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### The Impact of Bank and Non-Bank Financial Institutions on Local Economic Growth in China

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# Discussion Paper

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## **THE IMPACT OF BANK AND NON-BANK FINANCIAL INSTITUTIONS ON LOCAL ECONOMIC GROWTH IN CHINA**

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**The Impact of Bank and Non-Bank Financial Institutions on  
Local Economic Growth in China**

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**The Impact of Bank and Non-Bank Financial Institutions on  
Local Economic Growth in China**

**Abstract**

This paper provides evidence on the relationship between finance and growth in a fast growing country, such as China. Employing data of 27 Chinese provinces over the period 1995-2003, we study whether the financial development of two different types of institutions – banks and non-bank financial institutions – have a (significantly different) impact on local economic growth. Our findings indicate that only banking development shows a statistically significant and economically relevant impact on local economic growth.

Key Words: growth, financial development, Chinese provinces, banks

JEL-codes: E44, G21

## **I. Introduction**

Financial development plays an important role in promoting the growth of many countries. An under-researched question, however, is whether finance is an important driver of growth in countries exhibiting high growth rates. In this paper we address this “finance-high-growth-rate” nexus by studying the recent economic growth of Chinese provinces.

China, being one of the most important developing countries in the world, exhibited an average real growth rate of 9 percent per year during the last two decades. China’s experience therefore may be relevant for other countries with similar growth potential. China’s finance-high-growth-rate nexus only recently received attention; however, no consensus on the role of finance has been reached yet. One strand of papers argues that financial development matters for economic growth by observing that financial development is significantly correlated with local growth (e.g. Li and Liu (2001) and Zhou and Wang (2002)). Another strand of papers reasons that China is a counterexample to the current findings of the finance and growth literature (e.g., Allen et al. (2005), and Boyreau-Debray (2003)). Allen et al. (2005) conclude that there exist other financing channels for the private sector than those of financial institutions.

In addressing the finance-high-growth-rate nexus, we deal with the role different financial institutions may play – bank and non-bank financial institutions. Banks typically are state-owned, large, operate nationwide, and have many branches. Non-bank financial institutions, in contrast, operate locally within the province and

are much smaller<sup>1</sup>. Banks are generally technologically more advanced, better developed and dominate the financial system. Banks, however, are known for their reluctance to grant loans to small private companies (Allen et al. (2005)), while most loans of non-bank financial institutions are extended to the non-state-owned sector (Xie (1998)). The fact that bank and non-bank financial institutions show clear differences calls for a separate treatment. Employing a generalized “difference-in-differences” method, we compare the impact of the development of bank and non-bank financial institutions on Chinese provinces’ growth rates over the period 1995-2003. Our results indicate that only bank loans exert a statistically and economically significant positive impact on local economic growth.

Identifying the effects of financial development on economic growth is a challenging task in that financial development may react to the expectation of enhanced future economic growth; hence economies with good growth prospects develop institutions to provide funds necessary to support those good prospects (Robinson (1952)). Focusing on one country only, in our case China, allows us to make progress in controlling for this reverse causality. First, the Chinese economy with its different types of financial institutions allows taking a generalized “difference-in-differences” method, which helps in identifying the causation. The rationale for this approach stems from the following reasoning. Theory argues that financial institutions efficiently allocate capital to where it can generate better returns and therefore promote growth. Then, banks exhibiting a greater efficiency than non-bank financial

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<sup>1</sup> Banks in our study include the five biggest commercial banks in China: the four biggest state-owned commercial banks and one national commercial bank, Bank of Communications. Non-bank financial institutions mainly include rural credit cooperatives, and local trust and investment companies. For the detailed differences between those institutions, we refer to the third section.

institutions may be better at selecting fast growing firms. Empirically we should observe a stronger correlation between banking development and future economic growth. However, if finance simply follows growth, the huge demand for funds from the non-state-owned enterprises due to their growing needs will make the development of non-bank financial institutions show a stronger correlation with future growth.

Second, we study growth over 1995-2003, a period immediately after the Chinese government tried to “soft land” the economy. The growth rates have shown a decreasing trend during this sample period. When economic growth leads finance, the situation should be less severe during the downswing of the business cycle. Typically, we find that the fastest growing provinces in our sample are not those that exhibit the greatest increase in financial development.

Last, we also apply the dynamic system GMM estimator to control for potential endogeneity and find that our results remain robust.

Putting all evidence together, we conclude that the significant positive correlation more likely stems from banking development spurring local growth, rather than the other way around. As a comparison, non-bank financial institutions, while granting most of their loans to the non-state-owned sector, seem to be less important for local growth. This suggests that, despite the relatively weak Chinese financial sector, the efficiency of financial institutions still plays an important role in the allocation of funds, and in turn spurs growth.

How to reconcile these results with Allen et al. (2005), who argue that growth in China mainly stems from the private sector? First, Chinese banks may enjoy a better pool of borrowers. Banks can select first from the borrower pool; borrowers prefer to borrow from banks because bank loans, especially short-term loans, are less costly than other financial instruments. Banks also have a larger geographical scope, and face fewer restrictions in attracting deposits. As a result, banks can establish stronger bank-firm relationships, and finance both large and small firms. Non-bank financial institutions may have a restricted choice due to their smaller nature. Second, we notice that the state-owned sector still contributed around 40% of GDP growth in recent years (Sun (2004)). As banks can to some extent screen good borrowers from bad and allocate the capital to profitable state-owned enterprises (Cull and Xu (2000)), bank loans are still very important in supporting local industrial growth. Third, bank loans and especially short-term loans to the non-state-owned sector, have grown considerably during our sample period. This suggests that banks increased their relative exposure towards the financing of private firms, even though most financed private firms were large ones. This noticeable change is also documented by two recent surveys (see Appendix), which indicate that Chinese banks are more likely to discriminate borrowers with respect to their sizes rather than ownership. Finally, another plausible explanation is that bank loans may be transmitted to the private sector through state-owned enterprises. Lu and Yao (2004) argue that given the weak legal enforcement, Chinese banks may prefer to grant loans to state-owned enterprises that reinvest bank loans in the private sector.

The remainder of the paper is organized as follows. Section II briefly reviews the finance and growth literature. Section III describes the Chinese financial system,



focusing on the two types of financial institutions. Section IV presents our empirical results on the effects of financial development on economic growth in China. The last section concludes.

## **II Financial Development and Economic Growth: Theory and Evidence**

Theory has studied the relationship between finance and growth. In general there are two schools of thought with contrasting views. One school holds the idea that financial development follows rather than spurs economic growth. Robinson (1952) argues that finance does not cause growth, but reacts to the demand from the real sector. Hence economies with good growth prospects develop institutions to provide the necessary funds to support those good prospects.

The other school argues that financial development plays a key role for growth. First, financial intermediation economizes the costs associated with mobilizing savings (Boyd and Smith (1992) and Sirri and Tufano (1995)), and therefore increases capital accumulation. Second, financial intermediaries evaluate firms, managers and market conditions, and reallocate capital to its best use (Boyd and Prescott (1986), Greenwood and Jovanovic (1990), and Allen (1990)). Moreover, financial intermediaries monitor firms and exert control to overcome agency problems (Townsend (1979), Gale and Hellwig (1985), and Boyd and Smith (1994)). Financial intermediation meanwhile diversifies investment risks, which enhances the output and in turn economic growth (Gurley and Shaw (1955), Greenwood and Jovanovic (1990))

and Acemoglu and Zilibotti (1997)). In their view, differences in the quantity and quality of services provided by financial institutions partly explain why countries grow at different rates (Goldsmith (1969), Mckinnon (1973), and Shaw (1973)).

The recent literature also integrates financial development in innovation-based growth models. For instance, King and Levine (1993b) suggest that financial intermediaries can evaluate, finance and monitor potential entrepreneurs in their innovative activities. They also show that the relationship between finance and growth is likely to be dynamic and endogenous. Aghion, Howitt and Mayer-Foulkers (2003) show why the existence of technological transfers is not sufficient to put all countries on parallel long-run growth rate paths. They find that it is not just financial constraints that make some countries poor but rather that financial constraints inhibit a technological transfer and thus lead to an ever-increasing technology gap.

Recent empirical evidence employing cross-country datasets show that finance is positively correlated with growth. King and Levine (1993a) use data on 80 countries over the period 1960-1989, to document that the level of financial development determines long-run economic growth, capital accumulation, and productivity growth. Levine and Zervos (1998) refine this and find that initial stock market liquidity and banking development are both positively correlated with future rates of economic and productivity growth in a sample of 42 countries over the period 1976-1993.

The initial cross-country studies may suffer from simultaneity bias. More recent studies therefore focus on finding proper instruments to extract the exogenous part of financial development when trying to deal with the issue of causality. La Porta et al

(1998) link the legal origin of a country to its financial development. Their empirical results suggest that a variety of legal origins (British, French, German or Scandinavian laws) differing in protecting the rights of shareholders and creditors and in the efficiency of legal enforcement, reasonably lead to different levels of financial development. Based upon the above legal origin-finance instruments and using cross-country datasets, a substantial body of empirical work further shows that financial development promotes economic growth in aggregate, industry and firm level analysis (see e.g. Levine, Loayza, and Beck (2000) or Demirgüç-Kunt and Maksimovic (1998)). Next to instruments such as legal origin, economists also rely on improved econometric techniques to instrument endogenous variables. Authors use the dynamic system GMM panel estimator proposed by Arellano and Bover (1995), to extract the impact of financial development on economic growth by controlling for potential endogeneity.

One way to control for cross-country differences such as legal origin is to focus on one country only. Jayaratne and Strahan (1996) tackle the endogeneity problem by keeping effects other than financial development constant. They use financial deregulation in the early 1970s in 35 U.S.-states as an exogenous shock to local financial development. They find that in the 30 years after the deregulation, the economy grew faster in the deregulated states than in the other states. They also test the hypothesis of deregulation happening only due to expectation about the future needs of financing. They reject this hypothesis by observing that the loans after deregulation did not explode. Therefore, they attribute the relatively faster economic growth in the deregulated states to the improvements in loan quality. Guiso, Sapienza and Zingales (2004) study the effects of differences in local financial development on

economic activity in Italy. They find that local financial development enhances the probability that an individual starts a business, increases industrial competition, and in turn spurs firm growth.

Only few studies consider developing countries. Haber (1991, 1997) examines the role of financial liberalization for economic growth in Brazil and Mexico. He documents that financial liberalization allows more firms to have better access to external finance. He argues that political institutions play an important role in determining the degree of financial liberalization, and concludes that Brazil did better in financial liberalization due to its better political institutions.

The finance and growth issue in China received attention only recently but no consensus has been reached yet. One strand of papers holds the view that finance promotes growth in China. Employing a province-level dataset for the period 1985-1998, Liu and Li (2001) find that growth of provincial aggregate output is positively related to the growth of the loans of the largest banking institutions and self raised funds. They attribute the positive correlation to the improvement in the efficiency of capital reallocation during the liberalization in both financial and real sectors. Zhou and Wang (2002) study the impact of local financial development on economic growth, using a provincial dataset over the period 1978-2000, and find that local financial development is highly correlated with economic growth. Moreover, the provinces with relatively low initial level of financial development show slower growth rates afterwards. Particularly, they attribute the significant correlation between finance and growth to the openness of local financial markets, which improves the competition as well as the efficiency of financial institutions. However, those papers

do not formally deal with the endogeneity of finance and growth and hence to some extent their conclusion of the causality is less convincing.

The other strand of papers holds the opinion that China is a counterexample of the finance-growth nexus (e.g. Allen et al. (2005), and Boyreau-Debray (2003)). Allen et al. (2005) question whether financial development plays an important role for China's growth, as they observe the coexistence of weak Chinese legal and financial systems and fast economic growth. They examine closely the relationship between law, finance and growth in China. Their analysis reveals that the relatively poor legal system and the underdeveloped financial sector contribute little to the growth of the private sector, which is known as the most important component of China's fast growth. Hence, Allen et al. (2005) argue that there exist other financing channels for the private sector than those of financial institutions.

### **III. The Chinese financial system**

#### *3.1 The Chinese financial structure*

In this section, we offer a description of the Chinese financial structure.<sup>2</sup> We explicitly focus on the differently developed financial institutions in China – banks and non-bank financial institutions, rather than stock markets. The reasoning is that the Chinese financial system is dominated by financial institutions, especially banks.<sup>3</sup>

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<sup>2</sup> Table a1 in Appendix introduces the functions of the main Chinese financial institutions.

<sup>3</sup> For example, at the end of 1994, the ratio of the stock market capitalization to total assets of financial institutions

[Insert Figure 1 here]

Figure 1 presents the structure of the Chinese financial system at the end of 1994. It shows that financial institutions in China can be separated in two categories: banks and non-bank financial institutions. The banking sector (labeled as “banks”) entails three policy banks – focusing on policy-oriented loans – and fifteen commercial banks, of which the four state-owned commercial banks are, in terms of assets, by far the most important. Among the eleven national and regional banks, Bank of Communications<sup>4</sup> is the largest with China’s finance ministry as its largest shareholder. Researchers often refer to the four state-owned banks and the Bank of Communications as “the five biggest state-owned banks”. The non-bank financial sector (labeled as “non-bank financial institutions”) consists of urban and rural credit cooperatives, trust and investment companies, financial companies and other institutions.

Banks are hierarchically organized while non-bank institutions are generally following a “decentralized form”. This hierarchical structure mainly stems from their size. For example, Industrial and Commercial Bank of China, the largest state-owned bank has 37,039 branches all over the country. As a comparison, there are 50,745 rural credit cooperatives in China. Rural credit cooperatives either have a so-called “united

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was approximately 6.7%. Although the importance of stock markets has increased somewhat since the early 1990s, the scale and the importance of the financing channels of the stock markets are not comparable to those of financial institutions (Allen et al. (2005)). In this paper, we assume that stock markets have no significantly different impacts on different provinces. Hence employing a fixed effects panel model and incorporating time dummy variable in our analysis may well control for the impact of stock markets.

<sup>4</sup> The Bank of Communications has been publicly listed in Hong Kong Stock Exchange since June 2005.

headquarter” in the county, or are independent from each other. One rural credit cooperative is typically active in one county only.

[Insert Figure 2 here]

As Figure 2 illustrates, the total assets of the four state-owned banks, which were approximately 7,122 billion RMB<sup>5</sup> at the end of 1994, cover around 78 percent of the total assets of the entire financial sector. The other banks are much smaller. As the fifth biggest bank in China, Bank of Communications occupied more than half of the total assets of all national and regional banks at the end of 1994. The non-bank financial institutions together took 16 percent of the assets of all financial institutions. The market share of rural credit cooperatives was 7 percent, which was comparable to that of trust and investment companies. At the end of 2002, state-owned banks still dominated but their market share declined towards 68 percent. National and regional banks gained market share towards 15 percent. Market share of rural credit cooperatives increased whereas trust and investment companies’ market share decreased.

We argue that the two types of financial institutions – banks and non-bank financial institutions – differ in several dimensions, and their financial development should therefore be treated separately. First, they have a diverging geographical scope. Banks are bigger players than non-bank financial institutions. Most banks in China are national or regional players, and some of them are even international players. A non-bank financial institution, in contrast, is typically present in one province only.

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<sup>5</sup> RMB=Renminbi (in 2000, 1 US \$ = 8.3 RMB)

Second, banks are technological more advanced. Banks often pay higher salaries and offer better career opportunities to young graduates. Therefore, banks may attract higher quality personnel. Banks also benefit more easily from technological spillovers, as they recruit experts having overseas working experience.<sup>6</sup> Third, large banks' branches benefit from credit systems developed centrally. Most banks in China have set up their credit center to analyze the credit risk of their borrowers. Although a hierarchical structure also has clear disadvantages and may imply a focus on hard information as argued by Stein (2002), banks in emerging countries may still benefit from such organizational structure as it helps in reducing asymmetric information problems. Stand-alone non-bank financial institutions are more likely to suffer from asymmetric information in the Chinese financial system. The reasoning is that there is no third-party credit rating agency. The presence of high-quality personnel and a centrally developed credit rating system may help banks to better distinguish good from bad borrowers, in line with the findings of Cull and Xu (2000).

Recent balance sheet data as well as reported data on non-performing loans (NPLs) show that banks perform better than non-bank financial institutions. Tables 1 and 2 offer more information.

[Insert Tables 1 and 2 here]

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<sup>6</sup> The following statistics may illustrate the differences in educated personnel between banks and non-bank financial institutions. At the end of 2002, Industrial and Commercial Bank of China had approximately 18% of its personnel holding at least a university degree (Almanac of China's Finance and Banking (2003)). Rural credit cooperatives, in contrast, had in a typical Chinese city only around 0.1% of its personnel with a university degree (He and Li (2006)).



Table 1 displays the operating cost ratios of different types of Chinese financial institutions. The ratio of operating costs to assets is lower for banks than for non-bank financial institutions. Table 2 provides data on the non-performing loans (NPLs) in the Chinese financial sector. Although the average NPL ratio is high compared to other countries, banks have a lower NPL ratio than non-bank financial institutions. Wang and Li (2004) study rural credit cooperatives in some western provinces in China, and find that these cooperatives' NPL ratio even increased over the period 1997-2002. The numbers presented in Table 1 and 2 suggest that banks are more efficient than non-bank financial institutions.

### 3.2 Bank-firm relationships in China

Understanding the formation of bank-firm relationships may help us to gain insights into the role of finance for growth. As stock markets are not well developed in developing economies and emerging markets, firms heavily rely on debt, in particular short-term debt, for financing their investments. Hence the short-term loan portfolios of Chinese financial institutions may shed light on how different types of firms are financed. Figure 3 and Table 3 report how short-term credit has been allocated between two different types of firms, state-owned and non-state-owned enterprises in China, during our sample period.

[Insert Figure 3 and Table 3 here]

Figure 3 displays the evolution of the short-term loan portfolios of financial institutions in China. Although both state-owned enterprises and non-state-owned

enterprises received more short-term credit over the period 1994-2002, the short-term loans extended to the non-state-owned sector grew faster. Meanwhile the proportion of loans to the state-owned sector decreased from 82.5% in 1994 towards 64.4% in 2002. Data from BankScope show that the reporting banks' growth rate of short-term loans was larger than the one of the reporting non-bank financial institutions (average annual growth rate of 6.6% versus 2.3% respectively over the period 1996-2002). This evidence suggests that the growing short-term loans stem more from banks than from non-bank financial institutions.

Furthermore, two surveys provide evidence on how firms may choose between different financial institutions (see Appendix: survey a1 and a2). They show that firms apply first for credit at banks before turning to non-bank financial institutions or other sources of finance. As bank loans are known for their lower loan rate, borrowing from banks is less costly than from other institutions. Banks in China may therefore enjoy a better pool of borrowers. The two surveys indicate also that at the end of 2002, banks in China are more likely to discriminate according to borrowers' size rather than ownership. This may stem from the fact that the Chinese banks are used to extent loans on the basis of collateral.

## **IV. The growth effects of financial development in China**

### *4.1 Empirical framework and financial development indicators*

#### *4.1.1 Empirical framework*

[Insert Figure 4 here]

Figure 4 displays the channels through which financial intermediation contributes to economic growth in the model of King and Levine (1993b), on which our empirical model is based. The model identifies the following potential relationships between finance and growth. First, finance supports innovations and hence increases the productivity which is positively correlated with growth. Second, efficiency improvements in the financial sector, such as a decrease in the cost of monitoring, will increase the real rate of return and thus lead to a higher future growth rate. Third, the model also suggests a reverse channel of causation where distortions in the innovative sector lower the demand for financial services and retard financial development.

To estimate the impact of financial development on economic growth, consider a Cobb-Douglas production function at the individual level,

$$y = k^{\alpha} x, \quad (1)$$

where  $y$  equals real per capita GDP,  $k$  equals real per capita physical capital stock,  $x$  equals other determinants of per capita growth, and  $\alpha$  is a production function parameter. Taking the logarithm of (1) yields,

$$\ln y = \alpha \ln k + \ln x. \quad (2)$$

As most neo-classical R&D models predict, for example King and Levine (1993b), the growth of  $x$  comes from technological innovation. First-difference of (2) yields,

$$GYP = \alpha(GK) + PROD,$$

where  $GYP$  is the growth rate of real per capita GDP,  $GK$  is the growth rate of real per

capita capital stock and *PROD* is the growth rate of everything else. If we assume that the hours worked per worker are relatively stable in our sample range, *PROD* should provide a reasonable conglomerate indicator of technology growth. If there is any key relationship between technological growth and financial development, for instance, efficiency, the contemporaneous impact of finance on growth hence can be estimated by,

$$GPY_t = a_0 + a_1 GK_t + a_2 FI_t + \varepsilon_t \quad (3)$$

where  $FI_t$  is the financial development indicator at time  $t$ . For an empirical application of equation (3) to China's local province growth, we base our estimation on panel data from different provinces over the period 1995-2003. The advantage of using panel data is that we can estimate the corresponding relationship even in a relatively short period. The fixed effects model derived from equation (3), also controlling for time effects can be written as

$$GPY_{i,t} = \alpha_0 GDP_{i,t-1} + \alpha_1 GK_{i,t} + \alpha_2 FI_{i,t} + \alpha_3 CON_{i,t} + \sum_{i=1}^I \delta_i U_i + \sum_{t=1}^T \phi_t V_t + \varepsilon_{i,t}$$

where  $GDP_{i,t-1}$  is initial real GDP per capita and  $FI_{i,t}$  is the financial development indicator of either banks or non-bank financial institutions in province  $i$  at time  $t$ .  $U_i$  is a set of province dummy variables,  $V_t$  is the set of time dummy variables, and  $\delta_i$  and  $\phi_t$  are the vectors of coefficients. *CON* refers to the conditioning informational set. *CON* includes *FDI* and *Investment* measured by the ratio of Foreign Direct Investment to GDP, and the ratio of total investment to GDP, respectively.

In order to reveal the relationship between financial development and future economic growth, we introduce the lagged financial development indicators in our panel regression,

$$GPY_{i,t} = \alpha_0 GDP_{i,t-1} + \alpha_1 GK_{i,t} + \alpha_2 FI_{i,t-1} + \alpha_3 CON_{i,t} + \sum_{i=1}^I \delta_i U_i + \sum_{t=1}^T \phi_t V_t + \varepsilon_{i,t} \quad (4)$$

Here equation (4) can be estimated by OLS in general, assuming that the lagged  $FI$  is exogenous and there is no heteroskedasticity and serial autocorrelation in the error term. However, problems arise when those assumptions are violated. For example, heteroskedasticity or serial autocorrelation in the error term is often observed in panel analysis. This problem can be solved by introducing robust standard errors or by first differencing the data. In our analysis, heteroskedasticity is detected. We report the results of regression (4) employing robust standard errors.

Within-country panel analysis alleviates the potential endogeneity problem that most cross-country studies may face. It is easier to control for omitted variables that may drive both economic growth and financial development. Reverse causality is another concern. The significant correlation between finance and growth may not necessarily indicate that finance spurs growth, but possibly the reverse. As we argued before, examining two types of financial institutions may also mitigate this problem. In several robustness tests, we deal further with potential endogeneity.

Can we consider Chinese provinces as isolated markets? Boyreau-Debray and Wei (2004) show that during the 1951-2001 period, local investment was largely explained by local deposits, and thus within-country capital mobility was low. Therefore local

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<sup>7</sup> Here we control for the contemporaneous effects of conditioning variables, such as *FDI* and *Investment*, following the traditional finance and growth literature (see e.g. King and Levine (1993a)). As a robustness test, we also model the finance and growth relationship by controlling for the lagged value of conditioning variables, as conventional growth theory suggests. Our results remain robust.

capital markets are less influenced by cross-province capital flows. They also point out that the Chinese government is likely to reallocate capital to less developed areas. Such reallocation, however, takes capital away from the more productive regions towards the less productive ones. To the extent that this reallocation takes place through banks, this should work against finding a positive impact of banks' financial development on growth (see also Park and Seht (2001)).

#### *4.1.2. Bank and non-bank financial development indicators*

We construct three financial development indicators at the province level for banks and non-bank financial institutions, respectively.

##### *Indicators of financial development of banks*

*Bank Deposit* equals the ratio of the savings in the banking system to local GDP. *Bank Deposit* is a measure of “financial depth” of the local banking sector. A second indicator is *Bank Credit*, which equals the credit extended by banks to local enterprises over local GDP. This indicator measures the financial resources provided by banks to provincial entities. Finally, we construct a measure *Bank Concentration*, which is the Herfindahl-Hirschman Index (HHI)<sup>8</sup>, employing bank market shares in the deposit market and taking the province as the relevant market. We include this measure to proxy for the competitiveness of the banking sector. Before 1980, there were only 3 banks in China and each of them enjoyed a different segment of the deposit market. After 1984, the number of banks in the market increased and banks

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<sup>8</sup> Although HHI may not be an ideal estimate for the degree of competition, it is so far the best estimate we can have in provincial level.

began to compete for deposits under the permission of the central government.

### *Indicators of financial development of non-bank financial institutions*

In a similar fashion as for the bank indicators, we construct *Non-bank Deposit*, *Non-bank Credit* and *Non-bank Concentration* for non-bank financial institutions.

## 4.2 Data and empirical results

### *4.2.1 Data Description*

Our dataset contains annual growth rates of real per capita GDP, real per capita capital stock, FDI and Investment for 27 Chinese provinces over the period 1995-2003<sup>9</sup>. Lagged financial development indicators, lagged real per capita GDP, and lagged infrastructure indicators<sup>10</sup> are also included in our dataset from 1994 to 2002.

The financial development indicators in our study are calculated employing the statistics data reported by Almanac of China's Finance and Banking. The Almanac documents the provincial data of annual savings and loans of 5 banks only: 4 state-owned banks and the Bank of Communications, the biggest bank of the national commercial banks. At the end of 1994, those 5 banks represent approximately 96 percent of the total assets of the banking sector.

We start our analysis in 1995 as Almanac of China's Finance and Banking reports the

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<sup>9</sup> Data reasons prevent us to include three provinces (Hubei, Tibet and Hainan).

<sup>10</sup> Lagged infrastructure indicators are included in our robustness tests. Detailed illustration in section 4.3.2

provincial data of savings and loans of rural credit cooperatives and of some selected trust and investment companies, financial companies, and other non-bank financial institutions only from 1994 onwards.<sup>11</sup> Only the non-bank financial institutions that are considered to be large enough have their data included in the Almanac, whereas smaller institutions remain uncovered. This may introduce a reporting bias in that provinces with many small institutions may have an underestimated size of the non-banking sector. This reporting bias, however, should be taken care of by our province dummies in as far the reporting bias remains constant over our sample period within a province.

We construct the non-bank financial institutions' development indicators from the annual provincial data of rural credit cooperatives and other reporting non-bank financial institutions. The computation of the non-bank concentration based on the aggregate data of Almanac of China's Finance and Banking also poses some problems. While rural credit cooperatives, like other non-bank financial institutions, are isolated from each other, Almanac of China's Finance and Banking reports the province level aggregate for all rural credit cooperatives jointly in every province. However in reality rural credit cooperatives in one province are not "integrated" into one entity. Therefore, the degree of competition among non-bank financial institutions is estimated by measurement error, which is inevitable given our data limitations.

[Insert Table 4 here]

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<sup>11</sup> The data of urban credit cooperatives are also reported but not for every year. We therefore decided to exclude urban credit cooperatives from our sample.



Table 4 provides summary statistics. We present time averages for the 27 provinces. Table 4 highlights that there is substantial variation between provinces. The highest average annual real per capita GDP growth rate is 10.2 percent (Zhejiang province), while the lowest is 5.7 percent (Yunnan province). Shanghai, the richest province in China has on average annual real GDP per capita of 15,920 RMB while Yunnan, the poorest, has only 1,430 RMB. The financial development indicators for China are relatively high compared to those for other countries (see also Allen et al. (2005)). For example, the average ratios of *Bank Deposit* and *Bank Credit* across provinces are 0.843 and 0.683, while the average ratios of non-bank savings and loans to GDP across provinces are 0.141 and 0.109 only. Similarly, Beijing on average has the highest values of both *Bank Deposit* and *Bank Credit*, while Shandong province on average has the lowest levels of *Bank Deposit* and *Bank Credit*. Non-bank financial institutions exhibit the lowest development in Qinghai province, while Shanxi on average has the greatest *Non-bank Deposit* and Guangdong enjoys the greatest *Non-bank Credit*. Both *Bank Deposit* and *Bank Credit* outweigh those of non-bank financial institutions.

#### 4.2.2 Empirical results

[Insert Table 5 here]

Table 5 presents the regression results of different specifications of equation (4). The left panel (5a,b and c) displays the results including our bank financial development indicators in the regression. *Bank Deposit* and *Bank Credit* are significantly positively correlated with future economic growth. The middle panel (5d,e and f) presents the

results where non-bank financial development indicators enter the regression. None of the non-bank financial development indicators is statistically significant. The right panel (5g and h) shows the results for the regressions where both bank and non-bank financial development indicators enter the specification. The results are robust compared to the left columns (5a, b, d and e) as only the banking development indicators *Bank Deposit* and *Bank Credit* are statistically significant. *Bank Concentration* and *Non-bank Concentration* are not statistically significant, suggesting that either competition in banking markets does not affect growth or HHI as indicator for the degree of competition is not proper.

The bank and non-bank financial development indicators exhibit a significant different impact on growth even though bank loans are more focused on the state-owned sector. As a comparison, although non-bank loans are mostly extended to the non-state-owned sector, *Non-bank Credit* is largely irrelevant in explaining growth. This remarkable difference between bank and non-bank financial institutions suggests that the loans of the financial sector do not simply follow growth. On the contrary, it reveals that financial development plays an important role in promoting local Chinese economic growth, as banks compared to non-bank financial institutions have a better pool of borrowers, are technologically more advanced. Moreover, banks benefit from deregulatory financial reforms.

We now turn to the control variables as reported in Table 5. Neither *FDI* nor *Investment* has a significant impact on growth. This result may stem from the inclusion of province fixed effects. Therefore, *FDI* and *Investment* may not exhibit sufficient time-series variation to become significant. Another reason is that as FDI

mainly concentrates in certain industries, the growth effect of FDI is not necessarily observed at the macro-economic level. *Initial GDP* is significantly negative in all specifications. It captures the convergence effect of growth across the Chinese provinces. This effect has been documented in previous research dealing with China (see e.g. Boyreau-Debray (2003) and Démurger (2001)). The per capita capital stock growth is not statistically significant. This insignificance may stem from the fact that people move easier within a country (i.e. across provinces) than across countries. Hence an empirical application using local data of a country may suffer from the problem that the provincial population is quite unstable over time. In Table 6, we present the results of regressing provincial aggregate GDP growth on the growth of the aggregate capital stock and financial development indicators.

[Insert Table 6 here]

The aggregate capital stock growth is significant and positive. While *Bank Credit* keeps its positive sign and is statistically significant at the 10% level, *Bank Deposit* now becomes insignificant.

#### 4.3 Robustness tests: endogeneity

##### *4.3.1 Reverse causality*

Are our results driven by reverse causality? That is, does the expectation of future growth prospects imply greater financial development? If this were true, high economic growth provinces should also exhibit high growth rates of financial development. We investigate this issue in several ways. First, we select the 13 fastest

growing provinces in terms of economic growth. We do find, however, that only 6 of them are in the top 13 of fastest growing *Bank Deposit* or *Bank Credit* provinces. Therefore, high growth provinces are less likely to be provinces that exhibit a high growth rate of financial development.

Second, directly controlling for endogeneity is also possible when employing the dynamic system GMM estimator proposed by Arellano and Bover (1995). The dynamic panel model requires the lagged dependent variable to enter to right-hand side of the regression. For example, regression (4) can be extended to a dynamic panel regression as follows,

$$\begin{aligned}
 GPY_{i,t} = & \beta_0 GPY_{i,t-1} + \beta_1 GDP_{i,t-1} + \beta_2 GK_{i,t} + \beta_3 FI_{i,t-1} + \beta_4 CON_{i,t} \\
 & + \sum_{i=1}^I \varphi_i U_i + \sum_{t=1}^T \gamma_t V_t + \varepsilon_{i,t}
 \end{aligned} \tag{5}$$

First differences of (5) read,

$$\begin{aligned}
 GPY_{i,t} - GPY_{i,t-1} = & \beta_0 (GPY_{i,t-1} - GPY_{i,t-2}) + \beta_1 (GDP_{i,t-1} - GDP_{i,t-2}) \\
 & + \beta_2 (GK_{i,t} - GK_{i,t-1}) + \beta_3 (FI_{i,t-1} - FI_{i,t-2}) \\
 & + \beta_4 (CON_{i,t} - CON_{i,t-1}) + (\varepsilon_{i,t} - \varepsilon_{i,t-1})
 \end{aligned} \tag{6}$$

A system estimator jointly estimates the regression in levels (5) and the regression in differences (6). In order to correct for endogeneity, Arellano and Bover (1995) suggest employing lagged first differences of the explanatory variables as instruments for the equation in levels (5) and the lagged values of the explanatory variables in levels as instruments for the equation in differences (6). The crucial assumptions therefore are that the lagged differences of variables are good instruments for explaining subsequent levels and the lagged levels of variables are good instruments for

explaining subsequent first differences. Rejection of the Sargan test of over-identifying restrictions at 5% level however questions the validity of those instruments. It is also necessary to test whether the error term of regression (6),  $\varepsilon_{i,t} - \varepsilon_{i,t-1}$ , is second-order serially autocorrelated. Accepting the null hypothesis of no second-order serial autocorrelation supports the assumption of the moment condition of (6).

[Insert Table 7 here]

Table 7 reports the impact of financial development on economic growth when using the dynamic system GMM estimator. *Bank Credit* significantly spurs economic growth, both economically and statistically. For example, if Shandong, the province now receiving the least bank credit enjoyed as much bank credit as Beijing, where the most bank credit is extended, ceteris paribus, Shandong's growth rate would increase approximately 6 percent per year, which is huge. Column 7h displays the results when we include *Bank Credit* and *Non-bank Credit* in one regression. Again, only the impact of *Bank Credit* appears to be positive and significant. *Bank Deposit* turns statistically insignificant. The coefficients of *Bank Concentration* and *Non-bank Concentration* are significant but are much less robust than other results in different specifications and should therefore be taken with care. The fact that the null hypotheses of both the Sargan test and the second-order serial autocorrelation tests cannot be rejected at the 5 percent level approves the validity of the results of dynamic panel regressions.

#### 4.3.2 Omitted variables

Endogeneity may arise when a regression excludes some omitted variables. In robustness checks, we enlarge our conditioning set. Following Démurger (2001), we include two variables capturing development of the local transportation infrastructure<sup>12</sup>, *Road* and *Railway*. Démurger (2001) constructs an indicator for conglomerate development of road, railway and waterway for each province<sup>13</sup>. We introduce *Road*, which measures the lagged number of kilometers of roads per square kilometer in one province, and its square *Road*<sup>2</sup>, as well as *Railway*, which measures lagged number of kilometers of railway per square kilometer in one province, and *Railway*<sup>2</sup>. We also control for the potential congestion problem by including *Population*, which is the lagged population density per square kilometer in one province, and its interaction term with *Road* and *Railway*.

[Insert Table 8 here]

Table 8 reports the results when controlling for the development of the local infrastructure. While *Bank Deposit* and *Bank Credit* remain significant as reported in table 5 and robust, the indicators of transportation development show unclear correlation with growth. However, *Bank Concentration* and *Non-bank Deposit* now become significant in one specification (8c and 8g, respectively). In sum, the results in Table 8 relieve the concern of an omitted variable problem as adding more

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<sup>12</sup> One may be concerned that the local government may have impact on banks' lending policy. However, since the financial reforms in the mid-1990s, the local government can hardly intervene with the local banks.

<sup>13</sup> We exclude waterway because of the availability. However, we assume that development of waterway is highly subject to natural water resources and relatively stable during our sample period and hence can be captured by provincial dummy.

conditioning variables tends to increase the coefficients of our development variables.

In unreported regressions, we also control for the effect of human capital by introducing schooling into our regression analysis. However, due to data availability, we only have schooling data for 5 years. Our results remain robust after controlling for schooling in small sample.

## **V. Concluding Remarks**

Is the finance-growth nexus at work in an economy exhibiting a high growth rate? In this paper we address this question by providing empirical evidence on the impact of financial development on the growth of Chinese provinces over the period 1995-2003. Exploiting within variation on 27 provinces, we are able to more adequately control for institutional, legal and cultural factors that may commonly affect the Chinese financial system. We find that financial development significantly positively impacts local economic growth recently.

But which financial institutions' development contributes to the Chinese finance-growth nexus? We look at the impact of two types – “banks” and “non-bank financial institutions”. The reasoning to distinguish those two types is that banks have a wider geographical scope, are larger, attract higher skilled personnel, and are often more hierarchically organized than non-bank financial institutions. Bank branches are also well integrated and may benefit from more advanced technologies and centrally-developed credit systems.

We find that provinces with a greater financially developed banking sector enjoy a statistically and economically significantly higher local economic growth<sup>14</sup>. Even though non-bank financial institutions focus more on the non-state-owned sector, we still find that provinces with a more developed non-bank financial sector show no different growth rate than provinces with a little developed non-bank financial sector. We attribute this finding to the fact that banks compared to non-bank financial institutions attract a better pool of borrowers, are technologically more advanced, and increased their relative exposure towards the financing of private firms. The analysis of a recent time period and the different findings on banking development and non-bank financial institutions' development show that the finance-growth nexus also applies to the growth rate of Chinese provinces.

While we find that banking development spurs economic growth, it remains an open question on whether banking development, given their state-owned nature and the strong macroeconomic management from the Chinese government, leads to a qualitative, persistent economic growth. For example, the efficiency of the Chinese state-owned banks is low according to international standards. To generate more insights, further research may focus on the different efficiency between state-owned banks and non-state-owned banks in China and their contribution to the growth of different types of enterprises. We leave these questions for further research.

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<sup>14</sup> As the two surveys in Appendix document, the Chinese banks seem to be less prone to grant loans when firms are in the starting-up stage but become the most important loan providers once the firms survive and become larger. Hence the Chinese banks may discriminate the two different channels modeled by King and Levine (1993b), as illustrated in Figure 4. Specifically, banks are more likely to drop the channel of financing potential entrepreneurs but adopt the channel of evaluating and financing intermediate goods monopoly.



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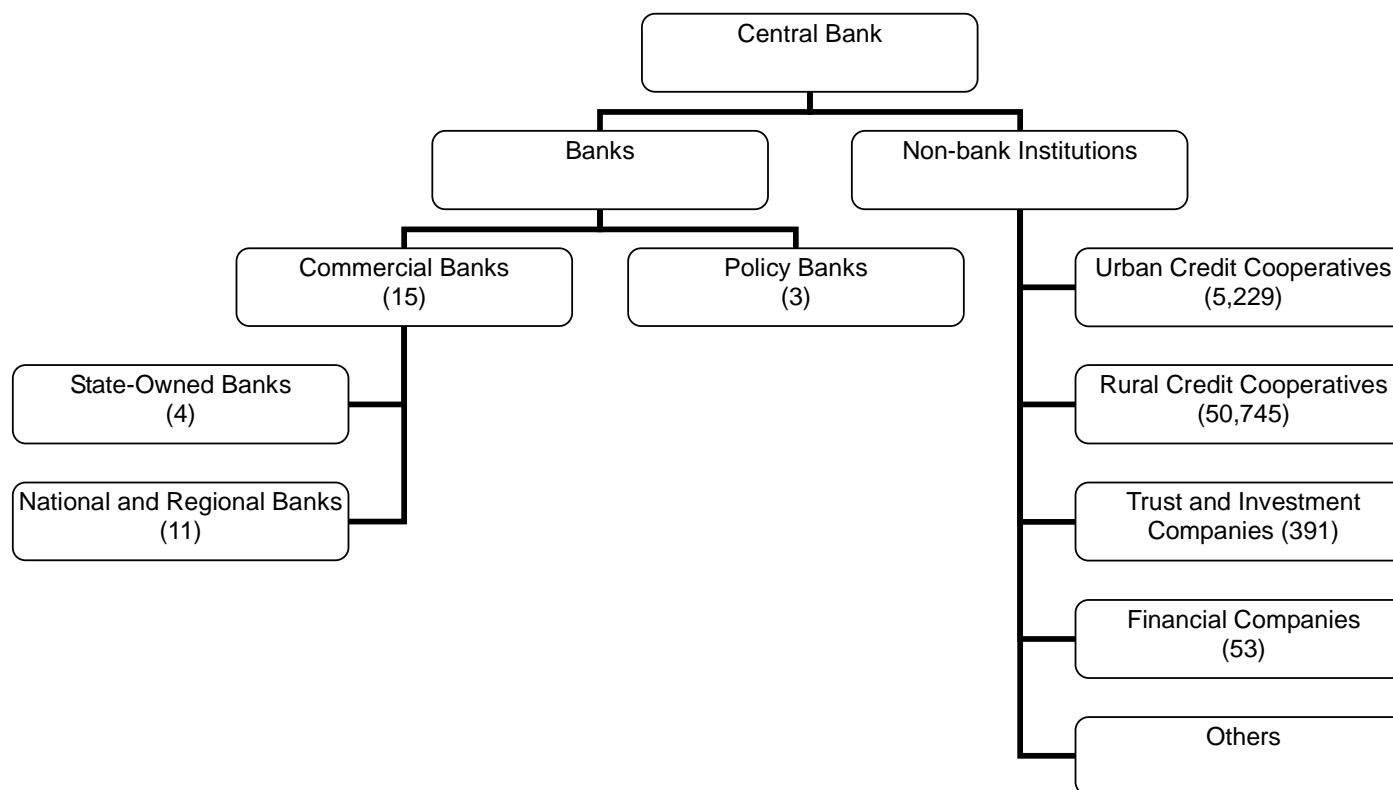
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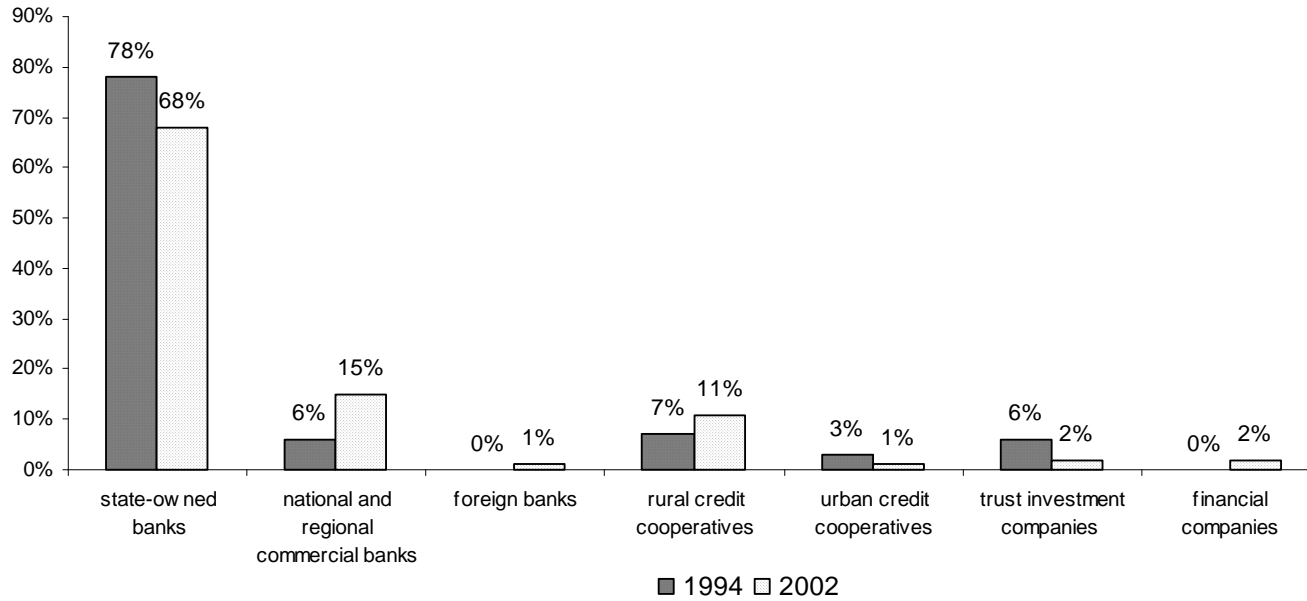
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**Figure 1: Financial institutions in China at the end of 1994**



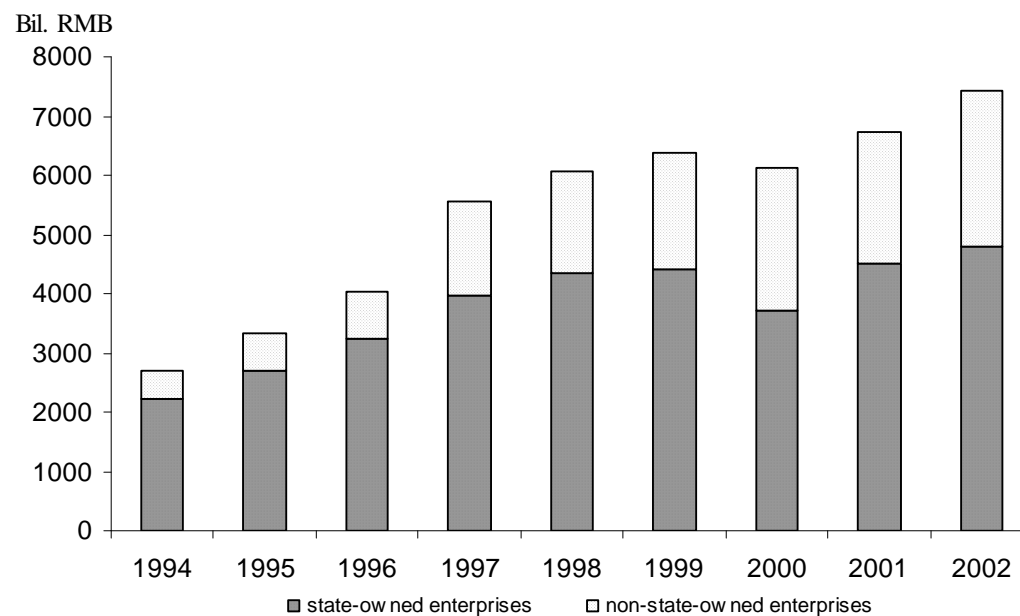
Source: Almanac of China's Finance and Banking (1995)

**Figure 2: Total assets of financial institutions at the end of 1994 and 2002**



Source: Almanac of China's Finance and Banking (1995, 2003)

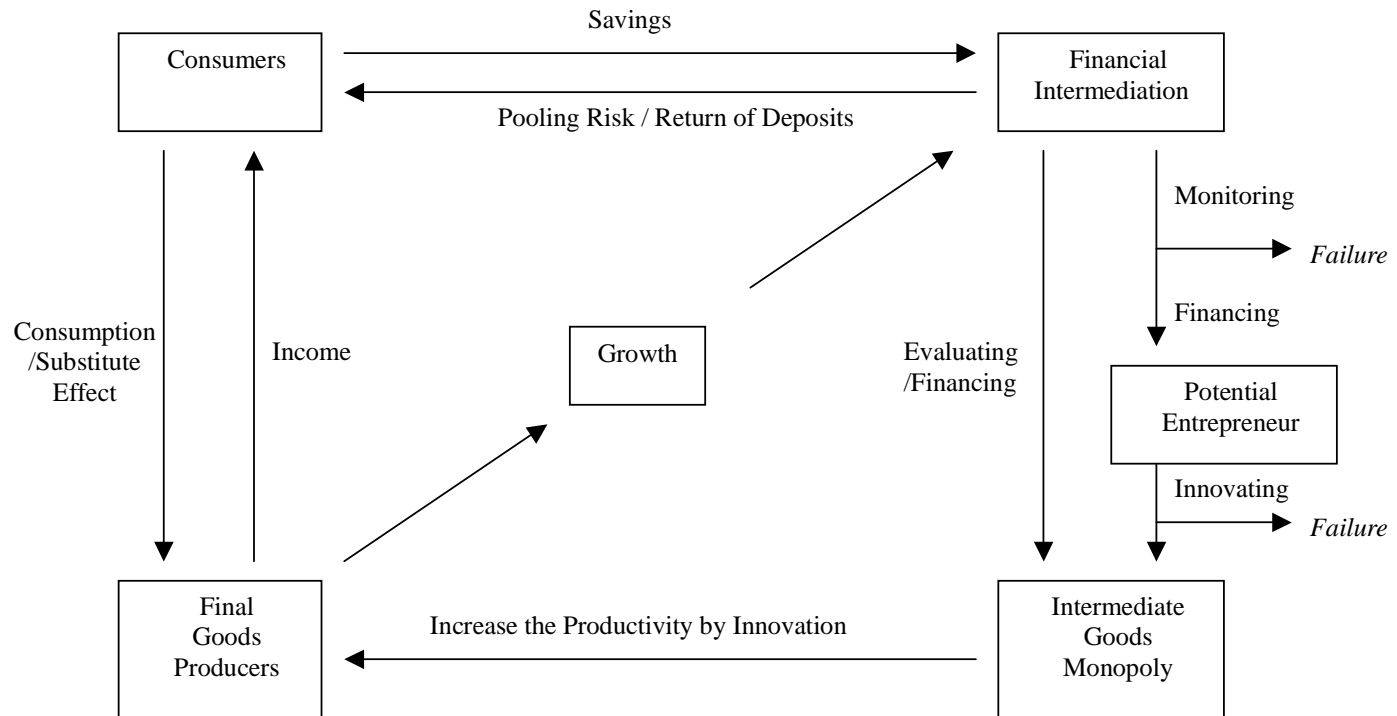
**Figure 3: Short-term loan portfolio of the Chinese financial institutions: 1994-2002**



Source: China Credit Yearbook (Volume I)



Figure 4: Channels: finance and growth model of King and Levine (1993b)



**Table 1: Operating costs of different Chinese financial institutions**

Institutions		Operating Costs Ratio <sup>c</sup>	Sample Period	Average Ratio	
Banks	<i>Industrial and commercial Bank of China</i> <sup>a</sup>	0.010	1996-2003	0.011	
	<i>Bank of China</i> <sup>a</sup>	0.007	1996-2003		
	<i>Bank of Communications</i> <sup>a</sup>	0.015	1996-2003		
Non-bank Financial Institutions	<i>Rural Credit Cooperatives</i> <sup>b</sup>	0.019	1998-1999	0.016	0.030
	<i>Heilongjiang International Trust &amp; Investment Corp.</i> <sup>a</sup>	0.030	1997-1998		
	<i>Jiangsu International Trust &amp; Investment Corp.</i> <sup>a</sup>	0.007	1996-1997		
	<i>Shanghai AJ Trust &amp; Investment Co, Ltd</i> <sup>a</sup>	0.014	1996-2002		
	<i>Shanghai Associated Finance Co.</i> <sup>a</sup>	0.008	1996-1997		
	<i>Shanghai International Trust &amp; Investment Corp.</i> <sup>a</sup>	0.022	2000-2002		
	<i>Shenzhen International Trust &amp; Investment Corp.</i> <sup>a</sup>	0.015	1996-1999		
	<i>Zhejiang International Trust &amp; Investment Corp.</i> <sup>a</sup>	0.128	1996-1999		

<sup>a</sup>: Source: Bankscope

<sup>b</sup>: Source: Xie (2001)

<sup>c</sup>: Operating costs ratio= operating costs/total assets

**Table 2: Financial risk comparison between banks and non-bank institutions**

Institutions		Financial Risk			
Banks		Non-performing Loan Ratios <sup>a</sup>			
	Name	2000	2001	2002	2003
	<i>ICBC</i>	0.334	0.298	0.257	0.213
	<i>BOC</i>	0.272	0.275	0.225	0.181
	<i>CCB</i>	0.203	0.192	0.152	0.119
	<i>ABC</i>	0.468	0.421	0.381	0.321
Non-bank Financial institutions	<i>Rural Credit Cooperatives</i>	Average nonperforming loan ratio was around 0.5 by the end of 2003. In some underdeveloped provinces the ratio even reached 0.9 <sup>b</sup> .			
	<i>Trust and Investment Companies</i>	Nonperforming Loan ratio is unreported but expected to be high. The bankruptcy of Guangdong International Trust and Investment Company (GITIC) in 1998 is an example. The Chinese government often decides to close the financially bankrupt Trust and Investment Companies. The total number of Trust and Investment companies shrank from 339 (by 1990) to 244 (by 1996) <sup>c</sup> .			

<sup>a</sup> : Source: Sun (2004)

<sup>b</sup> : Source : Zhang (2003)

<sup>c</sup> : Source: Xie (1998)

**Table 3: Composition of Short-term loan portfolio of the Chinese financial institutions: 1994-2002**

		1994	1995	1996	1997	1998	1999	2000	2001	2002	Average
State-owned enterprises	Proportion	0.824	0.808	0.807	0.718	0.720	0.690	0.603	0.669	0.644	
	Growth rate		0.176	0.169	0.185	0.088	0.010	-0.192	0.178	0.058	0.084
Non-state-owned enterprises	Proportion	0.176	0.192	0.193	0.282	0.280	0.310	0.397	0.331	0.356	
	Growth rate		0.263	0.174	0.503	0.079	0.142	0.188	-0.091	0.156	0.177

Source: China Credit Yearbook (Volume I)

**Table 4: Summary statistics of growth and financial development indicators**

<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<b>Real GDP per capita growth rate</b>	27	.077	.013	.057	.102
<b>Initial GDP</b> (initial real GDP per capita) <sup>a b</sup>	27	.471	.313	.143	1.592
<b>Per Capita Capital Stock Growth</b> (real capital stock per capita growth rate)	27	.114	.020	.072	.145
<b>Real aggregate GDP growth rate</b>	27	.088	.013	.067	.111
<b>Initial Aggregate GDP</b> (initial real aggregate GDP) <sup>a c</sup>	27	1854.933	1397.122	141.7747	5353.567
<b>Aggregate Capital Stock Growth</b> (real capital stock aggregate growth rate)	27	.121	.019	.080	.158
<b>Bank Deposit</b> (bank savings to GDP) <sup>a</sup>	27	.843	.467	.477	2.936
<b>Bank Credit</b> (bank loans to GDP) <sup>a</sup>	27	.683	.224	.402	1.223
<b>Bank Concentration</b> (HHI based on bank deposit market shares) <sup>a</sup>	27	.265	.029	.222	.353
<b>Non-bank Deposit</b> (non-bank savings to GDP) <sup>a</sup>	27	.141	.053	.049	.268
<b>Non-bank Credit</b> (non-bank loans to GDP) <sup>a</sup>	27	.109	.041	.038	.224
<b>Non-bank Concentration</b> (HHI based on non-bank deposit market shares) <sup>a</sup>	27	.726	.094	.549	.850
<b>Investment</b> (investment to GDP) <sup>a</sup>	27	.455	.087	.337	.683
<b>FDI</b> (FDI to GDP) <sup>a</sup>	27	.031	.033	.002	.110
<b>Road</b> (number of kilometers of roads per square kilometer)	27	.292	.188	.027	.761
<b>Railway</b> (number of kilometers of railway per square kilometer)	27	.027	.052	.002	.270
<b>Population</b> (population density) <sup>d</sup>	27	3.678	4.515	.072	23.118

<sup>a</sup>: Logarithm in regression

<sup>b</sup>: Number in *wan Yuan* (10,000 RMB)

<sup>c</sup>: Number in *yi Yuan* (0.1 Billion RMB)

<sup>d</sup>: Number in *bai ren* (100 people)

Source: Almanac of China's Finance and Banking (1995-2003); China Statistics Yearbook (1996-2004)

**Table 5: Finance and real per capita GDP growth in Chinese provinces: 1995-2003**  
**Fixed effects regressions, within estimator**

Dependent variable: *Real Per Capita GDP Growth*

regressors	5a	5b	5c	5d	5e	5f	5g	5h
<i>Initial GDP</i>	<b>-.334***</b> (.000)	<b>-.331***</b> (.000)	<b>-.356***</b> (.000)	<b>-.342***</b> (.000)	<b>-.343***</b> (.000)	<b>-.357***</b> (.000)	<b>-.334***</b> (.000)	<b>-.330***</b> (.000)
<i>Per Capita Capital Stock Growth</i>	.013 (.840)	.044 (.510)	.005 (.941)	.010 (.882)	.014 (.827)	.011 (.863)	.007 (.912)	.039 (.562)
<i>Bank Deposit</i>	<b>.070**</b> (.013)						<b>.062**</b> (.024)	
<i>Bank Credit</i>		<b>.083***</b> (.007)						<b>.084***</b> (.006)
<i>Bank Concentration</i>			.074 (.249)					
<i>Non-bank Deposit</i>				.030 (.121)			.022 (.157)	
<i>Non-bank Credit</i>					.006 (.667)			.007 (.521)
<i>Non-bank Concentration</i>						-.024 (.212)		
<i>Investment</i>	.044 (.183)	.046 (.156)	.040 (.302)	.025 (.454)	.031 (.405)	.034 (.353)	.036 (.237)	.043 (.168)
<i>FDI</i>	-.001 (.887)	-.001 (.992)	-.000 (.992)	-.000 (.932)	-.000 (.987)	.001 (.848)	-.001 (.811)	-.001 (.854)
Obs	242	242	242	242	242	242	242	242
R-squared	.512	.522	.492	.500	.487	.498	.520	.524

\* indicates significance at 10% level; \*\* indicates significance at 5% level; \*\*\* indicates significance at 1% level; *p*-value is reported between brackets

**Table 6: Finance and aggregate real GDP growth in Chinese province ( 1995-2003):  
aggregate capital stock growth  
Fixed effects regressions, within estimator**

Dependent variable: *Aggregate Real GDP Growth*

regressors	6a	6b	6c	6d	6e	6f	6g	6h
<i>Initial</i>								
<i>Aggregate GDP</i>	<b>-.253***</b> (.000)	<b>-.257***</b> (.000)	<b>-.263***</b> (.000)	<b>-.264***</b> (.000)	<b>-.265***</b> (.000)	<b>-.263***</b> (.000)	<b>-.256***</b> (.000)	<b>-.259***</b> (.000)
<i>Aggregate Capital Stock Growth</i>	<b>.346***</b> (.007)	<b>.379**</b> (.011)	<b>.384***</b> (.003)	<b>.386***</b> (.003)	<b>.388***</b> (.002)	<b>.376***</b> (.003)	<b>.356***</b> (.006)	<b>.384***</b> (.008)
<i>Bank Deposit</i>	.027 (.375)						.028 (.372)	
<i>Bank Credit</i>		<b>.052*</b> (.093)						<b>.052*</b> (.096)
<i>Bank Concentration</i>			-.014 (.731)					
<i>Non-bank Deposit</i>				-.002 (.853)			-.004 (.724)	
<i>Non-bank Credit</i>					-.003 (.647)			-.002 (.750)
<i>Non-bank Concentration</i>						-.002 (.816)		
<i>Investment</i>	-.043 (.224)	-.039 (.302)	-.052 (.127)	-.051 (.134)	-.050 (.163)	-.051 (.137)	-.043 (.227)	-.038 (.327)
<i>FDI</i>	.000 (.998)	-.000 (.954)	.000 (.960)	.000 (.960)	.000 (.942)	.000 (.949)	.000 (.985)	-.000 (.967)
Obs	242	242	242	242	242	242	242	242
R-squared	.544	.559	.539	.539	.540	.539	.544	.560

\* indicates significance at 10% level; \*\* indicates significance at 5% level; \*\*\* indicates significance

at 1% level; *p*-value is reported between brackets

**Table 7: Finance and real per capita GDP growth in Chinese provinces: 1995-2003**  
**Dynamic panel regressions, system GMM estimator**

Dependent variable: *Real Per Capita GDP Growth*

Regressors	7a	7b	7c	7d	7e	7f	7g	7h
<i>Initial GDP</i>	<b>-.630***</b> (.000)	<b>-.581***</b> (.000)	<b>-.677***</b> (.000)	<b>-.589***</b> (.001)	<b>-.690***</b> (.000)	<b>-.538***</b> (.000)	<b>-.481***</b> (.000)	<b>-.562***</b> (.000)
<i>Per Capita Capital Stock Growth</i>	.051 (.677)	-.000 (1.000)	.009 (.941)	.065 (.642)	.003 (.978)	-.034 (.726)	.006 (.933)	.002 (.976)
<i>Bank Deposit</i>	.079 (.239)						.043 (.302)	
<i>Bank Credit</i>		<b>.123**</b> (.019)						<b>.108**</b> (.010)
<i>Bank Concentration</i>			<b>.211*</b> (.060)					
<i>Non-bank Deposit</i>				-.001 (.982)			.026 (.310)	
<i>Non-bank Credit</i>					.010 (.588)			.010 (.473)
<i>Non-bank Concentration</i>						<b>-.037*</b> (.067)		
<i>Investment</i>	-.072 (.344)	.013 (.850)	-.064 (.313)	-.064 (.442)	-.071 (.392)	-.008 (.871)	-.030 (.518)	.005 (.922)
<i>FDI</i>	.008 (.584)	.000 (.994)	.002 (.915)	.006 (.704)	-.000 (.990)	-.002 (.839)	.006 (.535)	.001 (.944)
Obs	215	215	215	215	215	215	215	215
Sargan Test	1.000	1.000	1.000	1.000	1.000	.738	.908	.999
AR(2) Test	.744	.585	.587	.955	.827	.504	.846	.602

\* indicates significance at 10% level; \*\* indicates significance at 5% level; \*\*\* indicates significance

at 1% level; *p*-value is reported between brackets



**Table 8: Finance and real per capita GDP growth in Chinese provinces: 1995-2003**  
**Fixed effects regressions, within estimator**

Dependent variable: *Real Per Capita GDP Growth*

regressors	8a	8b	8c	8d	8e	8f	8g	8h
<i>Initial GDP</i>	<b>-.334***</b> (.000)	<b>-.343***</b> (.000)	<b>-.372***</b> (.000)	<b>-.347***</b> (.000)	<b>-.361***</b> (.000)	<b>-.367***</b> (.000)	<b>-.318**</b> (.000)	<b>-.336***</b> (.000)
<i>Per Capita Capital Stock Growth</i>	.040 (.578)	.059 (.418)	.024 (.750)	.031 (.658)	.027 (.724)	.028 (.704)	.042 (.519)	.056 (.417)
<i>Bank Deposit</i>	<b>.078**</b> (.019)						<b>.078**</b> (.011)	
<i>Bank Credit</i>		<b>.090***</b> (.005)						<b>.094***</b> (.004)
<i>Bank Concentration</i>			<b>.116*</b> (.076)					
<i>Non-bank Deposit</i>				.034 (.112)			<b>.033*</b> (.069)	
<i>Non-bank Credit</i>					.005 (.686)			.010 (.376)
<i>Non-bank Concentration</i>						-.023 (.238)		
<i>Road</i>	-.209 (.367)	-.216 (.342)	-.305 (.209)	-.290 (.257)	-.302 (.238)	-.272 (.283)	-.198 (.393)	-.214* (.347)
<i>Road<sup>2</sup></i>	.274 (.243)	.234 (.348)	.397 (.143)	.349 (.228)	.368 (.189)	.302 (.275)	.253 (.300)	.220 (.376)
<i>Road x Population</i>	-.013 (.194)	-.009 (.388)	<b>-.020*</b> (.092)	-.016 (.220)	-.017 (.184)	-.014 (.272)	-.013 (.251)	-.008 (.453)

**Table 8 (continued): Finance and real per capita GDP growth in Chinese provinces:  
1995-2003**

<i>Railway</i>	-0.797 (.279)	-0.968 (.198)	-0.812 (.309)	-0.571 (.460)	-0.666 (.363)	-0.458 (.551)	-0.697 (.369)	-0.971 (.197)
<i>Railway</i> <sup>2</sup>	1.204 (.106)	1.141 (.103)	<b>1.978**</b> <b>(.035)</b>	.818 (.418)	1.266 (.115)	.886 (.380)	.694 (.486)	.991 (.194)
<i>Railway</i> x <i>Population</i>	.018 (.770)	.038 (.555)	-.018 (.770)	.014 (.842)	.004 (.947)	-.006 (.942)	.030 (.661)	.044 (.504)
<i>Population</i>	.014 (.299)	.005 (.679)	.019 (.202)	.015 (.297)	.011 (.453)	.012 (.386)	.018 (.169)	.006 (.655)
<i>Investment</i>	.046 (.178)	.048 (.153)	.037 (.303)	.022 (.514)	.025 (.482)	.028 (.432)	.041 (.197)	.044 (.171)
<i>FDI</i>	.000 (.931)	.001 (.856)	.002 (.749)	.001 (.821)	.002 (.719)	.003 (.601)	-.001 (.896)	.000 (.980)
Obs	242	242	242	242	242	242	242	242
R-squared	.535	.548	.521	.528	.511	.519	.548	.551

\* indicates significance at 10% level ;\*\* indicates significance at 5% level ;\*\*\* indicates significance

at 1% level . *P*-value is reported between brackets

## Appendix

**Table a1: The introduction to the main Chinese financial institutions**

Name	Functions
<i>People's Bank of China</i>	The People's Bank of China (PBOC) is China's central bank, which formulates and implements monetary policy.
<i>China Banking Regulatory Commission</i>	China Banking Regulatory Commission (CBRC) was officially launched on April 28, 2003, to take over the supervisory role of the PBOC. It regulates and supervises banks, asset management companies, trust and investment companies as well as other deposit-taking financial institutions.
<i>Stated-owned commercial banks</i>	The four Stated-owned banks were established in the mid-1980s and transformed into commercial banks in 1994. The "big four" include: the Bank of China (BOC), the China Construction Bank (CCB), the Agricultural Bank of China (ABC), and the Industrial and Commercial Bank of China (ICBC).
<i>Policy banks</i>	The three policy banks were established in 1994 to take over the government-directed spending functions of the four state-owned commercial banks. The three policy banks are: the Agricultural Development Bank of China (ADBC), China Development Bank (CDB), and the Export-Import Bank of China (Chexim)
<i>National and regional commercial banks</i>	National and regional commercial banks were mostly established by key state entities. China Minsheng Banking Corp. is the first publicly traded private bank. Bank of Communications is the biggest bank among all those banks. Although those banks are much smaller than the four state-owned banks, they have a much lower ratio of non-performing loans (NPLs).
<i>Credit cooperatives*</i>	There are two types of credit cooperatives: rural credit cooperatives (RCCs) and urban credit cooperatives (UCCs). Both of them are local financial institutions and aimed to extend loans for local economic activities. They are functionally close to commercial banks.
<i>Trust and investment companies*</i>	Trust and investment companies (TICs) are engaged in various forms of merchant and investment banking activities. They take deposits from inter-bank markets. Except for few national TICs, most of them were established by government agencies and provincial authorities and are localized.
<i>Financial companies*</i>	Financial companies belong to state entities. They are only allowed to take deposits from and grant loans to entities.

\* They are classified as non-bank financial institutions, according to Almanac of China's Finance and Banking.

## Surveys: The bank loans to the non-state-owned sector

### *Survey a1*

A survey carried out by People's Bank of China in October, 2002, shows that 47.7% of the total bank loans had been extended to the non-state-owned sector during the first 9 months in 2002. This survey covers 184 cities from 30 provinces of China, 10,804 non-state-owned enterprises and 2,633 banks (branches) and non-bank financial institutions.

#### Satisfaction ratios reported by banks (2002.1-2002.9)

Institutions	Loans required (Billion RMB)	Satisfaction ratio
<i>State-owned banks</i>	1138.9	84.1%
<i>National and regional banks</i>	596.24	80.9%
<i>City commercial banks*</i>	149.68	84.5%
<i>Foreign banks</i>	122.66	75.4%
<i>Non-bank financial institutions</i>	208.95	85.5%

\*transformed from urban credit cooperatives

The satisfaction ratio varies among different types of applicants. For example, the satisfaction ratio of large non-state-owned enterprises is 85% while that of small and medium non-state-owned enterprises is only 69.5%. Moreover, ownership also matters for the satisfaction ratio. For instance, Hong Kong, Macao and Taiwan funded enterprises have a satisfaction ratio of 88.6%, which is the highest among all kinds of enterprises. Private enterprises, on the contrary, have the lowest satisfaction ratio of 73.8%.

**Ranked financing channels by enterprises (2002.1-2002.9)**

Bank Loans	Self-raised Funds	Client-raised funds	Private-lending loans	Bonds	FDI	Stock markets
35.7%	24.7%	17.4%	10.7%	8.2%	2.8%	0.6%

Source: Almanac of China's Finance and Banking (2003)

*Survey a2*

Another survey carried out by People's Bank of China in 2002 shows that after the deregulation of interest rate discrimination, bank loans become the most important sources for SMEs in Weizhou city, whose economic growth is typically driven by the private sector.

This survey covers 190 SMEs and 13 banks and credit cooperatives in Wenzhou. The survey shows that 61% of the debts of the SMEs were bank loans at 2002.

78% of the SMEs in the survey answered they would first go for bank loans (or credit cooperative loans) when needing external financing. The satisfaction ratio still varies between small and medium sized enterprises. For example, the satisfaction ratio of loans reported by medium sized enterprises is 72.7% while that reported by small sized enterprises is only 60.5%.

Source: Almanac of China's Finance and Banking (2003)