

Does Financial Development Necessarily Lead to Economic Growth? Evidence from Recent China

Shiyong Zhao^{1*}, Qianhe Gong

(School of Business, Macau University of Science and Technology, Macau, China)

E-mail: syzhao@must.edu.mo

Received: 19 November 2020; Revised: 24 November 2020;

Accepted 24 December 2020; Publication: 10 February 2021

Abstract: Using data from 286 Chinese cities over the period 2007-2014, this paper investigates the impact of financial development on economic growth at the city level in China. Our results from traditional cross-sectional regressions suggest the financial development negatively influenced China's city-level growth, while results from GMM estimators for dynamic panel data suggest that indicators of financial development have no significant effect on economic growth over this period. This result is consistent with many existing arguments that a state-ruled banking sector, such as that in China, hinders economic growth because of the distorting nature of the government. To examine the sensitivity of our results, different sets of control variables sets are experimented with. Our results are shown to be robust. Our finding shows that to let the financial sector play a more efficient and effective role in promoting real economic growth, China has to further reform its financial sectors.

Key words: China, economic growth, financial development, GMM estimators

JEL codes: N2, O1, O43

1. Introduction

More than 100 year ago Joseph Schumpeter argued in his seminal work *The Theory of Economic Development* (1911) that the services provided by financial intermediaries are essential for technological innovation and economic development. They mobilize savings, evaluate projects, manage risk, monitor managers, and facilitate transactions. Earlier empirical work by Goldsmith (1969) and McKinnon (1973) illustrates the close ties between financial and economic development for a few countries. Numerous influential economists, however, believe that finance is a relatively unimportant factor in economic development. Notably, Robinson (1952) argues that financial development simply follows economic development. Lucas (1988) terms the relationship between financial and economic development "over-stressed." In this paper we study whether higher levels of financial development are positively associated with economic growth using data on 286 Chinese cities from 2007 through 2014.

To examine whether Schumpeter (or Lucas) was right, we must define "financial development" empirically. We construct four indicators of financial development that are designed to measure the services provided by financial

intermediaries. First, we compute the traditional measure of financial depth, which equals the overall size of the formal financial intermediary system, i.e. the ratio of loans to GDP. Second, we measure the ability of financial intermediaries to mobilize capital, i.e., the ratio of deposits to GDP. Third, the ratio of households savings to GDP to measure the ability of financial intermediaries to attract household savings. Fourth, share of fixed asset investment financed by bank loans relative to state budgetary appropriation. It is believed that bank loans have more role than government appropriation in disciplining the recipients. Although each financial indicator has shortcomings (sometimes due to data limitations), using this array of indicators provides a richer picture of financial development than if we used only a single measure.

China has been experiencing rapid economic growth and remarkable expansion of financial sector since 1978, when China started its economic transformation. China's real GDP has been growing at an annual average rate of 9.65 percent over 1978-2015 (China Statistical Yearbook, 2016). Over the same period, the total loans outstanding in its financial institutions divided by GDP has increased from 51 percent to 147 percent (China Compendium of Statistics 1949-2008; China Statistical Yearbook 2016). As the largest emerging market and the second largest economy with rapid growth and dramatic transformation, China presents us with an intriguing case for study to test Schumpeter's view posed in 1911. Does finance play an important role in China's recent growth? This paper investigates this question by using a rich and most updated set of city-level data.

Many cross-country studies have shown that finance has an important impact on growth (to be reviewed in next section). China has been viewed as a counterexample to the common insight of the finance-growth literature, because on the one hand China has achieved fast economic growth for more than three decades, and on the other, China's financial sector has been controlled by the state very rigidly. For example, private investors are still not allowed to open a bank in China even today. Boyreau-Debray (2003) finds that financial intermediation has a negative impact on local economic growth in China over 1990-1999 because the banking sector was mainly supporting the loss-making state-owned enterprises in the 1990s. Using provincial level data over 1986-2002, Hasan *et al.* (2009) also finds that the financial sector has a negative impact on China's economic growth. Chen (2006), however, finds that China's financial development has a positive effect on economic growth by using provincial-level data over 1985-1999. Cheng and Degryse (2007) shows that the development of banking services contributes positively to economic growth over 1995-2003.

Our findings in this paper suggest that financial development does not show a positive effect on economic growth over 2008-2013. This result is consistent with some existing literature conclusions, which states that state-controlled

banking sector impedes economic growth because banks tend to lend money mostly to inefficient large SOEs due to various reasons (to be explained later), although millions of small and medium-sized private firms have an urgent need for money. While deposits did climb as a share of GDP, there was little expansion of credit to the private sector, as many state banks remained in existence, and their habits of directing credit died hard (World Bank, 2005). Our finding contrasts sharply with the significant, robust relationship between the level of financial development and both the current and future rate of economic growth (e.g., King and Levine, 1993).

The rest of the paper is organized as follows. Section 2 is a literature review. Section 3 presents a simple framework on the role of financial intermediaries. Section 4 offers a brief historical description of China's financial development. Section 5 reports the data, variables, and summary statistics. Section 6 introduces the methodology and results based on cross-sectional data. Section 7 presents the regression results based on first-difference and system GMM estimators. Section 8 concludes the paper.

2. Literature review

It is undoubted that financial market is essential to a country's economic growth and prosperity. Financial intermediaries are indispensable for the smooth functioning of financial markets. It may be in this sense that Miller (1988) said, "that financial markets contribute to economic growth is a proposition almost too obvious for serious discussion." Other influential economists, however, believe that finance is a relatively unimportant factor in economic development. Lucas (1988), for example, as mentioned above, said "the importance of financial matters is very badly over-stressed in popular and even much professional discussion." Apparently, there is no consensus among economists on the role of finance in promotion growth at least theoretically. It seems that this dispute should be solved empirically.

Early cross-country studies suggest a positive correlation between financial development and economic growth. King and Levine (1993) present cross-country evidence consistent with the view that the financial system can promote economic growth, using data on 80 countries over 1960-1989 period. Compared with earlier work by Goldsmith (1969) who arrive at the same conclusion, King and Levine (1993) add more control variables affecting growth to the regression model, such as trade, education and political stability. Levine and Zervos (1998) show that stock market liquidity and banking development can predict economic growth. We should remind ourselves that correlation does not prove causation. It is possible that a more developed financial sector is correlated with various other growth-enhancing factors, and it is other factors that promote growth. Technically, it is not easy to disentangle the effect of financial development from other factors. As Robinson (1952) contends, financial development simply follows economic growth.

Using a country's legal origin as a valid instrumental variable, Levine (1999) finds that financial development has a significant positive effect on economic growth. Levine *et al.* (2000) confirms this conclusion by using the generalized moments of method (GMM) for dynamic panel data on a panel of 71 countries over 1960-1995. From the perspective of econometric techniques, dynamic panel models allow the use of instrumental variables for all the explanatory variables so that more precise estimates could be obtained than cross-sectional data. This is why more recent studies on the relationship between finance and growth use dynamic panel models. Rioja and Valey (2004) explores the impact of financial development on sources of growth in different groups of countries with a panel dataset covering 74 countries. Beck *et al.* (2000) uses GMM estimators for dynamic panel data and find that financial development has a significant and positive effect on total factor productivity (TFP) growth. Moreover, Rousseau and Wachtel (2002) and Beck and Levine (2004) find that some exogenous components of bank and stock market development have a large impact on economic growth. This result is also echoed by studies with time-series data, such as Xu (2000), Christopoulos and Tsionas (2004), and Bekaert *et al.* (2005).

Apart from cross-country studies, there are also many researchers who focus on specific countries. This is advantageous because country-specific factors could be avoided in regression analysis. Jayaratne and Strahan (1996) provides evidence that financial markets can directly affect economic growth by studying the relaxation of bank branch restrictions in the United States. They argue that the observed changes in growth are the result of changes in the banking system, and improvements in the quality of bank lending appear to be responsible for faster growth. Dehejia and Lleras-Muney (2003) examined the effect of state-level banking regulation on financial development and economic growth in the U.S. from 1900 to 1940. In particular, they document that not all forms of financial development have a positive effect on economic growth, for example, indiscriminate lending can negatively impact economic growth. Japan's Meiji Restoration started from 1868, which successfully transformed Japan into an industrial power. Rousseau (1999) studies this period from 1880 to 1913 and offers evidence that financial factors played a key role in leading to Japan's rise. Examining Italy's experience, Guiso *et al.* (2004) suggest that local financial development is an important determinant of the economic success of an area even in an environment where there are no frictions to capital movements.

Besides the above studies based on country-level data, there are also a lot of studies using more micro-level data, such as industry- or firm-level data. Rajan and Zingales (1988) find that financial development facilitates economic growth, and the rationale is that financial development reduces the costs of external finance to firms. They find that industrial sectors that are relatively more in need of external finance develop disproportionately faster in countries

with more-developed financial markets. Kumar *et al.* (1999) show that size of firms in industries dependent on external finance is larger in countries with better financial markets, which means that the growing of firms relies on the support of financial markets. Wurgler (2000) shows that financial markets “appear to improve the allocation of capital,” thus conducive to economic growth. Cetorelli and Gambera (2001) investigate the role played by the market structure of the banking sector on the dynamics of capital accumulation. This paper provides evidence that bank concentration promotes the growth of those industrial sectors that are more in need of external finance by facilitating credit access to younger firms. Claessens and Laeven (2003) finds evidence consistent with better property rights leading to higher growth through improved asset allocation. Quantitatively, the growth effect is as large as that of improved access to financing due to greater financial development. Using a unique firm-level survey database covering 54 countries, Beck *et al.* (2008) investigate the effect of financial, legal, and corruption problems on firms’ growth rates. They show that financial and institutional development weakens the constraining effects of financial, legal and corruption obstacles.

It seems that an overwhelming weight of the evidence from this body of research is that Schumpeter was right, i.e., financial development is good for economic growth, though, a consensus has yet to emerge. Guariglia and Poncet (2008) use data for 30 Chinese provinces over the period 1989-2003 and find that traditionally used indicators of financial development is negatively associated with growth its sources. According to them, this is because of financial distortions in China, which represent an impediment to growth. Hasan *et al.* (2009) also argue that bank loans that are predominantly non-performing loans to SOEs are hardly likely to be growth inducing. From the literature, we conjecture that financial development is conducive to growth only when the financial system is efficient and the financial market is not heavily distorted.

3. A Theoretical framework on the role of financial intermediaries

It is without any doubt that a well-functioning financial market is imperative to economic growth. Economic growth implies more output, more output needs more capital and labor. To have more capital, more investment is needed, while investment comes from saving. A financial market works well when savers and investors can cooperate and scarce fund is allocated to the place where it produces the highest value. We present a simple framework on how to make the financial market work and under what conditions can it work efficiently and effectively.

Suppose Person C has a profitable investment project but he has not enough capital to finance it (Person C can be considered an entrepreneur / investor). Person A has some idle fund in her hand which is her saving (Person A is a saver). Apparently there is a potential opportunity for A and C to cooperate,

i.e., A gives her money to C, and C invests and shares part of the profit from the project to A. This is a “win-win” situation, which is called the financial market (or capital market) with Person C being the fund demander and A the supplier. But the successful cooperation between A and C faces several problems. If these problems cannot be solved, their cooperation will be impossible and the financial market cannot function normally.

Problem 1: Person A and C may not know each other. If you were A, you don't know in the crowd who has a profitable investment project. Similarly, if you were C, you don't know who has idle fund in her hand. This is the problem of information. Problem 2: Even if A and C know each other's condition, A may not trust C because C may run away and never appear again after obtaining A's money, or C may go bankrupt and have no money to repay A. This is the problem of trust. Problem 3: Even if A and C know each other and A trusts C, A's money may not be enough to finance A's project, C has to find numerous As, which exacerbates the first two difficulties. This is the problem of fund size. These three problems imply that for the working of the financial market, something is missing between A and C. The so-called financial intermediaries are organizations that bridge A and C, such as commercial banks.

With the introduction of financial intermediaries, say banks, the above three problems could be solved neatly. Both A and C know where the banks are - information problem is solved. A trusts the bank because the bank is under the supervision and regulation of the government, A trusts the government - financial intermediaries such as banks are highly regulated relative to non-financial firms, and this is true in virtually all countries and has been true for centuries. Besides that, in most countries there is some form of government insurance to protect depositors. The bank trusts C because C usually offers collaterals to get loans. So the trust problem is also solved. The bank usually has enough money to finance C's project, so the size problem is solved too. That is, banks become brokers between ultimate borrowers and ultimate lenders. Now we have a complete financial system, which contains three components: financial market, financial intermediaries and financial regulation. So the role of financial intermediaries becomes very clear in this simple framework (see Figure 1).

Financial development is of course conducive to growth if money is allocated to the most efficient sectors based on market principles. As La Porta *et al.* (1998) suggest, “nations with better-developed capital markets experience more rapid growth because it is easier for small and start-up companies to finance investment projects, leading to a more efficient allocation of the nation's capital.” In the same sense Guiso *et al.* (2004) assert that “financial development enhances the probability an individual starts his own business, favors entry, increases competition, and promotes growth of firms.” Beck *et al.* (2008) find that industries with a larger share of small firms grow faster in economies with well-developed financial systems. **A**

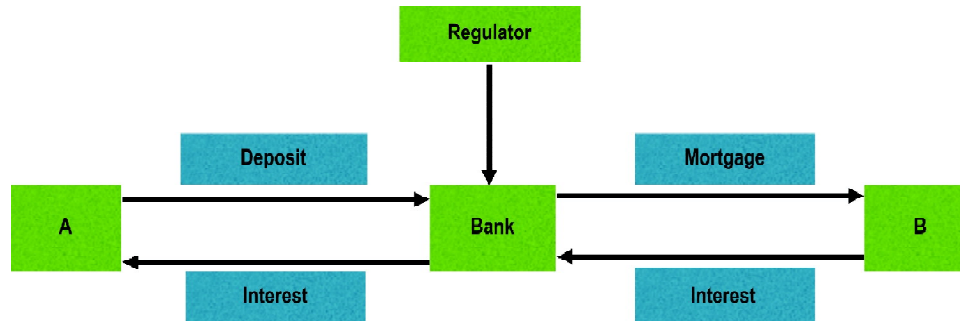


Figure 1: A Simple Framework of a Financial System

These authors emphasize a common point. That is, finance promotes growth only when the capital is allocated according to market principles, especially allocated to efficient small firms and even start-up companies. If a country's financial market and intermediaries are improperly regulated and capital is diverted to inefficient sectors of the national economy, then the development of finance may not contribute to growth and even exert a negative impact on growth. For example, in many countries the financial intermediaries are highly regulated and monopolized by the state. State-owned banks are ordered to lend money to large SOEs, even to bail these SOEs out when they are insolvent. Large numbers of small and medium-sized enterprises (SMEs), usually private firms, are financially constrained and cannot get loans from the monopolized large banks. This is why so many "underground banks" are flourishing in China. In this case, financial deepening and expansion, usually accompanies mounting non-performing loans, can hardly lead to higher growth.

4. China's banking reform and development: A historical perspective

China has been the second largest economy in the world, and its financial system, especially the banking sector, has also been undergoing dramatic reform and rapid growth. To better understand the role of financial development in China's growth, we summarize China's banking reform and development from three historical periods: 1978-1994, 1994-2001 and 2001 to today. Year 1978 marks the beginning of China's reform and opening up; 1994 marks the beginning of a series of financial reforms in China; and 2001 marks China's entry into the WTO.

4.1. 1978-1994

Prior to 1978, there was no market-based financial system in China. The People's Bank of China (PBOC) functioned at both the central bank and the only lending bank then in China. Since 1978, four state-owned banks ("Big Four") were reopened or established: Industrial and Commercial Bank of China (ICBC),

Agricultural Bank of China (ABC), Bank of China (BOC), and China Construction Bank (CCB). But they were initially committed to serving only their designated sectors of the economy (i.e., industrial and commercial lending; agriculture; foreign trade and exchange; and construction, respectively). Since 1984, the PBOC began to function as the central bank and the “Big Four” took over commercial lending business from the PBOC. The “Big Four” then were not commercial banks in real sense because they just followed orders from the government and lent money to support SOEs regardless of profitability. There was almost no competition among them.

From 1986 to 1992, several large joint-equity banks were established in China. The Bank of Communications, for example, was established in 1986 as the first domestic joint-equity bank. Foreign banks were gradually allowed to become an integral part of China’s banking sector. Meanwhile, some non-banking financial institutions also started to emerge and develop, such as trust and investment companies, financial companies, financial leasing companies, and urban and rural credit cooperatives. In this period, China’s banking sector was still overwhelmingly dominated by the “Big Four.” Their total assets accounted for more than 60 percent of the total assets of China’s entire financial system. But due to their low efficiency and policy-oriented lending, the “Big Four” accumulated huge amounts of non-performing loans (NPLs) in this period. They were often treated as a source of government finance, rather than providers of financial services to the private sector.

4.2. 1994-2001

Since 1994 the Chinese government had implemented a series of profound financial reforms. The general direction was to transform from an administrative and policy-oriented banking sector to a more independent and commercialized banking system. First, in 1994 three policy banks² were established to relieve the “Big Four” from policy lending. Second, the Commercial Bank Law of China was passed and put to effect, which made Chinese banking operations more congruent with international practices. Third, by the late 1990s the huge amount of NPLs of the “Big Four” were stripped off and taken over by the newly established four Asset Management Companies (AMCs). In 1999 the AMCs bought RMB 1.4 trillion of NPLs from the Big Four, which amounted to roughly 20 percent of their total loans (Almanac of China’s Finance and Banking, 2000). Because the banks were state-owned, the enterprises that defaulted on the loans were state-owned, and the AMCs were also state-owned, so the money just changed pockets of the same “person.” That is, all taxpayers bear the cost.

In 1996 China Minsheng Bank was established as the first privately-owned nationwide commercial bank. By the end of 2005 there have been 13 joint-equity commercial banks operating nationwide apart from the “Big Four.” Most of them were established in the late 1980s and early 1990s (see Table 1

for a summary). By the end of 2014, the assets of the “Big Four” plus the 13 nationwide joint-equity commercial banks had accounted for 59.4 percent of the total assets of all the 4,089 banking financial institutions in China (see Table 2). So China’s banking assets were disproportionately concentrated in a few large banks. This characteristic is important in understanding the role of financial development in China. Then in the mid-1990s, many city commercial banks were established by merging and consolidating local credit cooperatives. There were 133 city commercial banks in China by the end of 2014, they accounted for 10.5 percent of the total assets of all banking financial institutions in China (CBRC, 2014).

Table 1: The 13 Nationwide Joint-Equity Commercial Banks in China

<i>Name</i>	<i>Headquarters</i>	<i>Year of Establishment</i>
Bank of Communications	Shanghai	1986
China Merchants Bank	Shenzhen	1987
Ping An Bank	Shenzhen	1987
Heng Feng Bank	Yantai	1987
China CITIC Bank	Beijing	1987
China Guangfa Bank	Guangzhou	1988
Industrial Bank	Fuzhou	1988
Hua Xia Bank	Beijing	1992
China Everbright Bank	Beijing	1992
SPD Bank	Shanghai	1992
China Minsheng Bank	Beijing	1996
China Zheshang Bank	Hangzhou	2004
Bohai Bank	Tianjin	2005

Source: China Banking Regulatory Commission, www.cbrc.gov.cn.

4.3. 2001-Today

December 11, 2001 witnessed China’s entry into the WTO. After that, China’s financial sector has been liberalized to a considerable extent with less restrictions on ownership takeovers and foreign banks entry. Moreover, China also began to take prompt measures to relax restrictions on interest rates of loans and deposits. An independent banking regulatory authority, China Banking Regulatory Commission (CBRC), was established in 2003; before that, the PBOC was both China’s monetary policy maker and banking regulator. With the establishment of CBRC, China banks’ asset quality, capital adequacy and risk management have been improved significantly. On the same day of China’s entry into the WTO, Chinese government removed the restrictions on foreign banks’ operations in China, allowing foreign financial institutions to undertake RMB businesses in Shanghai, Shenzhen, Tianjin and Dalian. Foreign banks’ assets have reached RMB 1 trillion 10 years since China’s WTO entry.

Contrary to what many experts had predicted, foreign banks' entry has not posed a threat to Chinese banks. More than a decade ago, many people proclaimed that Chinese banking sector had been on the verge of "technical bankruptcy." Over the years since China's entry into the WTO, however, Chinese banks have been growing phenomenally in terms of assets, efficiency and profitability. For the last few years China's banks have dominated the "Top 1000 World Banks" ranking based on Tier 1 capital. According to the latest release by The Banker in June 2016, unprecedentedly, the "Big Four" are all listed in the top five banks by Tier 1 capital worldwide. ICBC remains number 1 and China Construction Bank number 2, with 4 out of the top 5 places held by Chinese banks. Moreover, the top 10 most efficient banks in the 2016 ranking are all from China. Chinese banks' profitability has increased dramatically over the past ten years. For example, back in 2006 Europe's banks contributed 42% of global banking profits. Now they only contribute 16%. By contrast, China's share has gone from 4% up to 32% (The Banker, 2016).

Table 2: Banking Financial Institutions in China, 2014

<i>Category</i>	<i>Number</i>
1. Big Four	4
2. Nationwide joint-equity commercial banks	13
3. China Development Bank and Policy banks	3
4. Urban commercial banks	133
5. Rural credit cooperatives	1596
6. Rural commercial banks	665
7. Rural cooperative banks	89
8. Financial companies of enterprise groups	196
9. Investment and trust companies	68
10. Financial leasing companies	30
11. Auto financing companies	18
12. Money broking companies	5
13. Consumption financial companies	6
14. Asset management companies	4
15. Foreign-invested financial institutions	41
16. Other institutions	1218
Total	4089

Source: CBRC Annual Report 2014, www.cbrc.gov.cn.

Note: "Other institutions" in Category 16 above refer to new types of rural financial institutions, postal savings banks, and China-Germany housing saving banks.

5. Variables and data

We will use city-level data to examine the relationship between financial development and economic growth in recent China. Before that we must construct a number of indicators to measure financial development. And we also list some control variables and put them into different conditioning sets.

5.1. Variables

The dependent variable in our regression model is growth, which is measured by the annual growth rate of real GDP. The independent variables consist of variables indicating financial development and a conditioning information set controlling for other factors affecting economic growth.

We construct four indicators to measure financial development.

- (1) *Loans*, which is the ratio of total loans of national banking system to GDP. This ratio measures financial deepening.
- (2) *Deposits*, which is the ratio of total deposits of national banking system to GDP. This ratio measures the overall size of financial intermediaries and their capacity to mobilize capital.
- (3) *Savings*, which is the ratio of total household savings deposited in the financial institutions to GDP. This ratio serves as a proxy for the degree of China's financial development in mobilizing household savings.
- (4) *Loan to appropriation*, which is the share of fixed asset investment financed by domestic loans relative to the share financed by state fiscal appropriation. Fixed asset investment, which forms the capital, may be financed by difference sources, such as domestic loans, government appropriation, foreign investment, and self-raised funds. Among these various sources, loans are considered more efficient than state appropriation in terms of capital allocation. Following the literature (i.e., Liu and Li, 2001; Chen, 2006; Zhang *et al.*, 2012), we use this ratio to measure the substitution of more market- and profit-oriented financial transactions for state fiscal appropriation in order to allocate capital more efficiently.

We put control variables into different conditioning information sets. The following control variables are chosen partly because they are conventionally used in the finance-growth literature, and partly because they are available in the data. We divide these control variables into four different conditioning information sets mainly to further test the sensitivity of the empirical results. The sets are defined as follows (and these variables are taken logarithms before entering into regression).

- (1) Small set. The logarithm of GDP in pervious year (Initial GDP) to capture the convergence effect, the logarithm of "students enrollment of regular institutions of higher education per 10,000 persons" (Human capital) to control for the effect of human capital on growth.
- (2) Medium set. The small set plus the share of "persons employed in private enterprises and self-employed individuals in urban areas" in "persons employed in various units at year end" (Private) as a proxy for the progress of economic reforms, and the Consumer Price Index (CPI) to control for inflation.

- (3) Large set. The medium set plus the ratio of foreign direct investment to GDP (FDI) to measure the degree of openness of the local economy, and government expenditure to GDP (Government) to control for the government size of each city and its role.
- (4) Full set. The large set plus the ratio of business volume of postal and telecommunication services to GDP (Postal & Telecom) to indicate the role of information communication, and the density of roads (Infrastructure) as a proxy for local infrastructure condition. The density of roads is measured by the ratio of area of city paved roads to total land area of that city.

Table 3: Descriptive statistics and correlations

	<i>Growth</i>	<i>Loans</i>	<i>Deposits</i>	<i>Savings</i>	<i>Loan_to_Appro.</i>
Descriptive Statistics					
Mean	12.379	-0.368	0.136	-0.440	1.038
Std. dev.	3.783	0.571	0.477	0.418	0.679
Minimum	-19.380	-4.041	-3.433	-3.714	-3.792
Maximum	32.900	3.171	3.557	2.611	3.455
Observations	2266	2236	2236	2235	2288
Correlations					
Growth	1.0000				
Loans	-0.121***	1.000			
Deposits	-0.141***	0.849***	1.000		
Savings	-0.142***	0.590***	0.843***	1.000	
Loan_to_Appro.	0.026	0.0241	-0.064***	0.092***	1.000

*** Significance level at 1%.

5.2. Data

Data in our sample are city-level. China has altogether 658 cities at three levels. Level 1: Four municipalities which are directly under the central government. They are Beijing, Shanghai, Tianjin and Chongqing. These 4 municipalities together with the other 22 provinces and 5 autonomous regions constitute the 31 provincial-level regions of mainland China. Level 2: 286 prefecture-level cities which are under the leadership of the provinces and autonomous regions.³ Level 3: 368 county-level cities which are under the leadership of the prefecture-level cities.

Our sample consists of 4 municipalities and 282 prefecture-level cities (we delete 4 prefecture-level cities from all the 286 because they lack complete data; one of them was just established in 2012). Our dataset covers 286 Chinese cities over 2008-2013. All the data are from China City Statistical Yearbook and China Statistical Yearbook for various years. Table 3 presents the descriptive statistics and correlations for the dependent variable (growth) and

four financial indicators. Table 3 shows that the correlation between financial development indicators and growth is rather weak.

6. Finance and growth: cross-sectional analyses

We first conduct a cross-sectional analysis focusing on the “initial values” of financial indicators and control variables in the conditioning information sets of 2008 with the average value of the dependent variable over 2008-2013. That is, there is only one observation in each city. The basic cross-sectional model is as follows:

$$Growth_i = \alpha + \beta Finance_i + [Control\ Variables\ in\ the\ Set]_i \gamma + \varepsilon_i \quad (1)$$

where $i=1, 2, \dots, 286$ represent the 286 cities in our sample. The dependent variable is the average real GDP growth rate over 2008-2013, Finance takes values of each of the four financial indicators defined in Section 5.1, and control variables in different sets are defined in Section 5.2.

The initial value regression can alleviate the critical weakness of the “contemporaneous” regressions where dependent and independent variables are all averaged over the same period, notwithstanding, this analysis does not address the issue of causality. There is a pitfall in the contemporaneous regressions, i.e., it is possible that a common shock to the dependent and independent variables occur in the same period (rather than the causation between them) that drives the empirical results. In other words, contemporaneous regressions may disregard the potential endogenous determinations of the dependent and independent variables.

Table 4 summarizes the OLS regression results with control variables in different sets. The results indicate a negative relationship between financial development and economic growth. We only report the coefficients on financial indicators to save space. Loans basically do not show any significant impact on growth, while the other three financial indicators all demonstrate significant negative effect on growth. In a word, our cross-sectional analyses do not show any positive role of financial development in economic growth.

7. Finance and growth: dynamic panel analyses

7.1. Model specification and methodology

To examine the effect of financial development on GDP growth, we construct our basic regression model as follows:

$$Growth_{it} = \alpha + \beta Finance_{it} + [Conditioning\ Information\ Set]_{it} \gamma + \mu_i + \lambda_t + \varepsilon_{it} \quad (2)$$

where the subscript i stands for city i ($i = 1, \dots, 286$) and t stands for year t ($t = 2008, \dots, 2013$). μ_i are unobserved city-specific effects, λ_t are time fixed effects, and ε_{it} is an idiosyncratic error term.

We use generalized method of moments (GMM) estimators to examine the effect of financial development on economic growth based on our sample

Table 4: Finance and growth: OLS estimators (initial value regressions)

Conditioning information set		Loans	Deposits	Savings	Loan_to_Appro.
Small set	Coefficient	0.148	-0.492	-0.435	-0.334*
	Standard error	0.3663	0.3604	0.4739	0.1790
	R-squared	0.103	0.110	0.107	0.117
	Observation	274	274	274	274
Medium set	Coefficient	0.087	-0.435	-0.366	-0.249
	Standard error	0.3545	0.3416	0.4537	0.1521
	R-squared	0.176	0.181	0.179	0.183
	Observation	273	273	273	273
Large set	Coefficient	-0.194	-0.704*	-0.685	-0.391**
	Standard error	0.2953	0.3832	0.4232	0.1681
	R-squared	0.200	0.210	0.208	0.214
	Observation	265	265	265	265
Full set	Coefficient	-0.085	-0.575	-0.520	-0.349**
	Standard error	0.3078	0.4366	0.4853	0.1661
	R-squared	0.206	0.212	0.210	0.217
	Observation	264	264	264	264

*** The significance levels at the 1%

** The significance levels at the 5%

dataset. There are several advantages of using GMM estimators for dynamic panel data (DPD) models. Firstly, we can control for both the city-specific effects and time effects. Secondly, we can choose appropriate lags of the independent variables as instruments to address the possible endogeneity in the regressions. As to the relation between financial development and economic growth, the joint determination between them may cause a simultaneous bias which would produce inconsistent estimators. Meanwhile, variables in the conditioning information sets may also suffer from the endogeneity problem. By using GMM estimators, we can solve these econometric problems with lagged observations of the independent variables as instruments. In this way we are capable of examining reliably the effect of exogenous components of financial development on economic growth. To save space, we omit the description of the econometric details of the GMM regressors.

7.2. Regression results

Table 5 presents the regression results based on differenced GMM estimators. It shows that financial development does not exert a significant effect on economic growth over this period. Only one indicator, loan to appropriation, has a statistically significant negative effect on growth, the other three indicators of financial growth do not show significant effects on growth at 5% level or below. The Sargan test of over-identifying restrictions, as well as the test for AR(2), is satisfactory.

Table 5: Finance and growth: first-differenced GMM estimation

<i>Conditioning information set</i>		<i>Loans</i>	<i>Deposits</i>	<i>Savings</i>	<i>Loans to Appro</i>
Basic	Coefficient	-4.950	-3.049*	-2.801*	-1.699**
	Standard error	3.0238	1.8078	1.6030	0.7442
	Sargan test (p-value)	0.605	0.365	0.392	0.650
	Instruments	14	14	14	14
Medium	Observations	1588	1588	1586	1615
	Coefficient	-3.331	-2.312	-2.617	-1.993***
	Standard error	3.1666	2.0885	1.8856	0.7253
	Sargan test (p-value)	0.225	0.153	0.172	0.454
Large	Instruments	17	17	17	17
	Observations	1566	1566	1565	1593
	Coefficient	-8.702**	-9.309*	-8.431***	-2.021***
	Standard error	4.0807	4.7401	3.1242	0.4752
Full	Sargan test (p-value)	0.522	0.345	0.518	0.826
	Instruments	21	21	21	21
	Observations	1494	1494	1494	1511
	Coefficient	-6.643	-2.623	0.585	-2.020***
	Standard error	4.4252	4.5618	4.2678	0.3660
	Sargan test (p-value)	0.153	0.227	0.295	0.228
	Instruments	25	25	25	25
	Observations	1478	1478	1478	1495

Notes: The test statistics and standard errors are asymptotically robust to heteroscedasticity. ***, **, and * stand for significant level at 1%, 5%, and 10% respectively.

Table 6: Finance and growth: system GMM estimations (full set)

<i>Regressors</i>	<i>model 1 collapsed</i>	<i>model 2 collapsed</i>	<i>model 3 collapsed</i>	<i>model 4 collapsed</i>
Loans	-2.146 (1.8646)			
Deposits		-2.126 (3.7707)		
Savings			-5.335 (3.6973)	
Loans to Appro				-2.057*** (0.4028)
Initial GDP	-0.183 (0.3142)	-0.244 (0.2897)	-0.168 (0.3125)	-0.344 (0.3220)
Human capital	-0.333 (1.0909)	0.096 (1.3941)	-0.439 (0.8653)	-0.417 (1.1815)
Private share	0.958 (1.0989)	0.981 (1.2927)	0.312 (1.1591)	0.947 (1.0985)
CPI	0.140 (0.3507)	0.024 (0.3969)	0.020 (0.3328)	-1.132 (0.3031)
FDI	0.577 (0.8492)	0.815 (0.8171)	0.585 (0.7983)	0.602 (0.6857)

contd. table 6

<i>Regressors</i>	<i>model 1 collapsed</i>	<i>model 2 collapsed</i>	<i>model 3 collapsed</i>	<i>model 4 collapsed</i>
Government	-8.294* (4.4644)	-10.538** (4.3793)	-6.333 (5.7600)	-8.681* (4.6916)
Postal & Telecom	-0.021 (1.0395)	0.495 (1.0255)	0.629 (1.1645)	0.219 (1.0610)
Infrastructure	-0.3432 (2.0860)	-1.544 (2.2108)	-0.523 (1.6755)	-0.762 (2.1514)
Dummy yr2009	3.005 (2.4339)	2.595 (2.6965)	2.026 (2.2450)	0.4158 (1.9432)
Dummy yr2010	6.162*** (1.9070)	6.326*** (1.8547)	5.450*** (2.1014)	4.386*** (1.5854)
Dummy yr2011	2.456* (1.2511)	3.152*** (1.1970)	2.005 (1.5926)	1.908 (1.3007)
Dummy yr2012	2.622 (1.8921)	3.275* (1.8505)	1.903 (2.2233)	0.869 (1.7179)
Dummy yr2013	2.393 (2.3417)	2.826 (2.6401)	1.677 (2.6113)	0.642 (2.1280)
Dummy yr2014	10.855 (11.1488)	11.826 (12.9924)	4.040 (11.7567)	8.2945 (10.8745)
Lagged growth rate	0.481*** (0.0719)	0.517*** (0.0813)	0.475*** (0.0791)	0.436*** (0.0657)
Constant	-27.095 (48.6725)	-9.342 (56.5285)	-2.108 (42.9100)	12.225 (42.3333)
Observations	1788	1788	1788	1807
Instruments	26	26	26	26
Sargan test (p-value)	0.990	0.920	0.997	0.988
Arellano-Bond test for AR(2) (p-value)	0.742	0.904	0.868	0.605

Notes: The standard errors are in parentheses. The test statistics and standard errors are asymptotically robust to heteroscedasticity. ***, ** and * stand for significance levels at 1%, 5% and 10% respectively.

Table 6 reports the system GMM estimates of Eq. (2) with the full set.⁴ We conduct two different regressions for each financial indicators by collapsing and un-collapsing the instruments in order to guarantee the credibility of system GMM estimators. Table 6 reports only the results from the collapsed regressions. Regression results in Table 6 shows that there is no significant relation between the four financial indicators and economic growth. All of the regressors pass the second serial correlation test and the Sargan test. All the p-values of the Sargan test comfortably satisfy the conventional significance levels with an average value of 0.6905.

7.3. Explanations

Contrary to Zhang *et al.* (2012), we do not find evidence supporting that the overall size and depth of financial sector spur economic growth. In the cross-

sectional analyses, we find that financial development even shows a significantly negative effect on growth. Our finding is contrary to most cross-country studies on the relationship between financial intermediation and economic growth. However, our finding is consistent with several existing studies on the finance-growth relationship in China, as surveyed in the literature section. The reason why financial development does not show any significant positive effect on economic growth is that banks, especially large-sized state-owned commercial banks continue to support loss-making SOEs thus capital is channeled to slow-growing sectors. The inefficient allocation of scarce capital was to blame as the main cause of the no effect or even negative effect of financial development on economic growth in China over 2008-2013. This suggests that China still has a long way to go to reform the financial system and promote financial marketization and liberalization.

Our argument is supported by Zhong *et al.* (2016), who assert that “Chinese banks are more willing to grant loans to low-efficiency firms.” They find that, on average, the debt ratio of an SOE has been 6 percentage points higher than a private enterprise since 2009; and it was 8 percentage points higher in 2013. This implies that the credit allocation mechanism of China’s banking system had been biased towards SOEs during 2008-2013. Undoubtedly, it would reduce the efficiency of the capital market. The huge debt of the SOEs were not repaid by liquidating their assets, but by injecting more capital from the banking system. Millions of small and medium-sized private enterprises, however, could not get loans for investment,⁵ large sums of bank fund flow into those several thousand large SOEs. It is a waste of resources, which must have dwindled the positive effect of financial development on growth.

But why do Chinese banks tend to lend money to large SOEs rather than small and medium-sized private firms? First, SOEs usually have more “valuable” assets as collaterals, such as land, plant, and property. Chinese banking regulatory authority has rather stringent requirements on banks’ risk and non-performing loan ratio. It is much safer for banks to lend money to large SOEs than to small private firms. Second, SOEs are usually “endorsed” or guaranteed by government, banks believe that even if the SOEs default or even become insolvent, the governments behind them would repay the loans in various ways. Third, banks may be “forced” by government policies to grant loans to certain sectors, this lending is not necessarily commercial and profit-oriented. For example, the Chinese government promised to spend RMB 4 trillion yuan to stimulate the economy in 2008 to mitigate the negative effect of financial crisis on growth and employment. Then many Chinese banks had to lend money to support the implantation of this policy. The added loans of Bank of China, for example, increased 33 percent in 2009 compared with 2008. According to Zhong *et al.* (2016), before 2008, an added loan of RMB 1 yuan would increase GDP by RMB 1 yuan; but by 2016, it would need RMB 4 yuan of new loans to increase GDP by 1 yuan. The phenomenon of so-called “finance

does not support the real economy” becomes increasingly prevalent. The underlying reason is because those large inefficient SOEs occupy too much loan; capital is not reasonably and efficiently allocated. Finally, the role of finance may be underestimated in the empirics because there are a lot of “underground banks” operating in China, they play a role but they are not officially accounted.

8. Conclusion

This paper examines the relationship between financial development and economic growth in China. We use data from 286 Chinese cities over the period 2008-2013. We employ first-difference and system GMM estimators for dynamic panel data. We do not find any significant positive effect of financial development on growth over this period. Most of the financial indicators do not have any significant effect on economic growth, while some of the indicators even have significant negative effect on growth in the cross-sectional analyses. Our findings are consistent with many existing studies on China that suggest that financial development hinders economic growth due to the distorting nature of state-ruled (even monopolized) banking sector, but run contrary to most cross-country studies on the relationship between financial development and economic growth. Thus, our findings suggest that the scarce capital had not flowed to the healthy and efficient firms who urgently need money, but was diverted to those inefficient large SOEs. The capital allocation mechanism of China's financial system has not been wholly market-oriented yet, which implies that there is still a long way to go for China's financial system reform.

Theoretically, we have a few remarks. Few would be inclined to deny that there is a rough parallel between economic and financial development. As real income and wealth increase, so do the size and complexity of the financial superstructure. Yet this is a loose relationship. It is hard to argue that a given volume or composition of financial assets is a sufficient condition for the development of real sectors of the economy - or even a necessary condition, given that rapid growth has sometimes taken place during periods of deliberate financial repression. We do admit, however, that financial innovation has at times sparked off virtuous circles of growth in particular sectors and regions, such as the successful microcredit movement in Bangladesh. As Greenwood and Jovanovic (1990) said, if building a functional formal sector of financial intermediaries is arduous and costly, the evolution of financial structure and real economic development may well be mutually determined, with causation flowing in both directions.

Notes

1. The three policy banks were China Development Bank, Agricultural Development Bank of China, and Export-Import Bank of China. From December 2008, Agricultural Development Bank of China and Export-Import Bank of China would

continue to be policy banks, but China Development Bank is positioned as development-oriented financial institution.

2. Of the 286 prefecture-level cities, 15 of them are further defined as sub-provincial level cities, but they are still considered prefecture level cities in terms of administrative statistics.
3. We try the regressions with other conditioning information sets, and the results are robust.
4. According to a survey conducted by All China Federation for Industry and Commerce, 90 percent of the small- and medium-sized private firms have never had borrowing and lending relations with financial institutions (Ba, 2014).

References

- Ba S. (2014). "Report on small and micro business financing: Chinese experience and Asian paths," Boao Forum for Asia.
- The Banker, Top 1000 World Bank (2016). *www.thebanker.com*.
- Beck T., R. Levine and N. Loayza, (2000). "Finance and the source of growth," *Journal of Financial Economics*, Vol. 58, pp. 261-300.
- Beck T. and R. Levine, (2004). "Stock markets, banks and growth: Panel evidence," *Journal of Banking & Finance*, Vol. 28, pp. 423-442.
- Beck T., A. Demirguc-Kunt, L. Laeven and R. Levine, (2008). "Finance, firm size, and growth," *Journal of Money, Credit and Banking*, Vol. 40, pp. 1379-1405.
- Bekaert B.G., C.R. Harvey and C. Lundblad, (2005). "Does financial liberalization spur growth?" *Journal of Financial Economics*, Vol. 77, pp. 3-55.
- Boyreau-Debray G., (2003). "Financial intermediation and growth: Chinese style," The World Bank, Policy Research Working Paper Series 3027.
- CBRC, (2014). China Banking Regulatory Commission Annual Report 2014, official website of CBRC, *www.cbrc.gov.cn*.
- Cetorelli, N. and M. Gambera, (2001). "Banking market structure, financial dependence and growth: International evidence from industry data," *Journal of Finance*, Vol. 56, pp. 617-648.
- Chen H., (2006). "Development of financial intermediation and economic growth: the Chinese experience," *China Economic Review*, Vol. 17, pp. 347-362.
- Cheng X. and H. Degryse, (2007). "The impact of banks and non-bank financial institutions on local economic growth in China," Bank of Finland Institute for Economies in Transition, BOFIT Discussion Papers 22/2007.
- Christopoulos D. K. and E. G. Tsionas, (2004). "Financial development and economic growth: Evidence from panel unit root and cointegration tests," *Journal of Development Economics*, Vol. 73, pp. 55-74.
- Claessens S. and L. Laeven, (2003). "Financial development, property rights, and growth," *Journal of Finance*, Vol. 58, pp. 2401-2436.
- Dehejia R. and A. Lleras-Muney, (2003). "Why does financial development matter? The United States from 1900 to 1940," National Bureau of Economic Research, Working Paper No. 9551.

- Goldsmith R. W., (1969). *Financial Structure and Development*. New Heaven: Yale University Press.
- Greenwood J. and B. Jovanovic, (1990). "Financial development, growth and the distribution of income," *Journal of Political Economy*, Vol. 98, pp. 1076-1107.
- Guariglia A. and S. Poncet, (2008). "Could financial distortions be no impediment to economic growth after all? Evidence from China," *Journal of Comparative Economics*, Vol. 36, pp. 633-657.
- Guiso L., P. Sapienza and L. Zingales, (2004). "Does local financial development matter?" *Quarterly Journal of Economics*, Vol. 119, pp. 929-969.
- Hasan I., P. Wachtel and M. Zhou, (2009). "Institutional development, financial depending and economic growth: Evidence from China," *Journal of Banking & Finance*, Vol. 33, pp. 157-170.
- Jayarathne J. and P. Strahan, (1996). "The finance-growth nexus: Evidence from bank branch deregulation," *Quarterly Journal of Economics*, Vol. 111, pp. 639-670.
- King R.G. and R. Levine, (1993), "Finance and growth: Schumpeter might be right," *Quarterly Journal of Economics*, Vol. 108, pp. 717-138.
- Kumar K., R. Raghuram and L. Zingales, (1999), "What determines firm size?" NBER Working Paper No. w.7208. Available at SSRN: <http://ssrn.com/abstract=227556>.
- La Porta R., F. Lopez de Silanes, A. Shleifer and R. Vishny, (1998). "Finance and growth," *Journal of Political Economy*, Vol. 106, pp. 1113-1155.
- Levine R., (1999). "Law, finance and economic growth," *Journal of Financial Intermediation*, Vol. 8, pp. 8-35.
- Levine R. and S. Zervos, (1998). "Stock markets, banks and economic growth," *American Economic Review*, Vol. 88, pp. 537-558.
- Levine R., N. Loayza and T. Beck, (2000). "Financial intermediation and growth: Causality and causes," *Journal of Monetary Economics*, Vol. 46, pp. 31-77.
- Liu T, and K. Li, (2001). "Impact of financial resources liberalization in China's economic growth," *Journal of Asian Economics*, Vol. 12, pp. 245-262.
- Lucas Jr. R. E., (1988). "On the mechanics and economic development," *Journal of Monetary Economics*, Vol. 22, pp. 3-42.
- McKinnon R. I., (1973). *Money and Capital in Economic Development*. Washington DC: Brookings Institutions.
- Miller M. H., (1998). "Financial markets and economic growth," *Journal of Applied Corporate Finance*, Vol. 11, pp. 8-15.
- Rajan R. and L. Zingales, (1998). "Financial dependence and growth," *American Economic Review*, Vol. 88, pp. 559-586.
- Rioja F. and N. Valey, (2004). "Finance and the sources of growth at various stages of economic development," *Economic Inquiry*, Vol. 42, pp. 127-140.
- Robinson J., (1952). "The generalization of the general theory," in *The Rate of Interest and Other Essays*. London: Macmillan.
- Rousseau P. L., (1999). "Finance, investment and growth in Meiji-era Japan," *Japan and the World Economy*, Vol. 11, pp. 185-198.

- Rousseau P. L. and P. Wachtel, (2002). "Inflation thresholds and the finance-growth nexus," *Journal of International Money and Finance*, Vol. 21, pp. 777-793.
- Schumpeter J. A., (1911). *The Theory of Economic Development*. Cambridge, MA: Harvard University Press.
- World Bank, (2005). *Economic Growth in the 1990s: Learning from a Decade of Reform*. Washington, DC: World Bank.
- Wurgler J., (2000). "Financial markets and the allocation of capital," *Journal of Financial Economics*, Vol. 58, pp. 187-214.
- Xu Z., (2000). "Financial development, investment, and economic growth," *Economic Inquiry*, Vol. 38, pp. 331-344.
- Zhang J. and S. Wang, (2012). "Financial development and economic growth: Recent evidence from China," *Journal of Comparative Economics*, Vol. 40, pp. 393-412.
- Zhong N., Z. Liu, J. He and C. Su, (2016). "The structural problem of China's non-financial corporate debt," *Economic Research Journal*, Vol. 51, pp. 102-117.