| 1999 | Dongguan, Hohhot, Xiaogan                 |
| 2000 | Daqing, Huaibei, Jiujiang, Langfang, Mianyang, Rizhao |
|      | Xuzhou                                    |
| 2001 | Baoji, Bengbu, Datong, Fuxin, Ganzhou, Huludao |
|      | Huaian, Lianyungang, Nanchong, Zigong, Zunyi |
| Year | Cities |
|------|--------|
| 2002 | Hengyang 3, Taizhou, Xianyang |
| 2003 | Zhangjiakou 1 |
| 2004 | Dezhou 1 |
| 2005 | Changzhi 4, Dongying, Laiwu, Panjin |
| 2006 | Chengde 9, Jining, Jincheng, Karamay, Mudanjiang, Qujing |
| 2007 | Wuhai 10, Yibin, Yuxi |
| 2008 | Erdos 12, Jinzhong, Shangrao, Taian, Tieling, Xiangyang |
| 2009 | Xingtai 9, Xuchang, Yangquan, Zaozhuang |
| 2010 | Anyang 12, Baoding, Chaoyang, Handan, Hebi, Liupanshui |
|      | Pingliang 11, Pingdingshan, Suining, Taizhou, Xinyang, Yaan |
| 2009 | Anshun 9, Dazhou, Hengshui, Luohe, Sanmenxia, Shangqiu |
|      | Shizuishan 9, Zhoukou, Zhumadian |
| 2010 | Baiyin 3, Benxi, Puyang |
| 2011 | Jingdezhen 1 |

Data source: City yearbooks, and Annual reports and official websites of CCBs.
5.2 Micro: Firm Level Growth

5.2.1 Model and Variables

A similar model to equation (1) is estimated to test the effect of establishment of CCB on firm growth,

\[ \text{Firm Growth}_{i,j,t} = c + \gamma \cdot \text{CCB}_{j,t} + \phi \cdot X_{i,j,t} + \alpha_t + \beta_i + \epsilon_{i,t} \]

where i, j, t, denote firm, located city, and year, respectively, \( \alpha_t \) and \( \beta_i \) control year and firm fixed effects. Firm growth can be measured by \( \text{GRSALES}_{i,j,t} \) and \( \text{GRASSET}_{i,j,t} \). \( \text{GRSALES}_{i,j,t} \) is annual growth rate of sales of firm i, located in city j in year t. \( \text{GRASSET}_{i,j,t} \) is annual growth rate of asset of firm i in city j at year t. The key variable, dummy \( \text{CCB}_{j,t} \), indicates whether CCB has already been established or not in city j at year t, which is equal to 1 if yes, 0 otherwise.

Control variables \( X_{i,j,t} \) are listed as follows. STATECAP is the percentage of state-owned paid-up capital. In addition, SOE is a dummy variable which indicates whether the firm is an SOE or not. It equals 1 if a firm has more than 50% shares as state-owned. The size of firm is controlled by \( \text{ASSET}_{i,j,t} \) and \( \text{SME}_{i,j,t} \). \( \text{ASSET} \) is the logarithm of firms total asset. SME is a set of two dummies classifying firms into three groups, small firms (employees less than 300 or sales below 30 million RMB or total asset below 40 million RMB), medium firms (employees less than 2000 or sales below 300 million RMB or total asset below 400 million RMB) and large firms. In addition, years since firms establishment is also used as control variables. Firms are divided into three groups according to their growth stages, which are start-up (established less than or equal to 5 years), growth (6-20 years) and mature (21 years and more).

5.2.2 Data

The data used for firm-level analysis is from Annual Census of Enterprises by the Chinese National Bureau of Statistics from 1999 to 2007. It includes all the SOEs, and non-SOEs with sales over 5 million RMB. The number of firms included in 1999 is 160,733, which rises to 335,076 in 2007. The data contains all the information from the three accounting statements (balance sheet, profit and loss, and cash flow). Only firms with four consecutive years presence are kept. Firms whose total asset, total output, fixed asset, paid-in capital are 0 and total staff less than 8 (lack of credible accounting system) are dropped, and observations with sales growth rate and asset growth rate ranked in top and bottom 0.5% of the sample (16,231 out of
Table 7: Variables used in firm growth regression model

| Variables     | Definition                                                                 |
|---------------|-----------------------------------------------------------------------------|
| **Dependent variables** |                                                                                 |
| GRSALES       | Sales growth rate of firms                                                   |
| GRASSET       | Total asset growth rate of firms                                             |
| **CCB variables** |                                                                 |
| CCB           | Dummy indicating whether the city where firm is located has its CCB set up or not, equals to 0 before and in the year of setup, 1 since the following year and equals to 0 in all periods for firms located in cities without their own CCBs. |
| **Control variables** |                                                                 |
| STATECAP      | Percentage of state-owned paid-up capital                                    |
| SOE           | Dummy indicating whether the firm is state-owned (equals to 1) or not         |
| ASSET         | Logarithm of firms total asset                                              |
| SME           | A set of two dummies (MEDIUM, SMALL) indicating whether the firm is large, medium or small. |
| AGE           | A set of two dummies (GROWTH, MATURE) indicating ages of firms (\( \leq 5, 6 - 20, > 21 \)) |
223,002) are dropped. Finally, the sample contains 206,771 firms from 40 industries (mainly manufacturing) and 947,536 observations. The summary statistics of the sample is reported in Table 8.

The 40 industries are Coal Mining and Dressing, Petroleum and Natural Gas Extraction, Ferrous Metals Mining and Dressing, Nonferrous Metals Mining and Dressing, Nonmetal Minerals Mining and Dressing, Other Mining and Dressing, Processing of Agricultural and Sideline Products, Food Manufacturing, Beverage Manufacturing, Tobacco Manufacturing, Textile Industry, Manufacturing of Textile Garments, Footwear and Headgear, Leather, Furs, Down and Related Products, Timber Processing, Wood, Bamboo, Cane, Palm Fiber and Straw Products, Furniture Manufacturing, Papermaking and Paper Products, Printing and Record Medium Reproduction, Manufacturing of Cultural, Educational and Sports Goods, Petroleum Processing, Coking, and Nuclear Fuel Processing, Raw Chemical Materials and Chemical Products, Medical and Pharmaceutical Products, Chemical Fiber Manufacturing, Rubber Products, Plastic Products, Nonmetal Mineral Products, Smelting and Pressing of Ferrous Metals, Smelting and Pressing of Nonferrous Metals, Metal Products, Manufacturing of General Purpose Equipment, Manufacturing of Special Purpose Equipment, Manufacturing of Transport Equipment, Manufacturing of Electric Machinery and Equipment, Manufacturing of Telecommunications Equipment, Computers and Other Electronic Equipment, Manufacturing of Instruments, Meters, Cultural and Office Machinery, Manufacturing of Handicrafts and Others, Recycling Processing of Deserted Resources and Wastes, Production and Supply of Electric Power and Heat Power, Production and Supply of Gas and Production and Supply of Water.
Table 8: Summary statistics of firm level data

|                      | Number of firms | Percentage |
|----------------------|-----------------|------------|
| **CCB**              |                 |            |
| Located in cities with CCB | 156230          | 75.60%     |
| Located in cities without CCB | 50541           | 24.40%     |
| **Ownership**        |                 |            |
| SOE                  | 18182           | 8.80%      |
| Non-SOE              | 188589          | 91.20%     |
| **Size**             |                 |            |
| Large                | 1829            | 0.90%      |
| Medium               | 26526           | 12.80%     |
| Small                | 178416          | 86.30%     |
| **Age**              |                 |            |
| < 6 years            | 50172           | 24.30%     |
| 5 – 20 years         | 126977          | 61.40%     |
| > 20 years           | 29621           | 14.30%     |
| **Total number of firms** | 206771         |            |
| **Sample period**    | 1999-2007       |            |
| **Total observations** | 947536         |            |

Data source: China Annual Census of Enterprises.

As shown above, around 3/4 of firms are located in cities with CCBs. More than 90% of firms are non-SOE and SMEs. As for ages, majority of firms are in the growth development phase. The descriptive statistics of variables employed in firm-level regression is summarized in Table 9.
Table 9: Descriptive Statistics for firm level data

|         | GRSALES | GRASSET | CCB    | STATECAP | SOE    |
|---------|---------|---------|--------|----------|--------|
| Mean    | 0.265   | 0.1977  | 0.7556 | 0.088    | 0.0879 |
| Std     | 0.5857  | 0.4977  | 0.4298 | 0.2682   | 0.2832 |
| Median  | 0.1476  | 0.0754  | 1      | 0        | 0      |
| Min     | -0.7588 | -0.7421 | 0      | 0        | 0      |
| Max     | 5.5839  | 5.0869  | 1      | 1        | 1      |
| Obs.    | 947536  | 947536  | 947536 | 947536   | 947536 |

|         | ASSET   | Medium | Small | Growth | Mature |
|---------|---------|--------|-------|--------|--------|
| Mean    | 10.1037 | 0.1283 | 0.8629| 0.6141 | 0.1433 |
| Std     | 1.4135  | 0.3344 | 0.344 | 0.4868 | 0.3503 |
| Median  | 9.9115  | 0      | 1     | 1      | 0      |
| Min     | 4.7791  | 0      | 0     | 0      | 0      |
| Max     | 20.1506 | 1      | 1     | 1      | 1      |
| Obs.    | 947536  | 947536 | 947536| 947536 | 947536 |

Data source: China Annual Census of Enterprises

5.3 Endogeneity

The endogeneity problem of CCB used in the above equation is not severe, as it is hard to think the purpose for city government to establish CCB is to lower city’s growth rate. But maybe CCB is established to mitigate the potential city growth slowdown, or there might be some omitted variables affecting growth rate and establishment of CCB simultaneously, such as city governance, all of which contribute to endogeneity problem for the above equations we will estimate.

In this paper, we adopt IV method to solve the potential endogeneity problem. From Figure 1, we see that there is obvious clustering among CCBs. We find that for every province, CCB was first established at its capital cities, except five provinces which have one sub-provincial status city each. Based on the clustering observation and policy diffusion argument detailed by Simmons and Elkins (2004), we use the percentage of neighboring cities in the same province having established CCB to instrument for the CCB dummy in our regressions. The reason we use the neighboring cities in the same province is that we group cities according to their province
and cities in the same province are more likely to share the same financial and economic policy because cities are under the leadership of provincial government.

We run the two stage regression for our endogeneity problem. The first stage takes the following form while the second stage is the main equation we described above.

\[ CCB_{i,t} = c + \gamma \cdot Neighbor_{i,t} + \phi \cdot X_{i,t} + \alpha_t + \beta_i + \epsilon_{i,t} \]

where i and t denote city and year respectively. \( CCB_{i,t} \) is what we used in regression (1), the key explanatory variable. \( Neighbor_{i,t} \) is the percentage of neighboring cities in the same province having established CCB by year t. Alternatively, we use the percentage of cities having established CCB by year t.

6 Empirical results

6.1 City commercial bank and city macro performance: city level data

6.1.1 City commercial bank establishment and city GDP growth

Table 10 reports the DID estimation results. Regression 1 only includes key independent variable \( CCB \) and the constant. Regression 2 adds logarithm of real GDP from previous year to control convergence effect, i.e., rich cities are expected to grow slower. Other control variables except \( LOAN \) are added in regression 3. Regression 4 includes all control variables. City and year fixed effects are included in all regressions. Coefficients before the key independent variable \( CCB \) are significantly negative for all the regressions, which indicate that the establishment of CCB significantly reduced city’s economic growth. After CCB establishment, growth rate was reduced by 0.546 to 0.676 percentage point. So the result is economically large as well. Other coefficients have the expected signs. \( LnRGDP_{-1} \) negatively affects grow rate, showing strong convergence effect. \( LOAN \) is negatively associated with growth rate, consistent with the finding by Boyreau-Debray (2003), who attribute the negative sign to Chinas distorted financial system. \( FAI \) strongly contributes to economic growth rates, but \( FDI \) is insignificant, possibly because FDI goes to developed regions which have high \( LnRGDP_{-1} \). Government spending or intervention \( FISCAL \) is negatively related to growth rate which might reflect Chinas inefficient government institution. \( GRPOP \) and \( EDU_{-1} \) are insignificant, possibly because
of relation with $LnRGP_{-1}$, i.e., highly developed cities usually have a large percentage of higher education group and also attracts a large amount of immigrants. The results on control variables are consistent with findings in the existing literature, such as Cai et al. (2002) on the existence of convergence in China, Guariglia and Poncet (2008) and Boyreau-Debray (2003) on insignificance of loans, Boyreau-Debray (2003) on insignificance of FDI, and Fleisher et al. (2010) on positive effect of education.

Table 11 shows the results when replacing dummy variable $CCB$ with $CCBYEAR$ to test the long term effect of CCB, as one might conjecture that there might be a learning curve for CCB to be effective. All the results show a significant negative effect from establishing CCB, indicating a negative long term effect of CCBs establishment on local GDP growth rate.

The possible lag-effect has already been taken into account when constructing dummy variable $CCB$. However, it may take more than one year for CCB to have an effect. We use lagged values of CCB to test this lag effect. Sample period is still kept from 2001 to 2011 and lagged $CCB$ is obtained manually based on years of CCBs establishment.

Table 12 reports the results using first to fifth lagged $CCB$ as key independent variable. Cities in the experimental group change correspondingly as a result of lagged $CCB$ used. When first to fifth lagged $CCB$ is used, 67, 61, 68, 108 and 115 cities with their CCBs setup during 2000-2009, 1999-2008, 1998-2007, 1997-2006 and 1996-2005 are set as experimental group. As a result, nearly all cities with CCBs setup are covered in experimental group among these regressions, considering that only two CCBs were set up before 1996, which are in Shenzhen and Shanghai respectively. The results still show a significant negative relation between lagged $CCB$ and local GDP growth rate for different lagged-effects and experiment group members.

Now, we use GDP per capita growth rate instead of GDP growth rate as dependent variable. Table 13 shows the results. We can see that the establishment of CCBs ($CCB$), their lagged effects ($CCB_{-1}, CCB_{-2}, CCB_{-3}$), and their dynamic effect ($CCBYEAR$) are all significantly negative to citys GDP per capita growth rate.
| Dependent Variable | Reg1       | Reg2       | Reg3       | Reg4       |
|-------------------|------------|------------|------------|------------|
| CCB               | -0.00546*  | -0.00563** | -0.00530** | -0.00676***|
|                   | (0.00263)  | (0.00229)  | (0.00202)  | (0.002)    |
| LnRGDP\(_{-1}\)   | -0.116***  | -0.124***  | -0.131***  |            |
|                   | (0.0268)   | (0.0212)   | (0.0226)   |            |
| LOAN              |            |            |            | -0.0268*** |
|                   |            |            |            | (0.00555)  |
| FAI               |            | 0.0728***  | 0.0712***  |            |
|                   |            | (0.00885)  | (0.00915)  |            |
| FDI               | 0.0608     | 0.028      |            |            |
|                   | (0.201)    | (0.174)    |            |            |
| FISCAL            |            |            | -0.0796*   | -0.0830**  |
|                   |            |            | (0.0372)   | (0.0327)   |
| GRPOP             |            |            | -0.0211    | -0.0149    |
|                   |            |            | (0.0399)   | (0.0488)   |
| EDU\(_{-1}\)     | 0.00366    | 0.0105     |            |            |
|                   | (0.042)    | (0.0497)   |            |            |
| Constant          | 0.0964***  | 0.450***   | 0.469***   | 0.515***   |
|                   | (0.00089)  | (0.0823)   | (0.0657)   | (0.0693)   |
| City fixed effect | Yes        | Yes        | Yes        | Yes        |
| Year fixed effect | Yes        | Yes        | Yes        | Yes        |
| Observations      | 3,157      | 3,157      | 3,042      | 3,042      |
| Within R2         | 0.316      | 0.387      | 0.463      | 0.484      |

Note: Standard errors robust to heteroskedasticity and autocorrelation are in parentheses. *, ** and *** denote significance at 10%, 5% and 1% levels respectively.
Table 11: City commercial bank setup years and city GDP growth rate

| Reg1 | Reg2 | Reg3 | Reg4 | Reg5 |
|------|------|------|------|------|
| **Dependent Variable** | **GRGDP** |      |      |      |
| **Lagged CCB** | CCB-1 | CCB-2 | CCB-3 | CCB-4 | CCB-5 |
| -0.00704*** | -0.00667*** | -0.00873*** | -0.00546** | -0.00574** |
| (0.00156) | (0.00157) | (0.00154) | (0.00211) | (0.0021) |
| **LnRGDP-1** | -0.131*** | -0.130*** | -0.130*** | -0.130*** | -0.129*** |
| (0.0227) | (0.0228) | (0.0233) | (0.0231) | (0.0231) |
| **LOAN** | -0.0266*** | -0.0264*** | -0.0260*** | -0.0256*** | -0.0250*** |
| (0.00561) | (0.00566) | (0.00552) | (0.00555) | (0.00558) |
| **FAI** | 0.0711*** | 0.0709*** | 0.0708*** | 0.0712*** | 0.0713*** |
| (0.00913) | (0.00922) | (0.0093) | (0.00941) | (0.00944) |
| **FDI** | 0.0336 | 0.0283 | 0.0356 | 0.036 | 0.0237 |
| (0.167) | (0.159) | (0.159) | (0.161) | (0.165) |
| **Fiscal** | -0.0832** | -0.0821** | -0.0808** | -0.0810** | -0.0818** |
| (0.0332) | (0.0332) | (0.032) | (0.0322) | (0.0321) |
| **GRPOP** | -0.0176 | -0.0151 | -0.0131 | -0.0174 | -0.0164 |
| (0.05) | (0.0497) | (0.0496) | (0.0475) | (0.0474) |
| **EDU-1** | 0.0136 | 0.0203 | 0.0223 | 0.0152 | 0.00843 |
| (0.048) | (0.0466) | (0.0464) | (0.0472) | (0.0461) |
| **Constant** | 0.515*** | 0.513*** | 0.510*** | 0.508*** | 0.505*** |
| (0.0691) | (0.0692) | (0.0706) | (0.0698) | (0.0699) |
| **City fixed effect** | Yes | Yes | Yes | Yes | Yes |
| **Year fixed effect** | Yes | Yes | Yes | Yes | Yes |
| **Observations** | 3,042 | 3,042 | 3,042 | 3,042 | 3,042 |
| **Within R2** | 0.484 | 0.484 | 0.485 | 0.484 | 0.484 |

Note: Standard errors robust to heteroskedasticity and autocorrelation are in parentheses. *, ** and *** denote significance at 10%, 5% and 1% levels respectively.
| Dependent Variable | Reg1   | Reg2   | Reg3   | Reg4   | Reg5   |
|-------------------|--------|--------|--------|--------|--------|
| Lagged CCB        |        |        |        |        |        |
| $CCB-1$           | -0.00704*** | -0.00667*** | -0.00873*** | -0.00546**  | -0.00574**  |
|                   | (0.00156)  | (0.00157)  | (0.00154)  | (0.00211)  | (0.0021)   |
| $LnRGDP-1$        | -0.131***  | -0.130***  | -0.130***  | -0.130***  | -0.129***  |
|                   | (0.0227)   | (0.0228)   | (0.0233)   | (0.0231)   | (0.0231)   |
| $LOAN$            | -0.0266***  | -0.0264***  | -0.0260***  | -0.0256***  | -0.0250***  |
|                   | (0.00561)  | (0.00566)  | (0.00552)  | (0.00555)  | (0.00558)  |
| $FAI$             | 0.0711***  | 0.0709***  | 0.0708***  | 0.0712***  | 0.0713***  |
|                   | (0.00913)  | (0.00922)  | (0.0093)   | (0.00941)  | (0.00944)  |
| $FDI$             | 0.0336     | 0.0283     | 0.0356     | 0.036     | 0.0237    |
|                   | (0.167)    | (0.159)    | (0.159)    | (0.161)   | (0.165)   |
| Fiscal            | -0.0832**  | -0.0821**  | -0.0808**  | -0.0810**  | -0.0818**  |
|                   | (0.0332)   | (0.0332)   | (0.032)    | (0.0322)  | (0.0321)  |
| $GRPOP$           | -0.0176    | -0.0151    | -0.0131    | -0.0174    | -0.0164   |
|                   | (0.05)     | (0.0497)   | (0.0496)   | (0.0475)   | (0.0474)   |
| $EDU-1$           | 0.0136     | 0.0203     | 0.0223     | 0.0152     | 0.00843   |
|                   | (0.048)    | (0.0466)   | (0.0464)   | (0.0472)   | (0.0461)   |
| Constant          | 0.515***   | 0.513***   | 0.510***   | 0.508***   | 0.505***   |
|                   | (0.0691)   | (0.0692)   | (0.0706)   | (0.0698)   | (0.0699)   |
| City fixed effect | Yes       | Yes       | Yes       | Yes       | Yes       |
| Year fixed effect | Yes       | Yes       | Yes       | Yes       | Yes       |
| Observations      | 3,042     | 3,042     | 3,042     | 3,042     | 3,042     |
| Within R2         | 0.484     | 0.484     | 0.485     | 0.484     | 0.484     |

Note: Standard errors robust to heteroskedasticity and autocorrelation are in parentheses. *, ** and *** denote significance at 10%, 5% and 1% levels respectively.
Table 13: CCB establishment and city GDP per capita growth rate

| Reg1  | Reg2  | Reg3  | Reg4  | Reg5  |
|-------|-------|-------|-------|-------|
| Dependent Variable | CCB   | CCB\_1 | CCB\_2 | CCB\_3 |
| GRGDPPC | -0.00419* | -0.00437* | -0.00575*** | -0.00831*** |
|          | (0.00207) | (0.00215) | (0.00179) | (0.00182) |
| CCBorLagged | -0.00288*** | -0.00288*** | -0.00288*** | -0.00288*** |
|          | (0.000597) | (0.000597) | (0.000597) | (0.000597) |
| LnGDPPC\_1 | -0.113*** | -0.114*** | -0.113*** | -0.113*** |
|          | (0.0216) | (0.0212) | (0.0218) | (0.0219) |
| LOAN    | -0.0310*** | -0.0244*** | -0.0309*** | -0.0308*** |
|          | (0.00573) | (0.00536) | (0.00573) | (0.00569) |
| FAI     | 0.0839*** | 0.0811*** | 0.0838*** | 0.0836*** |
|          | (0.0124) | (0.0122) | (0.0124) | (0.0125) |
| FISCAL  | 0.115 | 0.119 | 0.127 | 0.136 |
|          | (0.165) | (0.199) | (0.159) | (0.164) |
| GRPOP   | 0.0368 | 0.0367 | 0.0369 | 0.0377 |
|          | (0.0618) | (0.0616) | (0.0612) | (0.0607) |
| Constant | 1.075*** | 1.076*** | 1.076*** | 1.075*** |
|          | (0.198) | (0.199) | (0.2) | (0.2) |
| City fixed effect | Yes | Yes | Yes | Yes |
| Year fixed effect | Yes | Yes | Yes | Yes |
| Observations | 3,039 | 3,039 | 3,039 | 3,039 |
| Within R2 | 0.406 | 0.406 | 0.407 | 0.408 |

Note: Regression 1 contains all control variables and dummy variable CCB. Regression 2 replaces CCBYEAR with CCB. Regression 3 to 5 employ first year to third year lagged CCB. GDP per capita is also found significantly negatively correlated with CCBs setup, lagged CCBs setup and the years of CCBs setup. Standard errors robust to heteroskedasticity and autocorrelation are in parentheses. *, ** and *** denote significance at 10%, 5% and 1% levels respectively.
6.1.2 CCB establishment and city industrial sector growth

We now change our dependent variable to the number and total output of industrial enterprises above designated size \(^{11}\). Most of the enterprises therein are still SME so that we can examine how CCB affects the number of SMEs. For example, more than 90\% of industrial enterprises above designated size in 2007 are SMEs. We can see from Table 14 and 15 that the CCB effect is still insignificant and sometimes negative on the aggregate firm development.

\(^{11}\)The standard of industrial enterprises above designed size was changed twice during 2001 to 2011. So regressions are also done for different samples.
Table 14: CCB and number of industrial enterprises above designated size

| Dependent Variable | Reg1 | Reg2 | Reg3 | Reg4 | Reg5 | Reg6 |
|--------------------|------|------|------|------|------|------|
| GR#EN              | 0.00541 | 0.00147 | 0.00688 | - | -0.00715* | -0.00877 |
|                  | (0.011) | (0.0182) | (0.0189) | | (0.0017) | (0.0035) |
| CCB                | 0.00741*** | -0.00715* | -0.00877 | -0.00741*** | -0.00715* | -0.00877 |
|                  | (0.0017) | (0.0035) | (0.00933) | | (0.0017) | (0.0035) |
| CCBYEAR            | -0.0689 | 0.204 | 0.221 | -0.0585 | 0.232* | 0.19 |
|                  | (0.0642) | (0.113) | (0.208) | (0.0659) | (0.11) | (0.238) |
| LnRGDP             | 0.194*** | 0.240** | -0.0014 | 0.176*** | 0.229** | -0.0126 |
|                  | (0.0403) | (0.0903) | (0.0516) | (0.0399) | (0.0868) | (0.0405) |
| FAI                | 0.638 | 0.822 | 3.157 | 1.11 | 1.036 | 3.609 |
|                  | (0.846) | (1.495) | (5.279) | (0.911) | (1.545) | (4.878) |
| FDI                | 0.197 | -0.684* | -0.76 | 0.178 | -0.761* | -0.597 |
|                  | (0.21) | (0.339) | (0.812) | (0.213) | (0.335) | (0.966) |
| Constant           | Yes | Yes | Yes | Yes | Yes | Yes |
| Year fixed effect  | Yes | Yes | Yes | Yes | Yes | Yes |
| Year fixed effect  | Observations | 3,056 | 1,663 | 1,107 | 3,056 | 1,663 | 1,107 |
| Within R2          | 0.339 | 0.147 | 0.0954 | 0.343 | 0.149 | 0.0968 |

Note: The dependent variable is number of industrial enterprises above designated size for each city. Regression 1 studies the period 2001-2011. Regression 2 covers observations from 2001 to 2006 and regression 3 covers 2007-2010. CCBYEAR substitutes CCB to estimate the long term effect of CCBs setup, which is shown in regression 4 to 6. Standard errors robust to heteroskedasticity and autocorrelation are in parentheses. *, ** and *** denote significance at 10%, 5% and 1% levels respectively.
Table 15: CCB establishment and total output growth of industrial enterprises

| Dependent Var. | Reg1 | Reg2 | Reg3 | Reg4 | Reg5 | Reg6 |
|---------------|------|------|------|------|------|------|
| Sample period | 01−11 | 01−06 | 07−10 | 01−11 | 01−06 | 07−10 |
| $CCB$         | -0.00534 | - | -0.00293 | 0.0359*** | (0.00847) | (0.00748) | (0.0134) |
| $CCBYEAR$     | - | -0.00473* | - | 0.00597*** | (0.000636) | (0.00195) | (0.0024) |
| $LnRGDP$      | -0.101** | -0.0504 | 0.255 | -0.0926** | -0.0339 | 0.226 |
|               | (0.035) | (0.0792) | (0.368) | (0.0372) | (0.0795) | (0.383) |
| $FAI$         | 0.272*** | 0.285*** | 0.294* | 0.258*** | 0.281*** | 0.282* |
|               | (0.0252) | (0.0578) | (0.0962) | (0.0245) | (0.057) | (0.0968) |
| $FDI$         | 1.982** | -1.95 | 2.759 | 2.293** | -1.889 | 3.123 |
|               | (0.735) | (3.131) | (4.342) | (0.766) | (3.093) | (4.332) |
| Constant      | 0.358*** | 0.217 | -0.9 | 0.340** | 0.159 | -0.747 |
|               | (0.111) | (0.249) | (1.426) | (0.117) | (0.249) | (1.499) |
| City          | Yes | Yes | Yes | Yes | Yes | Yes |
| Fixed Effect  | Yes | Yes | Yes | Yes | Yes | Yes |
| Year          | Yes | Yes | Yes | Yes | Yes | Yes |
| Fixed Effect  | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations  | 3,058 | 1,665 | 1,107 | 3,058 | 1,665 | 1,107 |
| Within R2     | 0.24 | 0.297 | 0.174 | 0.244 | 0.297 | 0.176 |

Note: The dependent variable is number of industrial enterprises above designated size for each city. Regression 1 studies the period 2001-2011. Regression 2 covers observations from 2001 to 2006 and regression 3 covers 2007-2010. CCBYEAR substitutes CCB to estimate the long term effect of CCBs setup, which is shown in regression 4 to 6. Standard errors robust to heteroskedasticity and autocorrelation are in parentheses. *, ** and *** denote significance at 10%, 5% and 1% levels respectively.
6.2 CCB and Firm Growth: Micro Level Evidence

Table 16-19 demonstrate establishment of CCB on firms growth rate using the China Annual Census of Enterprises from 1999 to 2007, which include at least four years consecutive observation of 206,771 firms. Hausman test strongly pros the fixed effect model, but we use pooled regression model as robustness check.

From Table 16, firms growth rate significant declined after CCB establishment, which is robust to the commonly used controls including firms characteristic variables and in all the regressions, year and firm fixed effect were both controlled. We can see that compared to firms in the cities without CCB, CCB establishment will lead firms sales growth rate to decline by around 2 percentage, which is about one third of the sales growth rates standard deviation.

Other variables have the expected signs such as the negative signs of SOE and STATECAP indicating government intervention has negative consequences. Both size dummy and logarithm of firms asset indicate that larger firms enjoy a higher sales and asset growth rate, possibly because of more available capital and access to banking finance. Firms in start-up phase have a higher sales and asset growth rate than ones in growth and mature phases.

Table 17 replaced sales growth rate with asset growth rate of firms as dependent variable and generates the same result from all the four regressions that CCB establishment has a significant negative effect on firm asset growth rate.

The effect of CCBs setup might vary for firms in different scales. The key proponent for the invention of CCB is that local bank which is small relative to the nationwide bank can contribute to SME growth better. So, observations are divided into four groups, one for SMEs and one for large firms. We further divide the SME group into small and medium sized group. We can see from Table 18 that SMEs as well as small firms experienced slower growth rates in the cities with CCB located in.

In order to check the robustness of results, regression using pooled OLS with same observations is estimated and similar results are obtained, as displayed in Table 19. Industry and regional (province) dummies are added to control the possible industrial and regional specification. We can see still our results are quite robust that CCB presence will lead growth rate to decline by around 2 percent for sales and 1 percent for asset.
Table 16: CCB and Firms Sales Growth Rate

|                  | Reg1         | Reg2         | Reg3         | Reg4         |
|------------------|--------------|--------------|--------------|--------------|
| Dep. Var.        | *GRSALES*    |              |              |              |
| CCB              | -0.0154**    | -0.0162**    | -0.0218***   | -0.0218***   |
|                  | (0.00688)    | (0.00687)    | (0.00688)    | (0.00688)    |
| Medium Medium    | -0.0608***   |              |              |              |
|                  |              | -0.00901     |              |              |
| Small Small SOE  | -0.0846***   | -0.0291***   |              |              |
|                  |              | (0.00935)    |              |              |
| SOE              | -0.0266***   | -0.0291***   |              |              |
|                  | (0.00423)    | (0.00423)    |              |              |
| ASSET ASSET      | 0.0826***    |              | 0.0826***    |              |
|                  | (0.00249)    |              | (0.00249)    |              |
| STATECAP         |              | -0.0373***   |              |              |
|                  |              | (0.00479)    |              |              |
| Growth Mature    | -0.0633***   | -0.0691***   | -0.0690***   |              |
|                  | (0.00235)    | (0.00235)    | (0.00235)    |              |
| Constant         | 0.370***     | 0.490***     | -0.392***    | -0.391***    |
|                  | (0.00536)    | (0.0107)     | (0.0251)     | (0.0251)     |
| Year fixed effect| Yes          | Yes          | Yes          | Yes          |
| Firm fixed effect| Yes          | Yes          | Yes          | Yes          |
| Observations     | 947,536      | 947,536      | 947,536      | 947,536      |
| Within R2        | 0.015        | 0.016        | 0.018        | 0.018        |

Note: Regression 1 only includes key variable CCB as explanatory variable. Firm size, ownership and age are added in regression 2. For robustness check, logarithm of firms asset is used instead of size dummies in regression 3, and percentage of state-owned capital is used instead of ownership dummy in regression 4. Standard errors robust to heteroskedasticity are in parentheses. *, ** and *** denote significance at 10, 5, and 1% levels, respectively.
Table 17: CCB and Firms Asset Growth Rate

|                  | Reg1                          | Reg2                          | Reg3                          | Reg4                          |
|------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Dep. Var.        | GRASSET                       |                               |                               |                               |
| CCB              | -0.00842                      | -0.0103*                      | -0.0537***                    | -0.0538***                    |
|                  | (0.00553)                     | (0.00552)                     | (0.006)                       | (0.006)                       |
| Medium           |                               | -0.0299***                    |                               |                               |
|                  |                               | (0.00734)                     |                               |                               |
| Small            |                               | -0.0986***                    |                               |                               |
|                  |                               | (0.0076)                      |                               |                               |
| SOE              | -0.0248***                    | -0.0480***                    |                               |                               |
|                  | (0.00337)                     | (0.00342)                     |                               |                               |
| ASSET            |                               | 0.641***                      | 0.641***                      |                               |
|                  |                               | (0.00294)                     | (0.00294)                     |                               |
| STATECAP         |                               |                               |                               | -0.0585***                    |
|                  |                               |                               |                               | (0.00393)                     |
| Growth           | -0.0520***                    | -0.0981***                    | -0.0980***                    |                               |
|                  | (0.00208)                     | (0.00207)                     | (0.00207)                     |                               |
| Mature           | -0.0365***                    | -0.0787***                    | -0.0783***                    |                               |
|                  | (0.00345)                     | (0.00367)                     | (0.00367)                     |                               |
| Constant         | 0.253***                      | 0.378***                      | -5.920***                     | -5.919***                     |
|                  | (0.00431)                     | (0.00869)                     | (0.0293)                      | (0.0293)                      |
| Year fixed effect| Yes                           | Yes                           | Yes                           | Yes                           |
| Firm fixed effect| Yes                           | Yes                           | Yes                           | Yes                           |
| Observations     | 947,536                       | 947,536                       | 947,536                       | 947,536                       |
| Within R2        | 0.005                         | 0.007                         | 0.186                         | 0.186                         |

Note: Regression 1 only includes key variable CCB as explanatory variable. Firm size, ownership and age are added in regression 2. For robustness check, logarithm of firms asset is used instead of size dummies in regression 3, and percentage of state-owned capital is used instead of ownership dummy in regression 4. Standard errors robust to heteroskedasticity are in parentheses. *, ** and *** denote significance at 10%, 5% and 1% levels respectively.
Table 18: CCB and sales growth rate of firms in different sizes

| Dep. Var. | Reg1 | Reg2 | Reg3 | Reg4 |
|-----------|------|------|------|------|
| **GRSALES** | **CCB** | **ASSET** | **STATECAP** | **Growth** | **Mature** | **Constant** |
| SME | Large | Medium | Small | -0.0208*** | -0.0243 | -0.00161 | -0.0192** | (0.00703) | (0.0362) | (0.0182) | (0.0078) |
| (0.00496) | (0.0188) | (0.00892) | (0.00609) | 0.0824*** | 0.111*** | 0.0315*** | 0.0907*** | (0.00252) | (0.0216) | (0.00765) | (0.00282) |
| -0.0378*** | -0.0236 | -0.0364*** | -0.0325*** | -0.0681*** | -0.170*** | -0.134*** | -0.0566*** | (0.00237) | (0.0277) | (0.00772) | (0.00253) |
| (0.00415) | (0.0283) | (0.0101) | (0.00473) | -0.0455*** | -0.132*** | -0.112*** | -0.0325*** | (0.0252) | (0.303) | (0.0897) | (0.0276) |
| -0.386*** | -1.065*** | 0.133 | -0.459*** | Year fixed effect | Yes | Yes | Yes | Yes |
| Firm fixed effect | Yes | Yes | Yes | Yes |
| Observations | 934,955 | 12,581 | 121,557 | 817,597 |
| Within R2 | 0.018 | 0.052 | 0.029 | 0.016 |

Note: Regression 1 only includes key variable CCB as explanatory variable. Firm size, ownership and age are added in regression 2. For robustness check, logarithm of firms asset is used instead of size dummies in regression 3, and percentage of state-owned capital is used instead of ownership dummy in regression 4. Standard errors robust to heteroskedasticity are in parentheses. *, ** and *** denote significance at 10%, 5% and 1% levels respectively.
Table 19: CCB and firm growth: Pooled OLS

| Dep. Var. | Reg1          | Reg2          | Reg3          | Reg4          |
|-----------|---------------|---------------|---------------|---------------|
| CCB       | -0.0168***    | -0.0202***    | -0.00865***   | -0.0163***    |
|           | (0.00164)     | (0.00164)     | (0.00142)     | (0.00144)     |
| Medium    | -0.0392***    |               | -0.0249***    |               |
|           | (0.00596)     |               | (0.00482)     |               |
| Small     | -0.0667***    |               | -0.0620***    |               |
|           | (0.00586)     |               | (0.00473)     |               |
| SOE       | -0.0654***    |               | -0.0730***    |               |
|           | (0.00209)     |               | (0.00164)     |               |
| ASSET     |               | 0.0195***     |               | 0.0413***     |
|           |               | (0.000453)    |               | (0.000408)    |
| STATECAP  |               | -0.0871***    |               | -0.114***     |
|           |               | (0.00229)     |               | (0.00191)     |
| Growth    | -0.165***     | -0.169***     | -0.108***     | -0.115***     |
|           | (0.00166)     | (0.00167)     | (0.00139)     | (0.00139)     |
| Mature    | -0.222***     | -0.226***     | -0.168***     | -0.182***     |
|           | (0.00211)     | (0.00212)     | (0.00172)     | (0.00175)     |
| Constant  | 0.509***      | 0.254***      | 0.402***      | -0.0624***    |
|           | (0.00898)     | (0.00817)     | (0.00804)     | (0.00777)     |
| Year dummies | Yes  | Yes  | Yes  | Yes  |
| Industry dummies | Yes  | Yes  | Yes  | Yes  |
| Region dummies | Yes  | Yes  | Yes  | Yes  |
| Observations  | 947,536 | 947,536 | 947,536 | 947,536 |
| R2          | 0.044        | 0.046        | 0.027        | 0.038        |

Note: Standard errors robust to heteroskedasticity are in parentheses. *, ** and *** denote significance at 10%, 5% and 1% levels respectively.
6.3 Heterogeneous impact of CCB on firm growth

Table 20 shows CCBs heterogeneous impact on firm growth, where $CCB_{ASSET} = CCB \times \log(FirmsAsset)$, $CCB_{SMALL} = CCB \times (DummySmall)$. We can see that the establishment of CCB will reduce small firms growth rate more. We conjecture that CCB dictated by the city government intends to lend more to large firms for various reasons. SOEs are mostly large firms, which have political connection with the city government and therefore can get more loans from city government dictated CCB. City government also prefer to large firms even though they are private possibly because large firm has more resources to bribe the city government to get loans or because city government officials have their personal connections such as obtaining jobs for their family members in the large firm. Another reason might be that city government official can get their city more famous by having more brand name large firm to bring themselves more chances to be promoted.

6.4 Endogeneity

Though we cannot hardly image the purpose to establish a CCB is to lower its economic growth rate, as mentioned in the methodology part, there might be some endogeneity issue. We adopt the neighboring IV estimation as mentioned in the methodology section.

The first stage regression displays strong predictive power of establishing $CCB$ when there are more establishments located in the city’s neighbors. We use the percentage of neighbors having established $CCB$, i.e. $NEIGHBOR$, in our first two regressions and alternatively we use the percentage of cities in a province has already established $CCB$, i.e. $PROVpERCENT$, as another measure. Groups are at provincial level because cities are under the administration of provincial government officials.

We can see from the second stage regression that CCB still has a negative impact on citys GDP and GDP per capita growth rate. We can therefore conclude that the negative effect of CCB establishment on economic performance is quite robust.

7 Potential sources of CCBs negative impact on growth

In this section, we discuss possible reasons about CCBs negative effect on local economic performance.
Table 20: Heterogeneous impact of CCB on firm growth

| Dep. Var   | Reg1      | Reg2      | Reg3      | Reg4      |
|------------|-----------|-----------|-----------|-----------|
| CCB        | -0.616*** | -0.00478  | -4.691*** | 0.0370*** |
|            | (0.0251)  | (0.00759) | (0.0359)  | (0.0061)  |
| CCBSASSET  | 0.0583*** | 0.455***  |           |           |
|            | (0.00236) | (0.00363) |           |           |
| CCBSMALL   |           | -0.0139***| -0.0570***|           |
|            |           | (0.00404) | (0.00337) |           |
| STATECAP   | -0.0349***| -0.0336***| -0.0397***| -0.0298***|
|            | (0.0048)  | (0.00479) | (0.00406) | (0.0039)  |
| Growth     | -0.0660***| -0.0630***| -0.0752***| -0.0518***|
|            | (0.00235) | (0.00235) | (0.00208) | (0.00208) |
| Mature     | -0.0439***| -0.0410***| -0.0588***| -0.0361***|
|            | (0.00408) | (0.00408) | (0.0036)  | (0.00345) |
| Constant   | 0.433***  | 0.410***  | 0.478***  | 0.289***  |
|            | (0.00573) | (0.00561) | (0.00756) | (0.00454) |
| Firm fixed effect | Yes | Yes | Yes | Yes |
| Year fixed effect | Yes | Yes | Yes | Yes |
| Observations | 947,536 | 947,536 | 947,536 | 947,536 |
| R-squared   | 0.017    | 0.016    | 0.097    | 0.007    |
| Number of firms | 206,771 | 206,771 | 206,771 | 206,771 |

Note: Standard errors robust to heteroskedasticity are in parentheses. *, ** and *** denote significance at 10%, 5% and 1% levels respectively.
Table 21: First stage regression results

|                | (1)          | (2)          | (3)          | (4)          |
|----------------|--------------|--------------|--------------|--------------|
| Dependent Variable | CCB          | CCB          | CCB          | CCB          |
| Neighbor        | 0.3839***    | 0.3846***    |              |              |
|                | (0.0549)     | (0.0551)     |              |              |
| ProvPercent     | 0.5402***    | 0.5401***    |              |              |
|                | (0.0633)     | (0.0638)     |              |              |
| LnRGDP(ER)_{-1} | -0.0566      | 0.0256       | -0.064       | 0.0038       |
|                | (0.0722)     | (0.0624)     | (0.0735)     | (0.0633)     |
| LOAN           | -0.0641***   | -0.0605***   | -0.0624***   | -0.0597***   |
|                | (0.0191)     | (0.0189)     | (0.0183)     | (0.0183)     |
| FAI            | -0.0147      | -0.0228      | -0.0154      | -0.0211      |
|                | (0.0331)     | (0.0336)     | (0.0333)     | (0.034)      |
| FDI            | 5.3816***    | 5.3965***    | 4.1892***    | 4.2600***    |
|                | (1.3977)     | (1.4054)     | (1.3303)     | (1.3292)     |
| Fiscal         | -0.3940***   | -0.2979**    | -0.3727***   | -0.2930**    |
|                | (0.1425)     | (0.137)      | (0.1398)     | (0.1352)     |
| GRPOP          | 0.0549       | 0.0542       | 0.0016       | 0.0005       |
|                | (0.3196)     | (0.3168)     | (0.3436)     | (0.3413)     |
| EUD_{-1}       | -0.3191      | -0.2701      | -0.3165      | -0.2815      |
|                | (0.5044)     | (0.5044)     | (0.5088)     | (0.51)       |
| City fixed effect | Yes         | Yes         | Yes         | Yes          |
| Year fixed effect | Yes         | Yes         | Yes         | Yes          |
| Observations   | 3041         | 3039         | 3041         | 3039         |

Note: Standard errors robust to heteroskedasticity are in parentheses. *, ** and *** denote significance at 10%, 5% and 1% levels respectively.
Table 22: Second stage regression results

| Dependent Variable | (1)     | (2)     | (3)     | (4)     |
|--------------------|---------|---------|---------|---------|
|                    | GRGDP   | GRGDPPC | GRGDP   | GRGDPPC |
| IV.                | Neighbor| Neighbor| SameProv.| SameProv.|
| CCB                | -0.0751*** | -0.0701*** | -0.0777*** | -0.0820*** |
|                    | (0.015)  | (0.0181) | (0.013)  | (0.0171) |
| LnRGDP(PC)_{-1}    | -0.135*** | -0.111*** | -0.135*** | -0.110*** |
|                    | (0.0139) | (0.0138) | (0.0139) | (0.0141) |
| LOAN               | -0.0319*** | -0.0357*** | -0.0321*** | -0.0365*** |
|                    | (0.00711) | (0.00719) | (0.00716) | (0.00733) |
| FAI                | 0.0691*** | 0.0814*** | 0.0691*** | 0.0810*** |
|                    | (0.00533) | (0.00711) | (0.00538) | (0.00726) |
| FDI                | 0.493** | 0.565** | 0.511** | 0.647*** |
|                    | (0.236)  | (0.245)  | (0.231)  | (0.236)  |
| Fiscal             | -0.111*** | 0.0161 | -0.112*** | 0.0123 |
|                    | (0.0282) | (0.0362) | (0.0277) | (0.0363) |
| GRPOP              | -0.0036 | -0.231*** | -0.00316 | -0.229*** |
|                    | (0.0519) | (0.0631) | (0.0524) | (0.065)  |
| EDU_{-1}           | -0.05 | 0.0436 | -0.0524 | 0.0337 |
|                    | (0.0665) | (0.0763) | (0.0673) | (0.0791) |
| City fixed effect  | Yes     | Yes     | Yes     | Yes     |
| Year fixed effect  | Yes     | Yes     | Yes     | Yes     |
| Observations       | 3,041   | 3,039   | 3,041   | 3,039   |
| R-squared          | 0.291   | 0.283   | 0.276   | 0.234   |

Note: Standard errors robust to heteroskedasticity are in parentheses. *, ** and *** denote significance at 10%, 5% and 1% levels respectively.
Established by merging and reorganizing local urban credit cooperatives, most of CCBs took over asset, employees and also problems from their predecessors. They faced problems of low quality asset, high non-performing loan ratio and poor corporate governance.

Bank run, acquisition, corruption and financial fraud occur in CCBs occasionally. For instance, City Commercial Bank of Zhuzhou experienced a bank run on March 26, 2000, 92.44 million RMB was withdrawn on that day\textsuperscript{12}. On Jun 13, 2006, Bank of Hengyang experienced a bank run as well. More than 100 million RMB was withdrawn within 2 days\textsuperscript{13}. Established in 1997, City Commercial Bank of Foshan suffered from continuous profit loss, high non-performing loan ratio and was took over by the nationwide bank fo Industrial and Commercial Bank in 2004. For similar reasons, City Commercial Bank of Zhuhai was taken over by China Resources in 2009 and was renamed as Zhuhai China Resources Bank. Moreover, City Commercial Bank of Shantou violated a series of regulations and was suspended of bank licenses in August 2001\textsuperscript{14}. Relatively large CCBs besides small CCBs also suffer from poor risk control system. Bank of Qilu, one of the top 1000 banks in the world since 2007 (the Banker) in total asset, was involved in a notorious financial fraud, which caused losses as high as 2.256 billion RMB\textsuperscript{15}.

The negative effect of CCB on city economic growth and various case studies mentioned above motivate us to explore the efficiency of CCBs. Compared to big four, these CCBs were under solely control of local government. However, big four are headquartered in Beijing, and they are owned by central government as well. Albeit big fours city branches are affected by city government, there is a balance of power since the provincial branch and headquarter still have a large saying in their local city branch operation.

Using the method developed by Berger and Mester (1997) and Berger, Hasan, and Zhou (2009), we computed bank efficiency for 5 state-owned banks and 27 CCBs due to data availability during 2005-2012, as shown in Table 23. Assuming banks maximize their profit, the bank efficiency index is calculated as the profit difference between the most profitable bank and the rest of the banks with input and output controlled. The details can be found in the two source papers mentioned above. We use data from Bankscope. Methodology is briefly described here. The logarithm profit function is specified as followed.

\textsuperscript{12}Almanac of Zhuzhou, 2001
\textsuperscript{13}China Economic Weekly, Jun. 26, 2006
\textsuperscript{14}Security Times, Aug. 26, 2001.
\textsuperscript{15}Qilun Bank annual report, 2010.
\[
\ln\left(\frac{\pi}{w_2z_1}\right)_{i,t} = \delta_0 + \sum_j \delta_j \ln\left(\frac{y_j}{z_1}\right)_{i,t} + \frac{1}{2} \sum_j \sum_k \delta_j \ln\left(\frac{y_k}{z_1}\right)_{i,t} + \beta_1 \ln\left(\frac{w_1}{w_2}\right)_{i,t} + \\
\frac{1}{2} \beta_{11} \ln\left(\frac{w_1}{w_2}\right)_{i,t} + \ln u_{i,t} + \ln v_{i,t}
\]

where \( i \) denotes banks and \( t \) denotes years. \( y_j, j = 1, 2, 3, 4 \), denote outputs of banks, including total loan, total deposit, liquid asset and other earning assets respectively. \( \pi \) is banks net income. \( w_1 \) and \( w_2 \) are input prices for banks which are interest expenses divided by total deposit and non-interest expenses divided by fixed assets respectively. \( z_1 \) denotes total earning assets, which is used to exclude bank scale heteroskedasticity. \( \theta \) is a constant to avoid logarithm of a negative number. \( u \) denotes profit efficiency and \( v \) is the error. Following Berger and Mester (1997) and Berger, Hasan, and Zhou (2009), both stochastic frontier and distribution free approaches are used here.

Profit efficiency of each bank is reported in Table 23, and further summarized in Table 24. The result shows that CCBs has a lower profit efficiency using both stochastic and distribution free methods than state-owned nationwide banks during 2005-2012, although the big four are commonly criticized for their inefficiency.

### Table 23: Bank profit efficiency of 33 banks (2005-2012)

| State-owned banks                              | Stochastic frontier | Distribution free |
|-----------------------------------------------|---------------------|-------------------|
| Industrial & Commercial Bank of China          | 0.3662              | 0.831             |
| China Construction Bank                        | 0.3665              | 0.8987            |
| Bank of Communications                         | 0.3922              | 0.8124            |
| Agricultural Bank of China                     | 0.2861              | 0.6504            |
| Bank of China                                  | 0.45                | 0.8436            |

| City commercial banks                          | Stochastic frontier | Distribution free |
|-----------------------------------------------|---------------------|-------------------|
| Baoshang Bank                                 | 0.4473              | 0.8377            |
| Bank of Beijing                               | 0.2423              | 0.6734            |
| Bank of Chengdu                               | 0.3782              | 0.8183            |
| Bank of Chongqing                             | 0.349               | 0.7806            |
| Bank of Dalian                                | 0.2217              | 0.6044            |
| Bank of Dongguan                              | 0.2884              | 0.6513            |
Fujian Haixia Bank 0.3951 0.8084
Fudian Bank 0.2879 0.6966
Bank of Guiyang 0.3398 0.7527
Harbin Bank 0.4055 0.7831
Hankou Bank 0.3367 0.7601
Bank of Hangzhou 0.2486 0.6831
Huishang Bank 0.3243 0.8242
Bank of Jiangsu 0.2613 0.4128
Bank of Liuzhou 0.2471 0.6903
Bank of Nanchang 0.4603 1
Bank of Nanjing 0.3734 0.8815
Bank of Ningbo 0.3762 0.8916
Ping An Bank 0.1327 0.3385
Qishang Bank 0.322 0.752
Bank of Qingdao 0.2529 0.6472
Bank of Rizhao 0.62 0.8915
Bank of Shanghai 0.2441 0.5982
Bank of Shaoxing 0.3497 0.8781
Bank of Tianjin 0.2544 0.669
Bank of Wenzhou 0.3348 0.8062
Bank of Xinxiang 0.4334 0.8342

8 Conclusion

Using panel data of all cities (except Lhasa) in China from 2001 to 2011, the effect of CCBs setup on local economic growth is found to be negative, which is surprising considering the original motivation for the China Banking Regulatory Commission to invent CCB to promote local growth through its advantage in lending to local SMEs. Moreover, using firm-level data of more than 206 thousands firms from 1999 to 2007, we find CCB also has a negative effect on firm growth, especially to SMEs, small firms in particular. Both results are quite robust. Considering possible endogeneity problem, we borrow from policy diffusion literature by using
Table 24: Banks profit efficiency summary of 33 banks (2005-2012)

| Profit efficiency       | State-owned | City commercial | All  |
|-------------------------|-------------|-----------------|------|
| Stochastic frontier     | Mean        | 0.3722          | 0.3306 | 0.3371 |
|                         | Std         | 0.059           | 0.0965 | 0.0921 |
| Distribution free       | Mean        | 0.8072          | 0.7394 | 0.75   |
|                         | Std         | 0.0934          | 0.1438 | 0.1382 |
| Observations            | 5           | 27              | 32    |

Note: Banks financial data is from Bankscope database and stochastic frontier approach is used here.

percentage of neighbor cities having established CCB as instrument variable, and we still find the results are negative.

We then use a subset of banks to compute bank efficiency measure due to data availability and find that averagely, CCB even has lower efficiency than the nationwide state owned banks which are commonly criticized for their inefficiency. By looking at top 10 borrowers from top 9 CCBs which have their lending information public, we find that most of the borrowers still are SOE or public institutes owned by local government. We conjecture the factor causing CCB inefficiency might be the following. Local city branches of big four with almost every city presence have a balance of power between their headquarter in Beijing, local city government, and provincial branches, while local government has its sole power on CCBs operation, which might provide a source for CCBs low inefficiency.
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