DISCUSSION PAPER SERIES

No. 9497

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FINANCIAL ECONOMICS

Centre for Economic Policy Research

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Available online at: **www.cepr.org/pubs/dps/DP9497.asp**

ISSN 0265-8003

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Discussion Paper No. 9497
June 2013

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June 2013

ABSTRACT

Finance and Poverty: Evidence from India*

Using state-level data from India over the period 1983 to 2005, this paper gauges the effect of financial deepening and outreach on rural poverty. Following the 1991 liberalization episode, we find a strong negative relationship between financial deepening, rather than financial breadth, and rural poverty. Instrumental variable regressions suggest that this relationship is robust to omitted variable and endogeneity biases. We also find that financial deepening has reduced poverty rates especially among self-employed in the rural areas, while at the same time it supported an inter-state migration trend from rural areas into the tertiary sector in urban areas, consistent with financial deepening being driven by credit to the tertiary sector. This suggests that financial deepening contributed to poverty alleviation in rural areas by fostering entrepreneurship and inducing geographic-sectoral migration.

JEL Classification: G21, G28, O15 and O16
Keywords: economic development, entrepreneurship, financial liberalization, India, migration and poverty alleviation

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*We are grateful to Abhijit Banerjee, Ajay Shah, and seminar participants at the 8th Research Meeting of the Macro/Finance group of the National Institute of Public Finance and Policy, New Delhi; Hannover University; and Tilburg University for useful comments and suggestions. We would like to thank Ratnakar Aspari and Sunder Chandiramani for their invaluable assistance in obtaining the data. Thorsten Beck acknowledges financial support under the DFID-ESRC Growth Research Programme project titled "Politics, Finance and Growth" (ES/J009067/1).

Submitted 24 May 2013

1. Introduction

For better or worse, the 2008 financial crisis has put the financial sector again at the center of public debate. Several commentators have suggested that financial liberalization contributed both to the financial crisis and to growing income inequality (e.g., Krugman, 2009 and Moss, 2009). On a more general level and as in the case of other policy areas associated with the Washington consensus, financial liberalization has been controversial among academics and policy makers, as it is not clear whom the benefits of expanded credit allocation accrue to. While financial deepening fosters economic growth and reduces income inequality (Bekaert et al., 2005, Beck, Levine, and Levkov, 2010, Bruhn and Love, 2013), there has been little evidence on the structural economic changes following financial liberalization, with some authors arguing that benefits accrue to a small elite (Greenwood and Jovanovic, 1990; Philippon, 2008; Philippon and Reshef, 2007). While increasing access to credit services through microfinance had for a long time a positive connotation, this has also been questioned after recent events in Andhra Pradesh,[1] with critics charging that excessive interest rates hold the poor back in poverty.

This paper uses annual household survey data across 15 Indian states over the period 1983 to 2005 to assess the effect of financial sector development on changes in rural and urban poverty. Specifically, we exploit variation across states and over time in both financial depth, as measured by commercial bank credit to SDP, and financial inclusion, as gauged by branch penetration, to explore

(i) the relationship between financial development and poverty levels,

(ii) the relative importance of financial depth and financial inclusion in this relationship, and

[1] See "Discredited", *The Economist Magazine*, November 2010

(iii) the channels and mechanisms through which financial development alleviates poverty.

India is close to an ideal testing ground to ask these questions given not only its large sub-national variation in socio-economic and institutional development, but also significant policy changes it has experienced over the sample period (Banerjee and Iyer, 2005). By focusing on a specific country, using data from a consistent data source and exploiting pre-determined cross-state variation in socio-economic conditions, we alleviate problems associated with cross-country studies, including measurement error, omitted variable and endogeneity biases.

Gauging the effect of financial sector development on poverty is important not only for academics, but also for policy makers in developing countries who have to prioritize among multiple policy reforms to help their societies out of poverty and grow faster. Even if the pro-poor effect of finance has been established, policy makers have a choice between different policies, including policies that help deepen the financial system, such as judicial and regulatory reforms, and policies that target the broadening of the financial system, such as microcredit support systems or branching policies. Exploring the channels through which financial sector development affects poverty levels is thus critical for policy design.

Theory makes contradictory predictions about which income group should benefit most from financial sector deepening and also about the channels through which finance can have an impact on income distribution. Some studies argue that credit constraints are particularly binding for the poor (Banerjee and Newman,1993; Galor and Zeira, 1993; Aghion and Bolton, 1997) and that finance helps overcome barriers of indivisible investment (McKinnon, 1973). Other studies have claimed that only the rich can pay the “entry fee” into the financial system (Greenwood and Jovanovic, 1990) and credit is channeled to

incumbents, not to entrepreneurs with the best opportunities (Lamoreaux, 1986). While recent cross-country comparisons have shown that financial sector development helps reduce poverty and income inequality (Beck, Demirgüç-Kunt and Levine, 2007; Clarke, Xu and Zhou, 2006), they face the typical limitations of identification strategies on country-level and say little about the channels through which financial deepening affects income inequality.

Both theory and empirical evidence so far have also been ambiguous on the channels through which finance affects poverty. On the one hand, better access to credit by the poor enables them to pull themselves out of poverty by investing in their human capital and microenterprises, thus reducing aggregate poverty (Banerjee and Newman, 1993; Galor and Zeira, 1993; Aghion and Bolton, 1997). On the other hand, more efficient resource allocation by the financial sector (not necessarily to the poor, though), will benefit especially the poor if – as a result – they are included in the formal labor market. Different studies have pointed to indirect effects of financial sector deepening, by affecting structural transformation and increasing employment (Gine and Townsend, 2004; Beck, Levine and Levkov, 2010), in contrast to the more ambiguous results found by studying the impact of expanding access to credit (see World Bank, 2007; Karlan and Morduch, 2010 for surveys).

In this paper, we exploit within-state and over-time variation across 15 Indian states over the period 1983 to 2005 to gauge the relationship between financial sector development and poverty levels and disentangle the mechanisms and channels through which this relationship works. We measure financial depth by bank credit to SDP and financial breadth by bank branch penetration. To alleviate biases of reverse causation and omitted variables, we employ instrumental variable approaches. Specifically, we use the cross-state variation of per-capita circulation of English-language newspapers in 1991 multiplied by a time trend to capture the differential impact of the media across time after liberalization in 1991 as an instrument for financial depth. With the relatively free and independent press in India (Besley

and Burgess, 2002), a more informed public is better able to compare different financial services, resulting in more transparency and a higher degree of competition leading to greater financial sector development.[2] In addition, we follow Burgess and Pande (2005) and exploit the policy driven nature of rural bank branch expansion across Indian states as an instrument for branch penetration and thus financial breadth. According to the Indian Central Bank's 1:4 licensing policy instituted between 1977 and 1990, commercial banks in India had to open four branches in rural unbanked locations for every branch opening in an already banked location. Thus between 1977 and 1990, rural bank branch expansion was higher in financially less developed states while after 1990, the reverse was true (financially developed states offered more profitable locations and so attracted more branches outside of the program). These trend reversals between 1977 and 1990 and post-1990 in how a state's initial financial development (measured in 1960) affects rural branch expansion serve as an instrument for rural branches since they are a policy driven source of exogenous variation and have no direct impact on poverty outcomes.

We find that financial depth has a negative and significant impact on rural poverty in India over the period 1983-2005. This finding is robust to using different measures of rural poverty, controlling for time-varying state characteristics, and conditioning on state and year fixed effects. On the other hand, we find no effect of financial depth on urban poverty rates. The effect of financial depth on rural poverty reduction is also economically meaningful. One within-state, within-year standard deviation in Credit to SDP explains 18 percent of demeaned variation in the Headcount and 30 percent of demeaned variation in the Poverty Gap. We also find that over the time period 1983-2005, financial depth has a more significant

[2] Beck, Demirguc-Kunt, and Martinez Peria (2008) in a cross-country setting show that the index of media freedom is correlated with financial sector outreach.

impact on poverty reduction than financial outreach. Our measure of financial breadth, rural branches per capita, has a negative but insignificant effect on rural poverty over this period.[3]

We also explore the channels through which financial development lowers rural poverty. We find evidence for the entrepreneurship channel, as the poverty-reducing impact of financial deepening falls primarily on self-employed in rural areas. We also identify migration from rural to urban areas as an important channel through which financial depth reduces rural poverty. In particular, we find that financial sector development is associated with inter-state migration of workers towards financially more developed states. The migration induced by financial deepening is motivated by search for employment, suggesting that poorer population segments in rural areas migrated to urban areas. The rural primary and tertiary urban sectors[4] benefitted most from this migration, consistent with evidence showing that the Indian growth experience has been led by the services sector rather than labor intensive manufacturing (Bosworth, Collins and Virmani, 2007). We also find that it is specifically the increase in bank credit to the tertiary sector that accounts for financial deepening post-1991 and its poverty-reducing effect.

This paper contributes to the recent literature on the role of financial sector development on poverty reduction. In a cross-country setting, Beck, Demirguc-Kunt, and Levine (2007) find that banking sector development reduces income inequality and poverty.[5]

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[3]However, when we extend the time period to 1965-2005, where the 1:4 rural branching policy was in effect for a larger duration of the time, we find that financial outreach had a significant impact on reducing rural poverty. However, demeaned variation in outreach explains 28 percent of overall rural poverty reduction and less than depth (33 percent) in this time span.

[4]The primary sector consists of agriculture, fishing, forestry, mining and quarrying; the secondary sector is composed of manufacturing, construction, electricity, gas and water; and the tertiary sector is all services including trade, hotels and restaurants, transport, communication, storage, banking, insurance, real estate, ownership of dwelling, business services, public administration, and other services.

[5] Other cross-country studies have studied the relationship between financial development and the level of income inequality. Li, Squire, and Zou (1998) and Li, Xu, and Zou (2000) find a negative relationship between finance and the level of income inequality as measured by the Gini coefficient, a finding confirmed by Clarke, Xu, and Zhou (2006), using both cross-sectional and panel regressions and instrumental variable methods. Honohan (2004) shows that even among societies with the same average income, those with deeper financial systems have lower absolute poverty.

By contrast our paper looks at the effect of financial sector development and rural poverty in a single country setting allowing us to better address identification issues. Furthermore, we study the impact of both financial depth and breadth on poverty and find that financial depth has a greater impact on poverty reduction than financial breadth. Most other papers only look at the impact of either financial depth or breadth (e.g. Beck, Levine, and Levkov, 2010; Bruhn and Love, 2013; Burgess and Pande, 2005). Our findings also contribute to the literature on the channels through which finance should affect income equality and poverty ratios. Gine and Townsend (2004) find for Thailand that financial liberalization benefitted would-be entrepreneurs who could not previously go into business but it also resulted in wage increases through higher labor demand. Thus they found that the biggest impact of financial deepening and financial access is through indirect labor market effects. Consistent with this, Beck, Levine, and Levkov (2010) find that the main effect of branch deregulation in the United States on income inequality was through the indirect effects of higher labor demand and higher wages for lower income groups. Our paper finds that financial sector development reduces rural poverty in India both by fostering entrepreneurship in rural areas and by facilitating migration of workers from rural secondary and tertiary sectors to urban tertiary sectors.

Finally, our paper also adds to a flourishing literature on economic development in India, which has linked sub-national variation in historic experiences and policies to differences in growth, poverty levels, political outcomes and other dependent variables (see Besley et al., 2007 for an earlier survey). Specifically, researchers have focused on differences in political accountability (Besley and Burgess, 2002; Pande, 2003), labor market regulation (Besley and Burgess, 2004), land reform (Besley and Burgess, 2000; Banerjee and Iyer, 2005), trade liberalization (Topalova, 2010; Edmonds et al., 2010) and gender inequality (Iyer et al., 2012). Directly related to our paper, Burgess and Pande (2005) relate a social

banking policy on branching to differences in poverty alleviation across states. Our paper adds to this literature by focusing on cross-state differences in financial deepening after the 1991 liberalization episode and by comparing the effect of two different dimensions of financial development – total credit volume and outreach of financial institutions.

Before proceeding, several caveats are in place. First, while our paper carefully controls for biases arising from endogeneity of financial development and omitted variables by utilizing a difference-in-differences approach with instrumental variables, this is a quasi-randomized experiment, which – unlike randomized experiments – is not completely under the control of the researcher. On the other hand, we are able to capture indirect effects that go beyond small geographic areas of randomized experiments. Second, we use consistent household surveys that are representative on the state and even subgroup-level, which also allow us to identify specific groups by sector, geographic location, educational attainment and employment status and sector and thus disentangle different possible channels and mechanisms through which finance affects poverty levels. On the other hand, we cannot follow individuals or households over time and can thus not document the relationship between financial development and household decisions and consequent household income effects. Third, while we find a greater impact of credit rather than outreach on poverty reduction post-1991, we do find evidence that financial breadth had a significant impact on poverty reduction when including the period of the branch licensing program. The insignificant effect over the post-1991 period can be explained with the fact that branch expansion was limited to financially more developed states during this period.[6]

The remainder of the paper is organized as follows. Section 2 presents data and methodology. Section 3 discusses our main results, documenting the relationship between

[6] In fact, in 2013, the Reserve Bank of India reintroduced a version of the licensing program where private sector banks were required to open at least 25 per cent of its new branches in unbanked rural centers. See *Guidelines for Licensing of New Banks in the Private Sector*, Reserve Bank of India Publication

financial development and poverty using both OLS and IV regressions. Section 4 explores different channels through which finance affects poverty. Section 5 concludes.

2. Data, methodology and summary statistics

In this section, we describe the data sources from which we construct our measures of financial development and poverty, present summary statistics, and discuss the empirical research design used for examining the relationship between finance and the poverty. Table 1 presents the descriptive statistics for the poverty measures, the financial development indicators and the control variables. Panel A presents the summary statistics for the whole of India while Panel B presents a state-wise breakdown. In Panel A, we present mean, standard deviation as well as cross-state, cross-time and within-state-within-time standard deviations.

2.1. Data and descriptive statistics

We construct poverty measures across 15 Indian states[7] covering 95% of India's population, using 20 rounds of the Indian household expenditure surveys. The Indian National Sample Survey Organization (NSSO) has been conducting Consumer Household Expenditure surveys since the 1950s, eliciting detailed household level information on household characteristics such as household size, education, socio-religious characteristics, demographic characteristics of household members and detailed expenditure patterns. Our panel dataset extends from 1983 to 2005 and builds on the state-level aggregates, complemented by data provided in Datt, Özler and Ravallion (1996). In robustness tests for our baseline regressions, we also use data for the period 1965 to 2005.[8]

[7] The states are: Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. They contained 95.5% of Indian population in the 2001 nationwide census. Where states split during the sample period, we continued to consider them as one unit, using weighted averages for variables, with population shares being the weights.

[8] Detailed household survey data are not available before 1983 and we can therefore not run the channel regressions of section 4 over longer time periods.

We construct two measures of poverty. First, **Headcount** is the proportion of the population below the poverty line, as defined by the National Planning Commission (1993) and adjusted yearly by price increases, and measures the incidence of poverty. Second, **Poverty Gap** is the mean distance separating the population from the poverty line as a proportion of poverty line, with the non-poor being given a distance of zero (zero gap). The calculation process of the poverty measures is described in detail in the data appendix. We compute Headcount and Poverty Gap separately for rural and urban areas.[9] Figure 1 charts the average evolution of the Rural and Urban Headcount ratios across the 15 states in our sample. The overall pattern suggests that both measures of poverty declined over the sample period except for sharp fluctuation in the early 1990s following economic liberalization.

Table 1 Panel A shows that mean Rural Headcount in our sample period is 31.9 percent and larger than the corresponding Urban Headcount of 25.9 percent. While there is a large variation in both rural and urban poverty levels across states and over time, there is a smaller, although significant, variation within states over time. Panel B shows that the mean Rural Headcount varies from 14.1 percent in Punjab to 49.5 percent in Bihar. We find Punjab to also have the lowest Urban Headcount of 9.8 percent[10] while the highest Urban Headcount is in the state of Orissa with 37.9 percent. In most states we find urban poverty numbers to be lower than rural poverty except in the case of Andhra Pradesh, Uttar Pradesh and Orissa. Assam in particular looks unique given the large gap in the percentage of people below the poverty line in rural areas (37.4 percent) compared to urban areas (11.6 percent). The average Rural Poverty Gap in India is 7.5 percent and varies from 2.4 percent in Punjab to 12.6 percent in Bihar. The Urban Poverty Gap varies from 1.9 percent in Punjab to 10.6 percent in Orissa with an all-India average of 6.5 percent.

[9]The poverty line and price indices differs between rural and urban areas. Consistent with Topalova (2010), we adjusted the measures for the schedule change in the survey. In addition, we controlled for the seasonality bias due to different timing of the surveys. See data appendix for details.

[10] Historically the Punjab-Haryana region has been one of the richest regions in the country.

Insert Table 1 here

We use two different indicators of financial development at the state level, with underlying data from the Reserve Bank of India. The first indicator, **Credit to SDP,** is the ratio of total commercial bank Credit outstanding to the Net State Domestic Product and gauges the depth of financial development. The second indicator of financial development is **Branches per Capita**, which is the total number of operating bank branches per million persons in each state and is a measure of the extent of financial penetration.

Panel A of Table 1 shows that the standard deviation of both measures over time is higher than that across states, reflecting the upward trend in both depth and inclusion over the sample period. Commercial Bank Credit to SDP varies from 11.0 percent in Assam to 58.5 percent in Maharashtra with a national average of 27 percent. Figure 2 shows an upward trend of commercial bank credit over the sample period. On average across the 15 states, commercial bank credit increased from 18.7 percent of SDP in 1980 to 50.3 percent in 2005.

In our sample, Punjab has the highest number of branches per million people (112) compared to Assam which has fewer than 50 branches per million people. Figure 3 illustrates the evolution of bank opening per capita in India. The data show trend breaks around 1990 for most of the states, which may be attributed to the suspending of the 1:4 branch license rule in 1989 according to which commercial banks were required to open 4 new branches in previously unbanked locations for every branch opening in an already banked location.

In investigating the relationship between financial sector development and poverty, we will control for several other time-varying state characteristics. The data appendix details sources and provides extensive definitions. Specifically, we include the following variables: **SDP per capita,** which is net state domestic product per capita and a proxy for income levels, **Rural Population Share,** which is rural share of total population in each state, **Literacy**

Rate, which is defined as proportion of persons who can both read and write with understanding in any language among population aged 7 years and above, and **State Government Expenditure to SDP** defined as total state government expenses over SDP. As panel B of Table 1 shows, there is great variation in income levels across states with SDP per capita ranging from 3,509 Rupee in Bihar to 14,968 Rupee in Punjab, with a country-level mean of 8,781. The mean rural population share is 74 percent and ranges from 88.5 percent in Assam to 60.6 percent in Maharashtra showing that over 60 percent of the population in all states live in rural areas. The mean literacy rate in the country is 56 percent and average government expenditures are 19.3 percent of SDP.

Insert Table 2 here

Table 2 presents correlations between our main variables of interest and the control variables. The incidence and depth of poverty are highly correlated in both rural and urban areas (correlation coefficient ≥ 0.96), but we also find a significant correlation between the different rural and urban poverty measures: states with higher rural poverty also tend to have higher urban poverty. We also find that both measures of financial development are positively correlated with each other, with a correlation coefficient of 40.5%, and a negative correlation between the measures of financial development and rural and urban poverty measures. The only association that is not significant is between Urban Poverty Gap/Headcount and Credit to SDP. When we look at the control variables we find that states with higher SDP per capita, greater government expenditures to SDP, higher literacy rates and smaller rural populations have lower rural and urban poverty and greater financial development. Critically, there is a high negative correlation between the rural population share and Credit to SDP and we will therefore run most of our regressions with and without this variable.

2.2. Identification strategy

We are interested in using our state-level panel data on financial indicators and poverty outcomes to examine whether financial development reduced poverty in Indian states over the period 1983 to 2005. We utilize an instrumental variable approach using two instruments for financial development. In this section, we first discuss India's financial liberalization in the 1990s, then explain our instruments and specify the estimation methodology.

2.2.1. India's financial liberalization experience

Prior to financial liberalization in the 1990s, India's financial system was characterized by nationalized banks and directed credit that led to a complex structure of administered interest rates. There was detailed regulation of lending and deposit rates so as to maintain the spread between cost of funds and return on funds (Reddy, 2004). Thus India's public banks lacked proper lending incentives and had a high number of non-performing loans.[11]

Following a severe balance of payments crisis in 1991, there was a substantial liberalization of India's financial sector as part of an economy-wide liberalization process to move towards a market economy and increase the role of the private sector in development. The Government of India set up the Committee on the Financial System which released the Narasimhan Committee Report I that outlined a blueprint for financial reform.

Following the recommendations of the Narasimhan Committee Report I in 1991, the government reduced the volume and burden of directed credit so as to increase the flow of credit to the private sector. The statutory liquidity ratio (SLR) and cash reserve ratio (CRR) that were previously maintained at high levels of 38.5 and 15 percent respectively to lock up

[11] See Sen and Vaidya (1997) and Hanson (2003) for further details on the state of India's banking sector in the pre-liberalization period.

bank resources for government use were reduced so as to allow greater flexibility for banks in determining lending terms and increase productivity (Reserve Bank of India, 2004) . A second major component of the banking sector reforms was de-regulation of interest rates. Government controls on interest rates were eliminated and the concessional interest rates for priority sectors were phased out to promote financial savings and growth of the organized financial system. There was also greater competition introduced into the banking system by granting licenses to new private banks and new foreign banks and easing of restrictions on foreign banks' operations.

The financial liberalization was also accompanied by strengthening bank regulation and supervision, such as setting minimum capital adequacy requirements for banks (The Basel Accord was adopted in April 1992) and tightening the classification of non-performing loans. Several of the public sector banks were recapitalized and also partially privatized. They were also given more autonomy to enhance competitiveness and efficiency. Given the large proportion of non-performing loans that the public sector banks were saddled with following restrictive policies prior to liberalization, special debt recovery tribunals were set-up in 1993 to streamline the legal procedures and ensure speedy adjudication and recovery of debt (Visaria, 2009). A second committee was established in 1998 that released the Narasimhan Committee Report II, reviewing the banking reform progress and outlining further reforms for strengthening the financial institutions of India.

It is important to note that – unlike the branching policy described below in section 2.2.3 – these reforms were implemented over several years after 1991. In addition, we do not expect any immediate effect of individual policy measures on lending, as banks have to adjust their lending policies and risk management systems to the new regulatory framework.

2.2.2. Role of media

We link cross-state variation in the effects of financial liberalization on financial deepening to cross-state variation in the media environment. The recent literature in finance has explored the role of a free and independent media in promoting political and economic freedom. Djankov et al. (2003) find that countries with more prevalent state ownership of media (in particular newspapers) have less free press, fewer political rights for citizens, inferior governance, less developed markets, and do little to meet social needs of the poor. Similarly Dyck and Zingales (2004) show that private control benefits of majority shareholders are lower in countries with higher press penetration and thus higher media pressure. Beck, Demirguc-Kunt, and Martinez Peria (2008) show in a cross-country setting that a free media is correlated with lower barriers to financial inclusion. In the Indian context, Besley and Burgess (2002) show that governments are more responsive to natural calamities in states with more developed media presence such as greater newspaper circulation.

Following this literature, we argue that the media in India play an important role in financial sector development. The information flows resulting from a free media should result in better informed citizenry that stimulates competition in the financial sector leading to greater financial sector deepening. Following Besley and Burgess (2002), we use per capita newspaper circulation as a proxy for media development. Newspapers in India are published in a number of languages to cater to the linguistic diversity of the country and most are concentrated in circulation to particular states and cover more localized events. By contrast, English language newspapers have greater national coverage and more business and financial news coverage and are thus more likely to influence financial sector development. Figure 4 shows the variation across states in the circulation of English language newspapers per 1,000 people, with the highest levels in Tamil Nadu, Karnataka, and Maharashtra, and lowest levels in Rajasthan, Bihar, Orissa, and Assam. Figure 5 illustrates the variation over time - we

divide the states into two groups, above (represented by circles in the figure) and below (represented by crosses in the figure) the median (=2) of English language newspaper circulation per 1,000 people and then draw the trend of Credit to SDP in them. It can be clearly seen that the growth in Credit to SDP is more or less the same before liberalization, but afterwards it appears steeper in states with higher level of newspaper circulation, a difference that is statistically significant. Moreover, the growth rate accelerates as the distance from the starting point of liberalization becomes bigger. Hence, we use the cross-state variation of per-capita circulation of English newspapers in 1991 multiplied by a time trend to capture the differential impact of the media across time after liberalization in 1991 as an instrument for financial depth. This is in contrast to Besley and Burgess (2002) who focus on local language newspaper as they are interested in the accountability of local governments to local voters. In robustness tests, we provide a placebo test using local language newspaper penetration, which should not be significantly positive in predicting cross-state variation in financial depth over time.

2.2.3. India's social banking experiment

Following independence in 1949, India went through a wave of bank nationalization in 1969 which brought the fourteen largest commercial banks under the direct control of the Indian central bank. Shortly thereafter, the government launched a social banking program with the goal of opening branches in the most populous unbanked rural locations. To further facilitate rural branch expansion, the RBI announced a new licensing policy in 1977 whereby, to obtain a license for a new branch opening in an already branched location (one or more branches), commercial banks had to open branches in four unbanked locations. This rule remained in effect for thirteen years until it was revoked officially in 1991. Burgess and Pande (2005) show that between 1977 and 1990, rural branch expansion was relatively higher in financially less developed states while it was the reverse before 1977 and after 1990.

Thus, following Burgess and Pande's approach, we use the resulting trend reversals between 1977 and 1990 and post-1990 in how a state's initial financial development affects rural branch expansion as instruments for branch openings in rural unbanked locations.

Figure 6 illustrates this trend reversal in bank branches across states and over time, based on the following regression (Burgess and Pande, 2005). For state i in year t,

$$Branches_{it} = \eta_0 + \eta_1 (B_{i60} \times D_{60}) + \eta_2 (B_{i60} \times D_{61}) + \ldots + \eta_{41} (B_{i60} \times D_{05}) + s_i + y_t + \varepsilon_{it},$$

$$i = 1, \ldots, 15; \quad t = 1960, \ldots, 2005 \qquad (1)$$

where D_t equals 1 in year t and zero otherwise, B_{i60} is the initial level (in 1960) of financial development in that state, and s_i and y_t are state and year dummies. Figure 6 graphs the η_k coefficients for the number of branches per million persons as dependent variable. We can see two clear trend reversals in 1977 and 1990. Prior to 1977, the η_k coefficients have an upward trend suggesting that financially developed states provide a more profitable environment for the new branches. With the imposition of the 1:4 rule in 1977, the trend overturns and slopes downward until the rule was repealed in 1990. After 1990, the η_k coefficients are almost unchanging and just slightly grow over time. This reflects that more or less all states were equally likely to attract new rural branches after the rural branch expansion ended.[12]

When we examine the effect of rural branch expansion on overall banking development by estimating equation (2) for bank credit, we find no evidence of similar trend reversals. The bottom curve in Figure 6 presents the η_k coefficients graphed for the ratio of Bank Credits to SDP. Unlike branches, we find no trend reversals for this measure and the

[12] Panagariya (2006) and Kochar (2011) argue that India had a policy of linking urban branch expansion to rural branch expansion well before bank nationalization and 1977 is not a sharp break from the prior period in terms of the branch expansion rule. This does not concern our estimations since 1977 is not a trend break in our sample period of 1983-2005.

overall direction of variations is upward sloping. This is consistent with Joshi and Little (1996) who point out that although the number of bank branches increased over the period 1969-1991, many banks were inefficient and unsound due to poor lending strategies under government control.

In sum, the results from sections 2.2.1 and 2.2.2 imply that after financial liberalization in 1991, financial deepening increased considerably in states with higher English newspaper penetration. The rural branch expansion policy had a significant impact on the number of bank branches and increased the access of rural areas to banking but did not affect the depth of the banking sector.

2.2.4. Empirical strategy

Following sections 2.2.2 and 2.2.3, we use the following set-up for our instrumental variable specification to address endogeneity issues in the relationship between financial sector development and poverty. The first stage regression of our instrumental variable specification is as follows:

$$FD_{it} = \lambda_0 + \theta(M_{i91} \times [t\text{-}1991] \times D_{91}) + \delta_1 (B_{i60} \times [t - 1960]) + \delta_2 (B_{i60} \times [t - 1977] \times D_{77}) + \delta_3 (B_{i60} \times [t - 1990] \times D_{90}) + \lambda X_{it} + s_i + y_t + \varepsilon_{it}, \quad i = 1, \ldots, 15, \quad t = 1983, \ldots, 2005, \qquad (2)$$

where FD_{it} is Credit to SDP or Branches per capita, D_{year} is a dummy which equals one post-*year*, $M_{91}$is the state-wise per capita circulation of English newspapers in 1991, B_{i60} is the state-wise per capita rural branches in 1960, X_{it} is the set of control variables and includes SDP/capita, rural population share, literacy rate and state government expenditure to GDP. s_i and y_t are state and year fixed effects to control for any unobserved heterogeneity across states and years. The main coefficients of interest are θ and δ_i, where θ measures the relationship between media freedom interacted with a post-liberalization time trend and financial development and the δ_i*'s* check for trend breaks due to the 1:4 licensing rule. The coefficient δ_1 measures the trend relationship between initial financial development in 1960

and FD (specifically branch expansion). The trend reversals in this relationship are given by δ_2 and δ_3. In the estimations that cover the time period 1983-2005, we skip the first trend dummy, δ_1, since it would be collinear with δ_2.

To analyze the relation between finance and poverty across Indian states, we estimate the following second stage regression:

$$Poverty_{it} = \beta_0 + \beta_1 Credit_{it-1} + \beta_2 Branches_{it-1} + \beta_3 X_{it-1} + s_i + y_t + \varepsilon_{it}, \quad i = 1,\ldots,15, \quad t = 1983,\ldots,2005, \tag{3}$$

where $Poverty_{it}$ is a measure of poverty in state i and time t and is one of the four poverty indicators –Rural Headcount, Rural Poverty Gap, Urban Headcount, Urban Poverty Gap. Bank Credit and Branches are the predicted values from the first stage regressions in (2) and the remaining variables are also the same as in (2). The coefficients of interest are β_1 and β_2 which measure the effect of financial deepening and broadening access on poverty, respectively. We use one-period lags of all the explanatory variables.

All the regressions have a difference-in-difference specification where by including state and time dummies we control for omitted variables that might drive the dependent variable over time or across states. We thus focus on the within-state, within-year variation in the relationship between finance and poverty alleviation, controlling for other time-variant state characteristics. We apply double clustering,[13] both within states and within years to resolve the problem of underestimated standard errors arising from serial correlation of the error terms in difference-in-difference estimations as suggested by Bertrand, Duflo and Mullainathan (2004).[14] In further regressions and to disentangle the channels through which

[13] Our results are materially similar when we cluster only at the state level.

[14] The significance levels we obtain with this method should be treated as conservative because Cameron, Gelbach, and Miller (2008) suggest that when the number of clusters is <50, standard errors may be biased and need small sample correction such as the wild boostrap-t procedure. However, as reported by Angrist and Prischke (2009, page 323), Hansen (2007) shows that the clustered standard errors reported by the software

finance affects rural and urban poverty levels, we use different dependent variables, as we will discuss in detail below.

3. Empirical results

In this section, we examine if there is a causal relationship between financial development and poverty using two instruments for financial development, the trend reversals induced by the rural branch expansion program and the differential English newspaper circulation across states after financial liberalization. We first present and discuss the first-stage regressions, before moving to the second stage estimations.

3.1. Finance, media and branching policy: first stage results

Table 3 presents the first stage regressions following model (2). Specifically, we regress Credit to SDP and branch penetration on (i) the interaction between per capita English language newspaper circulation in 1991, a post-liberalization dummy that takes the value 1 for the years 1992 and beyond, and a time trend, (ii) the interaction between bank branches in 1960, a post-1977 dummy and a time trend, and (iii) the interaction between bank branches in 1960, a post-1990 dummy and a time trend. We also control for other time-variant state characteristics included in the second stage, namely SDP per capita, literacy, government expenditures to SDP and the rural population share.

Insert Table 3 here

The results in column (1) of Table 3 show that states with higher English-language newspaper circulation post-1991 have higher levels of Credit to SDP. The relationship is not only statistically significant, but also economically meaningful: one additional English

program Stata is reasonably good at correcting for serial correlation in panels even when the number of clusters is small.

newspaper per 1,000 persons in 1991 translates into an increase in Credit to SDP by 0.1 percent per year after liberalization. This compares to an average of English newspaper circulation of 5.51 per 1,000 people and a standard deviation of 8.72. On the other hand, the trend reversals in branch penetration associated with the social banking program cannot explain variation in financial depth.

The results in column (2) of Table 3 show that both English-language newspaper circulation and the social banking policy can explain cross-state, cross-year variation in branch penetration. Again, the results are not only statistically, but also economically significant. One additional English newspaper per 1,000 people in 1991 is associated with 9.5 more branch establishments per million population annually after liberalization. Moreover, one additional branch per million capita in 1960 translates to 0.139 fewer annual branches per million people during the rural branching expansion, but after the program, it is associated with 0.05 (0.144-0.139) branches more per million persons annually. We also report the Angrist-Pischke first-stage F-statistics, which are highly significant, indicating that our instruments are relevant (Angrist and Pischke, 2009).[15] In summary, we find that the differential English newspaper across states explains financial depth better than trend instruments while the reverse is true for branch penetration.

In columns (3) and (4), we conduct a placebo test by checking whether circulation of non-English newspapers, which are less likely to report economical and financial news, explain financial development. We find that the coefficients are mostly insignificant for credit to SDP suggesting that the circulation of non-English newspapers is not associated with financial sector development. This also suggests that the relationship between newspaper penetration and financial depth is not spurious and not driven by positive impact

[15] Unlike other F-statistics, which test the first stage regression as a whole, the Angrist-Pischke first-stage F-test gauges the relevance of each endogenous variable.

that more vibrant media have on government accountability and thus possibly indirectly on competition and depth in the financial system. We do however find a strong positive relationship between circulation of non-English newspapers and branch penetration. Finally, in columns (5) to (8), we show the robustness of our first-stage results to using the 1965 to 2005 sample period.[16]

3.2. Finance and poverty: second-stage results

We present both OLS and IV regressions of the relationship between financial development and indicators of the incidence and extent of poverty in rural and urban areas. While the OLS regressions do not control for endogeneity and simultaneity bias, we still present them for purposes of comparison.

Insert Table 4 here

The results in Table 4 show a negative relationship between Credit to SDP and the incidence and extent of rural poverty, although the estimate only enters significantly in the case of the rural poverty gap. The relationship between Credit to SDP and urban poverty is not only statistically insignificant but also enters with different signs in the urban Headcount (positive) and urban Poverty Gap (negative) regressions. While branch penetration enters negatively in all four regressions, it does not enter with a significant coefficient. When excluding the rural population share, however, we find that Credit to SDP enters negatively and significantly in both the Rural Headcount (though only at the 10% level) and the Rural Poverty Gap regressions (columns 5-8). The difference in significance between controlling and not controlling for the rural population share provides a first indication of a possible channel through which Credit to SDP impacts poverty. Credit to SDP continues to enter

[16] Over this period we have three missing points for Assam so the number of observations is 597.

insignificantly in the regressions of Urban Headcount and Urban Poverty Gap, while Branches per Capita does not enter significantly in any of the regressions.

Insert Table 5 here

The IV regressions in Table 5 show a negative and significant relationship between Credit to SDP and rural poverty whereas there is no significant relationship between branch penetration and rural poverty. As in the case of the OLS regressions, neither Credit to SDP nor branch penetration enter significantly in the regressions of the urban poverty measures. The relationship between Credit to SDP and rural poverty is not only statistically but also economically significant. Specifically, the point estimates in columns (1) and (2) imply that one within-state, within-year standard deviation in Credit to SDP explains 18 percent of demeaned variation in the Headcount and 30 percent of demeaned variation in the Poverty Gap. The Hansen over-identification tests reported in columns (1) to (4) are not rejected suggesting that the instruments are valid instruments. As reported already in Table 3, the Angrist-Pischke first-stage F-tests for the excluded exogenous variables are highly significant. The Stock-Yogo (2002) weak identification test also justifies the relevance of the instruments. This test is essential when the number of endogenous variables is more than one and F-test may not truly reflect the relevance of instruments (for details see Baum, Schaffer and Stillman, 2007).

The insignificant results on branch penetration are due to restriction of the sample period to 1983 to 2005. As the results on branch penetration, instrumented by the social banking policy experiment, are in contrast to the finding by Burgess and Pande (2005), we try to reconcile our with their findings in columns (5) and (6) by expanding the sample period back to 1965. We find that branch penetration enters negatively and significantly in the regressions of Rural Headcount and Rural Poverty Gap. The insignificant relationship

between branch penetration and poverty, found above, is thus due to the shorter time span that does not include the starting point of rural branching program. Even over the longer time period, however, Bank Credit to SDP continues to enter negatively and significantly in the regressions of Rural Headcount and Rural Poverty Gap.

To compare the economic effect of depth with breadth, we take a look at de-trended standard errors and use the longer sample period over which both financial depth and breadth are shown to have a significant relationship with rural poverty gauges. Between 1965 and 2005, the within state and year standard deviations of rural poverty, credit to SDP and branches per capita are 5.910, 0.049, and 5.339 respectively. Using the coefficient estimates from columns (5) and (6) we compute that one standard deviation increase in credit to SDP reduced Rural Headcount by 1.96, while a one standard deviation in branch penetration reduces Rural Headcount by 1.65. Thus, over the period 1965 to 2005, variation in branch penetration explains 28 percent of rural poverty reduction in India which is lower than the contribution of credit to SDP (33 percent).[17] Over the longer time period, financial depth was slightly more important than financial breadth in reducing poverty, while in the more recent sample period, after 1983, only financial deepening can explain reductions in rural poverty.

Overall, IV and OLS results suggest that higher levels of financial depth are associated with both a lower incidence and depth of rural poverty but not with incidence or depth of urban poverty. We also find that financial outreach, as gauged by branch penetration, is not significantly associated with lower poverty level unless we consider a longer sample period that includes the period before the social banking policy. These initial regressions thus show that financial deepening is more robustly related to poverty reduction than financial inclusion in recent periods. The regressions so far, however, do not give us

[17] The effect magnitude of credit is -40.186*0.049/5.910=-0.33, and for branches -0.310*5.339/5.910=-0.28

insights into the channels and mechanisms through which financial deepening is related to poverty reduction. We turn to this now.

4. Finance and poverty: channels

So far the results show that financial deepening since the liberalization in 1991 has helped reduce rural poverty in India. However, understanding the underlying channels is as important for policy makers who try to maximize the benefits of financial development. In this section, we explore different channels through which financial development helped reduce rural poverty. Specifically, we explore whether financial depth helped reduce rural poverty by enabling more entrepreneurship, by fostering human capital accumulation, or by enhancing migration and reallocation across sectors.

4.1. Financial depth and entrepreneurship

Theory and empirics have shown that financial imperfections represent particularly severe impediments to poor individuals opening their own businesses for two key reasons: (i) the poor have comparatively little collateral and (ii) the fixed costs of borrowing are relatively high for the poor (Banerjee and Newman, 1993; De Mel, McKenzie and Woodruff, 2008). The microfinance movement has been built on the premise that enabling the poor to become entrepreneurs will allow them to pull themselves out of poverty.

To assess whether higher entrepreneurship among the poor can account for the significant relationship between financial depth and rural poverty identified in section 3, we test whether financial depth, instrumented by English newspaper penetration interacted with a post-liberalization time trend can explain reduction in poverty among different occupational groups. Specifically, we distinguish between (i) self-employed in agriculture, (ii) self-employed in non-agriculture, (iii) agricultural labor, (iv) other labor and (v) a residual group, which comprises economically non-active population not fitting in the above categories.

While we focus in the discussion on IV regressions, our findings are robust to using OLS regressions. In the following, we focus on Credit to SDP as our main indicator of financial sector development. Robustness tests including branch penetration yield similar findings for credit depth, while the financial sector outreach measure does not enter significantly in any of the regressions. We focus on rural areas since this is where we found a negative and significant relationship between financial depth and poverty in the previous section.

Insert Table 6 here

The results in Table 6 show that Credit to SDP is negatively and significantly associated with the Headcount and the Poverty Gap among the rural self-employed in non-agriculture and in agriculture. Financial depth does not enter significantly in any of the other regressions. Notably, financial deepening cannot explain variation in Headcount or Poverty Gap among laborers or employed workers; while the coefficients enter negatively, the standard errors are far from standard levels of significance. Together, these results suggest financial deepening after the liberalization in the 1990s was associated with a reduction in both the share of the poor and the poverty gap in the population segment of self-employed in the rural areas. Overall, this provides evidence for the entrepreneurship channel, as the reduction in poverty rates fell on self-employed.

4.2. Financial depth and human capital accumulation

Financial imperfections in conjunction with the high cost of schooling represent particularly pronounced barriers to the poor purchasing education, perpetuating income inequality (Galor and Zeira, 1993). An extensive empirical literature has shown a relationship between access to finance and child labor, both using country-specific household data[18] and

[18] Specifically, survey data for Peru suggest that lack of access to credit reduces the likelihood that poor households send their children to school (Jacoby, 1994), while studies for Guatemala, India and Tanzania point to households without access to finance as being more likely to reduce their children's school attendance and

cross-country comparisons (Flug, Spilimbergo and Wachtenheim, 1998). Theory and previous empirical evidence would thus suggest that financial reforms that ease financial market imperfections will reduce income inequality and poverty levels by allowing talented, but poor, individuals to borrow and purchase education or parents to send their children to school rather than forcing them to earn money to contribute to family income. We test these hypotheses with our data focusing on different educational segments of the rural population across Indian states and gauge whether financial deepening is associated with an increase in the educational attainment in rural India. Specifically, we distinguish between (i) illiterates, (ii) population with primary education, (iii) population with middle school education and (iv) population with high school degree or higher. Unlike in the previous regressions, we also test for longer-run trends by running regressions with five and ten-year lags. Financial sector deepening that results in more human capital accumulation cannot be expected to have an effect immediately but rather after a certain time lag. Testing for the relationship across different lag structures also allows gauging whether any significant relationship is spurious or not.

Insert Table 7 here

The results in Table 7 do not show any consistent and significant impact of financial deepening on human capital allocation. The regression results do not show any increase in educational attainment, either immediately or after a five or 10 year lag from financial deepening. Rather, we find that the five-year lag of Bank Credit to SDP is positively and significantly associated with the share of illiterates, while it is negatively and significantly associated with the share of population with a high school education or higher. We also find that the 10-year lag of Bank Credit to GDP is negatively associated with the share of middle

increase their labor if they suffer transitory income shocks compared to household with more assets (Guarcello, Mealli and Rosati, 2010), Jacoby and Skoufias, 1997, and Beegle, Dehejia and Gatti, 2007).

school graduates. Overall, these results suggest that financial deepening has not led to increases in educational attainment in rural India.[19]

4.3. Financial depth, migration and reallocation across sectors

In a world with perfect factor mobility, workers and entrepreneurs would migrate to regions or sectors with better opportunities. Market frictions, however, might prevent such reallocation. Financial deepening can thus also contribute to poverty alleviation by helping households move to areas and sectors with higher earning opportunities. Gine and Townsend (2004) show that financial liberalization in Thailand has resulted in important migration flows from rural subsistence agriculture into urban salaried employment and ultimately in lower poverty levels, while Beck, Levine and Levkov (2010) show that financial liberalization in the U.S. in the 1970s and 80s has helped tighten income distribution by pulling previously unemployed and less educated into the formal labor market. In both countries, financial liberalization broadened opportunities for entrepreneurs, both incumbent and news ones, who in turn hired more workers. If we apply the same argument to the Indian context, we should therefore observe an increase in migration with financial deepening and sectoral reallocation of labor.

As we want to gauge whether finance provided enough incentives for migration within India, we obtain migration data from the NSS surveys for the following years – 1983, 1987-88, 1993, 1999-00, and 2007-08. These surveys have comprehensive data on migration including data on household migration, characteristics of migrants, years since migration, whether they are short-term migrants or out-migrants,[20] reasons for migration, employment type and the sector from and into which they migrate. We divide households in each state in

[19] In unreported regressions, we also limited our sample to children below the age of 18 years to gauge whether financial deepening increases schooling and thus literacy in this specific group and find no effect. Results are available on request.

[20] Short-term migrants are persons who had stayed away from the village/town for a period ≥1 month but ≤

each year into six groups based on region (rural or urban) and occupational sector (primary, secondary, or tertiary) and measure the ratio of each group to total population. For simpler interpretation, we do not count households who are unemployed or did not report their occupation, so the sum of the ratios is not equal to one.[21]

As a first step, we present summary statistics on migration in India in panel A of Table 8. The migration rate is computed as the ratio of the number of households that migrated to state *s* in year *t* to the total number of households sampled in state *s*. Intra-state migration is computed as the fraction of people who migrated within the state, either between or within the districts and inter-state migration is computed as the fraction of people migrating from another state to this state. For each year, we used the closest survey to estimate the rates. Specifically, we used round 38 in 1983 for estimating the rates in 1980-82, round 43 in 1987 for estimating the rates in 1983-86, round 49 in 1993 for estimating the rates in 1987-92, round 55 in 1999 for estimating the rates in 1993-98, and round 64 in 2007 for estimating the rates in 1999-2005. The estimations start from 1980 because if the migration occurred further past the survey year, it is usually not reported precisely. For instance, immigrants older than 10 years usually tend to report years since migration as multiples of five or ten, making a peak in migration rate of those years.

The data show that, while overall migration, both inter- and intra-state, is low at 1.4 percent of a state's population, on average, per year, it is dominated by intra-state migration, which constitutes about 80 percent of overall migration. When we look at the migration between rural and urban sectors, we find that as expected, urban to rural migration is the smallest and accounts for an average of 0.2% of total population through the years. Rural to urban migration is the highest though we find that there is comparable amount of migration

6 months during the past year for employment. Out-migrants are former members of a household who left the household any time in the past, for stay outside the village/town (and is still alive on the date of survey)

[21] The results are robust to entering them into the analysis.

from urban to urban areas and since 2000, there has also been a comparable share of rural to rural migration. When we look at occupational sector, we find that migration into the tertiary sector has been the largest. In unreported charts of migration trends over time, we find that while migration into the primary sector used to be smallest target sector, it overtook the secondary sector in most years after financial liberalization

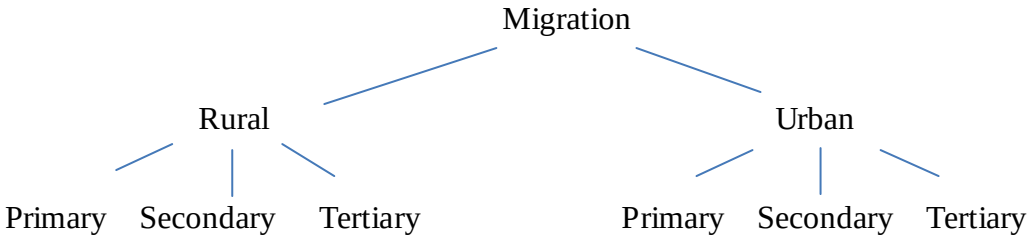
Next, we explore the finance and migration channel in more detail with regression analysis. In panel B of Table 8, we regress overall migration, intra-state, and inter-state migration on Credit to SDP, instrumented by English newspaper penetration interacted with a post-liberalization time trend and including our other control variables. To be consistent with the benchmark regression we estimate it for the period 1983-2005. Panel B shows that while financial deepening is not significantly associated with overall migration or intra-state migration, there is significant impact of financial deepening on inter-state migration. The economic size of this effect is reasonable, with one de-meaned standard deviation in Credit to SDP explaining around 30 percent of variation in de-meaned variation of inter-state migration.[22] In the following, we therefore focus on inter-state migration. Specifically, we use household-level data for inter-state migrants to gauge the impact of financial development on (i) sectoral migration decisions and (ii) reasons for migration. We have data available for almost 100,000 inter-state migrant households across the four surveys described above.

Insert Tables 8 and 9 here

In Table 9 we focus on inter-state migration and explore how financial development influences migration into different occupational sectors – primary, secondary, and tertiary. Migrant households can choose between six alternatives – rural primary, rural secondary, rural tertiary, urban primary, urban secondary, and urban tertiary sectors which we group by

[22] The de-meaned standard errors of credit and inter-state migration are 0.049 and 0.001 respectively, so the number will be 0.049*0.006/0.001= 0.294

geographic area (rural or urban). Thus the tree structure of a migrant's decision would be as follows:



We estimate our model as sequential logit model, first testing to which extent the decision to move into urban or rural areas depends on differences in Credit to SDP across origin and destination states and, second, gauging whether the decision to work in the primary, secondary or tertiary sector depends on these differences and controlling for the decision to move into the rural or urban area. Unlike in the previous regressions, we thus focus on differences in financial development and other state-level variables rather than levels at the year of migration. Hence, they compare the level of variables between the destination and origin when the households decided to migrate. We also control for two household characteristics, household size and per capita expenditure, that might influence migration decisions. We also control whether the migrant household used to live in an urban or rural area.

Table 9 shows that financial depth is significantly associated with inter-state migration flows into the rural primary and urban tertiary sectors. The results in columns 1 show a higher difference in Credit to SDP between destination and origin state increases the likelihood that migrants move into urban areas though this is not statistically significant. We also find that a higher difference in SDP per capita and government expenditure and a lower difference in literacy is associated with a higher likelihood of inter-state migrants moving into urban areas. In addition, richer and smaller migrant households coming from urban areas

are more likely to move into urban areas in the destination state. Considering interstate migrants into urban areas, we find that a higher difference in Credit to SDP between destination and origin states results in a higher likelihood that migrants allocate into the tertiary sector and a lower likelihood that migrants allocate into the secondary sector. We also find that interstate migrants into the rural areas are more likely to allocate into the primary sector, the higher the difference in Credit to SDP between origin and destination state. Thus the primary rural sector and the urban tertiary sector were the sectors that benefitted most from the inter-state migration associated with financial deepening.

Insert Table 10 here

In Table 10 we explore the reasons for inter-state migration for a smaller sample of inter-state migrant households, for which we have such data available. Here, we use multinomial logit regressions and report marginal effects. We find that a higher difference in Credit to SDP between destination and origin states is associated with a higher share of migrants that state "search for employment", "under transfer", and "parents migration" as reason for migration and a lower share of migrants that state "search for better employment" as reason for migration. As in Table 9, these findings are robust to controlling for other state-level differences and characteristics of the migrant households. This suggests that higher financial development in the destination state (as compared to the origin state) is associated with migration due to search for employment, though not with the search for better employment. This suggests that it were the poorest in rural areas that migrated to other states, either into the rural primary or urban tertiary sector in search for employment.

4.4. Sectoral credit and reallocation across sectors

In a final step, we relate the relationship between financial deepening and geographic-sectoral migration trends to the sectoral credit portfolio of the Indian banking system.

Specifically, which sector drives the cross-state variation in financial deepening observed after the 1991 liberalization? And can we link this through to the poverty-reducing effect in rural areas documented in section 3?

Figure 7 graphs the trends of sector-wise credit to SDP over time. For this purpose, we construct credit to SDP measure in the primary, secondary, and tertiary sectors by dividing RBI's sector-wise credit data with the corresponding net state domestic product in that sector. The detail of the source and construction of these measures are described in Appendix B. It can be clearly seen that credit to SDP in the tertiary sector started to grow sharply a few years after liberalization, but this pattern does not exist in the other sectors and there is even a downward trend in credit to the secondary sector.

Table 11 confirms in a regression framework that our findings so far are driven by credit to the tertiary sector. Using the same first-stage specification as in Table 3, we see that it is just Credit to SDP in the tertiary sector that is strongly associated with newspaper penetration and its interaction with a post-1991 time trend.[23] There is no significant relation between bank credit to primary or secondary sector and newspaper penetration. Not surprisingly, primary credit to SDP (and thus rural credit) is significantly associated with trend breaks of rural branching program, while neither credit to the secondary nor the tertiary sectors are. Overall, this suggests that financial liberalization after 1991 resulted in financial deepening benefitting mostly the tertiary sector.

In Table 12, we replicate the Table 5 regressions, using tertiary Credit to SDP rather than overall Credit to SDP, instrumented by English newspaper penetration in 1991 interacted with a post-1991 time trend. Our Table 5 results are confirmed using this sectoral credit measure. Tertiary Credit to SDP enters negatively and significantly in the regressions

[23]Compared to the regressions in Tables 3 and 5, we lose 5 years of data, because our sectoral credit data is not available in 1984-1986, 1988 and 1995.

of Rural Headcount and Rural Poverty Gap, but not in the regressions of the Urban Headcount or Poverty Gap. As in Table 5, branch penetration does not enter significantly. The coefficient sizes of Tertiary Credit to SDP are only slightly smaller than those of overall Credit to SDP in Table 5.

While we provide statistically and economically strong evidence on the relationship between financial deepening following the 1991 liberalization, geographic-sectoral migration trends and reductions in poverty rates, we have to be careful on our interpretation. Our results do not imply that the increase in credit to the tertiary sector is purely supply-driven. Rather, we interpret our findings as suggesting that financial deepening has supported growth opportunities in the tertiary sector by providing credit to enterprises in this sector, which in turn through labor market effects resulted in the geographic-sectoral migration documented above.

5. Conclusion

Academics and policy makers disagree on the effect of financial liberalization and deepening on poverty levels. While some argue that the benefits of liberalization accrue to the upper income segments, others point to pro-poor effects of financial liberalization, by fostering entrepreneurship, human capital accumulation or important labor market effects. Our findings speak directly to this debate.

Using state-level indicators on financial depth, branch penetration and poverty for 1983 to 2005 across 15 Indian states, we show a negative relationship between financial deepening post-1991 and rural poverty. Exploring different channels, we find evidence that the poverty reduction effects of financial deepening fell on the self-employed in rural areas. We also find evidence that financial liberalization resulted in inter-state migration towards states with deeper financial systems, benefitting the rural primary and urban tertiary sectors.

Together, these results suggest two related effects of financial deepening in rural areas: fostering entrepreneurship and migration of the poorest towards financially more developed states. Consistent with the migration trend into the urban tertiary sector we also find that the pro-poor effects of financial deepening are associated with credit to the tertiary sector only. Our regression analysis suggests that financial inclusion, as captured by branch penetration, is not significantly associated with rural poverty reductions over the period 1983 to 2005, although it is if we consider the longer sample period 1965 to 2005.

Our findings suggest that financial deepening can have important structural effects, including through structural reallocation and migration, with consequences for poverty reduction. The pro-poor effects of financial development are multi-faceted and can arise through different channels. There is some evidence that financial development can reduce poverty through fostering entrepreneurship, although this does not necessarily happen through more inclusive but rather more efficient systems. We also show that financial deepening can result in important labor market and migration effects. These effects are consistent with findings by Beck, Levine and Levkov (2010) for the U.S. and Gine and Townsend (2004) for Thailand. On the other hand, we cannot find significant evidence for a human capital channel of financial deepening on poverty reduction.

Our paper has important policy repercussions. The pro-poor effects of financial deepening do not necessarily come just through more inclusive financial systems, but can also come through more efficient and deeper financial systems. Critical, the poorest of the poor not only benefit from financial deepening by directly accessing financial services, but also through indirect structural effects of financial deepening.

References:

Aghion P. and P. Bolton, (1997). "A Theory of Trickle-Down Growth and Development", *Review of Economic Studies*, Vol. 64, pp. 151-172

Aghion P., R. Burgess, S. J. Redding, and F. Zilibotti, (2008). "The Unequal Effects of Liberalization: Evidence from Dismantling the License Raj in India", *American Economic Review*, vol. 98(4), pages 1397-1412.

Angrist, Joshua D. and Jörn-Steffen Pischke (2009). *Mostly Harmless Econo metrics: An Empiricist's Companion*. Princeton University Press, Princeton, NJ.

Banerjee, A, and L. Iyer (2005), "History Institutions and Economic Performance: The Legacy of Colonial Land Tenure Systems in India", *American Economic Review*, Vol. 95(4), pp. 1190-1213.

Banerjee, A. and A. F. Newman, (1993), "Occupational Choice and the Process of Development", *Journal of Political Economy* 101, 274-298.

Banerjee, A., E. Duflo, R. Glennerster, and C. Kinnan, (2009), "The Miracle of Microfinance? Evidence from a Randomized Evaluation," Working paper. MIT, Department of Economics.

Baum, C. F., Schaffer, M. E., & Stillman, S. (2007). Enhanced routines for instrumental variables/GMM estimation and testing. *Stata Journal*, *7*(4), 465-506.

Beck, T. and A. Demirgüç-Kunt (2008) "Access to Finance: An Unfinished Agenda", *World Bank Econ Rev* 22(3): 383-396

Beck, T., A. Demirgüç-Kunt and R. Levine, (2007) "Finance, Inequality and the Poor", *Journal of Economic Growth*, 12(1), 27-49.

Beck, T., A. Demirgüç-Kunt and M. S. Martinez Peria "Banking Services for Everyone? Barriers to Bank Access and Use around the World", *World Bank Economic Review* 22, 397 - 430.

Beck, T., R. Levine and A. Levkov (2010), "Big Bad Banks? The Winners and Losers from Bank Deregulation in the United States", *Journal of Finance*, vol. 65(5), pages 1637-1667.

Beegle, Kathleen, Rajeev Dehejia, and Roberta Gatti. 2007. "Child Labor and Agricultural Shocks." *Journal of Development Economics* 81 (1): 80–96.

Bekaert, G., C. Harvey, and C. Lundblad (2005) "Does financial liberalization spur growth?" *Journal of Financial Economics* 77 (1): 3-55.

Bertrand, M., E. Duflo and S. Mullainathan (2004) "How Much Should We Trust Differences-in-Differences Estimates?", *The Quarterly Journal of Economics*, vol. 119(1), pages 249-275.

Bosworth, B., Collins, S. and Virmani, A. (2007), "Sources of Growth in the Indian Economy", in Bery, S., Bosworth, B. and Panagariya, A. (eds.), *India Policy Forum, 2006-07*, Washington, DC: Brookings Institution Press.

Besley, T., and R. Burgess, (2000) "Land Reform, Poverty Reduction, and Growth: Evidence from India," *Quarterly Journal of Economics* 115, 389-430.

Besley, T., and R. Burgess, (2002) "The Political Economy Of Government Responsiveness: Theory And Evidence From India", *Quarterly Journal of Economics* 117(4), pages 1415-1451.

Besley, T., and R. Burgess, (2004) "Can Labor Regulation Hinder Economic Performance: Evidence from India," *Quarterly Journal of Economics* 119, 91-134.

Besley, T., R. Burgess, and B. Esteve-Volart (2007) "The Policy Origins of Poverty and Growth in India," Chapter 3 in Delivering on the Promise of Pro-Poor Growth: Insights and Lessons from Country Experiences, edited with Timothy Besley and Louise J. Cord, Palgrave MacMillan for the World Bank.

Bruhn, M., and I. Love (2013) "The economic impact of banking the unbanked: evidence from Mexico" *Journal of Finance* forthcoming.

Burgess, R., and R. Pande (2005), "Do Rural Banks Matter? Evidence from the Indian Social Banking Experiment", *American Economic Review*, vol. 95(3), pages 780-795.

Cameron, C., J. Gelbach, and D. Miller (2008) "Bootstrap-Based Improvements for Inference with Clustered Errors", *Review of Economics and Statistics* 90, 414-427.

Clarke, G., L. C. Xu and H. Zhou, (2006) "Finance and Income Inequality: What Do the Data Tell Us?", *Southern Economic Journal* vol. 72(3), pages 578-596.

Datt, G., B. Özler and M. Ravallion (1996) "Database on Poverty and Growth in India", Poverty and Human Resources Division Policy, Research Department, The World Bank. Available at: http://go.worldbank.org/SWGZB45DN0

De Mel, S., D. McKenzie and C. Woodruff. 2008. Returns to Capital in Microenterprises: Evidence from a Field Experiment. *Quarterly Journal of Economics* 123, 1329-72.

Deaton, A. (2003). Adjusted Indian poverty estimates for 1999-2000. *Economic and Political Weekly*, 322-326.

Djankov, S., C. McLiesh, T. Nenova, and A. Shleifer. 2003. "Who Owns the Media?" *Journal of Law and Economics* 46 ,341–82.

Dyck. A. and L. Zingales (2004) "Private Benefits of Control: An International Comparison. *Journal of Finance* 59, 537-600.

Edmonds, E., N. Pavcnik and P. Topalova (2010) "Child Labor and Schooling in a Globalized World: Some Evidence from Urban India" *Journal of European Economic Association* 7, 498-507.

Flug, K., A. Spilimbergo, and E. Wachtenheim. 1998. "Investment in Education: Do Economic Volatility and Credit Constraints Matter?" *Journal of Development Economics* 55 (2): 465–81.

Galor, E. and J. Zeira, (1993) "Income Distribution and Macroeconomics", *Review of Economic Studies,* vol. 60(1), pages 35-52.

Gine, X. and R. Townsend (2004) "Evaluation of financial liberalization: a general equilibrium model with constrained occupation choice", *Journal of Development Economics* 74, 269-307.

Greenwood, J. and B. Jovanovic (1990) "Financial Development, Growth, and the Distribution of Income", *Journal of Political Economy,* vol. 98(5), pages 1076-1107.

Guarcello, L., F. Mealli and F.C. Rosati (2010) “Household vulnerability and child labor: the effect of shocks, credit rationing and insurance”, *Journal of Population Economics* 23, 169-98.

Hansen, Christian, B. (2007) “Generalized Least Squares Inference in Panel and Multilevel Models with Serial Correlation and Fixed Effects”, *Journal of Econometrics* 140, 670-94.

Hanson, James (2003) “Indian Banking: Market Liberalization and the Pressures for Institutional and Market Framework Reform”, in A. Krueger and S. Chinoy, eds. *Reforming India's External, Financial, and Fiscal Policies*, Stanford University Press, Palo Alto, California

Honohan, Patrick (2004) “Financial Sector Policy and the Poor.” Working Paper 43, World Bank, Washington, DC.

Iyer, L., A. Mani, P. Mishra, P. Topalova (2012) “The Power of Political Voice: Women’s Political Representation and Crime in India,” *American Economic Journal: Applied Economics* 4, 165-93.

Jacoby, Hanan G., and Emmanuel Skoufias. (1997) “Risk, Financial Markets, and Human Capital in a Developing Country.” *Review of Economic Studies* 64 (3): 311–35.

Joshi, Vijay and I.M.D. Little (1996) “India’s Economic Reforms: 1991-2001” *Oxford, Clarendon Press*.

Karlan, D and J. Morduch (2010) “Access to Finance.” In *Handbook of Development Economics*, vol. 5, ed. Dani Rodrik and Mark Rosenzweig, 4703–4784. Amsterdam: Elsevier

King, R., and R. Levine, (1993), “Finance and Growth: Schumpeter Might Be Right”, *The Quarterly Journal of Economics*, vol. 108(3), pages 717-37.

Kochar, Anjini (2011) “The Distributive Consequences of Social Banking: A Micro-empirical Analysis of the Indian Experience,” *Economic Development and Cultural Change* 59, 251-280

Kochhar, K., U. Kumar, R. Rajan, A. Subramanian, and I. Tokatlidis, (2006). “India's pattern of development: What happened, what follows?”, *Journal of Monetary Economics*, vol. 53(5), pages 981-1019.

Krugman, Paul, 2009, The financial factor, <http://krugman.blogs.nytimes.com/2009/04/07/the-financial-factor/>.

Lamoreaux, N. R. (1986) "Banks, kinship, and economic development: The new England case", *Journal of Economic History* 46, 647-667.

Li, H., Squire, L. and Zou, H. (1998) "Explaining International and Intertemporal Variations in Income Inequality," *Economics Journal* 108(446),26–43

Li, H., L. Xu, and H. Zou (2000) "Corruption, Income Distribution and Growth," *Economics and Politics* 12, 155-82.

McKinnon, R. (1973) "Money and Capital in Economic Development", Washington, DC: *Brookings Institution*.

Moss, David A., 2009, An ounce of prevention: Financial regulation, moral hazard, and the end of "too big to fail," Harvard Magazine September-October, 25-29.

Pande, R. (2003) "Can Mandated Political Representation Provide Disadvantaged Minorities Policy Influence? Theory and Evidence from India" *American Economic Review* 93, 1132-1151.

Panagariya, Arvind (2006). Bank Branch Expansion and Poverty Reduction – A Critique. *mimeo, Columbia University*

Philippon, Thomas. (2008): "The Evolution of the US Financial Industry from 1860 to 2007: Theory and Evidence," NBER Working Paper No. 13405.

Philippon, Thomas, and Ariel Reshef (2007): "Wages and Human Capital in the U.S. Financial Industry: 1909-2006,"NBER Working Paper 13437.

Planning Commission (1993) "Report of the Expert Group on Estimation of Proportion and Number of Poor", Government of India, New Delhi.

Rajan, R., and L. Zingales (1998) "Financial dependence and growth", *American Economic Review* 88, 559-87.

Reddy, Y. V. (2004) "Monetary and Financial Sector Reforms in India: A Practitioner's Perspective" in *India's Emerging Economy: Performance and Prospects in the 1990s and Beyond* ed. Kaushik Basu, MIT Press.

Reserve Bank of India (2004): Report on Trend and Progress of Banking in India 2003-04, Reserve Bank of India Publication.

Sen, K. and R. R. Vaidya (1997), *The Process of Financial Liberalization in India*, Oxford: Oxford University Press.

Shirai, S. (2002) "Banking Sector Reforms in India and China: Does India's Experience Offer Lessons for China's Future Reform Agenda?" *JBICI Discussion Paper Series*, Discussion Paper No.2

Stock, J. H., & Yogo, M. (2002). Testing for weak instruments in linear IV regression.

Tarozzi, A. (2007) "Calculating Comparable Statistics from Incomparable Surveys, with an Application to Poverty in India" *Journal of Business and Economic Statistics*, 25(3), 314-336.

Topalova, P. (2010). "Factor immobility and regional impacts of trade liberalization: Evidence on poverty from India." *American Economic Journal: Applied Economics*, 1-41.

Visaria, Sujata. (2009). "Legal Reform and Loan Repayment: The Microeconomic Impact of Debt Recovery Tribunals in India." *American Economic Journal: Applied Economics* 1,59–81.

Figure 1- Rural and urban poverty in India.
This figure shows the trend in Rural and Urban Headcount ratios in India. Rural and Urban Headcount ratios are the percentage of rural and urban population with monthly per capita expenditure less than the official poverty line respectively. The vertical line represents the starting year (1991) of financial liberalization. The definitions and sources of all variables are in the appendix.

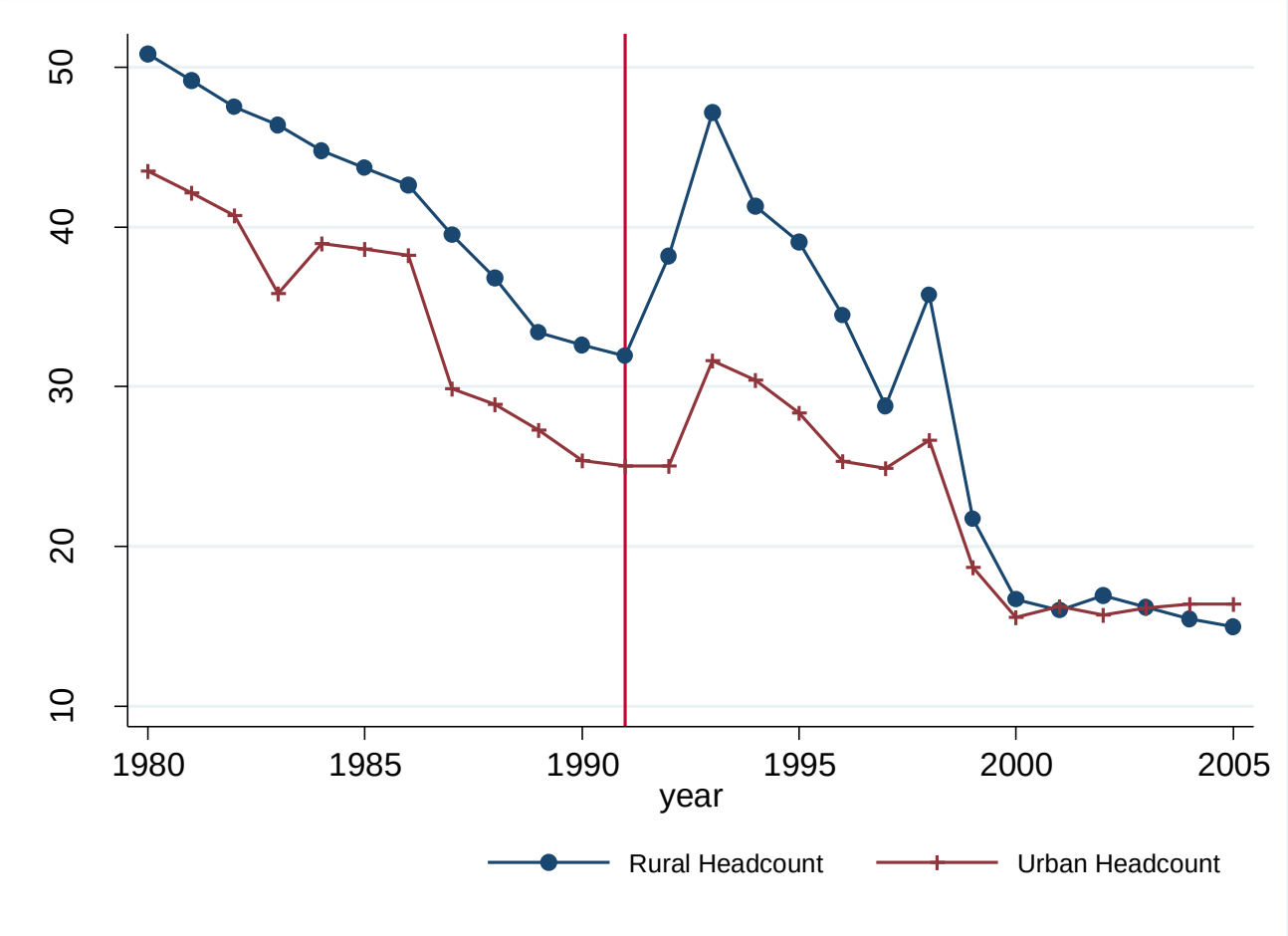


Figure 2- Credit to SDP.

This figure shows the trend in the ratio of total commercial bank credit outstanding to net state domestic product. Commercial bank credit comprises term loans, cash credit, overdrafts and bills purchased and discounted. The vertical line represents the starting year (1991) of financial liberalization. The definitions and sources of all variables are in the appendix.

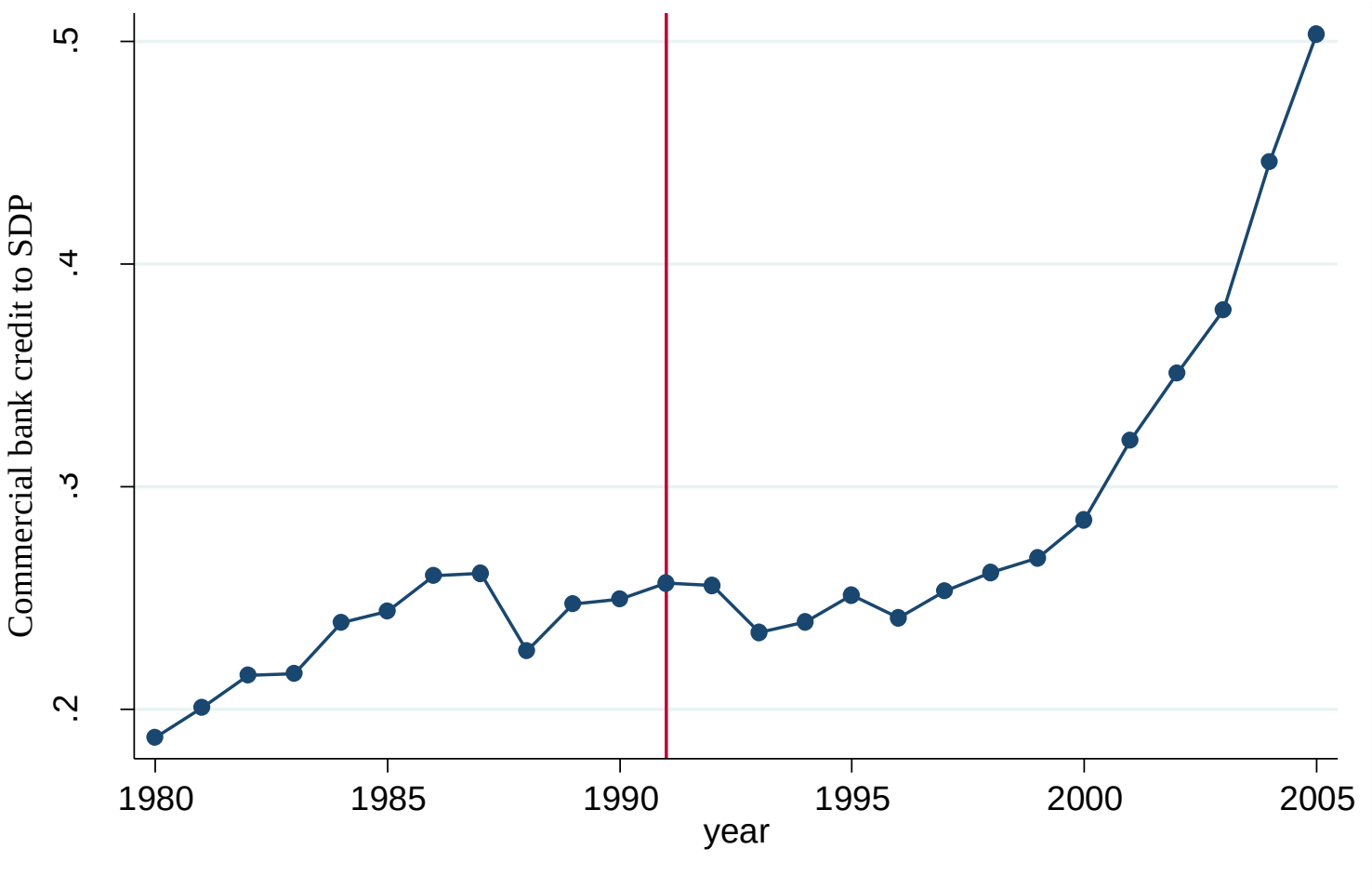


Figure 3- Bank branches per capita.

This figure shows the trend in the ratio of commercial bank branches over population (in million). The rural branch expansion program was in place up to 1989. The vertical line represents the starting year (1991) of financial liberalization. The definitions and sources of all variables are in the appendix.

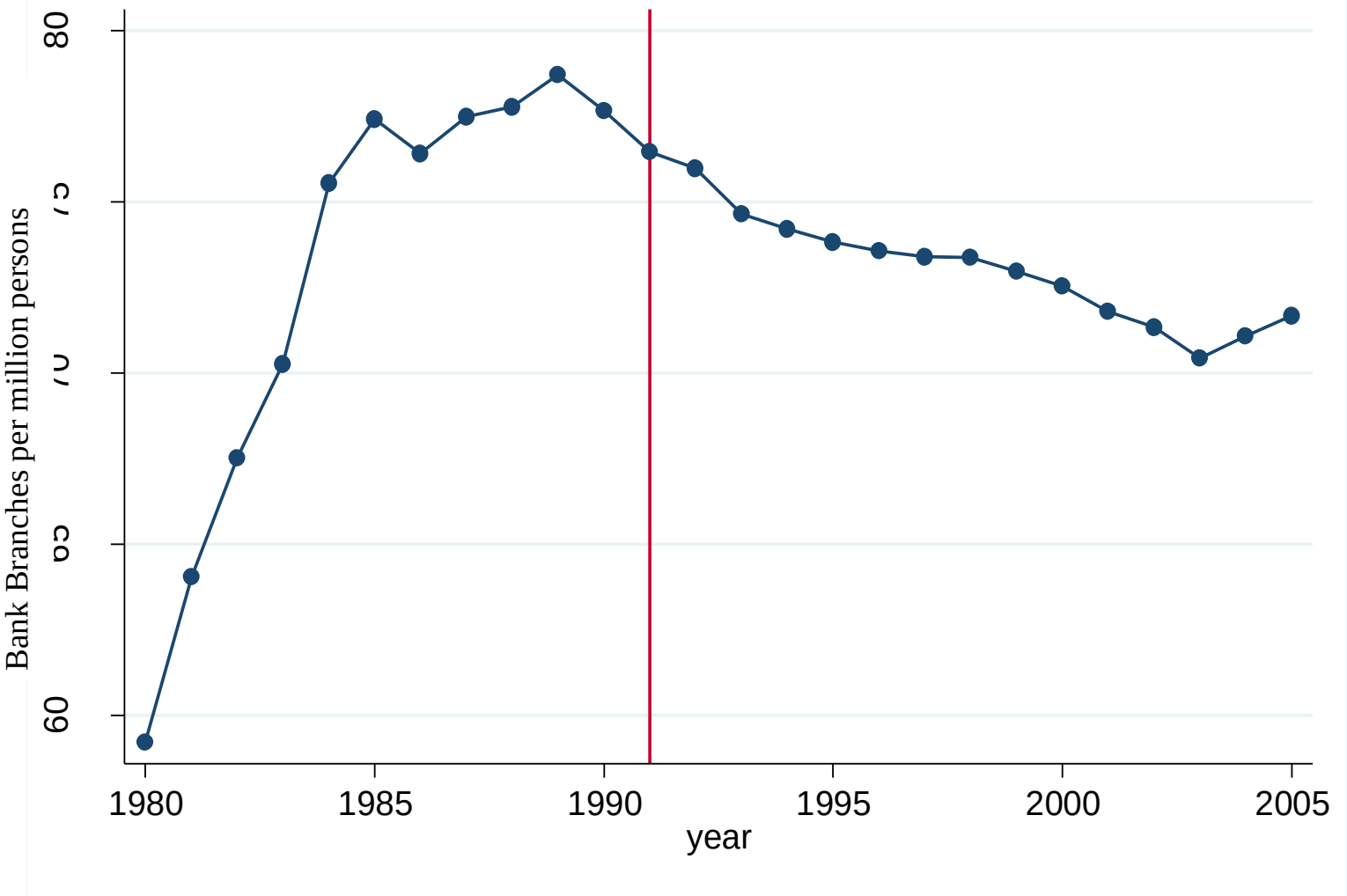


Figure 4- English newspaper circulation.
This figure shows the variation in English newspaper circulation per 1000 persons in 1991 across the different states of India. The definitions and sources of all variables are in the appendix.

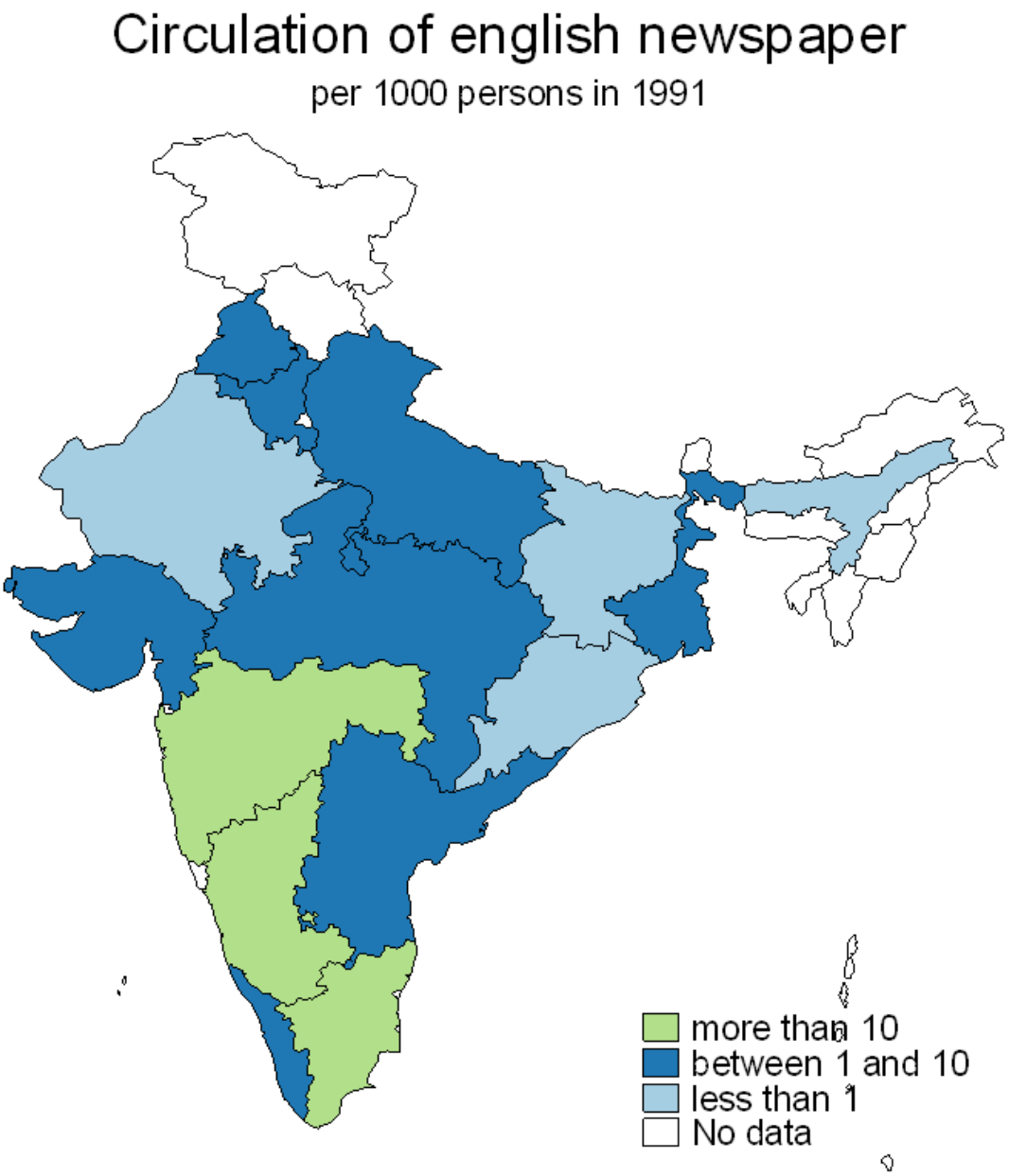


Figure 5- Bank Credit and English newspaper circulation.

This figure shows the effect of English newspaper circulation on Bank Credit. The circles (•) show states that had above the median (=2) English newspaper circulation per 1000 persons. The crosses (x) show the rest of states that had below the median circulation of English newspapers per 1000 persons in 1991. The vertical line represents the starting year (1991) of financial liberalization. Prior to 1991, the fitted lines have slopes 0.0055 and 0.0059 for the below and above median groups, but afterwards the slope of the below median is 0.012 and above median is 0.025. The definitions and sources of all variables are in the appendix.

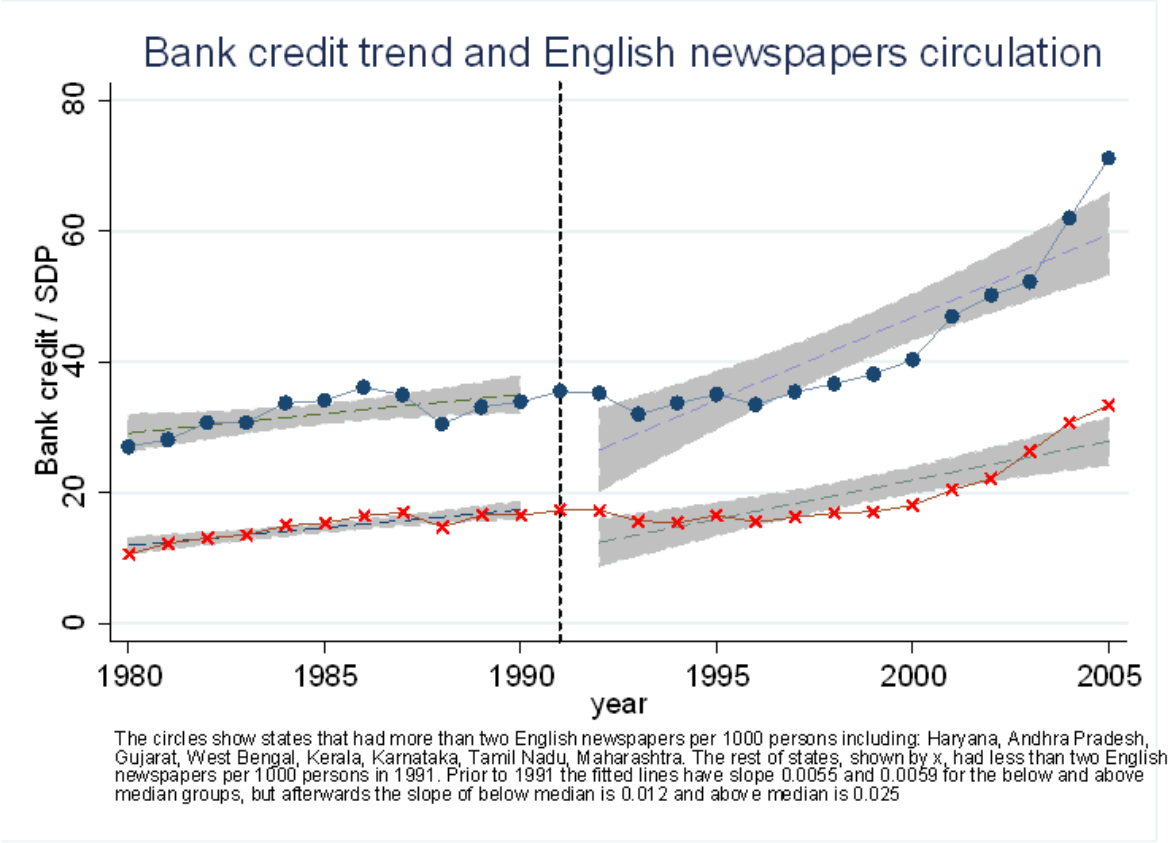


Figure 6- Year effect of initial financial development.

This figure plots the η_k coefficients obtained from the regression, $Branches_{it} = \eta_0 + \eta_1 (B_{i60} \times D_{60}) + \eta_2 (B_{i60} \times D_{61}) + \ldots + \eta_{41} (B_{i60} \times D_{05}) + s_i + y_t + \varepsilon_{it}$ where D_t equals 1 in year t and zero otherwise, B_{i60} is the initial level (in 1960) of financial development as measured by the number of branches per capita in that state, and s_i and y_t are state and year dummies. The definitions and sources of all variables are in the appendix.

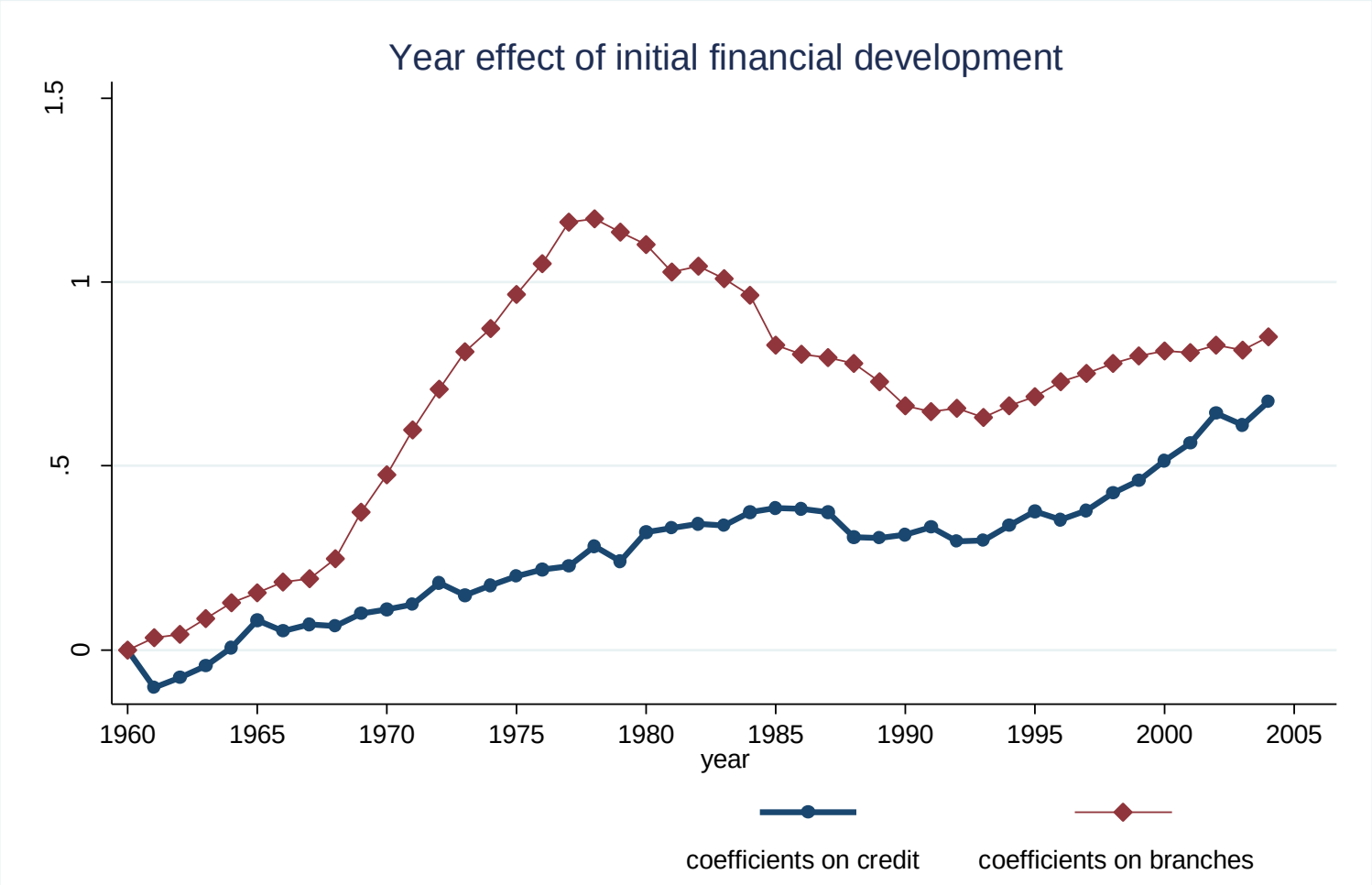


Figure 7- Sectoral credit to SDP

This figure shows the trends in sector-wise credit to SDP. The primary sector consists of agriculture, fishing, forestry, mining and quarrying; the secondary sector is composed of manufacturing, construction, electricity, gas and water; and the tertiary sector is all services including trade, hotels and restaurants, transport, communication, storage, banking, insurance, real estate, ownership of dwelling, business services, public administration, and other services. The definitions and sources of all variables are in the appendix.

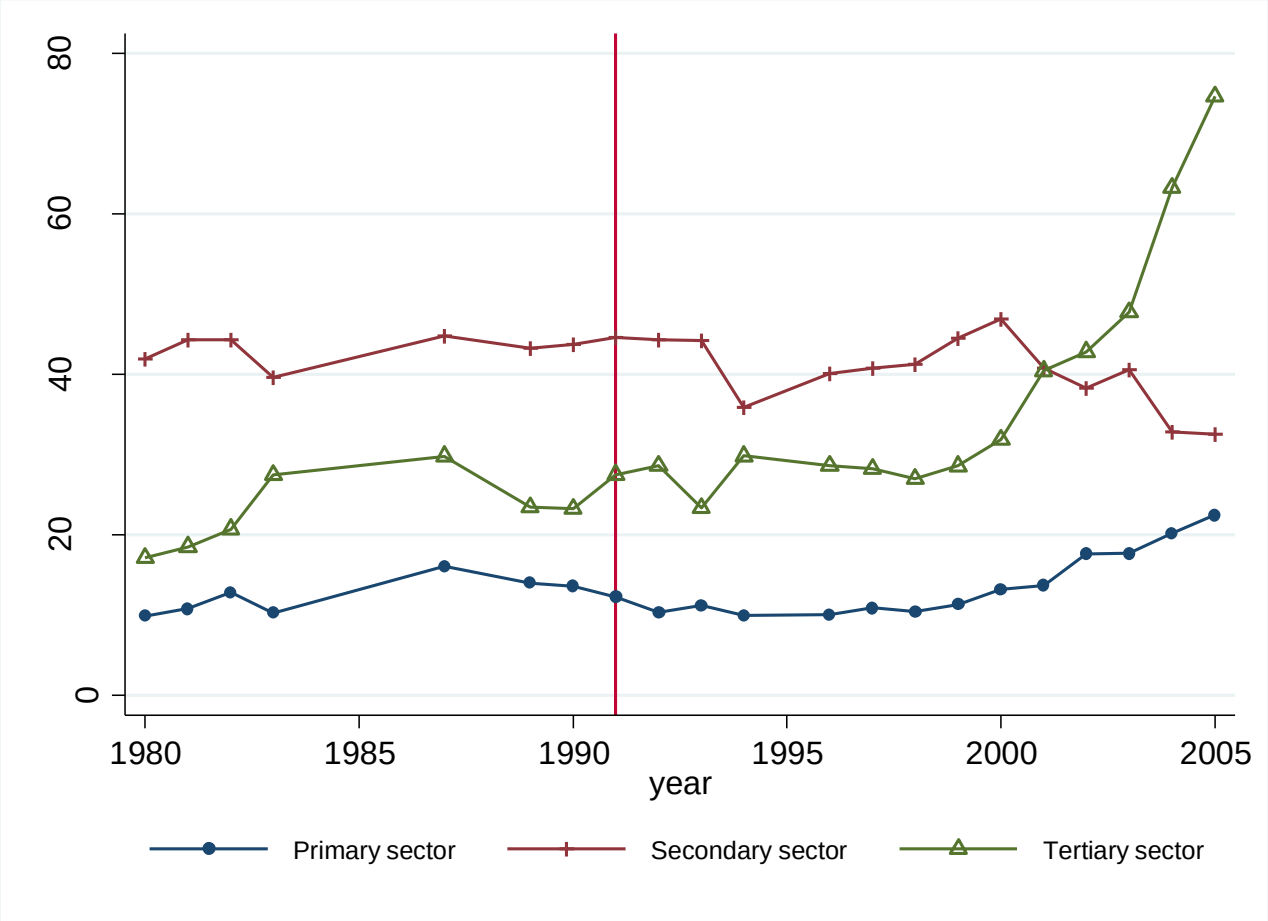


Table 1- Summary statistics

Panel A presents the mean and standard deviation of the main variables across all of India over the period 1983-2005. Three additional standard deviations are measured: *within state* which is standard deviation of ($x_{sy} - m_s$) where m_s is the average value of x in state s over the sample period, *within year* which is the standard deviation of ($x_{sy} - m_y$) where m_y is the average value of x in year y, and *within state and year* which is the standard deviation of ($x_{sy} - m_y - m_s$). Panel B presents the mean and standard deviation (in parentheses) of the main variables in each of the 15 states in India over the period 1983-2005. The definitions and sources of all variables are in the appendix.

Panel A: Across all India

	Rural Headcount	Rural Poverty gap	Urban Headcount	Urban Poverty gap	Credit to SDP	Branch per capita	SDP per capita	Rural population	Government exp./SDP	Literacy rate
Mean	31.935	7.521	25.890	6.515	26.962	74.100	8,781	74.487	19.274	55.981
SD	14.898	4.685	12.076	3.882	14.387	18.732	6,897	8.555	41.173	14.083
SD within state	12.064	3.937	8.647	2.838	7.274	3.832	6,096	1.977	3.362	9.088
SD within year	10.044	3.125	9.423	3.062	13.334	18.515	4,023	8.401	3.611	10.954
SD within state and year	4.946	1.822	4.210	1.535	4.869	2.568	2,404	1.140	2.633	2.061

Panel B: Across Indian States

	Andhra Pradesh	Assam	Bihar	Gujarat	Haryana	Karnataka	Kerala	Madhya Pradesh	Maharashtra	Orissa	Punjab	Rajasthan	Tamil Nadu	Uttar Pradesh	West Bengal
Rural Headcount	25.489	37.410	49.461	29.235	19.889	35.740	24.965	38.587	39.160	35.891	14.115	38.840	33.703	32.820	23.719
	(10.169)	(13.892)	(14.827)	(11.819)	(10.840)	(13.995)	(13.424)	(11.124)	(13.936)	(11.209)	(6.979)	(11.951)	(14.915)	(10.118)	(12.892)
Rural Poverty gap	5.574	7.845	12.567	6.350	4.371	8.917	5.951	9.528	10.223	8.329	2.410	9.975	8.330	7.484	4.956
	(2.574)	(3.408)	(5.712)	(3.383)	(2.739)	(4.777)	(3.804)	(3.980)	(4.960)	(3.789)	(1.465)	(4.805)	(5.319)	(3.324)	(3.980)
Urban Headcount	27.744	11.631	33.704	28.181	14.899	26.261	24.071	37.584	30.906	37.938	9.784	23.467	29.721	32.488	19.964
	(8.015)	(7.455)	(7.844)	(11.755)	(7.185)	(9.684)	(12.890)	(7.603)	(6.878)	(7.650)	(5.781)	(7.970)	(11.647)	(9.052)	(7.732)
Urban Poverty gap	6.814	2.117	8.670	6.448	2.940	7.138	6.306	10.065	8.873	10.624	1.908	5.343	7.761	8.410	4.310
	(2.512)	(1.776)	(3.021)	(3.285)	(1.551)	(3.237)	(4.273)	(3.623)	(2.496)	(2.752)	(1.556)	(2.365)	(3.835)	(3.331)	(2.162)
Credit to SDP	28.984	10.990	15.934	25.078	18.543	38.069	35.525	19.228	58.493	17.923	25.771	19.315	45.914	17.084	27.575
	(4.857)	(2.003)	(4.826)	(3.530)	(2.865)	(8.298)	(6.250)	(6.179)	(20.349)	(5.485)	(4.405)	(5.574)	(10.020)	(2.712)	(2.677)
Branches per capita	70.422	49.558	51.310	79.889	79.081	95.866	106.713	61.144	76.792	63.054	111.961	66.249	81.318	58.230	59.914
	(2.995)	(4.508)	(4.787)	(3.036)	(4.183)	(3.282)	(2.448)	(4.080)	(2.133)	(4.138)	(5.121)	(5.133)	(2.507)	(4.639)	(3.908)
SDP per capita	8601.0	6270.7	3509.6	11316.9	13096.2	9138.8	9001.5	5963.0	13533.7	5665.4	14968.9	6618.9	9873.4	5333.5	8822.3
	(6129.6)	(3465.5)	(1657.3)	(7563.5)	(8837.2)	(6422.1)	(6584.5)	(3400.0)	(8998.7)	(3420.8)	(9647.2)	(4055.4)	(7010.7)	(2949.1)	(6101.7)
Rural population	73.772	88.525	86.911	65.096	74.253	68.308	75.393	76.717	60.626	86.335	69.109	77.303	62.350	80.090	72.514
	(1.157)	(1.013)	(0.276)	(2.095)	(2.581)	(1.831)	(2.295)	(1.536)	(2.511)	(1.090)	(2.429)	(0.724)	(4.635)	(1.000)	(0.499)
Government exp. / SDP	18.932	22.026	22.971	17.702	17.584	19.117	21.789	20.097	15.228	22.119	16.442	21.514	19.439	19.357	14.792
	(1.766)	(5.219)	(7.269)	(2.959)	(3.248)	(0.940)	(2.237)	(3.723)	(1.433)	(3.728)	(3.015)	(3.003)	(1.955)	(3.812)	(1.444)
Literacy rate	47.389	54.360	40.570	60.749	56.388	56.518	86.246	48.314	65.783	51.401	59.165	43.784	63.561	47.050	58.440
	(9.940)	(7.073)	(7.833)	(7.673)	(9.729)	(8.630)	(5.986)	(11.727)	(9.076)	(9.239)	(8.831)	(11.909)	(8.228)	(12.318)	(8.539)

Table 2- Correlation table.

This table presents pair-wise correlation coefficients between the main variables. The definitions and sources of all variables are in the appendix. *, **, and *** shows significance at 10%, 5% and 1% level.

	Rural Headcount	Rural Poverty gap	Urban Headcount	Urban Poverty gap	Credit to SDP	Branches per capita	SDP per capita	Rural population	Government exp. To SDP	Literacy rate
Rural Poverty gap	0.962***									
Urban Headcount	0.714***	0.717***								
Urban Poverty gap	0.693***	0.718***	0.970***							
Credit to SDP	-0.248***	-0.198***	-0.0708	-0.0234						
Branches per capita	-0.314***	-0.239***	-0.187***	-0.142***	0.405***					
SDP per capita	-0.699***	-0.655***	-0.622***	-0.564***	0.487***	0.263***				
Rural population	0.316***	0.247***	0.135**	0.112**	-0.757***	-0.553***	-0.526***			
Government exp./SDP	-0.0823	-0.133**	-0.112**	-0.126**	-0.0921*	-0.206***	0.0395	0.361***		
Literacy rate	-0.547***	-0.543***	-0.447***	-0.400***	0.537***	0.471***	0.660***	-0.467***	0.174***	
Per capita circulation of English newspapers in 1991	0.318	0.288	0.305	0.335	0.842***	0.195	0.469*	-0.663***	-0.369	0.406

Table 3- Finance and Newspaper Circulation

The regression equation estimated is: Credit to SDP (or Branches per capita)$_{it}$= a_0 + β_1Per Capita Circulation of English newspapers in 1991$_i$ + β_2 Per Capita Circulation of Non-English newspapers in 1991$_i$ + β_3 (year-1960) x B60 + β_4(year-1977) x B60 x D77 + β_5 (year-1990) x B60 x D90 + β_6 Log (SDP per capita) $_{it}$+ β_7Literacy Rate$_{it}$ + β_8Government exp./SDP$_{it}$ + β_9Rural population$_{it}$ + s_i + y_t + e_{it}, where D77(90) is dummy for post 1977(1990), B60 is No. bank branches/Mill. capita in 1960, s_i and y_t are state and year dummies. All regressions are estimated by ordinary least squares and with time-variant independent variables all lagged by one period. Standard errors clustered at state and year level are in parentheses. AP-chi2 is Angrist and Pischke (2009) test of weak instruments. Weak ID test is Stock-Yogo weak identification test with critical values: 10% maximal LIML size=4.72 15%=3.39 20%=2.99 25%=2.79. *, **, and *** shows significance at 10%, 5% and 1% level. The definitions and sources of all variables are in the appendix.

	1983-2005				1965-2005			
	(1) Credit to SDP	(2) Branches per capita	(3) Credit to SDP	(4) Branches per capita	(5) Credit to SDP	(6) Branches per capita	(7) Credit to SDP	(8) Branches per capita
Per capita circulation of English newspapers in 1991 x (year-1991) x D91	104.214***	9.516**			97.973***	-6.855		
	(8.846)	(4.826)			(9.486)	(7.777)		
Per capita circulation of Non-English newspapers in 1991 x (year-1991) x D91			0.101	0.027**			0.092	0.056**
			(0.065)	(0.013)			(0.064)	(0.027)
(year-1960) x B60					0.066***	0.272***	0.065***	0.271***
					(0.013)	(0.064)	(0.017)	(0.064)
(year-1977) x B60 x D77	-0.020	-0.139***	-0.041	-0.142***	-0.065***	-0.389***	-0.073**	-0.389***
	(0.019)	(0.023)	(0.031)	(0.023)	(0.017)	(0.061)	(0.029)	(0.062)
(year-1990) x B60 x D90	0.064*	0.144***	0.061	0.137***	-0.012	0.132***	-0.015	0.113***
	(0.033)	(0.027)	(0.064)	(0.024)	(0.027)	(0.017)	(0.051)	(0.017)
Constant	133.265***	1.400	260.657***	20.555	197.535***	11.396	298.293***	12.440
	(46.601)	(43.077)	(87.746)	(45.197)	(64.468)	(63.233)	(90.648)	(60.980)
Observations	345	345	345	345	597	597	597	597
R-squared	0.962	0.992	0.915	0.992	0.956	0.982	0.926	0.983
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
AP-chi2	169.388	44.400	4.204	43.493	160.092	245.911	2.073	155.457
P-value	0.000	0.000	0.122	0.000	0.000	0.000	0.355	0.000
Weak ID test	74.336	74.336	15.955	15.955	134.912	134.912	13.067	13.067

Table 4- Finance and Poverty: OLS estimations

The regression equation estimated is: $Poverty_{it} = a_0 + \beta_1 Credit\ to\ SDP_{it} + \beta_2 Branches\ per\ capita_{it} + \beta_6\ Log\ (SDP\ per\ capita)_{it} + \beta_7 Literacy\ rate_{it} + \beta_8 Government\ exp./SDP_{it} + \beta_9 Rural\ population_{it} + s_i + y_t + eit$ where s_i and y_t are state and year dummies. Poverty is one of four measures – Rural Headcount, Urban Headcount, Rural Poverty gap, and Urban Poverty gap. All explanatory variables are entered with one year lag. All regressions are estimated by ordinary least squares and with time-variant independent variables all lagged by one period. Standard errors clustered at state and year level are in parentheses. The definitions and sources of all variables are in the appendix. *, **, and *** shows significance at 10%, 5% and 1% level.

	Including rural population				Excluding rural population			
	(1) Rural Headcount	(2) Rural Poverty gap	(3) Urban Headcount	(4) Urban Poverty gap	(5) Rural Headcount	(6) Rural Poverty gap	(7) Urban Headcount	(8) Urban Poverty gap
Lag of Credit to SDP	-0.082	-0.081***	0.034	-0.010	-0.103**	-0.074***	-0.032	-0.028
	(0.051)	(0.029)	(0.061)	(0.025)	(0.047)	(0.028)	(0.073)	(0.027)
Lag of Branches per capita	-0.220	-0.070	-0.129	-0.053	-0.186	-0.081	-0.018	-0.021
	(0.182)	(0.100)	(0.110)	(0.042)	(0.211)	(0.105)	(0.127)	(0.057)
lag of Log(SDP per capita)	-0.664	0.082	-7.075	-2.015	-1.589	0.386	-10.049**	-2.859*
	(5.395)	(3.575)	(4.782)	(1.489)	(6.195)	(3.783)	(5.022)	(1.660)
lag of Literacy rate	0.309***	-0.014	0.344	0.061	0.330***	-0.021	0.410*	0.079
	(0.105)	(0.114)	(0.244)	(0.092)	(0.117)	(0.120)	(0.233)	(0.088)
lag of Rural population	0.243	-0.080	0.781**	0.222				
	(0.507)	(0.219)	(0.370)	(0.152)				
lag of Government exp./SDP	-0.048	-0.007	-0.269**	-0.093**	-0.034	-0.011	-0.225*	-0.081**
	(0.180)	(0.075)	(0.121)	(0.042)	(0.174)	(0.072)	(0.122)	(0.041)
Constant	33.430	24.142	32.318	11.982	56.458	16.567	106.301***	32.976***
	(52.666)	(33.875)	(48.542)	(16.350)	(45.732)	(32.223)	(38.974)	(11.558)
Observations	345	345	345	345	345	345	345	345
R-squared	0.896	0.857	0.894	0.855	0.896	0.857	0.890	0.852
Fixed effects	YES	YES	YES	YES	YES	YES	YES	YES

Table 5- Finance and Poverty: Instrumental Variable results

This table presents the second stage of instrumental variable regressions estimated by LIML method. The regression equation estimated is: $Poverty_{it} = a_0 + \beta_1$Instrumented value of Credit to $SDP_{it} + \beta_2$ Instrumented value of Branches per $capita_{it} + \beta_3$ Log (SDP per capita) $_{it} + \beta_4$Literacy $rate_{it} + \beta_5$Government exp./$SDP_{it} + \beta_6$Rural $population_{it} + s_i + y_t$ + eit where s_i and y_t are state and year dummies. Poverty is one of four measures – Rural headcount, Urban headcount, Rural poverty gap, and Urban poverty gap. The instrumented values are obtained from first stage regressions in Table 3. All independent variables are lagged by one period. Standard errors clustered at state and year level are in parentheses. The definitions and sources of all variables are in the appendix. The OID test is the Hansen J statistic over-identification test of all instruments. *, **, and *** shows significance at 10%, 5% and 1% level.

	1983-2005				1965-2005	
	(1)	(2)	(3)	(4)	(5)	(6)
	Rural Headcount	Rural Poverty gap	Urban Headcount	Urban Poverty gap	Rural Headcount	Rural Poverty gap
lag of Credit to SDP	-0.176**	-0.111***	0.013	-0.025	-0.402**	-0.178**
	(0.084)	(0.039)	(0.100)	(0.036)	(0.174)	(0.081)
lag of Branches per capita	-0.273	-0.107	-0.045	0.008	-0.310***	-0.118**
	(0.198)	(0.096)	(0.144)	(0.089)	(0.083)	(0.055)
Observations	345	345	345	345	597	597
Fixed effects	YES	YES	YES	YES	YES	YES
OID test	0.932	0.326	0.610	0.075	1.227	0.981
OID P-value	0.334	0.568	0.435	0.785	0.268	0.322

Table 6- Entrepreneurship channel

This table presents the second stage of instrumental variable regressions estimated by LIML method. The regression equation estimated is: Rural $Poverty_{it} = a_0 + \beta_1$Instrumented value of Credit to $SDP_{it} + \beta_2$ Log (SDP per capita) $_{it} + \beta_3$Literacy $rate_{it} + \beta_4$Government exp./$SDP_{it} + \beta_5$Rural $population_{it} + s_i + y_t + e_{it}$ where s_i and y_t are state and year dummies. Rural Poverty is one of two measures – Rural headcount and Rural poverty gap in each of 5 categories of rural household employment type: (i) self-employed in agriculture, (ii) self-employed in non-agriculture, (iii) agricultural labor, (iv) other labor and (v) others, a residual group that comprises economically non-active population not fitting in the above categories. All explanatory variables are entered with one year lag. The definitions and sources of all variables are in the appendix. Weak ID test is Stock-Yogo weak identification test with critical values: 10% maximal LIML size=4.72 15%=3.39 20%=2.99 25%=2.79. *, **, and *** shows significance at 10%, 5% and 1% level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	rural & self-employed in non-agriculture		rural & self-employed in agriculture		rural & agricultural labor		rural & other labor		rural & others	
	Headcount	Poverty gap	Headcount	Poverty gap	Headcount	Poverty gap	Headcount	Poverty gap	Headcount	Poverty gap
Lag of Credit to SDP	-0.226*	-0.120***	-0.436***	-0.211***	-0.143	-0.096	-0.046	-0.033	0.156	0.023
	(0.120)	(0.035)	(0.167)	(0.065)	(0.116)	(0.075)	(0.095)	(0.035)	(0.108)	(0.058)
Observations	299	298	294	297	298	299	297	298	296	297
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Weak ID test	427.372	427.560	443.976	446.658	446.546	450.719	447.204	449.689	442.968	420.545

Table 7- Education channel

This table presents the second stage of instrumental variable regressions estimated by LIML method. The regression equation estimated is: $Education_{it} = a_0 + \beta_1$Instrumented value of Credit to $SDP_{it} + \beta_2$ Log (SDP per capita) $_{it} + \beta_3$Literacy $rate_{it} + \beta_4$Government exp./$SDP_{it} + \beta_5$Rural $population_{it} + s_i + y_t + e_{it}$ where s_i and y_t are state and year dummies. Education is the education segment of the rural population and is one of four variables – proportion of illiterates, proportion of population with primary education, proportion of population with middle school education, and proportion of population with high school degree or higher. All explanatory variables are entered with one year lag unless specified otherwise. The definitions and sources of all variables are in the appendix. Weak ID test is Stock-Yogo weak identification test with critical values: 10% maximal LIML size=4.72 15%=3.39 20%=2.99 25%=2.79. *, **, and *** shows significance at 10%, 5% and 1% level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Proportion of illiterates (%)			Proportion of up to primary (%)			Proportion of middle school (%)			Proportion of High school & above (%)		
lag of Credit to SDP	0.085**			-0.061*			0.019			-0.056		
	(0.040)			(0.031)			(0.025)			(0.048)		
5 years lag of Credit to SDP		0.382***			-0.025			-0.023			-0.261***	
		(0.071)			(0.139)			(0.099)			(0.060)	
10 years lag of Credit to SDP			-0.193			0.077			-0.195**			0.288
			(0.225)			(0.202)			(0.077)			(0.277)
Observations	285	285	285	285	285	285	285	285	285	285	285	285
Control	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
WeakID test	456.701	93.259	18.531	456.701	93.259	18.531	456.701	93.259	18.531	456.701	93.259	18.531

Table 8- Financial deepening and migration

Panel A presents summary statistics of the migration variables. All variables are in percentage terms. Standard errors are computed similar to panel A of Table 1. Panel B presents second stage of instrumental variables estimated by LIML method. The regression equation is Migration rate/Intra-state migration/Inter-state $migration_{it}$ = β_1Instrumented value of Credit to SDP_{it} + β_2 Log (SDP per capita) $_{it}$ + β_3Literacy $rate_{it}$ + β_4Government exp./SDP_{it} + β_5Rural $population_{it}$ + s_i + y_t + e_{it} where s_i and y_t are state and year dummies. All explanatory variables are entered with one year lag. The definitions and sources of all variables are in the appendix. Weak ID test is Stock-Yogo weak identification test with critical values: 10% maximal LIML size=4.72 15%=3.39 20%=2.99 25%=2.79. *, **, and *** shows significance at 10%, 5% and 1% level

Panel A: Summary Statistics of migration variables

	Migration rate	Intra-state	Inter-state	Migration from rural to rural	Migration from rural to urban	Migration from urban to rural	Migration from urban to urban	Migration to primary	Migration to secondary	Migration to tertiary
Mean	1.373	1.093	0.292	0.363	0.490	0.147	0.401	0.219	0.257	0.517
SD	0.669	0.592	0.241	0.224	0.271	0.103	0.229	0.135	0.198	0.317
SD within state	0.529	0.445	0.150	0.167	0.224	0.0890	0.183	0.110	0.157	0.270
SD within year	0.508	0.477	0.224	0.193	0.217	0.0890	0.187	0.118	0.160	0.223
SD within state and year	0.300	0.273	0.120	0.121	0.159	0.0710	0.125	0.0870	0.106	0.149

Panel B: IV results

	(1)	(2)	(3)
	Migration rate (%)	Intrastate (%)	Interstate (%)
lag of Credit to SDP	0.002	-0.004	0.006***
	(0.003)	(0.003)	(0.002)
Observations	345	344	330
Control	YES	YES	YES
Fixed Effects	YES	YES	YES
Weak ID test	442.121	439.732	420.446

Table 9- Financial deepening and inter-state migration, sequential logit estimation.

This table presents sequential logit regressions for inter-state immigrants. The regression equation is $Y_{k,i,t} = \beta_1 \text{Diff [Credit to SDP}_{i,t}] + \beta_2 \text{Diff[Log (SDP per capita)}_{it}] + \beta_3 \text{Diff[Literacy rate}_{it}] + \beta_4 \text{Diff[Government exp./SDP}_{it}] + \beta_5 \text{Diff[Rural population}_{it}] + s_i + y_t + e_{it}$ where s_i and y_t are state and year dummies. Y is a vector of dummy variables taking on value one if household *k* migrates to an urban area, into the primary, secondary and tertiary sector. Column 1 presents a logit regressions, columns (2) to (4) and columns (5) to (7) present multinominal regressions. Diff indicates the difference between destination and origin (= destination - origin). All explanatory variables are entered with one year lag. The definitions and sources of all variables are in the appendix. The reported coefficients are marginal effects and multiplied by 100 for better illustration. The definitions and sources of all variables are in the appendix. *, **, and *** shows significance at 10%, 5% and 1% level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	urban after migration	rural after migration			urban after migration		
		Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
Lag of difference in Credit to SDP	0.003	0.178***	-0.089*	-0.088*	-0.040	-0.211***	0.252***
	(0.029)	(0.061)	(0.046)	(0.049)	(0.027)	(0.045)	(0.046)
Lag of difference in SDP per capita	11.152***	-3.455	5.059**	-1.604	2.479**	18.072***	-20.551***
	(1.196)	(2.713)	(2.044)	(2.230)	(1.164)	(2.044)	(2.108)
Lag of difference in Literacy Rate	-0.112***	-0.240***	0.046	0.193***	0.017	-0.126***	0.109**
	(0.028)	(0.060)	(0.046)	(0.048)	(0.028)	(0.047)	(0.048)
Lag of difference in Rural population	-0.893***	0.286**	-0.174*	-0.112	0.099	-0.132	0.033
	(0.062)	(0.136)	(0.104)	(0.111)	(0.061)	(0.107)	(0.109)
Lag of difference in Government expenditures/SDP	0.296***	0.395*	-0.089	-0.306*	0.145	0.587***	-0.732***
	(0.091)	(0.213)	(0.159)	(0.174)	(0.090)	(0.156)	(0.161)
Monthly per capita expenditure	0.07317***	-4.406***	0.659	3.747***	-3.309***	0.055	3.254***
	(0.417)	(0.953)	(0.695)	(0.683)	(0.454)	(0.519)	(0.543)
Household size	-2.593***	2.282***	-1.288***	-0.994***	0.808***	-1.522***	0.714***
	(0.090)	(0.239)	(0.194)	(0.201)	(0.106)	(0.216)	(0.217)
rural=0/urban=1 before migration	17.906***	-11.723***	3.846***	7.877***	-2.822***	-6.394***	9.216***
	(0.547)	(1.312)	(1.013)	(1.082)	(0.605)	(1.047)	(1.054)
Observations	28549	5419	5419	5419	11061	11061	11061

Table 10–Financial deepening and reasons for inter-state migration

This table presents multinomial logit estimation for households with inter-state migration. The regression equation is $Y_{k,i,t} = \beta_1 \text{Diff [Credit to SDP}_{i,t}] + \beta_2 \text{Diff[Log (SDP per capita)}_{it}] + \beta_3 \text{Diff[Literacy rate}_{it}] + \beta_4 \text{Diff[Government exp./SDP}_{it}] + \beta_5 \text{Diff[Rural population}_{it}] + s_i + y_t + e_{it}$ where s_i and y_t are state and year dummies. Y is one of eight reasons for migration. The reported coefficients are marginal effects and multiplied by 100 for better illustration. Diff indicates the difference between destination and origin (= destination - origin). All explanatory variables are entered with one year lag. The definitions and sources of all variables are in the appendix. *, **, and *** shows significance at 10%, 5%, and 1% level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	search for employment	search for better employment	under transfer	studies	marriage	parents migration	political problems	others
lag of Difference in Credit to SDP	0.081***	-0.141***	0.039**	0.009	-0.023	0.054***	-0.012*	-0.007
	(0.022)	(0.027)	(0.015)	(0.008)	(0.029)	(0.010)	(0.007)	(0.018)
lag of Difference in SDP per capita	12.648***	13.404***	-5.071***	-2.134***	-10.358***	-0.319	-1.695***	-6.474***
	(0.921)	(1.103)	(0.665)	(0.359)	(1.218)	(0.466)	(0.330)	(0.795)
lag of Difference in Literacy rate	-0.130***	0.018	0.035**	-0.007	-0.138***	0.015	0.014**	0.194***
	(0.022)	(0.026)	(0.014)	(0.007)	(0.028)	(0.011)	(0.007)	(0.017)
lag of Difference in Rural population	-0.257***	-0.114*	0.014	-0.041**	-0.015	0.030	-0.021	0.404***
	(0.050)	(0.060)	(0.033)	(0.017)	(0.063)	(0.023)	(0.016)	(0.040)
lag of Difference in Government expenditures/SDP	0.833***	0.211**	-0.246***	-0.109***	-1.118***	0.152***	0.021	0.255***
	(0.071)	(0.084)	(0.050)	(0.026)	(0.092)	(0.036)	(0.025)	(0.061)
Monthly per capita expenditure	-0.551**	0.516	3.162***	0.670***	-4.720***	0.404***	-0.149	0.668***
	(0.277)	(0.324)	(0.131)	(0.057)	(0.400)	(0.125)	(0.108)	(0.226)
Household size	-2.816***	-2.605***	-0.143**	-0.544***	5.474***	0.098**	0.081***	0.455***
	(0.101)	(0.111)	(0.061)	(0.049)	(0.093)	(0.038)	(0.024)	(0.061)
Observations	28455	28455	28455	28455	28455	28455	28455	28455

Table 11- Sector-wise financial development.

The regression equation estimated is: Primary/Secondary/Tertiary Credit to SDP_{it}= a_0 + β_1Per Capita Circulation of English newspapers in 1991_i +β_2 (year-1960) x B60 + β_3(year-1977) x B60 x D77 + β_4 (year-1990) x B60 x D90 + β_5 Log (SDP per capita) $_{it}$+ β_6Literacy$Rate_{it}$ + β_7Government exp./SDP_{it} + β_8Rural $population_{it}$ + s_i + y_t + e_{it}, where D77(90) is dummy for post 1977(1990), B60 is No. bank branches/Mill. capita in 1960, s_i and y_t are state and year dummies. All regressions are estimated by ordinary least squares and with time-variant independent variables all lagged by one period. Standard errors clustered at state and year level are in parentheses. AP-chi2 is Angrist and Pischke (2009) test of weak instruments. Weak ID test is Stock-Yogo weak identification test with critical values: 10% maximal LIML size=4.72 15%=3.39 20%=2.99 25%=2.79. *, **, and *** shows significance at 10%, 5% and 1% level. The definitions and sources of all variables are in the appendix.

	(1) Credit/SDP -Primary sector	(2) Credit/SDP -Secondary sector	(3) Credit/SDP -Tertiary sector
Percapita circulation of english newspapers in 1991 x (year-1991) x D92	8.425	0.152	156.396***
	(7.657)	(27.025)	(28.891)
(year-1977) x B60 x D77	-0.075**	0.008	-0.011
	(0.034)	(0.066)	(0.044)
(year-1990) x B60 x D90	0.142***	0.011	0.067
	(0.046)	(0.092)	(0.060)
Constant	104.724**	236.989*	110.347
	(44.591)	(138.616)	(96.320)
Observations	270	270	270
R-squared	8.425	0.152	156.396***
Control	YES	YES	YES
APchi2	1.085	2.397	74.656
P-value	0.781	0.494	0.000
Weak ID test	1.061	1.701	72.687

Table 12- Poverty and Tertiary sector credit.

This table presents the second stage of instrumental variable regressions estimated by LIML method. The regression equation estimated is: $Poverty_{it} = a_0 + \beta_1$Instrumented value of Tertiary Credit to $SDP_{it} + \beta_2$ Instrumented value of Branches per $capita_{it} + \beta_3$ Log (SDP per capita) $_{it} + \beta_4$Literacy $rate_{it} + \beta_5$Government exp./$SDP_{it} + \beta_6$Rural $population_{it} + s_i + y_t$ + eit where s_i and y_t are state and year dummies. Poverty is one of four measures – Rural headcount, Urban headcount, Rural poverty gap, and Urban poverty gap. The instrumented values are obtained from first stage regressions in Table 3. All independent variables are lagged by one period. Standard errors clustered at state and year level are in parentheses. The definitions and sources of all variables are in the appendix. The OID test is the Hansen J statistic over-identification test of all instruments.

	(1)	**(2)**	**(3)**	**(4)**
	Rural Headcount	Rural Poverty gap	Urban Headcount	Urban Poverty gap
lag of Tertiary Credit to SDP	-0.147**	-0.083**	-0.008	-0.023
	(0.075)	(0.035)	(0.065)	(0.025)
lag of Branches per capita	-0.159	-0.086	0.043	0.067
	(0.175)	(0.074)	(0.056)	(0.059)
Observations	270	270	270	270
Controls	YES	YES	YES	YES
FixedEffects	YES	YES	YES	YES
OID test	0.624	0.173	0.489	0.092
OID P-value	0.430	0.678	0.484	0.761

Appendix A: Variable Definitions and Source

Variable	Source	Definition
Rural Headcount	Authors' calculation using NSSO surveys + Datt et al (1996)	Proportion of the population below the poverty line in rural areas
Rural Poverty gap		Mean distance of the poor from the poverty line --normalized by poverty line-- in rural areas
Urban Headcount		Proportion of the population below the poverty line in urban areas
Urban Poverty gap		Mean distance of the poor from the poverty line --normalized by poverty line-- in urban areas
Credit to SDP:	Burgess & Pande (2005) + updates from Reserve Bank of India (RBI) (http://dbie.rbi.org.in)	Credit given by scheduled commercial banks over net state domestic product.
Branches per capita	RBI's publications "Directory of Bank Offices" (http://dbie.rbi.org.in)	Number of back branches per million persons.
SDP per capita	LSE Economic Organisation and Public Policy Programme Indian States Database (EOPP) + updates from RBI (http://dbie.rbi.org.in)	Net state domestic product per person.
Rural population	EOPP + updates from Indian census	Share of rural population to total. Constructed using census data from the five censuses for 1961, 1971, 1981, 1991, 2001. Between any two successive censuses, the state-sectoral populations are assumed to grow at a constant rate, derived from the respective census population totals.
Government exp. / SDP	EOPP + updates from RBI (http://dbie.rbi.org.in)	Total state government expenditures over net state domestic product
Literacy rate	EOPP + updates from Indian census	Proportion of persons who can both read and write in any language among population aged 7 years and above. Constructed using census data from the five censuses for 1961, 1971, 1981, 1991, 2001. Between any two successive censuses, the state-sectoral populations are assumed to grow at a constant rate, derived from the respective census population totals.

Per capita circulation of English newspaper in 1991	EOPP	Circulation of English newspaper over total population
Per capita circulation of non-English newspaper in 1991	EOPP	Circulation of non-English newspaper over total population
Credit/SDP -Primary sector	RBI's publications "Basic Statistical Returns of Banks" and "Banking Statistics 1972-2002". (http://dbie.rbi.org.in)	Credit given by scheduled commercial banks to the primary sector over net state domestic product of primary sector (agriculture, fishing, forestry, mining and quarrying). The data is from RBI's online publications *Basic Statistical Returns of Banks* and *Banking Statistics 1972-2002*. The data is on an annual basis under the heading Occupation-wise Classification of Credit, but not available for the full sample period and has some missing value in between. The classification of occupation is different from NSDP, so we divide them to three main groups to construct the depth measures: primary (agriculture, mining and quarrying), secondary (industry excluding mining and quarrying, electricity, gas, and water) and tertiary (the rest minus personal loans).
Credit/SDP -Secondary sector	RBI's publications "Basic Statistical Returns of Banks" and "Banking Statistics 1972-2002" (http://dbie.rbi.org.in)	Credit given by scheduled commercial banks to the secondary sector over net state domestic product of secondary sector (manufacturing, construction, electricity, gas and water). The classification of occupation is different from NSDP, so we divide them to three main groups to construct the depth measures: primary (agriculture, mining and quarrying), secondary (industry excluding mining and quarrying, electricity, gas, and water) and tertiary (the rest minus personal loans).
Credit/SDP -Tertiary sector	RBI's publications "Basic Statistical Returns of Banks" and "Banking Statistics 1972-2002" (http://dbie.rbi.org.in)	Credit given by scheduled commercial banks to the tertiary sector over net state domestic product of tertiary sector (trade, hotels and restaurants, transport, communication, storage, banking, insurance, real estate, ownership of dwelling, business services, public administration, and other services). The classification of occupation is different from NSDP, so we divide them to three main groups to construct the depth measures: primary (agriculture, mining and quarrying), secondary (industry excluding mining and quarrying, electricity, gas, and water) and tertiary (the rest minus personal loans).
Rural & self-employed in non-agriculture HC	Authors' calculation using NSSO surveys	Proportion of the population below the poverty line among self-employed in non-agriculture in rural areas
Rural & self-employed in agriculture HC		Proportion of the population below the poverty line among self-employed in agriculture in rural areas
Rural & agricultural labor HC		Proportion of the population below the poverty line among agricultural labors in rural areas
Rural & other labor HC		Proportion of the population below the poverty line among other labors in rural areas
Rural & other HC		Proportion of the population below the poverty line among non-active population which not fitting in the above four categories in rural areas
Proportion of illiterates	Authors' calculation	Share of illiterates in total population

Proportion of up to primary	using NSSO surveys	Share of literate people who at most have a primary school degree in total population
Proportion of middle school		Share of people who have a middle school degree in total population
Migration rate		Ratio of the number of households that migrated to state *s* in year *t* to the total number of households sampled in state *s*.
Intra-state migration		Ratio of the number of households that migrated to state *s* in year *t from the same states* to the total number of households sampled in state *s*.
Inter-state migration		Ratio of the number of households that migrated to state *s* in year *t from other states* to the total number of households sampled in state *s*.
Migration from rural to rural		Ratio of the number of households that migrated to rural areas of state *s* in year *t from rural areas (either the same state or not)* to the total number of households sampled in state *s*.
Migration from rural to urban		Ratio of the number of households that migrated to urban areas of state *s* in year *t from rural areas (either the same state or not)* to the total number of households sampled in state *s*.
Migration from urban to rural		Ratio of the number of households that migrated to rural areas of state *s* in year *t from urban areas (either the same state or not)* to the total number of households sampled in state *s*.
Migration from urban to urban		Ratio of the number of households that migrated to urban areas of state *s* in year *t from urban areas (either the same state or not)* to the total number of households sampled in state *s*.
Migration to primary		Ratio of the number of households that migrated to primary sector of state *s* in year *t* to the total number of households sampled in state *s*.
Migration to secondary		Ratio of the number of households that migrated to secondary sector of state *s* in year *t* to the total number of households sampled in state *s*.
Migration to tertiary		Ratio of the number of households that migrated to tertiary sector of state *s* in year *t* to the total number of households sampled in state *s*.
Reason for migration	NSSO migration surveys	Reason for migration of immigrants that can be one of the following categories: search for employment, search for better employment, under transfer, studies, marriage, parents migration, political problems, others.
Household size		Number of person in the household
Monthly per capita expenditure		Monthly expenditure of household over household size

Appendix B: Construction of poverty and migration variables

Poverty and **migration** measures are calculated using socioeconomic surveys of India. The National Sample Survey Office or NSSO is the largest organization in India conducting regular socio-economic surveys. The schedule 1.0 of each round is a survey of household consumer expenditures which has been carried out in India since 1950s. However, prior to 1990s, they were not evenly spaced and sampled. The "thick" (large-sample) rounds are conducted about every five years and some "thin" rounds are in between. Datt et al. (1996) provides the time series of state-wise poverty and inequality measures from 1951- 1992. Since 1986, NSSO has started to conducts "thin" surveys on an annual basis and thick surveys every five years. We obtain the data of 20 rounds (38, 43, and 45 to 62) and among them; the thick surveys are 38th, 43th, 50th, 55th, and 61th rounds. For the missing years, we make use of Datt et al. (1996) data[24]. Also, to be consistent with them, we use the same poverty line, which is recommended by the Planning Commission in 1993 and adjusted for other years using price indices (for details, see notes of Datt et al, 1996).

Round	Time span	Round	Time span	Round	Time span	Round	Time span
38	**1983**	48	Jan-Dec1992	53	Jan-Dec1997	58	July-Dec2002
43	**July87-June88**	49	Jan-June1993	54	Jan-June1998	59	Jan-Dec2003
45	July89-June90	**50**	**July93-June94**	**55**	**July99-June2000**	60	Jan-June2004
46	July90-June91	51	July94-June95	56	july2000-june01	**61**	**July04-June05**
47	July-Dec1991	52	July95-June96	57	July2001-June02	62	July05-June06

The NSSO's household expenditure survey has a variety of data at household level. It provides information on expenditure patterns, employment (self-employed, labor, etc.), education, occupation, and some other characteristics of households and individuals which enable us to compute a variety of within group measures. It covers all Indian states and follows

[24] The data is available at: http://go.worldbank.org/YMRH2NT5V0

the Indian Census definition of urban and rural areas. To be classified urban, an area needs to meet several criteria regarding size and density of the population, and the share of male working population engaged in non-agricultural pursuits. However, the surveys are not quite the same and to make comparable indices over time, we make two adjustments: one for a methodology change and the other for seasonal effects.

There was a change in recall period of surveys in 51th to 54th rounds. Until the round 50 and after the round 55 food, tobacco and intoxicant items were asked and reported by a 30-day recall period, but in the rounds 51 to 54 two sub-samples are defined: one with 30-day and the other with 7-day recall period for those items[25]. Deaton (2003) and Tarozzi (2007) show that there is an upward bias in total expenditures when the recall period is shorter. To achieve comparability, he suggests using the goods with unchanging recall period to find the true distribution of total expenditures. With plausible assumptions, Tarozzi (2007) shows that if τ represents survey type, and v is the bundle of goods that have the same recall period, the distributions of income y in the two sub-samples have the following relation

$$f(y|\tau = 1) = f(y|\tau = 0) \times E\left[\frac{P(\tau = 1 \mid v)P(\tau = 0)}{P(\tau = 0 \mid v)P(\tau = 1)}\middle| y, \tau = 0\right]$$

Where $P(\tau \mid v)$ is estimated by a logit regression. Using this approach, we impute the correct poverty measures of the rounds 51 to 54.

The second adjustment is done for removing seasonal bias. Table 1 shows that the surveys are not distributed evenly across time. Moreover, most rounds are conducted in two adjacent years. Therefore, estimating each survey separately poses two problems: First, it is not

[25] In the round 55 these items were asked with both of the recall periods independently and we used the 30-day data.

for one exact year, but the rest of variables in the paper are year-specific. Second, some surveys do not cover four seasons (like rounds 47), so the expenditures have a seasonal bias in them. To control for these problems, we estimate the indices for each season (sub-round) and then average them over each specific year. Before 1987, we just have data of 1983, but after 1987 the missing points are fewer (14 of 78), so we interpolate seasonal data after 1987 using Cubic Spline method. This method is a common way to impute high-frequency data from low-frequency (like seasonal from annual). If we have *n* point and *n-1* space in between, this method assigns a cubic polynomial for each space to connect the two points and forces all first and second derivatives to be continuous at margins.

The **migration** surveys has been conducted in 5 rounds by NSSO since 1980 including 1983 (round 38, schedule 10), 1987-88 (round 43, schedule 10), 1993 (round 49, schedule 1.2), 1999-2000 (round 55, schedule 10), 2007-08 (round 64, schedule 10.2). Using these surveys the migration measures are estimated.