

Bank ownership, credit and local economic growth

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Abstract

We test for impact of bank ownership differences on the relationship between financial development and economic growth at local level with a unique panel data. Using instrumentation techniques, we find that credit availability positively affects economic growth at a local level. While credit from state owned banks, private banks and foreign banks, all contribute to local economic growth, credit from private and foreign banks have a significantly higher impact on economic growth compared to credit from state owned banks. However, in rural areas where private and foreign banks have limited presence, credit from state owned banks significantly contribute to local economic growth. Our findings are robust under different specifications and sub-samples.

Key words: State owned banks, Bank ownership, Financial development, Economic growth

1. Introduction

In this paper, the role of bank ownership in the relationship between financial development and economic growth is discussed using data from India, a large emerging market. The presence of state-owned, private and foreign banks across districts of the country provides an opportunity to study the impact of bank ownership of banks on financial development and economic growth at the local level within a country. Bank ownership and its impact on economic development is an important issue for economists and policy makers as economies, particularly in developing countries, went through a wave of nationalization in the 1960s and 1970s, and more recently of privatization and liberalization of the banking sector. Indian banking sector, as it has gone through both phases of nationalization and liberalization, enables us to examine this issue of bank ownership and economic growth in the light of recent experience.

The role of financial development in economic growth has been debated since Schumpeter (1912). There are two main views on the role of the financial sector in economic growth. One view as propounded by Joan Robinson (1952, p.86) argue that “where enterprise leads finance

follows”. This school holds that finance does not cause growth but rather that finance responds to changing demands from the “real sector”. The other view (Bagehot, 1873; Schumpeter, 1912; Gurley and Shaw, 1955; Goldsmith, 1969; McKinnon, 1973) holds that ignoring the finance-growth relationship will limit our understanding of economic growth. Recent studies, mainly cross-country studies, conclude that a strong and efficient financial system has a positive effect on economic growth (Beck, Levine, and Loayza, 2000; Carlin and Mayer, 2003; King and Levine, 1993; Ross Levine, Loayza, and Beck, 2000)¹. However, these studies analyse evidence from cross-country data. Results of such studies contain potential biases induced by measurement errors, simultaneity, omitted variables, and unobserved country-specific effects and therefore are not able to resolve the issue of causality (Beck, 2008; Levine et al., 2000). Use of cross country data underlies problem of omitted variable because across different countries, grave heterogeneity exists in factors like capital flows, trade flows, labor movement, legal code and enforcement machinery etc. Ang (2008) notes that the dominant part of the literature, which consists of the cross-country studies, does not provide a satisfactory solution on the endogeneity of the variables used in their analyses. Furthermore, results of these studies may vary considerably due to different institutional and structural characteristics of each economy. Because of these issues, Wachtel (2001) refers to the results of cross-country studies as “fragile”, whereas Kendall (2012) cautions to be “sceptical” about findings of cross-country studies. Levine (2005) notes that despite presence of extensive literature focusing on solving the finance-growth puzzle, “we are far from definitive answer to the question: Does finance cause growth, and if it does, how?”

A few papers, starting with Gershenkron (1962) have examined the role of government owned banks in financial development and economic growth. There are again two views of the government participation in financial markets. The first view, associated with Gershenkron (1962), is the “development” or “social” view, which focuses on the need for financial development for economic growth, arguing that while banks were a crucial vehicle of channelizing savings into industry, hold that in countries where the banking institutions are not developed, the government should step in through government financial institutions to provide the necessary finances for industrialization and economic development. This view was broadly

¹ For detailed review of literature, see Ang (2008), Beck (2008), Levine (2005).

held by several development economists at the time. Lewis (1950) advocated government ownership of banks as part of the economic policy whereby the government through the ownership and control of strategic industries would be at the “commanding heights” of the economy. These ideas were widely popular around the world during the 1960s and 1970s when governments in several developing countries, including India, nationalized existing commercial banks. Burgess and Pande (2005) find that, post nationalization of the major banks in India, the state-led rural branch expansion was associated with poverty reduction.

The alternative view of government participation in finance is the “political” view which holds, as with the “development view”, that politicians desire to control investments in the economy, but emphasize the political rather than social goals. In this view, the objective of government control is to provide benefits to supporters who return the favor in terms of votes, financial contributions, and bribes. Gershenkron (1962, p. 20) does lend some support for the political view on government provision of services: “There is no doubt that the government as an *agens movens* of industrialization discharged its role in a far less than perfectly efficient manner. Incompetence and corruption of bureaucracy were great. The amount of waste that accompanied the process was formidable.” Studies by Dinç (2005), Khwaja and Mian (2005), Claessens et al (2008) and Cole (2009) provide evidence of inefficiency of state owned banks linked to political connections, cronyism and lending connected with election cycles. La Porta, Lopez-de-Silanes and Shliefer (2002) find that higher government ownership of banks slow financial development and lowers growth of per capita income and productivity.

The government can, through regulation, direct private banks to channel credit to developmental projects. However, the advantage of owning banks is that it provides the government extensive control over the choice of projects being financed providing for the possibility of both the “development” and the “political” theories. In the development case, the ownership of banks enables the government to collect savings and direct them towards strategic long term projects, which might otherwise not occur due to the institutional and market failures but are socially desirable. In the political theories, bank ownership enables government to finance politically desirable but inefficient projects. In both cases, government finances projects that would not have been privately funded. The “development” view of government ownership of banks is that it would lead to economic development, while the “political” view of government ownership of

banks is that it would lead to inefficient projects and consequently to adverse economic development. We are able to examine the two theories by studying the effect of credit by state-owned and private banks on economic growth. Our results provide support for both the “development” theories as well as the “political” theories.

This paper extends the existing literature on relationship between finance and growth in two ways. First, we use district level panel data to analyze the relationship between finance and growth at a local level of economic and geographic aggregation which helps to avoid several problems that beset the cross-sectional cross-country studies such as omitted variable and heterogeneity among countries. Factors like legal codes, economic policies and regulation are likely to be much more homogeneous within a country as compared to between countries. Any country-specific effects are also, by design, controlled for in a sub-national study. Thus, such a construct, by providing an automatic control environment, overcomes many of the potential biases that plague the findings of existing cross-country studies (Beck, 2008). Second, using the framework developed in the first part, we study the effect of bank ownership on the finance-growth relation. Nationalization of the major banks starting from 1969 to 1980 has led to the largest banks being owned by the government, with small and regional banks remaining in the private sector. The foreign banks were not nationalized but the Reserve Bank of India, through branch licensing, restricted their growth. Since the liberalization of the economy and financial sector in the 1990s, private sector banks have been allowed to grow. The Indian banking sector thus provides a good opportunity to study how bank ownership affects the finance-growth relationship. This study uses growth in per capita gross district domestic product (GDDP) as a measure of economic growth and credit outstanding at the district by the commercial banks by ownership type as measure of financial development. Both of these measures are widely accepted and frequently used in the finance-growth literature (Aghion, Howitt, and Mayer-Foulkes, 2005; Jayaratne and Strahan, 1996; Kendall, 2012; King and Levine, 1993).

2. Review of literature on local financial development and growth and bank ownership

2.1 Local financial development and growth

Although the finance-growth relationship has been subject of academic research, much of the contributions are cross-country studies and time series at the country level. As discussed earlier,

cross-country studies have several methodological issues such as omitted variable and heterogeneity in legal and economic policies across countries. Sub-national level studies have an advantage in that the heterogeneity in legal and economic policies would be significantly lower compared to cross-country studies. Chen, Wu, and Wen (2013) examine non-linearity between financial development and economic growth in China. Using threshold model they find that that finance has a strong positive influence on growth in high-income provinces, but a strong negative impact on growth in low-income provinces. Pal (2011) analyses the role of improvements in banking services, infrastructure penetration, and labor market rigidity on the growth of manufacturing industries across 14 major states in India. He finds that outreach of the banking sector as well as infrastructure penetration has a significant positive impact on the growth of industries. Jalil, Feridun, and Ma (2010) also use sub-national construct and analyze finance-growth relationship using evidence from China. They use principal components analysis and ARDL bounds testing approach and find that principal components have an effective role in examining the links between growth and financial development and, that financial development fosters economic growth. However, these sub-national level studies (Chen et al., 2013; Jalil et al., 2010; Pal, 2011) do not study the finance growth relation at a local level.

This study entails a sub-national level analysis and utilizes evidence from districts of India in order to study the link between financial development and growth. Districts are a very basic level of economic and geographic aggregation in India. India is sub-divided into many states and union territories, and these states and union territories are further subdivided into many districts. Each district is typically characterised by a dominating city, after which the district is generally named, and is composed of many other urban/sub-urban and village localities into them. Thus, a district being a very basic level of geographic and economic aggregation, studying them enables identifying the relationship between financial development and economic growth at a local level. A local-level study identifies need to have locally diffused financial growth, as against having only a few pockets of financially developed regions. Kendall (2012) studies the relationship between financial development and economic growth at local level as well as uses instrumentation technique to address the issue of reverse-causality. However, his study is limited in following main aspects. He uses observations from two years: 1991 and 2001; he studies the changes in the variables in 2001 from their 1991 situation. This averaging out of the variables

over a period of a decade may render the instrumentations technique ineffective in resolving the issues of reverse causality (Ahmed, 1998; Ericsson et al., 2001). Ang (2008) points out that averaging data over long periods may mask the important features of the growth path of the economy as well as introduce a spurious contemporaneous correlation between time-averaged variables, even though the original series may not be contemporaneously correlated. Consequently, the sign and size of the induced correlation may differ from those of the original series. Furthermore, Kendall (2012) uses only one cross-section of data, which may not be adequate to capture the relationship between finance and growth as Thiel (2001) stresses the importance of having long time series for analysis of the finance–growth link. Thus, four key advantages of this study can be summarized as follows: firstly, this study entails a sub-national level analysis and thereby avoids the problems contained in cross-country studies. Secondly, this study captures the relationship between finance and growth at local level of economic and geographic aggregation which has received little attention. Thirdly, this study utilizes instrumentation technique which addresses the problem of simultaneity. And fourthly, this is a panel data study, which not only brings about the information contained in the annual fluctuations of variables, but also renders use of instrumentation technique more appropriate.

2.2 Bank ownership and the finance-growth relationship

As discussed in the introduction, two alternative theories on government ownership of banks have been proposed, namely the “development” or “social” view and “political” view. “Development” view says that presence of state-owned banks may foster economic growth in scenarios where a private bank may not be able to function due to unfavorable economic and legal conditions (Gerschenkron, 1962). Furthermore, a private bank may be unwilling to extend its services to players/sectors which might be economically important but still unprofitable for the banks. A government-owned bank can take decisions of social importance and thus will foster overall economic growth. In contrast, “political” view says that state-owned banks start functioning on political objectives rather than on desired social objectives. Due to the political objectives, higher state-ownership of banks results in more misallocation of resources and thus results in negative impact on economic growth.

La Porta et. al. (2002) examine the impact of government ownership of banks on the economic growth and find evidence that government ownership is negatively related to productivity growth

as well as per capita income growth. In line with the “political” view, they argue that government ownership leads to misallocation of resources that are detrimental to productivity growth and ultimately to economic growth itself. However, they qualify their results to be limited because of clubbing of countries which are diverse in many respects and a detailed study which accounts for this factor, might find different results for different countries.

Empirical results in extant literature have support for both the theories. Sapienza (2004) comparing state-owned and private banks in Italy find the state owned banks lend at lower interest rates, and are more likely to lend in poorer areas, compared to the private banks which supports the “development” theories. At the same time, some of lending by state owned banks are likely to be politically motivated which provides support to the “political” theories. Khwaja and Mian (2005) compare state owned and private banks in Pakistan using loan level data. They find that state owned banks are more likely to lend to firms with directors who are politically connected and also more experience loan defaults from these firms. Dinç (2005) in a cross-country study and Cole(2009) using data from India, find that state owned banks, relative to private banks, lend more in election years demonstrating that state owned banks are subject to political capture. Claessens, Feijen and Laeven (2008) find that in Brazil, where government owns the two largest banks besides development banks, firms that make political contributions substantially increased their bank financing relative to a control group suggesting that access to bank finance is an important channel through which political capture operates.

Micco and Panizza (2006), in a study across developing and industrialized countries, observe that state-owned banks play a credit smoothing role over the fluctuations of business cycles as their lending is less responsive to macroeconomic shocks than the lending of private banks. They devise tests to find which of these best explains less pro-cyclical lending behavior of the state-owned banks, and find support for the “social” view. However, they caution these tests not to be strong enough and, thereby, conclude that they cannot rule out “political” view or “laziness” view as other possible explanations. Burgess and Pande (2005) and Burgess, Pande and Wong (2005), provide evidence that the government policy of opening branches in rural unbanked locations in India was associated with reduction in rural poverty and also increased bank borrowing among the poor, in particular low caste and tribal groups. These results provide support for the “development” view of state ownership of banks.

3. Indian banking sector

At the time of independence in 1947, there were 96 scheduled commercial banks in India. In 1955, the government took over the largest bank, the Imperial Bank of India, to form the State Bank of India (SBI). In the early years of the country, there was continued pressure to extend bank credit to the agricultural and small business sectors. In 1969, the Indian government nationalized 14 banks that had deposits greater than Rs. 500 million. In 1980, the government nationalized another 6 big banks. The smaller banks that were not nationalized remained under private ownership. The economic rationale for the nationalization of the banks was to direct bank credit to “underserved” sectors and populations. These nationalized banks remained corporate entities and retained most of their staff, although their boards of directors were replaced by the state, appointees included representatives from both the government and private industry (Banerjee et al., 2005). A significant part of the deposits mobilized by the banking sector were directed to support government expenditure through statutory measures that required banks to maintain a percentage of their deposits as cash reserves with the RBI and investments in government and quasi-government securities.

During the 1970s and 1980s, the Indian government sought to increase the reach of the banking system to the rural areas, particularly in regions with fewer bank branches per capita. In order to encourage banks to expand to previously unbanked regions, the RBI announced a new branch licensing policy in 1977. It mandated that to obtain a license for a branch in an area with existing branches of banks; it required that a bank must open branches in four eligible unbanked locations. This policy was in force until 1990. Since 1991, the RBI policy on branch expansion states that it should reflect the “need, business potential, and financial viability of the location” (Government of India, 1991), although closing a rural bank was not allowed, especially if it is the only one serving a given location. Another policy tool that was used by the government to direct credit to preferred sectors was the “priority sector” lending requirement. All banks were required to a minimum proportion of their loans to “priority sector” at below market rates. Priority sectors consisted largely of agriculture, exporters and small businesses.

During the 1990s, the banking reforms were introduced alongside economic reforms in the country. These included license to establish de novo banks in the private sector, the entry of foreign banks, deregulation of branch expansion, and the reduction in government ownership in

the state owned banks. A total of 25 de novo private banks began operations between 1994 and 2000, beside the small number of incumbent private banks that existed before 1990. Some of the state owned development financial institutions that were set up to provide term financing, such as ICICI, were successfully privatized to become full service banks.

In 2001, there were 28 state owned banks which included the nationalized banks and the State Bank of India and its subsidiaries, 36 private banks and 46 foreign banks. As shown in Table 1, state owned banks dominate the sector, accounting for about 80% of bank assets, with the private sector having about 12% and the foreign banks about 8%. By 2008, share of state owned banks in total banking sector assets had fallen to 70%, while private banks had increased their share to 22% and foreign banks share of bank assets remaining at 8%. So while the state owned banks continue to dominate the banking sector, private sector banks have been increasing their market share. Private sector banks on average have higher profitability and lower non-performing assets compared to state owned banks.

Table 1: Banking statistics 2001

Ownership	# Banks	# Branches	# Accounts	Total deposits (million US\$)	Total assets (million US\$)
Foreign	46	251	26,830	12,544	21,579
State	28	46,129	3,336,260	182,125	218,237
Private	36	5,524	290,800	28,963	34,625
Total	110	51,904	3,653,890	223,632	274,441

Source: Reserve Bank of India (2005)

4. Data and summary statistics

The data set is a unique data set created by merging two major sets of data. The Reserve Bank of India provides data on bank deposits and credits for each district, by ownership type. This gives us data on aggregate credit and deposits, by bank ownership namely - state owned, private, and foreign - in each district. Population and literacy data for each district is obtained from the States of India database maintained by the Centre for Monitoring of the Indian Economy (CMIE) and the Census database. Infrastructure at the district level is measured by the value added in electricity, gas and water supply. The data on Gross District Domestic Product (GDDP) and electricity, gas and water supply at the district level is obtained from databases of department of economics and statistics of respective states as well as the database of the Planning Commission

of India. These two databases are merged by district for the years 2000 to 2009. This gives us an unbalanced panel dataset of 531 districts from 23 states in India for a 10 year period.

Table 2 provides the summary statistics for all districts. The average per capita GDDP is Rs. 17,570 state with mean per capita GDDP growth of 4% during this period. Many of the districts have agriculture as the main economic activity which given the dependence on monsoon rains can fluctuate significantly which explains the wide range in per capita GDDP growth. As can be seen from the Table 2, state owned banks have the dominant share of credit and deposits. However, the private sector banks have been slowly increasing market share during the period of this study.

Table 2: Summary statistics

	Observations	Mean	Std. Deviation	Min	Max
Per Capita GDDP (Rs.)	3397	17,570	9,221	3,636	155,855
Per Capita GDDP Growth	2866	4%	9%	-65%	71%
Population Density	3397	0.6	2.2	0.0	30.8
Literacy	3372	66%	12%	28%	97%
Credit/GDP	3348	24%	32%	1%	518%
Credit/GDP (state banks)	3348	20%	24%	1%	518%
Credit/GDP (private banks)	3348	3%	8%	0%	122%
Credit/GDP (foreign banks)	3348	0.4%	4%	0%	91%
Deposit/GDP	3344	45%	43%	1%	660%
Deposit/GDP (state banks)	3344	41%	35%	1%	524%
Deposit/GDP (private banks)	3344	3%	10%	0%	221%
Deposit/GDP (foreign banks)	3344	0%	4%	0%	100%

5. Empirical methodology

This study uses evidence from 531 districts from 23 states in India for the period 2000 to 2009. We adopt the model and instrumentation technique of Kendall (2012). Growth in per capita GDDP for each district (termed GROWTH) is used as a measure of economic growth. Credit outstanding by commercial banks in each district is used as a measure of financial deepening. Credit outstanding is standardized by dividing by respective levels of GDDP for each district (termed CREDIT/GDDP). In panel data setting, GROWTH is regressed on lagged values of (CREDIT/GDDP) and square of (CREDIT/GDDP). Further, in line with Kendall (2012), we

have used population density and its squared term, literacy, and prior period GDDP as control variables. In a labor intensive economy like India, both quality as well as quantity of labor supply are crucial factors impacting the economic growth. The quantity of labor supply is controlled for by using population density (thousand people per square km of area) for each district (termed POPULATION). An underlying assumption here is that heterogeneity in labor participation for a given total population is negligible across districts and periods. The squared term of population density (termed POPULATIONSQ) tests for the second-order effect of the quantity of labor supply on the growth equation. The quality of workforce is controlled for by using literacy rates to capture availability of skilled labor (termed LITERACY). Lagged value of log of per capita GDDP controls for changing base effect and also tests for the convergence of economic growth as levels of income increase (LOGGDDP_{t-1}). Infrastructure development may also have an impact on the economic growth. To control for this, Kendall (2012) uses road density (measured as length of roads per square kilometer of area of the district). However, in absence of availability of this data, we use the lagged values of per capita value added at the district from electricity, water and gas supply (termed INFRA) in our analysis to control for infrastructure development on the economic growth. The resulting equation is:

$$\text{GROWTH}_{i,t} = \beta_0 + \beta_1.\text{CREDIT/GDDP}_{i,t-1} + \beta_2.\text{POPULATION}_{i,t-1} + \beta_3.\text{POPULATIONSQ}_{i,t-1} + \beta_4.\text{LITERACY}_{i,t-1} + \beta_5.\text{INFRA}_{i,t-1} + \beta_6.\text{LOGGDDP}_{i,t-1} + \varepsilon_{i,t} \quad \dots(1)$$

$$\text{GROWTH}_{i,t} = \beta_0 + \beta_1.\text{CREDIT/GDDP}_{i,t-1} + \beta_2.(\text{CREDIT/GDDP}_{i,t-1})^2 + \beta_3.\text{POPULATION}_{i,t-1} + \beta_4.\text{POPULATIONSQ}_{i,t-1} + \beta_5.\text{LITERACY}_{i,t-1} + \beta_6.\text{INFRA}_{i,t-1} + \beta_7.\text{LOGGDDP}_{i,t-1} + \varepsilon_{i,t} \quad \dots(2)$$

As discussed in section 2, existing literature predicts that if financial development impacts economic growth, we should see positive coefficient of CREDIT. A higher quantity of labor supply is expected to positively impact rate of growth. Similarly, we should see a positive coefficient of LITERACY as an improvement in quality of labor supply is a critical factor for real economic growth. If infrastructural development plays a critical role in pace of economic growth, we should see a positive coefficient of infrastructure variable. And finally, if growth rate converges for increased level of income, we should expect a negative coefficient of GDDP_{t-1}.

In finance-growth literature, sound theoretical support exists for presence of endogeneity. A developing financial sector may fuel real economic growth through channels like more efficient allocation of society's savings (Schumpeter, 1912). Also, a spurt in real economic growth may result in developments in financial sector through increased demand for funds and other financial services (Robinson, 1952). To avoid the problem of endogeneity, we use the instrumentation strategy used by Kendall (2012) which employs deposit/GDDP² and its squared term as instruments. Kendall (2012) argues that due to high fixed costs associated with establishing new banks branches a bank would, typically, not open new branches in a location where it expects to collect more deposits. Rather, a bank would try to open branches to location where it expects to reach more borrowers and capture more lending opportunities. Since banks are well connected to all its branches, it can easily transfer funds across branches and use deposits from one branch to provide loans at another branch. However, distance to a branch plays an important role in determining the number of bank accounts and thereby amount of total deposits in a region. A region with easier access to bank branches is expected to be more heavily banked and thus would attract more deposits.

6. Empirical results

6.1 Local financial development and growth

Table 3 shows the regression results of economic growth regressed on measure of financial development along with the control variables. First two columns show the results using panel data estimates, without use of instrument variables. Last two columns show the results using instrumental variables technique. In both the methods, we perform regressions using equation (1) and (2). As discussed in the previous section, the instruments used for the IV regression are Deposit/GDDP and square of Deposit/GDDP. We can see that the coefficients of Credit/GDDP are positive and statistically significant in all the specifications. Under IV regressions, the coefficient for bank credit is 0.314 which indicates that for every 1% increase in the Credit/GDDP ratio, the GDDP growth rate of the district increases by 31.4 basis points per year. The coefficient of square of Credit/GDDP is negative and statistically significant; indicating that the second order effect of higher Credit/GDDP is negative. Further, the impact of literacy is

² Due to non-availability of GDP data, Kendall (2012) uses NDP data

positive and statistically significant showing that an improvement in the literacy increases the economic growth of the district. Negative and statistically significant coefficients of lagged values of GDDP show the convergence and negative base effect. As a district keeps on growing, its further growth reduces because of increase base effect, and that there is a convergence of the GDDPs of different districts in the long run. We do not find impact of infrastructure development, population density, and population density square to be significant factors in determining economic growth rate. All these findings are in line with the findings of existing literature (Jayaratne and Strahan, 1996; Kendall, 2012; King and Levine, 1993; Ross Levine, Loayza, and Beck, 2000; Ross Levine, 2005; Pal, 2011).

Table 3: Regressions with panel data estimation and instrumental variable estimation techniques using equation (1) and (2).

Dependent Variable: GDDP Growth	Panel regression		IV regression	
	Equation (1)	Equation (2)	Equation (1)	Equation (2)
Credit/GDDP	0.066** [2.132]	0.182*** [5.037]	0.314*** [3.683]	0.591*** [5.459]
(Credit/GDDP)²		-0.034*** [-4.967]		-0.120*** [-4.524]
Population density	0.044 [0.562]	0.043 [0.546]	0.109 [1.304]	0.068 [0.841]
Population density²	-0.001 [-0.527]	0.000 [0.212]	-0.005** [-2.564]	0.001 [0.636]
Literacy	2.407*** [13.321]	2.200*** [12.882]	1.890*** [8.676]	1.439*** [6.196]
Infra	0.000 [0.894]	0.000 [0.199]	0.000 [-1.206]	-0.000* [-1.901]
Lagged per capita GDDP	-0.604*** [-15.396]	-0.607*** [-15.582]	-0.611*** [-18.866]	-0.618*** [-19.015]
Constant	4.243*** [13.102]	4.386*** [13.360]		
District fixed effects	Yes	Yes	Yes	Yes
R-squared	32.9%	34.1%	19.0%	23.8%
N	2812	2812	2806	2806

* p<.10, ** p<.05, *** p<.01, robust t-statistics are in the parenthesis below

The evidence of positive impact of financial development at a local level has two-fold significance. First, it provides an important addition to the overall finance-and-growth literature. The findings suggest that financial development increases the rate of economic growth even at a very small level of economic and geographic aggregation and thus the link between finance and growth is very robust. Second, the evidence that financial development is causing positive changes in economic growth even at a local level suggests the need to have a geographically diffused financial development model and provides support for the advocates of financial inclusion.

Kendall (2012) uses two different instrumentation techniques for his analysis. First one uses deposit/NDP and its squared term as instruments. Second one uses population density and its squared term as instruments. We perform our analysis using both the instrumentation techniques and perform econometric tests for validity and suitability of the instruments. Deposit/GDDP and its squared term provide satisfactory results in these tests. However, the econometric tests for suitability of the instruments suggest that population density and its squared term are not suitable instruments for our dataset. Thus we perform our analysis using deposit/GDDP and its squared term only. Table 4 shows the results of the various econometric tests used for checking validity of the instrument for equation (2). Partial R^2 for the excluded instruments in the first stage regression checks what proportion of the variation in the instrumented variables are explained by the instruments used. Kleibergen-Paap rk Wald F test and the F test of excluded variables tests the null that instruments are weak. Kleibergen-Paap rk Wald Chi-square test examines the null that the model is under-identified. Sargan/Hansen J-statistic tests the null that the instruments are properly excluded from the second stage regression. As we can see in Table 4, the instruments used are valid and relevant under these tests. The partial R^2 for the excluded instruments in the first stage regression is 14.7% showing the relevance of the instruments used as their explanation power for variations in the bank credit. The nulls under Kleibergen-Paap rk Wald F test, F test of excluded variables, and Kleibergen-Paap rk Wald Chi-square test are rejected showing no statistical evidence that the instruments are weak or the model is under-identified. The null for Sargan/Hansen J-statistic is not rejected for all the states regression, showing that the instruments do not enter the second stage regressions directly.

Table 4: Tests for validity of instrumental variables

Statistics under IV regression using equation (2)		
Partial R² of excluded variables	14.7%	
F-test of excluded IVs	F-stat.	p-value
	70.07	0.000
Kleibergen-Paap rk Wald test	Chi-square stat	p-value
	79.33	0.000
Kleibergen-Paap rk Wald F	F-stat.	p-value
	196.72	<10%
Sargan/Hansen J-stat.	J-stat.	p-value
	1.66	0.197
Number of observations	2806	

6.2 Bank ownership and economic growth

We introduce the impact of differences in the bank ownership into the construct used above for analyzing local financial development and growth relationship. Adapting equation (1), we formulate three different specifications for three different types of banks: state owned banks, private banks and foreign banks as listed below.

$$\begin{aligned} \text{GROWTH}_{i,t} = & \beta_0 + \beta_1.\text{CREDIT/GDDP}_{i,t-1}(\text{state owned banks}) + \beta_2.\text{POPULATION}_{i,t-1} \\ & + \beta_3.\text{POPULATIONSQ}_{i,t-1} + \beta_4.\text{LITERACY}_{i,t-1} + \beta_5.\text{INFRA}_{i,t-1} + \beta_6.\text{LOGGDDP}_{i,t-1} \\ & + \varepsilon_{i,t} \end{aligned} \quad \dots(3)$$

$$\begin{aligned} \text{GROWTH}_{i,t} = & \beta_0 + \beta_1.\text{CREDIT/GDDP}_{i,t-1}(\text{private banks}) + \beta_2.\text{POPULATION}_{i,t-1} + \\ & \beta_3.\text{POPULATIONSQ}_{i,t-1} + \beta_4.\text{LITERACY}_{i,t-1} + \beta_5.\text{INFRA}_{i,t-1} + \beta_6.\text{LOGGDDP}_{i,t-1} + \\ & \varepsilon_{i,t} \end{aligned} \quad \dots(4)$$

$$\begin{aligned} \text{GROWTH}_{i,t} = & \beta_0 + \beta_1.\text{CREDIT/GDDP}_{i,t-1}(\text{foreign banks}) + \beta_2.\text{POPULATION}_{i,t-1} + \\ & \beta_3.\text{POPULATIONSQ}_{i,t-1} + \beta_4.\text{LITERACY}_{i,t-1} + \beta_5.\text{INFRA}_{i,t-1} + \beta_6.\text{LOGGDDP}_{i,t-1} + \\ & \varepsilon_{i,t} \end{aligned} \quad \dots(5)$$

The above three equations are estimated using IV technique with Deposit/GDDP and square of Deposit/GDDP for respective banks ownership types as instruments. For example, equation (3) is instrumented by Deposit/GDDP and square of Deposit/GDDP which are calculated using deposits in state owned banks for respective districts in respective years. Table 5 shows the

regression results of these three specifications. We can see that the coefficients for Credit/GDDP are positive and significant for all the three ownership types. This confirms positive growth impact of a rupee lent from a bank, irrespective of its ownership pattern. Furthermore, the coefficient of state owned bank is lower than that of private and foreign banks. This indicates that the marginal growth impact of a rupee lent by private and foreign banks is higher than that of state owned banks. Our findings support both “political” view, as well as “social” view of impact of bank ownership. As can be seen from Table 1 that state owned banks have significantly larger credit and deposit as compared to that of private and foreign banks. This difference is primarily emanating from a much wider presence of state owned banks’ presence across districts rather than from larger scale of operation of their branches as compared to that of private and foreign branches. This is evident from the stark differences in number of branches across ownership types: in year end March, 2009³ there were 64,608 offices (branches and administrative offices) of scheduled commercial banks in India. 85.8% of these are offices of state owned banks, 13.7% are offices of private banks, 0.5% are offices of foreign banks. Furthermore, in our dataset, from 3,348 district-year observations, all of them (100%) have presence of a state owned bank, 2,539 (75.8%) have presence of private banks, and only 811 (24.2%) have presence of foreign banks. Thus, when we examine the differences in number of branches across ownership types to the difference in of presence of banks in a district; we can deduce that compared to private and foreign banks; state owned banks not only have a wider coverage of districts across India, but also have a much greater branch density within the districts. This fact, when combined with a positive coefficient of Credit/GDDP for state-owned banks in the regression results, support the “social” view of the impact of state owned banks on growth of the region. That is, state owned banks are functioning in the regions where private or foreign banks are not venturing in. Due to their presence, state-owned banks increase the financial inclusion factor across regions, and contribute to the growth of every region, especially those where banking services would not have reached but for the state owned banks. This is in accordance with the central argument of Gerschenkron (1962) who proposed that presence of state-owned banks may foster economic growth in scenarios where a private bank may not be able to function due to unfavorable economic and legal conditions. A counter argument to this

³ All the data on state owned banks, private banks, private banks, and foreign banks that are discussed in this section have been collected from RBI – operations and performance of commercial banks (2009)

interpretation can be that the growth effect of even the state-owned banks is merely arising because of the instances of financially developed districts with even private and foreign banks presence, and the coefficients are merely averaged out in the overall regression. We test for this possibility in our robustness checks, and our findings refute such proposition. We discuss more on this in the next section.

As we can see in Table 5, the coefficients of Credit/GDDP for private and foreign banks are higher than that of state-owned banks. That implies, for every rupee lent by banks across different ownership types, the marginal growth impact for that a private and foreign bank is much higher than that of a state-owned bank. This provides support for the “political” view for the impact of bank ownership differences on economic growth. That is, the lower growth impact of a state owned banks may be arising out of their misallocation of resources that are detrimental to productivity growth and ultimately to economic growth itself (La Porta, Lopez-De-Silanes, and Shleifer, 2002). Another possible explanation for the differences in coefficients can be by examining the routes through which financial development is expected to impact economic growth. Existing literature points out that, among other factors, financial development impacts growth through screening projects, managing risks, and monitoring managers (Ang, 2008; Ross Levine, 2005; Schumpeter, 1912). A state owned bank may perform poorly on these parameters as compared to private and foreign banks due to counterproductive effects of political considerations and influences (Khwaja and Mian, 2005; Micco et al., 2007) or they may be “lazy” to perform all the necessary due diligence activities (Micco et al., 2007) or they might simply be less efficient (Berger, Hasan, and Zhou, 2009; Micco et al., 2007). A look at non-performing assets (NPAs) for different banks will provide an understanding about how different bank groups are faring compared to each other on account of evaluating better projects, managing risks, and monitoring managers. State owned banks had average NPA ratio (NPAs/gross advance) of 4.8% during the years 2001-2009. While the average NPA ratio for private banks was 3.8%, for foreign banks it was 3.4% during the same period. Further, average annual return on assets for the period 2000-2009 for the state owned banks was 0.77%, while the same for private banks was 0.83% and for foreign banks it was 1.56%. These facts support possible explanations that state owned banks are less efficient than private and foreign banks. These inefficiencies may, in turn, be resulting from political considerations (Cole, 2009).

Table 5: Growth regressions for credit by state owned banks, private banks, and foreign banks.

Dependent Variable: GDDP Growth	State-owned banks	Private banks	Foreign banks
Credit/GDDP (state-owned banks)	0.362*** [3.305]		
Credit/GDDP (private banks)		1.869*** [4.147]	
Credit/GDDP (foreign banks)			1.487* [1.653]
Population density	0.150* [1.719]	-0.113 [-1.441]	0.025 [0.382]
Population density ²	-0.004** [-2.325]	-0.005** [-2.244]	-0.001 [-0.675]
Literacy	1.842*** [7.401]	2.266*** [14.435]	2.551*** [18.055]
Infrastructure	0.000 [-1.285]	0.000 [0.078]	0.000* [1.767]
Lagged per capita GDDP	-0.594*** [-18.858]	-0.690*** [-15.962]	-0.606*** [-19.293]
District fixed effects	Yes	Yes	Yes
R-squared	23.1%	33.6%	34.4%
N	2796	2796	2796

* p<.10, ** p<.05, *** p<.01, robust t-statistics are in the parenthesis below

6.3 Robustness checks

Findings in Table 5 show that the coefficients of Credit/GDDP for private and foreign banks are higher than that of state-owned banks. Discussion in section 3 and section 6.2 outline that the presence of private and foreign banks is fairly small compared to that of state owned banks. Typically, a private and a foreign bank would like to open a branch in an economically growing region. Thus there might be a possible content of self-selection happening in the entire dataset wherein, the private and foreign banks are represented in more rapidly growing districts, while the state owned banks may get averaged out in the full data set. This, if true, will result in higher coefficients of Credit/GDDP for private and foreign banks as compared to that of state owned banks. To examine this possibility, we perform regression tests of equation (3), (4), and (5) for a

subset of the total dataset wherein we include only those district-year observations which have presence of all the three bank ownership types. Table 6 shows the results of this test. As we can see, our findings are robust to this specification as well. All the Credit/GDDP coefficients are positive and significant and the coefficient for state owned banks is lesser than that of private and foreign banks. Thus, we rule out the possibility that higher Credit/GDDP coefficient for private and foreign banks as compared to that of state owned banks is arising due to self-selection bias induced by differences in presence of bank groups across regions.

Table 6: Growth regressions for credit by state owned banks, private banks, and foreign banks for the observations where all three ownership types have their presence.

Dependent Variable: GDDP Growth	State-owned banks	Private banks	Foreign banks
Credit/GDDP (state-owned banks)	0.214*** [3.820]		
Credit/GDDP (private banks)		1.099*** [3.252]	
Credit/GDDP (foreign banks)			0.965** [2.283]
Population density	0.139 [1.406]	-0.079 [-0.657]	0.054 [0.561]
Population density ²	-0.004* [-1.848]	-0.003 [-1.358]	-0.001 [-0.842]
Literacy	1.753*** [4.157]	2.221*** [5.516]	2.926*** [9.966]
Infrastructure	-0.000* [-1.916]	0.000 [0.593]	0.000 [1.295]
Lagged per capita GDDP	-0.285*** [-6.630]	-0.418*** [-7.741]	-0.345*** [-8.496]
District fixed effects	Yes	Yes	Yes
R-squared	17.1%	-12.0%	19.2%
N	598	598	598

* p<.10, ** p<.05, *** p<.01, robust t-statistics are in the parenthesis below.

In our second robustness check, we test for the possibility that positive and significant coefficient for Credit/GDDP for the state owned banks is not driven by their presence in backward regions as proposed by the “social” view. Rather, it might be emanating from presence of a few high-growth districts with already a better level of financial development. In order to test for this, we rank all the observations according to their population density and divide our dataset into four quartiles based on that. In India, typically, differences in population density across regions is used to measure for differences in the degree of urbanization. For example, different criteria based on population density differences are used by Ministry of Home Affairs of India (in census of India) as well as by Reserve Bank of India to classify regions into metropolitan, urban, semi-urban or rural regions. Higher the population density, higher is the associated level of urbanization. Thus we use differences in the population density to separate out a rural region from an urban region. The district-years falling in the first quartile (Q1) of the population density represent rural region, while those falling in fourth quartile (Q4) contain more urban regions. Now, we perform IV regressions using equations (3) and (4). We run this test for all the district-years which have presence of both state-owned banks and private banks. We leave out equation (5) because there is negligible presence of foreign banks in the rural region. Table 7 shows the results of this analysis. As we can see, Credit/GDDP coefficients of state owned banks are positive and significant for both rural regions, as well as for urban regions. The coefficient of state owned bank Credit/GDDP is higher in rural areas compared to urban areas, suggesting that the marginal impact of a rupee lent would have a higher multiplier effect on economic growth. These findings support the “social” view that state-owned banks extend financial services to socially important regions where private and foreign banks are reluctant to enter, and thereby, they contribute positively to the economic growth. However the higher coefficient for private credit compared to state bank credit suggest relative inefficiency of credit by state owned bank compared to private credit for economic growth, suggesting the possibility for the existence of “political capture” of the state owned banks.

Table 7: Comparison of population density effect for state owned banks' vs. private banks' growth impact for observations with positive credit from state owned and private banks

Dependent Variable:	Rural regions:		Urban regions:	
	Low population density (Q1)		High population density (Q4)	
	State-owned banks	Private banks	State-owned banks	Private banks
Credit/GDDP (SOBs)	0.539*** [4.391]		0.302*** [4.684]	
Credit/GDDP (PBs)		1.678 [1.245]		1.438* [1.800]
Population density	2.371*** [4.947]	2.033*** [3.881]	0.173 [1.225]	-0.028 [-0.140]
Population density ²	-2.582*** [-4.676]	-2.216*** [-3.656]	-0.004* [-1.683]	-0.005 [-1.567]
Literacy	3.343*** [5.798]	4.269*** [7.306]	0.982** [2.379]	1.485*** [4.284]
Infrastructure	0.000 [0.741]	0.000 [0.172]	0.000 [0.970]	0.000 [1.441]
Lagged per capita GDDP	-1.106*** [-15.759]	-1.155*** [-14.642]	-0.449*** [-4.003]	-0.586*** [-4.484]
District fixed effects	Yes	Yes	Yes	Yes
R-squared	54.5%	49.4%	25.3%	6.1%
N	440	440	525	525

* p<.10, ** p<.05, *** p<.01, robust t-statistics are in the parenthesis below.

As an alternate specification, we use proportion of credit by state owned banks and proportion of credit from private banks as a measure of presence of state owned banks and private banks respectively. Proportion of credit by state owned banks for a particular district-year is credit from state owned banks divided by credit from all banks for that district-year. Similarly, proportion of credit by private banks for a particular district-year is credit from private banks divided by credit from all banks for that district-year. We can see in the discussions in section 3 that the state owned banks have a dominant presence in districts across India and private and foreign banks, combined, represented 30% of total bank assets in 2008. However, in majority of the districts,

the presence of state owned is much higher than 70%. For example, in our dataset, in terms of proportion of credit, state owned banks 2016 out of 3397 district-years have 95% or higher credit from state owned banks. Of these 1365 districts years have 99% or higher credit from state owned banks. Typically, these are the poorer districts with lower per capita income which is less attractive for bank profitability (and hence less presence of private and foreign banks) but are important for overall growth of the region. To examine this, we modify our model to control for low income districts. We create a dummy termed 'LowIncome' which takes value 1 for district-years with above median per capita income and 0 otherwise. We interact this dummy with credit proportions to determine the impact of low income districts. Further, to ensure that the results are not biased by presence of districts with negligible or no presence of private and foreign banks, we run the model only for the observations which have presence of all the bank ownership types: state owned, private and foreign. Table 8 shows the results after introducing these terms in equation (1) and (2). Column A and B show the results of including proportion of state owned bank credit and poor district dummy in equation (1) and (2) respectively. Column C and D show the results of including proportion of private bank credit and poor district dummy in equation (1) and (2) respectively. As we can see in Table 8 the coefficient for the credit proportion of state owned banks is not significant, whereas, the coefficient for the interaction term of credit proportion of state owned banks to dummy of low income district is positive and significant. The findings support "social" view of ownership impact in the low income districts and indicate that greater presence of state owned banks in the poorer districts is instrumental in their higher growth.

Table 8: Regression with bank ownership impact captured by proportion of credit from state owned banks and proportion of credit from private banks for the observations where all three ownership types (state owned, private, and foreign banks) have their presence. Proportion_(SOBs) is $\text{credit}_{(\text{state owned banks})} / \text{credit}_{(\text{all banks})}$. Proportion_(PBs) is $\text{credit}_{(\text{private banks})} / \text{credit}_{(\text{all banks})}$. LowIncome is a dummy variable which takes value 1 for district-years with above median per capita income and 0 otherwise.

Dependent Variable: GDDP Growth	Credit Proportion: State owned banks		Credit Proportion: Private banks	
	A	B	C	D
Credit/GDDP	0.244*** [3.871]	0.474*** [3.279]	0.254*** [3.926]	0.489*** [3.322]
(Credit/GDDP)²		-0.087** [-2.477]		-0.089** [-2.485]
Proportion_(SOBs)	-0.001 [-0.018]	0.045 [0.573]		
Proportion_(SOBs)*LowIncome	0.088*** [3.204]	0.091*** [3.234]		
Proportion_(PBs)			-0.028 [-0.459]	-0.079 [-0.997]
Proportion_(PBs)*LowIncome			0.316 [1.533]	0.375* [1.823]
Population density	-0.028 [-0.330]	-0.056 [-0.532]	-0.015 [-0.171]	-0.041 [-0.363]
Population density squared	-0.002 [-1.230]	0.002 [1.019]	-0.002 [-1.388]	0.002 [0.875]
Literacy	1.765** [2.561]	1.101 [1.342]	1.647** [2.350]	1.007 [1.207]
Infra	0.000 [-0.449]	0.000 [-0.835]	0.000 [-0.575]	0.000 [-0.935]
GDDP t-1	-0.319*** [-4.486]	-0.306*** [-3.899]	-0.317*** [-4.446]	-0.306*** [-3.871]
District fixed effects	Yes	Yes	Yes	Yes
R-squared	13%	4%	11%	1%
N	598	598	598	598

* p<.10, ** p<.05, *** p<.01, robust t-statistics are in the parenthesis below

7. Conclusion

This paper, by using a unique panel data of bank credit by ownership type and economic and social characteristics of districts in India, is able to contribute to our understanding of the finance-growth relationship. As the data is at the local level within the same country, we are able to overcome several of the limitations of cross-country studies.

There are two main findings of this study. One is that the financial development, irrespective of ownership, at the local level does have a positive impact on the local economic growth, thus confirming the conclusions of several cross-country studies, and providing support to the “development” or “social” view. Two, we find that credit by state owned banks, while it has a positive effect on local economic growth, has a lower impact than a unit of credit by private banks and foreign banks. Credit by state owned banks has a higher impact in rural areas, where the presence of private and foreign banks is limited. In more urban districts, credit by private banks has a significantly higher effect on local economic growth compared to credit by state owned banks. This lower productivity of credit from state owned banks suggests that state owned banks finance less value adding projects compared to private banks. This could be due to a combination of inadequacies in screening technologies, improper monitoring of borrowers and political capture.

While this study examines the relation between financial development and economic growth at the local level, the measure of financial development used is bank credit, and does not take market based measures such as stock market into account. However, in context of this study, the banks-based measure is more appropriate for two reasons. First, banks are predominant sources of outside finance in India and market-based sources of finance are still comparatively less widespread. Second, for a study focusing on growth at local level, it is appropriate to consider the route of finance which caters to local borrowers.

The findings of the study that private delivery of credit is more efficient for economic growth at the local level calls for a rethink on whether there are more efficient combinations of regulation and bank ownership for achieving the goal of economic development.

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