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## Lending for Growth? An Analysis of State-Owned Banks in China

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Department of Economics  
School of Economics and Management

# Lending for Growth? An Analysis of State-Owned Banks in China

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# **Lending for Growth?**

## **An Analysis of State-Owned Banks in China**

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### **Abstract**

This paper provides the first comparative analysis of different types of publicly owned banks operating in China between 1997 and 2008. Using principal component analysis and Granger-causality tests, this study shows that China's state-owned commercial banks and rural credit cooperatives did not promote GDP growth during the observation period. State-owned commercial banks even had a negative effect on growth in the manufacturing sector. By contrast, state policy banks and joint stock commercial banks did promote domestic growth. China's experience presents a more nuanced picture of state banking that goes beyond the role of ownership to consider functional and institutional differences.

Keywords: China, Banking sector, Economic growth

JEL Classification: G21; O16; P30

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## 1 Introduction

Populist accounts of China's development model often refer to government sponsored "superbanks" as *the* engine of the country's growth model (Anderson and Forsythe, 2013).<sup>1</sup> Indeed, with heavy state ownership of financial institutions and far-reaching control rights, government officials and politicians in China enjoy substantial leeway in influencing the allocation of a rapidly growing pool of financial resources. Between 1997 and 2008 alone, total bank loans grew by 260% in real terms, while GDP grew by 180% over the same period. Particularly large-scale, partly or fully state-owned corporations and multinationals seem to enjoy competitive advantages via subsidized loans readily supplied by government-owned banks.

A rapid increase in bank lending, however, does not necessarily imply a positive causal relationship between banking activities and economic growth. The causality may also move in the opposite direction, as a growing economy also generates a higher demand for credit. In the absence of functioning financial markets, credit and economic growth may even be causally

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<sup>1</sup> Theoretical arguments supporting a positive finance-growth nexus draw on a broad theoretical literature interpreting government-owned banks as a convenient tool to spur economic development and alleviate poverty (Banerjee, 2003; Burgess and Pande, 2003) by channeling household savings into productive investments (Gerschenkron, 1962; Stiglitz, 1994; Hausman and Rodrik, 2003; Adrianova et al., 2008), lower interest rate risks and greater financial stability (Demirgüç-Kunt and Detragiache, 1998; Reinhart and Kaminsky, 1999), an absence of excessive risk taking by bank managers (Akerlof and Romer, 1993; Demirgüç-Kunt and Detragiache, 1998), and an increased effectiveness of monetary policy instruments, such as expansive measures to push the economy out of a recession (Micco and Panizza, 2006; Yeyati et al., 2007).

unrelated. Given China's economic success, it is crucial to pin down the actual nature of the finance-growth nexus. This is all the more important, as China has emerged as a role model for many other developing economies following a state-capitalist reform path.

Notwithstanding vast research efforts, the empirical evidence on China's finance-growth nexus is not only inconclusive (Aziz and Duenwald, 2002; Boyreau-Debray, 2003; Liang and Teng, 2006; Hasan et al, 2009; Liang, 2005; Hao 2006; Rousseau and Xiao, 2007; Cheng and Degryse, 2010) but also neglects the institutional and functional heterogeneity of China's state banking sector. This invites serious identification problems regarding the question of which types of state banks and lending strategies – if any – are in fact growth promoting.

Prior work on bank profitability has convincingly demonstrated the organizational heterogeneity of China's banking sector. There is broad empirical support for a substantial efficiency gap between traditional state-owned commercial banks and joint stock commercial banks, which involve different degrees of institutional and private ownership (Fu and Heffernan, 2007; Shih et al., 2007; Ariff and Can, 2008; Berger et al., 2009; García-Herrero et al., 2009; Lin and Zhang, 2009). Similarly, there is strong evidence suggesting differences in non-performing loans and loan default rates. Shifting to a disaggregated analysis of the finance-growth nexus is therefore a logical extension of the work that has been conducted at the micro-organizational level. This type of disaggregated analysis not only provides a more nuanced answer to the question of whether bank lending in China is growth promoting. Our empirical strategy of exploring the distinct roles of various government-owned policy banks and commercial banks also promises empirical insights in response to the more general question of which – if any - financial tasks government can successfully accomplish through bank ownership. In contrast to cross-country studies, our approach benefits from a relatively homogenous external environment,

administered by the same government, and characterized by shared historical roots, language, and cultural values.

We construct a novel dataset to analyze the effect of bank lending on various measures of economic growth for the period from 1997 to 2008. Using Granger causality tests, we separately analyze the effects of total lending, short term lending and long term lending. Our results provide a fairly mixed account, which strongly undermines the generally held view that the country's state commercial banks are successfully employed to promote economic growth. Among the various financial institutions under review here, only traditional policy banks and partly state-owned joint stock commercial banks are growth promoting. Lending by the dominant state-owned commercial banks, which still hold more than 50% of loans and assets, reduces growth in the short run. Moreover, the lending activities of rural credit cooperatives led to an overall decline in growth, although we find positive growth effects for agricultural production. However, these are outweighed by negative effects in other sectors. Overall, our results underline the importance of a more fine-grained approach to the study of state-owned banks and their potential developmental role. Institutional and functional features apparently combine to shape different lending strategies, which do not invite general conclusions on the either positive or negative role of government in lending decisions. If anything, our research would suggest that government lending can be growth promoting, if the contextual features are appropriate.

The remainder of the paper is organized as follows: Section 2 provides a summary account of China's banking sector, highlighting the major institutional and functional differences between the four most important types of banking institutions. Section 3 describes our data and methodology. Section 4 moves on to a disaggregated analysis and discussion of the observed finance-growth effects, and section 5 presents the study's conclusions.

## **2 Organizational diversity in China's banking sector**

Behind the façade of a state-dominated banking system, a portfolio of relatively diversified financial institutions characterized by different degrees of state and public ownership has evolved. While it is beyond the purpose of our study to discuss each financial intermediary in detail, it seems essential to highlight at least some of the key institutional differences and the functional diversity of banking in China, to substantiate our advocacy of a disaggregated analytical approach.

We include four types of banking institutions that dominate the financial landscape in our analysis: These are state policy banks (PBs), the key provider of policy loans, state-owned commercial banks (SOCBs), which still held a dominant market share of 43% of total loans by the end of our observation period in 2008, followed by joint stock commercial banks (JSCBs), and rural credit cooperatives (RCCs). All four institutions jointly held 83% of financial assets and nearly 85% of total loans in 2008 (Almanac of China's Finance and Banking, 2009).<sup>2</sup> While all financial institutions are subject to state guidance and political intervention, they are distinct organizational units operating under different formal institutional incentives and constraints. The diversity of these banking institutions is reflected in the differentiated set of domestic regulations and supervisory rules guiding banking activities in China. In the most general sense, one can

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<sup>2</sup> These institutions' market positions also remained relatively unaffected by new market entrants, such as foreign banks (Berger et al., 2009). As of 2010, years after the entry of foreign banks into the Chinese market, these foreign banks still held less than 2% of China's banking assets (China Banking Regulatory Commission, 2010).

differentiate between banks solely responsible for the provision of policy directed loans, resembling the concept of traditional development banks, and those providing commercial loans.

The provision of policy loans is the responsibility of three different state policy banks, which are organized around distinct economic activities. These are the Agricultural Development Bank (ADB), the China Development Bank (CDB), primarily responsible for infrastructure projects, and the Export–Import Bank of China (Exim). Given their prominent strategic role, PBs are fully state-owned entities under tight political regulation and guidance.<sup>3</sup> All three policy banks finance large capital construction projects, typically in the range of 0.5 to 10 billion CNY, mostly with medium- to long-term maturity. In line with the functional specialization of the three different policy banks, the purpose of the funding varies widely (see Appendix 1 for example loans).

Regarding commercial lenders, the Commercial Banking Law (1995) holds all lenders responsible to lend “*in accordance with the needs of the national economic and social development and under the guidance of the industrial policies of the State*” (Art 34). The actual degree of political intervention and closeness of state bank relations, however, varies substantially and in keeping with differences in the degree of state ownership. China’s four SOCBs, which provide the lion’s share of commercial loans, are the most exposed to political guidance and ad-hoc intervention (Cull and Xu, 2003). Although stock listings after 2005 put an end to complete state-ownership, political control over commercial banking persists thanks to the

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<sup>3</sup> This is also reflected in the choice of geographic locations. The number of branches is small and limited to centrally administered cities and provincial capitals. Locations typically coincide with provincial offices of the China Banking Regulatory Commission, the country’s banking supervisory body.



continued majority holdings of the state.<sup>4</sup> Similar to the potential losses resulting from policy lending (Art 41 of The Commercial Banking Law), loans are de facto guaranteed by the state (Chiu and Lewis, 2006).<sup>5</sup>

Although the younger joint stock commercial banks also have some state ownership, the degree of state involvement is on average smaller (Shih et al., 2007; Garcia-Herrero et al., 2009). State ownership ranges in most cases from between 15 and 25%. State shareholding only plays a stronger role in two of the JSCBs (at 48 and 62%; see Appendix 2 for details). Given the lower degree of state ownership, institutional and private shareholders seem more successful in mitigating political interference. JSCBs are generally more likely to prioritize profit motives over social or political objectives (Lin and Zhang, 2009).<sup>6</sup> In line with their higher degree of non-state ownership, JSCBs are – different from SOCBs - fully responsible for any non-performing loans and face substantial bankruptcy and takeover risk.<sup>7</sup> In line with harder budget constraints, the

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<sup>4</sup>At the end of 2011, the state held 57.13% of the total shares of CCB; 67.60% of the shares of BOC; 82.7% of the shares of ABC; and 70.7% of the shares of ICBC (annual reports of the respective banks).

<sup>5</sup> In the period from 1999 to 2005 alone, the state cleaned the balance sheets of China's financial institutions by transferring 2038.9 billion RMB worth of non-performing loans to newly established Asset Management Companies (AMCs) responsible for loan management. Nearly 95% of this amount was directed towards SOCBs (China Financial Statistics, 2007).

<sup>6</sup> The sole exception is China Minsheng Bank – a JSCB wholly owned by non-government run private enterprises (Jia, 2009).

<sup>7</sup> Internationally well documented examples were the 1998 bankruptcy of the Hainan Development Bank (HDB) and the 2004 takeover of Shenzhen Development Bank by Newbridge

share of their non-performing loans is substantively smaller compared to SOCBs: 2.1% compared to 8.0% (China Banking Regulatory Commission, 2007).

In terms of ownership, rural credit cooperatives occupy a unique position as collectively run local banks. They are subject to considerably less state guidance than their urban counterparts. Formally registered as publicly owned legal persons, they are run and managed by their members, such as local investors, local governments and County RCC Unions (Ong, 2006). While many RCCs experience various forms of government interference through local party secretaries and the County RCC Unions, they are believed to be politically more independent than SOCBs and JSCBs due to a greater administrative distance from the central and provincial governments (Ong, 2006; Gao, 2012).<sup>8</sup> As in the case of JSCBs, RCCs are held accountable for their individual profits and losses and face considerable bankruptcy risk (Garcia-Herrero et al., 2006).<sup>9</sup> Nevertheless, given their strict limitation to local business lending, business operations are critically constrained.

A review of the distinct lending strategies reveals striking commonalities. All commercial banks favor short-term loans with maturities of up to one year. This limits opportunities for 

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Capital, a US investment firm (Podpiera, 2006). However, in the case of HDB, all deposits were guaranteed by the government (Jia, 2009).

<sup>8</sup> Central supervision is rather indirect, as only the so-called RCC Unions are placed under the direct supervision and administrative responsibility of the Central Bank.

<sup>9</sup> See, for instance, RCCs Regulation on the Administration of RCCs (1997) and Regulation on the Administration of County-level RCC Unions (1997). As the evaluation criteria of County RCC Unions primarily focus on financial performance, the grassroots RCCs are motivated to maximize profit and the efficiency of capital.

major, large-scale technical investments with longer amortization periods. Short-term loans are predominantly used to bypass liquidity constraints and finance working capital. Only SOCBs have a substantial proportion of medium-term loans, representing 40.7% of their loan portfolios (see table 1). However, even for medium-term loans, the majority of lending is for purposes other than capital construction or technical improvements, with the latter only receiving 4.9% of the total SOCB loans granted between 1997 and 2005. Borrowers are traditional state-owned companies, corporatized state-owned firms, and partly privatized joint stock companies operating in the manufacturing and commercial sectors.<sup>10</sup> In line with the smaller degree of political interference and greater scope of organizational autonomy, JSCBs tend to lend to a somewhat greater extent to small-scale state owned enterprises (SOEs) not prioritized by political leaders. Lending to the newly founded private enterprises operating in the industrial and commercial sector remains limited (see table 1; see also Yan et al., 2007; Sufian, 2009). Nevertheless, JSCBs extend substantively more short-term loans for “other” purposes. Such consumption and investment loans typically benefit private individuals and households, but are also provided to small-scale household enterprises and businesses. Finally, based at the village, township and county levels, and geographically confined in their market access, RCCs primarily cater to the financial needs of local farmers, small-scale township and village enterprises, small-scale individual and private manufacturing companies, and rural supply and marketing cooperatives.

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<sup>10</sup> While precise data on the ownership structure of customers is scarce, the information available for the China Construction Bank provides a good indication of the general trend among the SOCBs. Here, SOEs hold approximately 50% of outstanding loans, while joint stock enterprises make up 20% and private enterprises receive only 10-15% of total loans (CCB Annual Reports 2005 - 2007).

Given the relatively weak financial basis of these RCCs, the average loans are comparatively small, the loan maturities rarely exceed one year (as indicated by an extremely large share of short-term lending of 91%, see table 1) and the banks' client bases are limited. Loans are granted to finance modest organizational improvements of township-village enterprises, bridge the seasonal liquidity constraints of households, or pay for educational expenses.

*Insert table 1 about here*

In summary: China's banking sector is composed of a diversified portfolio of partially or fully state or publicly owned financial institutions. While all financial institutions involve state or public ownership to a substantial degree, they operate under distinct institutional incentives and constraints. While precise measurements of individual qualities are hard to come by, the stylized comparison provided in Table 2 summarizes some of the most important cross-organizational differences with respect to ownership, political independence, and budget constraints. Institutionally, JSCBs and RCCs should enjoy stronger profit incentives and greater operational autonomy. However, functionally, the local market limitations of RCCs may well outweigh these advantages. PBs and SOCBs, in contrast, enjoy very limited operational autonomy, and weaker profit incentives, which suggests the existence of standard problems of corporate governance and soft budget constraints that are also observed for state-owned firms in the manufacturing and service sectors (Boardman and Vining, 1992; Megginson et al., 1994; Shleifer, 1998; Dewenter and Malatesta, 2001).

Clearly, this stylized illustration underscores our argument for a disaggregated review of the distinct linkages between lending activities and growth performance in China. Our working

hypothesis is that the institutional and functional diversity of state banking is associated with different effects on economic growth.

*Insert table 2 about here*

### 3 Empirical strategy

#### 3.1 Method

To test our hypothesis we employ Granger causality tests. Two sets of Granger causality tests are performed: one set testing the short-run causal relationship and one set testing the long-run causal relationship. Differentiating between the short- and long-run causal relationships is important, as we do not have information regarding the objective functions state banks and their principals apply. Clearly, the quality and timing of a potential finance-growth nexus depends on the question of whether state banks aim to pursue strategic, long-term goals (which may not result in an immediate response in terms of growth promotion) or respond to social, economic and political needs with a focus on short-term effects.

The short-run tests are based on the following two Granger test regressions,

$$x_{it} = \alpha_{x0} + \sum_{j=1}^J x_{it-j} \alpha_{ij} + \sum_{j=1}^J l_{bt-j} \beta_{ij} + \varepsilon_{it}, \quad \text{and (1)}$$

$$l_{bt} = \alpha_{bo} + \sum_{h=1}^H x_{it-h} \alpha_{bh} + \sum_{h=1}^H l_{bt-h} \beta_{bh} + \varepsilon_{bt}, \quad (2)$$

where  $x_{it}$  is growth in the real economy and  $l_{bt}$  is the growth rate in real bank lending from bank-type  $b$ , and testing whether  $\beta_{ij} = 0$  for all  $j=1, \dots, J$  and  $\alpha_{bh} = 0$  for all  $h=1, \dots, H$  to determine the casual relationship.<sup>11</sup> Because we use growth rates, these tests explore the short-run relationship. To test the long-run causal relationship, we employ Toda and Yamamoto's (1995)

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<sup>11</sup> The lag length is chosen using the Bayesian information criterion.

modified Granger-causality test for non-stationary data. This test is similar to the test in equations (1) and (2), but additional lags of the dependent and the explanatory variables are added to the regression models to control for non-stationarity. These tests are based on estimating the two test regressions,

$$X_{it} = a_{i0} + \sum_{j=1}^J X_{it-j} a_{ij} + \sum_{j=1}^J L_{bt-j} b_{ij} + \sum_{d=1}^D X_{it-j-d} r_{id} + \sum_{d=1}^D L_{it-j-d} q_{id} + e_{it} \quad (3)$$

$$L_{bt} = a_{b0} + \sum_{h=1}^H X_{it-h} a_{bh} + \sum_{h=1}^H L_{bt-h} b_{bh} + \sum_{d=1}^D X_{it-j-d} r_{bd} + \sum_{d=1}^D L_{it-j-d} q_{bd} + \epsilon_{bt}, \quad (4)$$

where  $X_{it}$  is the logarithm of the real economic measure in levels and  $L_{bt}$  is the logarithm of real bank lending in levels. To control for the non-stationarity,  $D$  additional lags of the dependent and explanatory variables are added to the test regression, where  $D$  is equal to the integration order of the respective variables. In other words, if  $X$  and  $L$  are integrated of order 1, one additional lag of these variables is included in the test regressions. The casual relationship is tested as for the stationary case by testing whether  $b_{ij} = 0$  for all  $j$  and  $a_{bh} = 0$  for all  $h$ .

### 3.2 Data

We consider three different measures of bank loans: total loans, short-term loans and long-term loans. The differentiation between short- and long-term loans is important, as short-term loans may be more plagued by ad-hoc political intervention at the local level. Reportedly, government officials in China are careful to avoid the social unrest often associated with rising local unemployment levels. It has been observed, for instance, that the employment policies of state-owned companies follow a counter-cyclical pattern, hinting at political interference to maintain surplus employment during economic downturns (Hu et al., 2006). The inclination for politicians and firms to lobby for short-term liquidity loans is therefore more pronounced. Long-term loans, in contrast, are more likely to reflect strategic political interests and government mandated

development plans addressing the expansion of distinct priority sectors specified by China's medium- and long-term development plans.

The data are collected from *China Financial Statistics: 1949-2005* (Financial Survey and Statistics Department of the People's Bank of China; 2007), which offers a unique compilation of Chinese banking statistics not previously publicly released. The data frequency is monthly and the data cover the period from 1997M1 to 2005M12. Although these unique data allow us to perform a fine-grained analysis, the time period is relatively short. We therefore test whether our benchmark results also hold for a longer time period. For this robustness exercise, we compiled additional total loan statistics from the annual *Almanac of China's Finance and Banking*. These almanacs contain total loans to non-financial institutions, albeit only at a quarterly level. Combined with total loans from the *China Financial Statistics*, this provides us with a longer time series for total loans, which stretches from 1997Q1 to 2008Q4. The almanacs, however, do not distinguish between short- and long-term loans, and consequently only permits a less detailed analysis of the longer sample.<sup>12</sup>

To measure real economic activity, we rely on six different measures: GDP, agricultural production, manufacturing production, service production, total factor productivity and capital

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<sup>12</sup> The bank loan statistics contain two breaks: one break in 2001Q1 for JSCBs and one break in 2007Q1 for RCCs. The break for JSCBs is caused by an additional bank being added to the group of JSCB banks. The RCC break coincides with the intervention of the Central Bank, which removed a substantial amount of non-performing loans from the RCCs' balance sheets. In parallel, ownership reforms reduced the RCC sector from 19,348 legal entities at the end of 2006 to fewer than 8,509 by the end of 2007. To control for these breaks, we include dummy variables in our test regressions.

stock. GDP is the most commonly used measure of real economic performance in the finance-growth literature. As individual bank lending is unevenly distributed across economic sectors, it is not to be expected that potential growth effects would necessarily be represented in overall GDP growth. We therefore also separately test for growth effects for agriculture, manufacturing and services. Moreover, considering the differences between typical borrowers and in loan size and maturity, bank loans are likely to affect growth through different transmission channels (Bonfiglioli, 2008). For example, PBs' focus on large-scale infrastructure investments is likely to affect capital accumulation and productivity. JSCBs and RCCs, in contrast, typically prioritize short-term lending (see table 1), which is less likely to affect the rate of capital growth, but may nonetheless increase productivity. By relaxing firms' short term budget restrictions, such short-term loans may allow for internal restructuring, the introduction of new quality control systems, and human capital improvements. As an extension of the standard analysis, we therefore also include capital growth and total factor productivity (TFP) in our analysis.

Differentiating between the effect of bank lending on capital growth and the effect on TFP growth is not trivial. Although capital accumulation is important, a substantial component of cross-country income differences is explained by differences in TFP. Increasing the rate of TFP growth is thus crucial for developing countries to permanently close the income gap with developed countries. However, sustained TFP growth is generally more difficult to achieve than capital accumulation (Easterly and Levine, 2002).

All real economic variables, except TFP, are collected from Thompson Financial Statistics Datastream. Because GDP data are only compiled on a quarterly basis, we constructed matching quarterly observations of the lending data by using the last month of the respective quarter. All economic variables and bank lending variables are deflated using the GDP deflator and have been



seasonally adjusted<sup>13</sup>. Total factor productivity growth is estimated as the Solow residual from a Cobb-Douglas production function with constant returns to scale,

$$P_t = G_t - \gamma_1 C_t - (1 - \gamma_1) E_T, \quad (5)$$

where  $P$  is the logarithm of TFP,  $G$  is the logarithm of real GDP,  $C$  is the logarithm of the real capital stock and  $E$  is the logarithm of the employment level. We use the standard assumption that  $\alpha_1 = 0.3$  (Baekert et al., 2011). As a robustness check, we confirmed that our results also hold if the capital intensity is assumed to be 0.4 or 0.5.

Naturally, bank lending is not only affected by institutional and functional diversity across different lending institutions. Lending is also affected by common factors such as shifts in supply and demand related to domestic business cycles, as well as monetary policy responses formulated by the Central Bank. To correctly identify bank-specific effects on growth, we decompose bank lending into a common component (capturing, for instance, the effect of the Central Bank's monetary policy) and an idiosyncratic component (capturing the distinct lending strategy of each banking institution),

$$l_{bmt} = \theta_{bm0} + \theta_{bm1} f_{mt} + z_{bmt}, \quad (6)$$

where  $m$  denotes the loan type (total loans, short-term loans or long term loans),  $f$  is the common component and  $z$  is the idiosyncratic component capturing changes in lending unique to bank type  $b$ . The common component and the component loading ( $\theta_{bm1}$ ) are estimated using Principal Component Analysis (PCA). Because PCA requires stationary data, we follow the procedure suggested by Bai and Ng (2004) and estimate the principal components using first differenced

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<sup>13</sup> We use the Census X12 filter in EViews 7.1 to seasonally adjust the variables, which is the technique used by the U.S. Census Bureau.

data.<sup>14</sup> Having estimated the common component ( $f$ ) and the loadings, we then estimate the idiosyncratic component  $\hat{z}$  as,

$$\hat{z}_{bmt} = \hat{\theta}_{bmt} - \theta_{bm0} - \hat{\theta}_{bm1}\hat{f}_{mt} . \quad (7)$$

The long run common components and idiosyncratic components are obtained by cumulating the short-run common components and the short-run idiosyncratic components (Bai and Ng, 2004).

Both a CUSUM test and a Chow break point test reveal a structural break in the short-run but not in long-run parameter values for JSCBs and SOCBs after 2001Q4 for the 1997Q1 to 2005Q4 sample and a break after 2003Q3 for the 1997Q1 to 2008Q4 sample. To account for this break in our tests, we define a dummy variable that separates between the two periods. This yields the regression,

$$x_{it} = \alpha_{x0} + \sum_{j=1}^J x_{it-j}\alpha_{ij} + \sum_{j=1}^J dx_{it-j}\alpha_{idj} + \sum_{j=1}^J l_{bt-j}\beta_{ij} + \sum_{j=1}^J dl_{bt-j}\beta_{idj} + \varepsilon_{it}, \quad (8)$$

$$l_{bt} = \alpha_{bo} + \sum_{h=1}^H x_{it-h}\alpha_{bh} + \sum_{h=1}^H dx_{it-h}\alpha_{bdh} + \sum_{h=1}^H l_{bt-h}\beta_{bh} + \sum_{h=1}^H dl_{bt-h}\beta_{bdh} + \varepsilon_{bt}, \quad (9)$$

where  $d$  is the dummy variable that takes the value one after the indicated break. In the Granger-causality tests, we test jointly whether the parameters are equal to zero both before and after the break. We also analyze the effect of the break on the banks' abilities to promote growth.

## 4 Results and Discussion

### 4.1 The role of idiosyncratic lending over time

As the first step of our analysis, we explore the extent to which growth in lending over time reflects idiosyncratic behavior linked to the individual financial institution and the extent to

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<sup>14</sup> The Phillips Perron unit root test shows that all variables are integrated of order 1 in levels and of order 0 in first differences.

which lending patterns reflect common monetary policy and business cycle effects. Table 2 summarizes our results. Two observations stand out: First, JSCBs realized the highest quarterly average lending growth (6.5% per quarter) between 1997Q1 and 2005Q4, which is certainly connected with the younger organizational age of these lending institutions relative to the SOCBs.<sup>15</sup> For the other bank types, average quarterly lending growth varies between 1.9% (SOCBs) and 2.4% (RCCs). Both PBs and SOCBs have exhibited slower growth in short-term loans compared to long-term loans, while JSCBs and RCCs have increased short-term and long-term lending at comparable rates. The observed pattern is broadly confirmed for the longer sample: here, lending growth by JSCB reached on average 5.6%, while lending growth otherwise remained between 1.9% (SOCBs) and 2.8% (PBs).

Second, our analysis reveals a substantive variation in the respective roles of the common and idiosyncratic components in explaining lending growth in China. Lending by PBs is least affected by common shocks. Depending on loan type, the common component only explains between 3% and 18% of the variability in lending growth between 1997 and 2005. This is in line with the distinctive role policy banks play as facilitators of large-scale, politically driven infrastructure projects. For commercial banks, the explanatory power of the common component is naturally higher and ranges between 40% and 60% for total lending. For JSCBs, the common component achieves the highest explanatory power, confirming the aforementioned stronger market orientation (and insulation from ad-hoc policy interventions) of these banks. Over time, the common component explains a larger proportion of the variation in comparison with what the longer sample (1995-2008) shows. However, also in the longer sample, the difference in the

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<sup>15</sup> These growth rates have been corrected for breaks in the time series in 2001Q1 (JSCBs) and 2007Q1 (RCCs).

degree of market orientation between JSCBs on the one hand and SOCBS and RCCs on the other persists.

*Insert table 3 about here*

#### 4.2 Short-term growth effects between 1997 and 2005

Our analysis of short-term growth effects confirms substantial differences across bank types and loan maturities (see table 4). Regarding PBs, their total lending Granger causes both GDP and total factor productivity growth. These effects are primarily driven by long-term loans that causally explain GDP growth, and total factor productivity growth, whereas short-term loans only have a temporary effect on manufacturing. For the service sector, long-term loans have a bidirectional causal relationship with GDP. For agricultural, manufacturing, and capital growth, total policy bank lending follows rather than precedes short-term growth, reflecting the banks' role as a political tool employed to respond to rather than drive market development. This is most pronounced in the case of agricultural production, which Granger causes PB lending in the form of both short-term and long-term loans. This is clearly associated with the lending policies of the Agricultural Development Bank of China (see Appendix 1 for details), which finances purchases of surplus grain and edible oil production from farmers to stabilize market prices.

Lending by SOCBs, China's major commercial lender, in contrast, does not generate any positive short-term effects on growth with respect to total lending. Moreover, total lending activities also do not follow economic activity, leaving the lending performance virtually disconnected from activities in the real economy. For short-term lending, our tests suggest that SOCB loans Granger cause negative growth effects for GDP, manufacturing production and TFP. In other words, an increase in short-term SOCB loans reduces economic activity. This suggests

that SOCB lending is structured in a way that allows unproductive firms to remain in business while crowding out loans to more productive enterprises. This is consistent with the widely reported incidents of political interference to rescue prioritized, but ailing, large-scale state-owned enterprises (Wei and Wang, 1997; Cull and Xu, 2003; Shih et al., 2007). The only positive effect of SOCB loans in the short-run is in the relationship between long-term loans and agricultural production. Because the structural break tests indicated a break in the parameters after 2001, we also compared the parameter estimates of the period before (1997 to 2001) and after the break (2002 to 2005). The identified short-term effects of SOCB lending, however, are confirmed, and the negative effects of SOCB loans increased rather than decreased.<sup>16</sup>

Based on our estimations, JSCBs are the most effective among China's commercial lenders in terms of short-term growth promotion. Although the market share of JSCBs had only reached 20% of total loans by the end of 2005, JSCB lending Granger caused growth in GDP and manufacturing production by strengthening both TFP growth and capital growth. Similar to the SOCBs, the structural break test indicates a break in the short-run parameters after 2001Q4. An analysis of the respective sub-periods shows that the positive growth effects generated by JSCB lending increased in the latter period. In light of the rapid expansion in JSCB-lending (with an average growth rate of 6.5%), it is reasonable to assume that growth effects have increased as the banks' market share gradually expands. Somewhat strikingly, the positive growth effects of total lending are not matched by similar effects stemming either from short-term or long-term loans. A possible explanation is that the lending portfolios of JSCBs have changed substantively over the observation period, with a redistribution of loans toward short-term lending. Once we include an

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<sup>16</sup> Results are available upon request.

interaction term between short-term and long-term lending into the Granger causality regressions, we find positive effects on growth.

Finally, RCC lending generates positive growth effects in the agricultural sector. As a downside, however, RCC-lending also negatively Granger causes manufacturing production and TFP growth. RCCs lend to local small-scale ventures and agricultural enterprises, and these loans are efficient in the sense that they expand overall agricultural production. However, these small ventures often operate at below average total factor productivity, and an expansion of these local ventures reduces overall productivity in the economy. Moreover, an expansion of the agricultural sector increases the competition for resources with manufacturing production, thus resulting in negative effects on this sector.

We conclude with a review of the growth effects associated with the common component. In the short-run, a shock to the common component increases both GDP growth and agricultural production. Strikingly, the common component does not generate any short-term effects for manufacturing or services. This pattern is consistent with casual accounts reporting that expansive policy measures, such as low interest rate policies, introduced in an ad-hoc manner may not benefit the best lenders but instead politically connected ones. During the global economic crisis, for instance, state-owned companies reportedly used stimulus money for stock market investments instead of productive uses. It is also notable that the common component is Granger caused by capital growth, confirming that China's leadership is firmly committed to following a capital-driven growth strategy.

*Insert table 4 about here*

### 4.3 Long-term growth effects between 1997 and 2005

Shifting our analytic attention to the linkage between idiosyncratic lending behavior and long-term growth effects, the general account is comparable, revealing no major differences in the banks' abilities to influence short-term or long-term growth objectives (see table 5).

PB lending registers a bidirectional causal effect between lending and TFP growth. Typically, there is a three to four quarter lag between short-run PB loans and TFP growth. This difference in lags is in line with the typical lending pattern of PBs, which provide financing for major capital investments such as infrastructure construction. While these projects do not have immediate productivity effects, they can generate productivity effects for a large part of the local and regional economy, once projects develop and reach completion. These positive growth effects of PBs are thus indirect rather than direct. Otherwise, PB lending follows rather than precedes growth in GDP, agriculture and manufacturing. This is true for both short- and long-term lending.

For SOCBs, the main lenders in China's market for commercial loans, the long-term account seems particularly bleak. Not only do our estimates fail to reveal positive growth effects (and present a negative causal relationship between short-term lending and manufacturing growth), SOCB lending between 1997 and 2005 appears disconnected from real economic activities in the sense that lending does also not follow trends in domestic demand. In fact, SOCB lending appears virtually disconnected from economic realities in this particular period of time. Clearly, SOCBs fail to play the role of a strategic lender that is emphasized by Chinese policymakers and legally prescribed.

Although JSCB lending loses its positive impact on GDP growth observed in the short-run analysis, total JSCB lending still spurs long-term manufacturing growth and total factor

productivity growth, which reinforces the superior lending decisions made by JSCBs in comparison with SOCBs as their main competitors in the commercial lending market. This further undermines the developmental view of state banking, asserting that state-ownership and political involvement may be better adapted to spur long-term economic development.

Finally, the long-term perspective confirms the difficult position of RCCs, which exert a positive effect on agricultural production, but at the expense of manufacturing and TFP growth. Clearly these effects are closely associated with the local role of RCCs, limiting their economic activities to relatively confined lending markets, making efficient capital allocation rather difficult.

In the long run, the common component is the only driver of GDP growth and capital accumulation. Thus, despite China's highly interventionist approach to financial institutions and domestic lending, by 2005, the only effective means to spur long-term GDP growth are monetary policies and market responses.

To summarize the analysis of long-term growth effects: None of the financial institutions had positive effects on GDP growth in the long run. Regarding total lending, only policy banks were able to promote total factor productivity growth, JSCB lending had a positive impact on manufacturing and total factor productivity development and RCCs were able to promote agricultural production, albeit at the cost of negative growth in GDP, manufacturing, and TFP. The largest share of commercial lending conducted by SOCBs remained disconnected from the real economy, and neither spurred nor followed economic growth.

*Insert table 5 about here*

#### 4.4 Robustness checks



To scrutinize our findings, we have extended our sample period to the end of 2008. Regrettably, data availability does not allow for an even longer sample. Moreover, we will lose some degree of detail in the information, as short-term and long-term loans are not reported separately for the period in question. However, this simplified perspective may be justifiable, as our analysis found no striking differences between the two types of lending. Importantly, the inclusion of additional years covers a major reform package, the incorporation and stock listing of China's SOCBs. This reform was initiated to bring in new minority investors and – often foreign - expertise in an effort to help SOCBs modernize their bank operations and increase profitability. Moreover, the central government sought to combat arbitrary political intervention and the awarding of personal favors at the local level, without losing majority control over financial assets. As a consequence of this partial de-politicization process, the balance sheets of SOCBs improved, as the successful reduction of non-performing loans to 1% in 2010 confirms (China Banking Regulatory Commission, 2010).

*Insert table 6 about here*

As can be expected, our benchmark results are broadly confirmed for PBs, which did not undergo any substantive political or economic changes between 2005 and 2008. An expansion of the agricultural sector causes greater demand for capital, which is provided by PBs (i.e., by the Agriculture Development Bank). PB lending again has positive effects on manufacturing production and indirect effects on TFP both in the short- and long-run. The most notable difference from the previous sample is that PB lending Granger causes not only short-run but also long-run GDP growth.

As expected the most critical changes are observed for SOCB lending. Clearly, the completed incorporation and stock-listing of SOCBs and concomitant hardening of budget

constraints has led to a closer alignment of bank activities with changes in the real economy. The main difference from the smaller sample is that SOCB lending is Granger caused by developments in the real economy as measured by GDP, manufacturing production, service production and TFP. Although SOCBs do not cause growth, they have begun to respond to economic growth. However, SOCB loans still Granger cause negative growth effects in the manufacturing sector in both the short- and long-run. This may hint at difficulties in breaking up established patronage and clientelist networks linking the management of state-owned companies, local politicians and local branches of SOCBs. Clearly, the misallocation of loans in the manufacturing sector could not be stopped by the simple introduction of non-state minority shareholders. Structural break tests reveal a break in 2003Q2, six months later than the break in the shorter sample. The comparison of parameter estimates for both sub-samples (1997Q2-2003Q2 and 2003Q3 and 2008Q4) shows that growth in the real economy Granger causes SOCB lending in the second period but not in the first.<sup>17</sup> Apparently, the corporatization, governance and management reforms applied to SOCBs have successfully led to a closer alignment of lending activities with changes in the real economy. However, thus far SOCB lending does not facilitate or promote economic growth.

With a slight expansion in market share from 20% in 2005 to 23% in 2008, JSCBs have expanded their positive impact on the real economy in comparison to the shorter sample. Similar to the previous results, JSCB loans positively Granger cause GDP, manufacturing production, TFP and capital accumulation in the short-run. Unlike the shorter sample, these effects are also sustained in the long-run in the case of manufacturing production and TFP growth. Similar to SOCBs, the structural break tests reveal a significant break approximately 2003Q2 for the short-

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<sup>17</sup> Results are available upon request.

run model. A comparison of the two periods' parameter estimates reveals a slightly more significant effect in the second sub-period than in the first.<sup>18</sup>

There are no significant structural breaks for RCCs, and the results for the expanded sample confirm those of the smaller sample: RCC lending promotes agricultural growth but has negative effects on the overall economy, possibly through its indirect effects on productivity and resource competition between agricultural and manufacturing firms. The negative effects on overall productivity and manufacturing production suggest that an expansion in RCC lending is harmful to the modernization of the Chinese economy. However, given the large rural population and share of rural household production, these negative side effects of RCC lending may be well justified in a broader context. First, the agricultural sector in a developing country requires capital investments for development to be sustained over the long-term (see, e.g., Lewis, 1954; Ranis and Fei, 1961). Second, the availability of agricultural loans is essential to slow down rural-to-urban migration and illegal migration, which may pose a threat to urban stability, particularly in labor surplus societies such as China. Temporarily negative growth effects on TFP and manufacturing production at the national level may therefore be a necessary byproduct of supporting rural and remote areas during the economic transition process.

Finally, the short-term effects of the common component are consistent with our shorter sample. In the long run, however, the common component is now following rather than promoting growth. Given the high-performance years preceding the 2008 global economic crisis, the monetary policy response was – as our results show – an effort to avoid an overheating of the economy rather than a tool employed to jump-start domestic growth processes.

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<sup>18</sup> Results are available upon request.

Our analysis suggests a pair of tentative conclusions. Most generally, we assert that ownership alone is a poor predictor of the economic role that state banks can play in fostering economic development. While PBs and SOCBs were both wholly state owned banks (until 2005), the difference in the identified finance growth nexus is striking. While PBs promoted total factor productivity and GDP growth, the lending of SOCBs seems largely disconnected from economic realities, as it does not promote, but rather is harmful to, economic growth. The most obvious differences are organizational and structural features, as PBs are highly centralized and assume the role of a development bank, whereas SOCBs operate a fairly dispersed branch network with a focus on commercial lending. Under this set-up, the negative effects associated with policy banks are obviously more difficult to control given the extensive clientelist and patronage networks linking the local financial sector to the local economy.

Similarly, the reduced state ownership of in JSCBs and RCCs, again, is associated with strikingly different results. While JSCB lending is associated with an increase in manufacturing growth and total factor productivity, the confined rural market of RCCs helps to channel capital into local, low-productivity investments that ultimately reduce GDP, manufacturing and factor productivity.

## **5 Discussion and Conclusions**

It is a widely held belief that China's economy has benefited from a state-owned banking system, particularly among Western policymakers and practitioners who regard China's rapid development with skepticism. This paper provides new evidence by employing disaggregated lending data to produce a more nuanced account of the nature of the finance-growth nexus in China. Using detailed lending data available for the period from 1997 to 2008, a principal

component analysis provides empirical insights into the short- and long-run relationship between bank lending and economic growth.

Our analysis reveals that the performance of state banks is closely linked to the nature of financial activities in which they are engaged. Between 1997 and 2008, only two types of banks generated positive effects on GDP growth: PB lending spurred GDP growth in the short- and long-run. Among the commercial lenders, only JSCB lending registered a positive impact on GDP growth. The main commercial lenders, the heavily state-controlled SOCBs, did not contribute to growth. In the long-run, SOCB-lending had a negative effect on manufacturing growth. Clearly, this suggests a crowding-out of credit to private and politically unconnected firms, which would promise higher returns than their politically connected counterparts (La Porta et al., 2002; Sapienza, 2004).

These findings suggest several tentative conclusions: Wholly owned state banks only seem to enjoy advantages regarding the financing of public goods, such as road networks, or long-term projects with substantial uncertainty and information asymmetries. Regarding commercial lenders, majority ownership by the state seems associated with substantive losses in efficiency. Our findings are in contrast to the general perception that Chinese companies enjoy unfair advantages thanks to generous support from SOCBs. While individual firms certainly benefit, the manufacturing sector as a whole experiences negative growth effects in the long run. The apparent misallocation of financial resources is most likely associated with the widely reported ad-hoc political interference in support of ailing state-owned companies, an interpretation that is also consistent with the superior performance of JSCBs in which the state only holds a minority of shares.

In light of the Chinese government's most recent efforts to liberalize and modernize its banking system, our results do not present to an optimistic outlook. Recent efforts to gradually merge the political functions of policy banks with commercial lending may dilute the relatively strong comparative advantage policy banks displayed until 2008.<sup>19</sup> If ongoing reforms were to shift the functions of policy banks closer to those of standard commercial banks, the banking system would lose one of its central advantages.

While generalizations would clearly be premature, China's experience certainly calls for a more nuanced assessment of state banking that considers the distinct institutional and functional features of specific policy and commercial banks. Further research applying a disaggregated approach to state banking may provide crucial insights, particularly for developing countries, concerning how to employ state banking to pursue developmental goals successfully.

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<sup>19</sup> See *Policy bank to be commercialized*, <http://www.china.org.cn/english/business/243063.htm>.

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TABLES:

Table 1 Average shares of different types of loans in total loans in percentages (1997-2005)

	Short-term loans	Medium and Long-term loans	Other loans <sup>1</sup>
PBs	47.0	52.8	0.2
SOCBs	55.3	40.7	4.0
JSCBs	62.6	25.1	12.3
RCCs	91.2	5.8	3.0

Note: <sup>1</sup> Include paper financing and total advances.

Source: Own calculations based on China Financial Statistics (2007).

Table 2: Institutional and Functional Features of Key Banking Institutions

	PBs	SOCBs	JSCBs	RCCs
<i>Institutional characteristics</i>				
Main task	Policy lending	Commercial lending	Commercial lending	Commercial lending
Ownership	State	State	Mixed	Collective
Political independence	Low	Low-medium	High	High
Budget constraints	Soft	Medium	Hard	Hard
<i>Functional characteristics</i>				
Major recipients of loans	SOEs, Government agencies	SOEs, partly privatized joint stock companies	SOEs, partly privatized joint stock companies	TVEs and rural households
Loan size	0.5-10 billion CNY	4-7 million CNY	Na	1-2 thousand CNY
Main purpose	Capital construction	Industrial sector	Industrial sector	Agricultural sector
Maturity	Medium – and long-term	Short- and medium- term	Short-term	Short-term
Market	National	National	National	Local
Market share in 2008 (in%)	8.94	51.58	13.99	8.25

Source: China Financial Statistics (2007); OECD (2004); Qian et al. (2011); Banks' Annual Reports; China Banking Regulatory Commission, 2009.

Table 3: Descriptive Statistics – Growth Rates

	1997Q2 to 2005Q4				1997Q2 to 2008Q4			
	Average Growth Rate	Std. Dev.	Variance decomposition		Average Growth Rate	Std. Dev.	Variance decomposition	
			Common Component	Idiosyncratic Component			Common Component	Idiosyncratic Component
					<i>PBs</i>			
Total	2.3%	3.0	18%	82%	2.8%	3.0	31%	69%
Short-term	0.7%	3.2	13%	87%	NA	NA	NA	NA
Long-term	4.0%	5.1	3%	97%	NA	NA	NA	NA
					<i>SOCBs</i>			
Total	1.9%	2.9	40%	60%	1.9%	3.7	64%	36%
Short-term	-0.4%	4.4	8%	92%	NA	NA	NA	NA
Long-term	4.6%	4.3	18%	82%	NA	NA	NA	NA
					<i>JSCBs</i>			
Total	6.5%	3.1	64%	36%	5.6%	4.2	80%	20%
Short-term	5.5%	3.6	7%	93%	NA	NA	NA	NA
Long-term	9.6%	6.3	25%	75%	NA	NA	NA	NA
					<i>RCCs</i>			
Total	2.4%	2.0	63%	37%	2.5%	2.6	60%	40%
Short-term	2.4%	2.0	29%	71%	NA	NA	NA	NA
Long-term	3.3%	5.1	4%	96%	NA	NA	NA	NA

Notes:

- a. Growth in real loans.
- b. There is a break in JSCB loans in 2001 and in RCCs in 2007. These breaks affect the growth rate for one quarter; that quarter has been removed from these calculations.

Table 4: Granger Causality Tests: Short-term growth effects 1997-2005

	Loan type	GDP	Agriculture	Manufacturing	Service	TFP	Capital
	Total loans	PB → GDP	Agric. → PB	Manuf. → PB	-	PB → TFP	Capital → PB
PB'S	Short-term loans	-	Agric. → PB	PB → Manuf.	-	-	-
	Long-term loans	PB → GDP	Agric. → PB	-	Service ↔ PB	PB → TFP	-
	Total loans	-	-	-	-	-	-
SOCBs	Short-term loans	SOCB → GDP*	-	SOCB → Manuf.*	-	SOCB → Manuf.*	-
	Long-term loans		SOCB → Agric.	-	-	-	-
	Total loans	JSCB → GDP	-	JSCB → Manuf.	-	JSCB → TFP	JSCB → Capital
JSCBs	Short-term loans	-	-	-	-	JSCB → TFP	-
	Long-term loans	-	-	-	-	-	-
	Total loans	-	RCC → Agric.	RCC → Manuf.*	-	RCC → TFP*	-
RCCs	Short-term loans	-	RCC → Agric.	-	-	-	-
	Long-term loans	GDP → RCC	-	-	Service → RCC	TFP → RCC	-
	Total loans	GDP ↔ CC	CC → Agric.	-	-	-	Capital → CC
Common Component	Short-term loans	-	CC → Agric.	-	-	-	-
	Long-term loans	GDP → CC	-	-	Service → CC	TFP → CC	-

Note: \* denotes a negative effect; all other effects are positive. Due to the small sample and the relatively small volume of loans from JSCBs and RCCs compared to the size of the economy, we use a 10% significance level.

Table 5: Granger Causality Tests: Long-term growth effects, 1997-2005

	Loan type	GDP	Agriculture	Manufacturing	Service	TFP	Capital
	Total loans	GDP → PB	Agric. → PB	Manuf. → PB	-	PB ↔ TFP	-
PB'S	Short-term loans	-	Agrc. → PB	PB → Manuf.	-	PB → TFP	-
	Long-term loans	GDP → PB	Agric. → PB	-	-	PB → TFP	-
	Total loans	-	-	-	-	-	-
SOCBs	Short-term loans	-	-	SOCB → Manuf.*	-	-	-
	Long-term loans	-	-	-	-	-	-
	Total loans	-	-	JSCB → Manuf.	-	JSCB → TFP	-
JSCBs	Short-term loans	-	.	-	-	-	-
	Long-term loans	-	-	-	-	-	-
	Total loans	GDP → RCC*	RCC → Agric.	RCC → Manuf.*	-	RCC → TFP*	-
RCCs	Short-term loans	-	-	-	-	-	-
	Long-term loans	-	RCC → Agric.	-	-	-	-
	Total loans	CC → GDP	CC → Agric.*	-	-	-	CC → Capital
Common Component	Short-term loans	-	-	-	-	-	-
	Long-term loans	-	-	-	-	-	-

Note: \* denotes a negative effect; all other effects are positive. Due to the small sample and the relatively small volume of loans from JSCBs and RCCs compared to the size of the economy, we use a 10% significance level.



Table 6: Granger Causality Tests: Short- and long-term growth effects of total loans, 1997-2008

Bank	GDP	Agriculture	Manufacturing	Service	TFP	Capital
<i>Short-term effects</i>						
PB's	PB → GDP	Agric. → PB	PB → Manuf.	-	PB→TFP	-
SOCBs	GDP → SOCB	-	SOCB↔Manuf.	Service→SOCB	TFP → SOCB	SOCB↔Capital
JSCBs	JSCB→ GDP	Agric.→JSCB	JSCB → Manuf.	-	JSCB → TFP	JSCB → Capital
RCCs	RCC→ GDP*	RCC↔Agric.	JSCB → Manuf.*		JSCB → TFP*	
Common Component	CC↔GDP	CC→ Agric.	-	-	CC↔TFP	Capital → CC
<i>Long-term effects</i>						
PB's	PB → GDP	Agric. → PB	PB → Manuf.	-	PB↔TFP	Capital→TFP
SBCs	-	-	SOCB→Manuf.*	-	-	-
JSCBs	-	-	JSCB → Manuf.	-	JSCB → TFP	-
RCCs	RCC → GDP*	RCC→ Agric.	RCC→Manuf.*	-	JSCB → TFP*	-
Common Component	GDP → CC*	-	Manuf → CC*	-	TFP → CC*	-

Note: \* denotes a negative effect, all other effects are positive. For the longer sample, we use a 5% significance level.

**Appendix 1:** Project examples of policy banks in 2005 (billion CNY)

Name	Total assets	Outstanding loans	Project example	Project description	Project value
China Development Bank <sup>1</sup>	1897.9	1731.8	Jiangsu Tianwan Nuclear Power Plant	A nuclear power plant with a capacity of 4 million kilowatts to improve the energy infrastructure in Jiangsu province and the East China region	5.1
Export-Import Bank of China <sup>2</sup>	204.79	175.99	Strategic Cooperation Agreement with China National Machinery Industry Corporation	Financing of the company's export of mechanical and electronic products, complete sets of equipment, high- and new- tech products, its overseas investment and overseas contracting projects and in support of its international market expansion	24.2 <sup>4</sup>
Agricultural Development Bank of China <sup>3</sup>	850.21	787.07	Loans for the purchase of grain and edible oil	The purchase of surplus grain and edible oil from farmers by enterprises maintaining accounts with the bank to improve farmers' income	166.28

Notes:<sup>1</sup> The China Development Bank, the largest of the three policy banks (with 64% of the total policy lending), focuses on eight key industries: power, road construction, railways, petro-chemical, coal mining, telecommunications, agriculture, and public facilities (CDB Annual Report 2010). Although the bank also provides loans to small and medium sized enterprises with average assets of 1.5 million CNY, these loans constitute only a small fraction of total lending (approximately 1% in 2005; CDB Annual Report).

<sup>2</sup> Lenders can either be international buyers purchasing products in China<sup>1</sup>, or domestic sellers aiming to strengthen their participation in global trade. Chery Automobile, for instance, received a loan worth CNY 5 billion in 2005 to support the company's export development. By 2011, Chery was exporting 170,000 cars annually, which made Chery the strongest exporter among China's car producers.

<sup>3</sup> The Agricultural Development Bank of China is responsible for the majority of short-term loans granted by China's policy banks. Of these loans, 98 percent are dedicated to the purchase of farm products (such as surplus grain and edible oils), in an effort to stabilize rural markets and alleviate poverty among farmers.

<sup>4</sup> 3 billion USD converted into CNY based on IMF representative exchange rate from 30.12.2005.

## Appendix 2

Summary information from 2011 on banking institutions included in the analysis (in billions of RMB and percentages)

Banking institution	Total assets	Share in total assets of banking institutions	Total loans	Share in total loans of banking institutions	Type of the largest shareholder	Ownership share of the largest shareholder
<b>State-owned commercial banks</b>						
Industrial and Commercial Bank of China (ICBC)	15477	13.88	7594	13.05	State-owned	35.40
Agricultural Bank of China (ABC)	11678	10.47	5399	9.28	State-owned	40.12
Bank of China (BOC)	11830	10.61	6203	10.66	State-owned	67.60
China Construction Bank (CCB)	12282	11.01	6325	10.87	State-owned	57.13
<b>Policy banks</b>						
China Development Bank (CDB)	6252	5.61	5526	9.50	State-owned	100
Agricultural Development Bank of China (ADBC)	1751	1.57	1671	2.87	State-owned	100
Export-Import Bank of China (Exim)	1199	1.08	914	1.57	State-owned	100
<b>Joint stock commercial banks</b>						
Bank of Communications	4611	4.13	2505	4.31	State-owned	26.52
CITIC Industrial Bank	2766	2.48	1411	2.42	State-owned	61.85
Everbright Bank of China	1733	1.55	869	1.49	State-owned	48.37
Hua Xia Bank	1244	1.12	594	1.02	State-owned legal person	20.28
China Guangfa Bank	919	0.82	540	0.93	Foreign legal person	20.00
Shenzhen Development Bank	1258	1.13	610	1.05	Private legal person	42.16
China Merchants Bank	2795	2.51	1604	2.76	State-owned legal person	17.86
Shanghai Pudong Development Bank	2685	2.41	1302	2.24	State-owned legal person	20.00
Industrial Bank	2409	2.16	969	1.67	State-owned legal person	21.03
Evergrowing Bank	437	0.39	145	0.25	State-owned legal person	20.55
China Zheshang Bank	163	0.15	87	0.15	State-owned legal person	14.29
China Bohai Bank	312	0.28	113	0.19	State-owned legal person	25.00
China Minsheng Banking Co.	2229	2.00	1178	2.02	State-owned legal person	15.27

Source: Based on CBRC Annual Report 2011, annual reports 2011 of respective banks