Finance, Law and Poverty: Evidence from India

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Abstract: Using state-level data from India over the period 1983 to 2005, this paper shows a strong negative relationship between financial depth (as measured by credit volume) and rural poverty. Instrumental variable regressions suggest that this relationship is robust to endogeneity biases. Furthermore, financial deepening has a bigger impact on rural poverty alleviation than outreach (as measured by branch penetration). We find suggestive evidence that financial deepening reduced poverty rates especially among self-employed in the rural areas and also 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. Our findings suggest that financial deepening contributed to poverty alleviation in rural areas by fostering entrepreneurship and inducing geographic-sectoral migration.

Keywords: Financial Liberalization, Economic Development, Poverty Alleviation, Entrepreneurship, Migration, India
JEL codes: G21, G28, O15, O16

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1. Introduction

Finance as a fundamental driver of economic growth, especially in middle income countries, has been largely accepted after several decades of research in this area.[1] The debate today has shifted to the multifaceted nature of financial development, specifically on the role of financial depth versus outreach. While financial deepening has accelerated in emerging markets, it has not always been accompanied by increased use of financial services (World Bank, 2014). Previous empirical evidence has shown that financial deepening fosters economic growth and reduces income inequality (Beck, Levine, and Levkov; 2010, Bruhn and Love, 2014) but the effects of financial outreach are less understood, even as financial inclusion is being adopted as a top development priority by policymakers worldwide.[2]

This paper contributes to a better understanding of the role of financial outreach versus depth by using annual household survey data from India over the period 1983 to 2005. Specifically, using geographic (state-level) and time variation in commercial bank credit to State GDP as proxy for financial depth and bank branch penetration as proxy for financial outreach, we find that it is depth rather than outreach that is more robustly linked to a reduction in rural (but not urban) poverty over this specific period. Exploring the mechanisms and channel, we offer suggestive evidence that financial depth helped reduce rural poverty both through higher entrepreneurship and inter-state migration into employment in the tertiary sector.

There are two novel components to our empirical design. First, India offers the perfect landscape to examine these issues because it has a long history of implementing policies targeting financial outreach and has recently become the poster child for financial inclusion

[1] See Levine (2005) for a review.

[2] Financial depth refers to the overall provision of financial services (such as credit) in the economy, while financial outreach refers to the ease with which firms and households can gain access to such financial services. While generally deeper financial systems offer greater access, the relation is far from perfect (World Bank, 2008). We discuss this distinction in detail in the data section.

with the Prime Minister making a bank account for each household a national priority.[3] Furthermore there is large sub-national variation in socio-economic and institutional development, and significant policy changes over the sample period (Besley, Burgess and Esteve-Volart, 2007), including in the legal framework underpinning bank lending (Visaria, 2009). 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.

Second, we incorporate the policy changes in our empirical design to address endogeneity concerns. First, 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. Second, we use increases in judicial efficiency of Indian courts following the establishment of Debt Recovery Tribunals (DRTs) in India that provide exogenous and staggered changes in enforcement costs across states and time as an instrument for financial depth. [4] This follows earlier work by Visaria (2009) and others who study the impact of DRT on corporate outcomes as well as a large law and finance literature (e.g. La Porta et al. 1998) showing the impact of contract enforcement costs on overall financial development.

[3] On August 28, 2014, the Prime Minister of India launched *Jan Dhan Yojana*, a national campaign for financial inclusion under which 18 million bank accounts were opened during the first week alone. See Agarwal et al. (2017) for an early assessment.

[4] The Government of India (GoI) passed a national law in 1993 to establish DRTs across the country to help Indian banks recover bad loans, where banks and financial institutions could file suits against defaulted borrowers. Once the DRTs were set up in five states by 1994, the process was halted by a legal challenge to the law and then resumed two years later in 1996 upon a favorable ruling from the Supreme Court of India. By 2000, all Indian states had access to a DRT. However, there is wide variation in the use of DRT across different regions. Hence, since we are focused on the efficiency gain (in the form of quicker resolution of contractual disputes and lower enforcement costs) from the implementation of DRT, our specific instrument is constructed by interacting a post-DRT establishment dummy with the demand for cases in these courts.

We find that financial depth is negatively and significantly associated with rural poverty in India over the period 1983-2005. This relationship is robust to using different measures of rural poverty, controlling for time-varying state characteristics, and state and year fixed effects. We find no significant relationship of financial depth with urban poverty rates. The relationship of financial depth with rural poverty reduction is also economically meaningful. One standard deviation in Credit to SDP (within-state, within-year) explains 17 percent of the demeaned variation in the proportion of the population below the poverty line (Headcount ratio). We also find that over the time period 1983-2005, financial depth has a more significant relationship with poverty reduction than financial outreach. Our measure of financial outreach, branches per capita, has a negative but insignificant relationship with rural poverty over this period (though it is significant over the period 1960 to 2005, in line with Burgess and Pande, 2005, but even there branch penetration has less than half the explanatory power as financial depth).[5]

Our micro-data also allow us to explore different channels identified by theory through which financial development lowers rural poverty. On the one hand, better access to credit enables the poor to pull themselves out of poverty by investing in their human capital and microenterprises, thus reducing aggregate poverty (e.g. Banerjee and Newman, 1993). These theories have also been behind the microfinance movement (Hermes and Lensink, 2007). 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. Thus, there could be indirect general equilibrium effects that explain the effect of financial depth on poverty. We find suggestive evidence for the entrepreneurship

[5] When we decompose branch penetration over time into rural versus urban areas, the effect of the rural branching policy before and after 1989 is clearly visible. After 1990, the expansion of branches seems to have taken place largely in urban areas only. In regression estimations, over the time period 1983-2005, we find a weakly significant relationship between rural branches per capita and rural poverty in the ordinary least squares (OLS) estimations but this does not survive instrumental variable estimations to address causality issues.

channel, as the poverty-reducing effect of financial deepening falls primarily on self-employed in rural areas. We also identify migration from rural to urban areas as a potentially important channel through which financial depth reduces rural poverty. In particular, there is inter-state migration of workers for employment reasons towards financially more developed states, suggesting that poorer population segments in rural areas migrated to urban areas. This finding is also consistent with our instrumental variable strategy based on the introduction of Debt Recovery Tribunals for larger loans, thus capturing the effect of financial efficiency rather than inclusion. The rural primary and tertiary urban sectors 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.[6]

Our finding that financial depth is more robustly associated with rural poverty reduction than outreach has important policy implications. As pointed out by several studies including Panagriya (2006), the returns to increased density of bank branches are bound to diminish rapidly since after a point, new branches would get business only by taking away customers from the existing branches and raising costs without yielding extra poverty reduction. Our paper shows that financial deepening has a strong and persistent effect on poverty reduction.

This paper contributes to the recent literature on the role of financial sector development in poverty reduction. Theory makes contradictory predictions about which income group should benefit most from financial sector deepening. 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

[6] This finding is also consistent with Arnold et al. (2016) who find that following liberalization of the services sector in India, a more efficient services sector has increased productivity in manufacturing.

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). In a cross-country setting, Beck, Demirguc-Kunt, and Levine (2007) find that banking sector development is associated with a reduction in income inequality across countries.[7] Our paper advances the cross-country literature in several ways. First, using a single country framework allows us to better exploit pre-determined cross-state variation in financial development which is important in a country like India that has large sub-national variation in socio-economic and institutional development across different states. More importantly, Beck, Demirguc-Kunt, and Levine (2007) do not analyze the impact of a specific, exogenous policy change and hence are unable to comment on how to foster poverty-reducing financial development. Given the significant policy changes in India over the sample period (Besley, Burgess and Esteve-Volart, 2007), including in the legal framework underpinning bank lending (Visaria, 2009), our setting allows us to better address identification issues and also comment on the channels through which financial development leads to poverty alleviation.

Second, we study the relationship of both financial depth and outreach with poverty and find that financial depth has a statistically more significant and economically stronger relationship with poverty reduction than financial outreach. Most other papers only look at the impact of either financial depth *or* outreach (e.g. Beck, Levine, and Levkov, 2010; Bruhn and Love, 2014; Burgess and Pande, 2005).

Given the large domination of the banking sector in India by public sector banks, our paper also relates to the large literature on the government ownership of banks. La Porta, Lopez-de-

[7] 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.

Silanes, and Shleifer (2002) demonstrate that government ownership of banks is prevalent in both developing and developed countries, and is associated with slower financial development and slower growth. Several studies have shown that state control leads to political considerations determining credit allocation, making the banking sector susceptible to elite capture (Sapienza, 2004; Khwaja and Mian, 2005; Dinc, 2005; Cole, 2009; and Carvalho, 2014). Our paper contributes to this literature by examining if state-led expansion of the banking sector has an impact on poverty.

Our findings also contribute to the literature on the channels through which finance affects income equality and poverty ratios (e.g. Beck, Levine, and Levkov, 2010; Gine and Townsend, 2004).While Beck, Levine, and Levkov (2010) show that banking deregulation in the US lowered income inequality in the US through the indirect effects of higher labor demand and higher wages for lower income groups,our paper provides suggestive evidence 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 the urban tertiary sector. It is thus not necessarily the direct access to external finance, but rather general equilibrium effects that can explain our findings.

Our paper also relates to the literature linking reforms of contractual institutions with financial sector development in India. Visaria (2009) shows that the DRT tribunals not only reduced delinquency for the average loan but also lowered the interest rates suggesting that the speedier processing of debt recovery suits can lower the cost of credit and Lilienfeld-Toal, Mookherjee and Visaria (2012) show that total credit increased for larger borrowers, while it decreased for smaller borrowers, consistent with an inelastic aggregate supply of credit and additional demand by larger borrowers more easily satisfied. Gopalan, Mukherjee and Singh (2014) show that improvement in judicial efficiency due to the DRTs resulted in a significant

increase in the ratio of long-term debt to assets.[8] Chemin (2009, 2012) uses the geographic variation in the procedural handling of court cases in India following a reform in 2002 to show that a more efficient court procedure resulted in a reduction in case backlog in courts, lower contract breach, and higher investment by firms in fixed assets.[9] We use the DRT reform to extract the component of financial depth, related to larger firm lending and thus higher efficiency and depth rather than outreach of the financial system.

Finally, our paper also adds to a flourishing literature on economic development in India, (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; Hasan, Mitra, and Ramaswamy, 2007; Dougherty, Robles, and Krishna, 2011), 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. More recently, Allen et al. (2012) explore different financing sources for firms in India and Gormley (2010) gauges the impact of foreign bank entry on firm financing in India. 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 branch penetration of financial institutions.

Before proceeding, we would like to offer some caveats. First, our measures of financial depth and outreach are crude proxy indicators. The finance and growth literature has used Credit/GDP as standard indicator even though it might capture the efficiency of financial

[8] See Vig (2013) for an alternate view on the impact of strengthening creditor rights. Vig (2013) finds that the SARFAESI Act (Securitization and Reconstruction of Financial Assets and Enforcement of Security Interests Act) 2002 increased the threat of premature liquidation prompting firms to avoid debt leading to an overall reduction in total debt.

[9] For evidence from other developing countries, see Ponticelli and Alencar (2016) and Assuncao, Bemmelech and Silva (2013) for Brazil and Campello and Larrain (2016) for Romania.

institutions only to a limited extent. Similarly, branch penetration is a rather crude but more easily available indicator than the actual share of population having access to and using financial services. However, the correlation between our branch penetration measure and the share of households reporting cash borrowings from institutional credit agencies in Census data in 2002-03 is 0.85 across states.[10] Second, even though we use exogenous variation in branch penetration and financial depth as instrumental variables, our identification strategy is not perfect and we are therefore careful to not draw causal inferences, but rather refer to relationships.

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 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 poverty and financial development, present summary statistics, and discuss the empirical research design used for examining the relationship between finance and the poverty.

2.1. Data and Summary Statistics

2.1.1. Poverty Measures

We construct poverty measures across 15 Indian states[11] covering 95% of India's population, using 20 rounds of the Indian household expenditure surveys. The Indian National Sample

[10] The number of households reporting cash borrowings is drawn from NSS Debt and Investment Survey which is conducted in 2002-03 and not available in other years for our period of study.

[11] 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 95.4% of Indian population in the 2011 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.

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.[12]

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)[13] and adjusted yearly by price increases, and measures the incidence of poverty. Second, **Poverty Gap** is the mean distance separating the poor population from the poverty line as a proportion of poverty line. The calculation process of the poverty measures is described in detail in the data appendix B. We compute Headcount and Poverty Gap separately for rural and urban areas.[14] 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.

[12] 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.

[13] We test the robustness of our results to the new poverty line measures suggested by the Tendulkar Committee of the Planning Commission of India. Official estimates based on the new poverty line and methodology exist for only two years - 1993-04 and 2004-05 – and are presented in Radhakrishna et al. (2009). Compared to the older poverty line measures, the new estimates are based on normative expenditure on food, education, and health and are higher than calorie intake lines. Panagariya and Mukim (2013) discuss the controversies regarding the different poverty lines and find that no matter which poverty line is used, poverty has declined steadily in all states over time. When we apply the new poverty lines (price adjusted for the other years) we find a parallel increase in the poverty measure across states with no change in the qualitative results of our regressions. See data appendix for details. More recently in June 2014, the Rangarajan Committee Report issued new poverty line estimates for 2011/12 based on a new methodology but also concluded that the percentage point decline in headcount rations over the period 2004-05 to 2011-12 are not markedly different between the Tendulkar and Rangarajan Committee methodologies.

[14] The poverty line and price indices differ 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.

Table 1 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. The Appendix table A2 shows summary statistics for the main variables in each of the 15 states in India, with significant geographic variation.

Insert Figure 1 and Table 1 here

2.1.2. Financial Development and Other Control Variables

Before explaining the financial development measures, we provide some statistics on the structure of banking system of India. Figure 2 shows the overall number of branches and total credit by bank ownership over the sample period in India. The data of total credit by bank ownership is not available before 2001. It can be clearly seen that public banks dominate the banking sector of India by sizing about 68 percent of branches and about 70 percent of total credit. In addition, while one quarter of total branches are cooperative and regional rural banks (non-commercial banks), less than 5 percent of total credit is allocated by them. In comparison, private and foreign banks with less than 10 percent of total branches allocate at least 20 percent of total credit. As of 2013, of 89 commercial banks, 26 were public sector banks (20 nationalized banks and 6 State Bank of India and its Associates), 20 were domestic private sector banks, and 43 were foreign banks. Non-commercial banks include 56 regional rural banks and more than 500 cooperative banks.

In our analysis, we distinguish between two different dimensions of financial development (Cihak and Demirguc-Kunt, 2013). Specifically, one way to characterize financial systems is the size of financial institutions relative to the size of the economy, *Financial Depth*. Financial depth relates to the overall extent of financial services available in a country and

there is an extensive literature documenting the importance of depth for growth and poverty alleviation (e.g. see Levifne, 2005 for a review). A second characteristic of the financial system is also the ability of individuals and firms in an economy to access financial services, *Financial Access.* Financial access has been shown to accelerate economic growth and particularly benefit the lower end of the income distribution (e.g. Beck, Demirguc-Kunt and Levine, 2007; Beck, Levine, and Levkov, 2010). Barriers to financial access can include the lack of geographic proximity to bank outlets, lack of the necessary documentation (formal registration and property rights, audited financial statements etc.), and the lack of assets that can be used as collateral.[15]

While generally deeper financial systems offer greater access, the relation is far from perfect (World Bank, 2008). Many banking systems, especially in developing countries, are skewed towards the wealthy or large enterprises due to a number of reasons including allocation based on connections and nonmarket criteria (e.g. Rajan and Zingales, 2003), and physical access, affordability and eligibility issues (e.g. Beck et al. 2007). As noted by Claessens and Perotti (2007), even if financial depth is associated with more economic growth, when very few firms and households benefit (i.e. financial access is poor), the resulting growth may be of lower "quality."[16]

We use two different indicators of financial development at the state level, with underlying data from the Reserve Bank of India, to capture these two dimensions. **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. **Branches per Capita** is the total number of

[15] In the following, we will use *Financial Outreach* rather than *Financial Access* to highlight the supply-side character of our branch penetration measure.

[16] The difference between these two dimensions can be illustrated by the access to credit by firms of different sizes. An expansive literature has shown that SMEs rely on geographic proximity to banks (reflecting the need for relationships and collection of soft information by banks), much more so than large enterprises (where bank lending relies more on formal balance sheet and other publicly available information). A high level of Credit/SDP might reflect primarily loans to large enterprises, while a wide branch network might reflect geographic ease of access to credit services (by, among others, SMEs).

operating bank branches per million persons in each state and is a measure of the extent of financial outreach. Table 1 shows that the standard deviation of both measures over time is higher than across states, reflecting the upward trend in depth and trend reversal in outreach 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.[17] We also split the Branches per capita into **Rural branches per capita** and **Urban branches per capita** to examine if rural branch expansion specifically had an effect on poverty in rural areas. As alternate measures we also use **Rural branch share** (ratio of rural branches to all branches in a state and year) and **Urban branch share** (ratio of urban branches to all branches in a state and year).

Figure 3 shows a decomposition of branches and credit by rural versus urban areas over time. While we find that the increasing trend of urban branches after 1991 corresponds with an increasing share of urban credit, we also see that rural branch expansion was largely before 1989 when the rural branching policy was in effect.

Figure 4 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 5 illustrates the evolution of branch opening per capita in India. The data show trend breaks around 1990, which may be attributed to the suspending of the 1:4 branch license rule in 1990 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.

[17] In robustness tests (available on request), we use the following alternate measures for financial development - *Bank credit/billion of population* and *Number of branches / SDP* – and find similar results.

Insert Figure 2, 3, 4 and 5 here

In investigating the relationship between financial sector development and poverty, we control for several other time-varying state characteristics. Appendix Table A1 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.

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 find that both measures of financial development are positively correlated with each other, with a correlation coefficient of 40.5%,[18] 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.

Given the positive and significant correlation between our two gauges of financial development, we perform a couple of additional tests to confirm whether these two variables

[18] This correlation, however, is far from perfect. For instance, while the state of Punjab has the highest financial penetration among states, it is at the median level in terms of financial depth. Similarly, Maharashtra with the highest financial depth has financial penetration near the median. Given that our regression set-up focuses on within-state, within-year relationships between financial development and poverty measures, we also consider the correlation between the de-trended variables which is 0.15 and significant at the 1% level.

capture independent dimensions of financial development. First, we test for Granger causality from branch penetration to Credit/SDP – while lagged Credit/SDP enters positively and significantly in a regression of Credit/SDP, lagged branch penetration enters either negative and significant or insignificant. Second, we follow Dumitrescu and Hurlin (2012) to do a panel non-causality test which separately runs a dynamic regression for each state. If the null is rejected it means that branches per capita does Granger-cause credit to SDP for at least one state. We find that even in states where the non-causality is rejected (4 out of 15) the effect of lag of branches per capita on credit to SDP is negative. This result is not consistent with the hypothesis that outreach drives depth. We find similar result for Granger causality from Credit/SDP to branch penetration, supporting our hypothesis that these two dimensions of financial development are independent even if correlated.

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. All our regression results are robust to including rural population share. Similarly, we also run all our regressions without SDP/capita given the relatively high correlation with Credit to SDP and again all our results hold.

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. Our main regressions will focus on instrumental variables to extract the exogenous component of financial development. This allows us to not only control for reverse causation and omitted variable bias, but also address the measurement bias in the gauges of financial development mentioned above. Specifically, by focusing on a legal

reform that allowed easier recovery of large loans, we extract the component of Credit/SDP that is driven by the consequent expansion of loans to such firms, documented by Visaria (2009) and thus the efficiency and depth component of this measure. Similarly, by focusing on the social branching policy, we extract the component of branches/capita driven by the financial inclusion policy of the government. So, while we recognize the imperfection of the two indicators we are using, the instrumental variable strategy allows us to address this measurement bias to a certain extent. In this section, we first describe the different instrumental variables we use for the two different dimensions of financial development and specify the estimation methodology.

2.2.1. Debt Recovery Tribunals

An extensive literature has shown the importance of an effective contractual framework for financial sector development (e.g. La Porta et al. 1997, 1998), including an array of cross-country but also country-level studies exploiting variation in judicial efficiency across sub-national units. Directly related to our work, Visaria (2009) exploits subnational variation in the introduction of new tribunals to resolve large claim contract disputes and finds not only lower delinquency rates but also lower ex ante interest rates for borrowers of large amounts. We will use the staggered introduction of debt recovery tribunals across Indian states and the change in judicial efficiency their introduction implied, to extract the exogenous component of financial sector depth, i.e., Credit to SDP.

The debt recovery tribunals (DRT) were introduced with a national act in 1993 to more quickly process legal suits instigated by banks against defaulting borrowers, using a streamlined procedure to speed up adjudication of cases, and allow for swift execution of the verdict. There is a monetary threshold of 1 million Rupee (around 20,000 USD in 1993). However, the DRTs were established at different points in time across different states due to

constitutional challenges to the DRT Act. Specifically, it was not until 2002 that the Supreme Court accepted the constitutionality of the DRT and only after changes to DRT Act. This constitutional uncertainty implied that it was up to the states to establish DRTs or not. Five tribunals were set up shortly after the original DRT Act in 1994, while other states set them up between 1996 and 1999, as illustrated in Figure 6. Following Visaria (2009) we can use this staggered introduction of DRTs to extract the exogenous component of credit intermediation. As shown by Visaria (2009) and Lilienfeld et al. (2014) the timing of the establishment of DRTs across the different states was not related to the size of states, urban populations share, size of the industrial sector, level or growth of bank credit, states' political structure, income level or efficiency of the judiciary.

Insert Figures 6, 7 and 7 here

Specifically, using state-variation in establishment of DRT, we extract the state- and year-varying exogenous component of Credit to SDP by interacting a dummy indicating the introduction of the DRT (varying between 1994 and 1999) with the number of applications per million capita in the first year of functioning, thus capturing latent demand for an accelerated judicial process. Rather than simply focusing on the establishment of such courts, we also include the efficiency gain that this establishment should involve in the form of quicker resolution of contractual disputes and lower enforcement costs. Figure 7 shows that this variable ranges from 0.06 for the DRT responsible for Madhya Pradesh and Uttar Pradesh to 8.9 in Maharashtra. Theory suggests that higher demand for DRTs' services (as captured by the application per million capita) will imply a stronger impact for the introduction of DRTs on financial deepening. Figure 8 shows the difference in Credit to SDP and branches per capita across states with above and below median latent demand for DRTs in the years before and after the respective introduction of the DRT in a given state. While the annual change in the gap in credit/SDP between them is less than 3 percent in the five

years leading up to the introduction of the DRT, after the introduction it rises by more than 7 percent suggesting there is a much more pronounced increase in Credit to SDP in states with above-median latent demand for the DRT courts than in states with below-median latent demand. We will test the significance of these differences more formally below. For branch penetration, however, we do not observe a trend break following the introduction of DRT.

2.2.2. India's social banking experiment

Following independence in 1947, 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 1990. 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.

Insert Figure 9 here

Figure 9 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,

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

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

where D_t equals 1 in year t and zero otherwise, B_{i60} is the initial level (in 1960) of branch penetration in that state, and s_i and y_t are state and year dummies.

Figure 9 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.[19] 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, 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 the introduction of specialized debt recovery tribunals was associated with financial deepening and more so in states with higher demand for such specialized courts. 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.

[19] 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.

2.2.3. Empirical strategy

Following sections 2.2.1 and 2.2.2, 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:

$$FD_{it} = \lambda_0 + \theta_1(App_i \times DRT_{i.t}) + \theta_2 DRT_{i.t} + \delta_1 ((B_{i60} \times [t - 1977] \times D_{77}) + \delta_2 (B_{i60} \times [t - 1990] \times D_{90}) + \lambda X_{it} + s_i + y_t + \varepsilon_{it}, \quad i = 1, \ldots, 15, \quad t = 1983, \ldots, 2005, \quad (2)$$

where FD_{it} is Credit to SDP or Branches per capita, $DRT_{i.t}$ is a dummy which equals one post-establishment of a DRT in a state and App_i is the number of applications per million during the first year of the existence of a DRT. B_{i60} is the state-wise per capita rural branches in 1960[20], X_{it} is the set of control variables and includes SDP/capita, literacy rate and state government expenditure to GDP.[21] 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_i and δ_i, where the θ_1 coefficient measures the impact of the establishment of the DRTs on financial deepening 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_1 and δ_2.

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

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

[20] We use 1960 as initial year to be consistent with Burgess and Pande (2005). If we were to use 1950 as initial year, we find similar results (available on request).

[21] All our results are materially the same if we were to not use any of the control variables alleviating concerns about our estimates being biased by the bad control problem (Angrist and Pischke, 2009). Furthermore, all results are robust to including rural population share.

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.

In all the regressions, 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,[22] both within states and within years to resolve the problem of underestimated standard errors arising from serial correlation of the error terms as suggested by Bertrand, Duflo and Mullainathan (2004).[23] In further regressions and to disentangle the channels through which finance affects rural and urban poverty levels, we use different dependent variables, as we will discuss in detail below.

3. Finance and poverty across states

In this section, we examine if there is a significant relationship between financial development and poverty and if it is robust to endogeneity concerns using two instruments for financial development, the trend reversals induced by the rural branch expansion program and the demand for specialized DRT, introduced at different points in time across states. We

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

[23] 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 less than 50, standard errors may be biased and need small sample correction such as the wild bootstrap procedure. However, as reported by Angrist and Prischke (2009, page 323), Hansen (2007) shows that the clustered standard errors reported by the software program Stata is reasonably good at correcting for serial correlation in panels even when the number of clusters is small.

first present and discuss the first-stage regressions, before moving to the second stage estimations.

3.1. Finance, law 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 terms between DRT establishment and number of DRT applications per million capita during the first year, and (ii) 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, and government expenditures to SDP.

Insert Table 3 here

The results in column (1) of Table 3 show that states with higher demand for DRT services after the introduction of a DRT have higher levels of Credit to SDP. The relationship is not only statistically significant, but also economically meaningful: one standard deviation in applications per million capita translates into an increase in Credit to SDP by 8.5 percent. 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 the social banking policy can explain cross-state, cross-year variation in branch penetration, while the DRT introduction cannot. Again, the results are not only statistically, but also economically significant. One additional branch per million capita in 1960 translates into 0.141 fewer annual branches per million people during the rural branching expansion, but after the program, it is associated with -0.01 (0.140-0.141) branches less per million persons annually. The Cragg-Donald F statistic test, with critical values compiled by Stock-Yogo (2002), a weak identification test for the excluded exogenous variables, is highly significant. This test is essential when the number of

endogenous variables is more than one and the standard F-test may not truly reflect the relevance of instruments (for details see Baum, Schaffer and Stillman, 2007). We also report the Angrist-Pischke first-stage F-statistics, which are highly significant, indicating that our instruments are relevant (Angrist and Pischke, 2009).[24]

When we consider separately rural and urban branches per capita, we similarly find that higher branch penetration in 1960 is associated with fewer additional rural branches during the period of rural branching operation, but more afterwards, while urban branch penetration is not significantly (at the 5% level) associated with these policy changes (columns (3) and (4)). In summary, we find that the differences in demand for DRT services and judicial quality improvements after DRT introduction across states explain financial depth better than trend instruments while the reverse is true for branch penetration.

In columns (5) and (6), we show the robustness of our first-stage results to using the 1965 to 2005 sample period.[25] In unreported tests we find similar results if we use Rural/Urban Branch share (ratio of rural/urban branches to all branches in a state and year) in place of Rural/Urban branches per capita. In Appendix Table A3 we show that our results in columns (1), (2), (5), and (6) are robust to including rural population share.

3.2. Finance and poverty: second-stage results

In this section, 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.

[24] 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.
[25] Over this period, we have three missing points for Assam, so the number of observations is 597.

Insert Table 4 here

The OLS estimations in Table 4 show a negative relationship between Credit to SDP and the incidence and extent of rural poverty and no significant relationship between Credit to SDP and urban poverty. While branch penetration enters negatively in all four regressions, it does not enter with a significant coefficient. In Appendix table A4, we find similar results if we were to include rural population share in columns (1) to (4) of Table 4. The insignificant effect of credit to SDP on urban poverty can be a first indication of a possible migration channel through which Credit to SDP impacts poverty. Columns (3) and (4) suggest that urban poverty is negatively associated with SDP per capita and Government expenditure as a share of SDP.

In columns (5) to (8), when we consider rural and urban branch penetration separately, we find that rural branch penetration enters negatively and significantly at the 10%, while urban branch penetration does not enter significantly.

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 (columns (1) and (2)). 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 in columns (3) and (4). 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 17 percent of demeaned variation in the Headcount and 22 percent

of demeaned variation in the Poverty Gap.[26] The Hansen over-identification tests reported in columns (1) to (4) are not rejected suggesting that the instruments are valid instruments. When separating rural and urban branch penetration in columns (5) and (6), we find no effect of rural branch penetration on rural poverty.

As the results on branch penetration are in contrast to the finding by Burgess and Pande (2005), we try to reconcile our results with their findings in columns (7) and (8) 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, in columns (1) and (2), 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 outreach 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, 7.715, and 5.339 respectively. Using the coefficient estimates from columns (7) and (8) we compute that one standard deviation increase in Credit to SDP reduced Rural Headcount by 2.89, while a one standard deviation in branch penetration reduces Rural Headcount by 1.78. Thus, over the period 1965 to 2005, variation in branch penetration explains 30 percent of rural poverty reduction in India which is lower than the contribution of credit to SDP (49 percent).[27] Over the longer time period, financial depth was more

[26]The effect of credit/SDP on rural headcount and poverty gap are calculated as -0.168*4.87/4.95 = -0.17, and -0.082*4.87/1.82 = -0.22, respectively.
[27] The effect of credit is -0.375*7.715/5.910=-0.49, and for branches it is -0.332*5.339/5.910=-0.30

important than financial outreach in reducing poverty, while in the more recent sample period, after 1983, only financial deepening can explain reductions in rural poverty.

In further sensitivity tests in Appendix Tables A6 and A7 we control for additional time-variant state factors, most of which, however, are not available for the whole sample period. First, we include the state government development expenditures as ratio to SDP, which might explain variation in poverty rates across states and over time. While this variable enters negatively and significantly, it does not change the economic or statistical significance of Credit to SDP. Second, we include an indicator to gauge the degree to which a state is open to trade with other countries, with annual data available for the period 1980 to 2002 (Marjit, Kar and Maiti, 2007). While trade openness does not enter significantly, Credit to SDP continues to enter negatively and significantly.

Third, we control for an indicator of labor market regulation, based on Besley and Burgess (2004) and Gupta, Hasan and Kumar (2007) that indicates whether labor market regulation in a given state and year can be considered flexible, neutral or inflexible. As the labor market indicator does not vary after 1991, we also interact it with a time trend to test whether states with initially more flexible labor market regulation experienced faster poverty reduction post-1991 liberalization. While the labor market index enters negatively, it does not enter significantly and our financial depth indicator continues to enter with a negative and significant coefficient. Fourth, we control for an indicator of physical infrastructure; specifically, the log of unit costs of electrical power supply, which we have available for the period up 2001 and after 2007, with data from the Planning Commission. We extrapolate for the period in between with linear extrapolation. While the unit cost of energy enters negatively and significantly at the 10% level (thus contrary to expectations), our main findings are confirmed.

Overall, this shows that even when controlling for development expenditures, trade openness, and infrastructure, some of which are also significantly correlated with financial depth, Credit to SDP instrumented by the demand for and efficiency of specialized courts, introduced at different points in time across states, continues to be negatively and significantly associated with rural poverty.

In a further robustness test, we address the correlation between our measures of financial depth and financial outreach. Specifically, we net Credit/SDP and Branches per capita of the respective other variable by regressing Credit/SDP (Branches per capita) on state and year dummies and Branches per capita (Credit/SDP) and then predict Credit/SDP (Branches per capita). The two orthogonalized measures are explained by our policy variables in the first stage regressions in the same way as in Table 3. The second stage results confirm our findings from Table 5: the orthogonalized Credit/SDP enters negatively and significantly in the rural poverty regressions, but not in the urban poverty regressions while the orthogonalized branch penetration does not enter significantly in any of the regressions (results available on request).

Finally, we address the concern that our findings are driven by time- rather than state-variation and estimate a 2SLS regression using data averaged over five years before and after DRT adoption. The R-squared in the averaged first stage regression is high (0.985) and in the second stage we still find a negative and significant effect of financial depth on rural poverty suggesting that our results are mainly driven by cross-state variation rather than only time series variation (results available on request).[28]

In summary, IV and OLS results suggest that higher levels of financial depth are associated with a lower incidence and depth of rural poverty but not with incidence or depth of urban

[28] We similarly find that averaging data five years before and after 1989 provides a negative but insignificant coefficient on branch penetration. In all cases, the IV specification tests still hold.

poverty. Financial outreach, as gauged by branch penetration, is not significantly associated with lower poverty level unless we consider a longer sample period including the period before the social banking policy. Our results suggest that financial deepening is more robustly related to poverty reduction than financial outreach in recent periods and hence we focus on financial depth for the rest of the paper. We next turn to the channels and mechanisms through which financial deepening is related to poverty reduction.

4. Finance and poverty: channels

So far, the results have provided evidence that financial deepening since the liberalization in 1991 has helped reduce rural poverty in India. However, understanding the underlying channels is as important for policymakers 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 the demand for and efficiency of specialized courts 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 our discussion on IV regressions, our findings are robust to using OLS 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 agriculture and the Poverty Gap in non-agriculture, as well with Headcount among rural and agricultural labor. Financial depth does not enter significantly in any of the other regressions.[29] Notably, financial deepening cannot explain variation in Headcount or Poverty Gap among non-agricultural laborers. 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 some evidence for the entrepreneurship channel, as the reduction in poverty rates fell on self-employed.[30]

[29] In unreported regressions (available on request) we also look into the share of each occupational group in total population and find that Credit to SDP is positively associated only with the share of self-employed in agriculture. In addition, we find no relation between Credit to SDP and Headcount and Poverty Gap among the urban self-employed in agriculture or non-agriculture.

[30] 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. However, when we split outreach into rural and urban branches, we see a weak association (significant at 10% level) between rural branches per capita and entrepreneurship. Furthermore, in unreported robustness tests (available on request) we confirm these findings using the orthogonalized measures of Credit/SDP and branches per capita (net of the respective other financial development variables).

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[31] 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

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

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 an education up to primary school. Overall, these results suggest that while the five-year lag of credit has a weak positive effect on the share of illiterates, it also has a weak negative effect on the share of the uneducated population.[32,33]

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 earnings opportunities. Gine and Townsend (2004) show that financial liberalization in Thailand resulted in 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 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 new ones, who in turn hired more workers. Applying 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,

[32] 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. We also confirm these insignificant findings using the orthogonalized measures of Credit/SDP and branches per capita (net of the respective other financial development variables) and using rural rather than total branches per capita.

[33] In unreported robustness tests (available on request) we confirm these findings using the orthogonalized measures of Credit/SDP and branches per capita (net of the respective other financial development variables) and using rural rather than total branches per capita.

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,[34] reasons for migration, employment type and the sector from and into which they migrate. We divide households in each state in 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.[35]

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 estimated number of households that migrated to state *s* in year *t* to the estimated total number of households in state *s* and year *t*. 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 from over 10 years ago tend to report years since migration as multiples of five or ten, creating a peak in migration rate of those years.

[34] Short-term migrants are persons who had stayed away from the village/town for a period ≥1 month but ≤ 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 to stay outside the village/town (and are still alive on the date of survey).

[35] The results are robust to including unemployed households and households that did not report their occupations.

The data show that, while overall migration, both inter- and intra-state, is 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. Assuming one migration per household, during the period 1983-2005, around 30% of population experienced a migration.[36] 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 0.15% of total population through the years. Rural to urban migration is the highest though we find that there is comparable amount of migration 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 sectors, we find that migration into the tertiary sector has been the largest. In unreported charts of migration trends over time, we find that while 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 the post-establishment demand for and efficiency of specialized DRTs, 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 a significant (at the 10% level) impact of financial deepening on inter-state migration. The economic size of this effect is reasonable, with one demeaned standard deviation in Credit to SDP explaining around 16 percent of variation in demeaned variation of inter-state migration.[37,38] In the following, we therefore focus on inter-state migration. Specifically, we

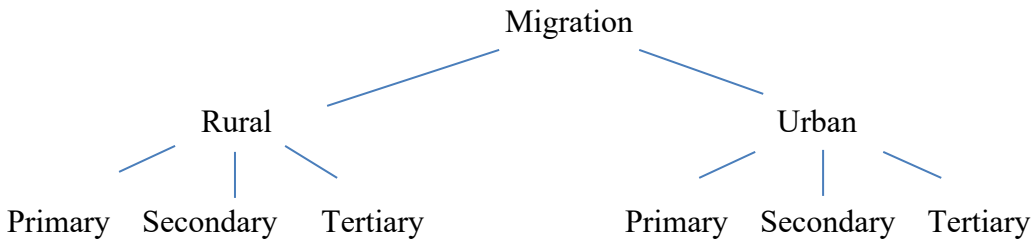
[36] In the migration surveys only the earliest migration is reported. The number is computed as 1.373×22=30.2.

[37] The demeaned standard errors of credit and inter-state migration are 0.049 and 0.001 respectively, so the number will be 0.049*0.0032/0.001= 0.157. If we run the same regression including both Credit/GDP and Branch penetration, the same result hold for financial depth and there is a significant (at the 10% level) and negative impact of branch penetration on inter-state migration. We find no significant effect of Branch

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 around 28,000 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 geographic area (rural or urban). Thus, the tree structure of a migrant's decision would be as follows:[39]



We estimate our model as sequential logit model, first testing to what 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. We thus focus on differences in financial development and

Penetration on overall migration. Thus, while higher financial depth in a state thus results in higher migration into the states from other states, higher branch penetration has the opposite effect.

[38] When we include our financial outreach variables, neither branch nor rural branch penetration enter significantly. The results hold when we use the orthogonalized Credit/SDP, i.e., financial depth net of branch penetration.

[39] In robustness tests, available on request, we reverse the sequence, with the three sectors as the first decision and rural/urban as the second decision. We also run a multinomial regression with all six options. Both specifications confirm our main conclusions.

other state-level variables here rather than levels at the year of migration. Hence, we compare the level of variables between the destination and origin states 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 that 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 is associated with 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.

In Appendix Table A8 we also gauge whether differences in financial depth across states explains specific reasons for inter-state migration. 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. When focusing on migrants below the poverty line in Appendix table A9, "search for employment" is the only significant reason associated with state-level differences in Credit/SDP.

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 10 shows 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 in the late 1990s, but this pattern does not exist in the other sectors and there is even a downward trend in credit to the secondary sector.

Insert Figure 10 and Table 10 here

In Table 10, we replicate the Table 5 regressions, using tertiary Credit to SDP rather than overall Credit to SDP, instrumented by the post-implementation demand for specialized DRTs.[40] Our Table 5 results are confirmed using this sectoral credit measure. Tertiary Credit to SDP enters negatively and significantly in the regressions of Rural Headcount and Rural Poverty Gap, but not in the regressions of the Urban Headcount or Poverty Gap. As in Table

[40] In Appendix Table A8, using the same model as in Table 3, we find that it is only tertiary credit that is associated with the demand for specialized DRTs. Not surprisingly, primary credit to SDP (and thus rural credit) is significantly associated with trend breaks of the rural branching program, while neither credit to the secondary nor credit to the tertiary sector are.

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, geographic-sectoral migration trends and reductions in poverty rates, we have to be careful in 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

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 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. 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.

References:

Aggarwal, S., S. Alok, P. Ghosh, S. K. Ghosh, T. Piskorski, and A. Seru. 2017. "Banking the Unbanked: What do 255 Million New Bank Accounts Reveal about Financial Access?" *SSRN Working Paper Series*

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*, 98(4), 1397-1412.

Allen, Franklin, Rahesh Chakrabarti, Sankar De, Jun QJ Qian and Meijun Qian. 2012. "Financing Fims in India", *Journal of Financial Intermediation* 21, 409-445.

Angrist, J. D. and J. Pischke. 2009. *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton University Press, Princeton, NJ.

Arnold, J.M., B. Javorcik, M. Lipscomb and A. Mattoo. 2016. "Services Reform and Manufacturing Performance: Evidence from India." *The Economic Journal*, 126(590), 1-39.

Assuncao, J. J., E. Benmelech, and F. S. S. Silva. 2014. "Repossession and the Democratization of Credit" *Review of Financial Studies* 27(9), 2661-2689.

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. 2015. "The Miracle of Microfinance? Evidence from a Randomized Evaluation." *American Economic Journal: Applied Economics* 7(1), 22-53.

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 Economic Review* 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 . 2008. "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* 65(5), 1637-1667.

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

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

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.

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

Bruhn, M., and I. Love. 2014. “The Real Impact of Improved Access to Finance: Evidence from Mexico” *Journal of Finance* 69(3), 1347-1376.

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.

Campello, M. and M. Larrain. 2016. "Enlarging the Contracting Space: Collateral Menus, Access to Credit, and Economic Activity," *Review of Financial Studies*, 29(2), 349-383.

Carvalho, D. 2014. The real effects of government-owned banks: Evidence from an emerging market. The Journal of Finance, 69(2), 577-609.

Chemin, M., 2009. "Do judiciaries matter for development? Evidence from India," *Journal of Comparative Economics*, 37(2), 230-250.

Chemin, Matthieu. 2012. “Does court speed shape economic activity? Evidence from a court reform in India” *Journal of Law, Economics, and Organization*, 28(3):460–485.

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

Cole, S. 2009. “Fixing market failures or fixing elections? Agricultural credit in India” *American Economic Journal: Applied Economics*, 1(1), 219-250.

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.

Dinc, I. S. 2005. “Politicians and banks: Political influences on government-owned banks in emerging markets.” *Journal of Financial Economics* 77(2):453-479.

Dougherty, S., V. C. F. Robles, and K. Krishna. 2011. “Employment Protection Legislation and Plant-level Productivity in India.” *NBER Working Paper Series No. 17693*

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), 35-52.

Ghosh B., and D. Prabir. 2005. India infrastructure database, *Bookwell*

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.

Gopalan, R., A. Mukherjee, and M. Singh. 2016. “Do Debt Contract Enforcement Costs Affect Financing and Asset Structure” *Review of Financial Studies* 29(10), 2774-2813.

Gormley, Todd. 2010. “The Impact of Foreign Bank Entry in Emerging Markets: Evidence from India.” *Journal of Financial Intermediation* 19, 26-51.

Greenwood, J. and B. Jovanovic.1990. “Financial Development, Growth, and the Distribution of Income”, *Journal of Political Economy,* vol. 98(5), 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.

Gupta, P., R. Hasan, and U. Kumar. 2009. “Big Reforms but Small Payoffs: Explaining the Weak Record of Growth and Employment in Indian Manufacturing.” *MPRA working Paper*

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

Hasan, R., D. Mitra, and K. V. Ramaswamy. 2007. “Trade Reforms, Labor Regulations, and Labor-Demand Elasticities: Empirical Evidence from India.” *Review of Economics and Statistics* 89(3): 466-481.

Hermes, Niels and Robert Lensink. 2007. “The Empirics of Microfinance: What Do We Know?” *The Economic Journal* 117, issue 517, F1-F10.

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

Khwaja, A. I. and Mian, A. 2005. “Do lenders favor politically connected firms? rent provision in an emerging financial market.” *The Quarterly Journal of Economics,* 120(4), 1371-1411.

King, R., and R. Levine. 1993. “Finance and Growth: Schumpeter Might Be Right”, *The Quarterly Journal of Economics*, vol. 108(3), 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), 981-1019.

Kuhnen, C., and A. Niessen. 2012. "Public Opinion and Executive Compensation." *Management Science* 58, 1249-1272.

Lamoreaux, N. R. 1986. "Banks, Kinship, and Economic Development: The New England Case", *Journal of Economic History* 46, 647-667.

La Porta, Rafael, Florencio Lopez-de-Silanes, and Andrei Shleifer. 2002. "Government ownership of banks." *The Journal of Finance*, *57*(1), 265-301.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny. 1997. "Legal Determinants of External Finance." *Journal of Finance*, 52(3): 1131–50.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny. 1998. "Law and Finance." *Journal of Political Economy*, 106(6): 1113–55.

Levine, R. 2005. "*Finance and Growth: Theory and Evidence*" in *Handbook of Economic Growth*, Eds. Philippe Aghion and Steven N. Durlauf, Vol. 1., Elsevier North Holland, 866-934.

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

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

Lilienfeld-Toal, U., D. Mookherjee, and S. Visaria. 2012. "The distributive impact of reforms in credit enforcement: Evidence from Indian debt recovery tribunals." *Econometrica* 80: 497–558.

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

Marjit, Sugata, Saibal Kar and Dibyendu Maiti. 2007. “Regional trade openness index and income disparity: a new methodology and the Indian experiment.” *Economic and Political Weekly*, 757-769.

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.” Columbia University, mimeo.

Panagariya, Arvind and Mukim, Megha. 2013. “A Comprehensive Analysis of Poverty in India.” SIPA Working Paper No. 2013-01

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

Ponticelli, J., and Alencar, L. S. 2016. “Court enforcement, bank loans, and firm investment: Evidence from a bankruptcy reform in Brazil.” *Quarterly Journal of Economics*, 131(3), 1365-1413.

Radhakrishna, R., S. Sengupta, and S. Tendulkar. 2009. “Report of the expert group to review the methodology for estimation of poverty”, 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.

Sapienza, P. 2004. “The effects of government ownership on bank lending.” *Journal of Financial Economics*, 72(2), 357-384.

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

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.

Vig V. 2013. “Access to collateral and corporate debt structure: Evidence from a natural experiment”. *Journal of Finance* 68: 881–928.

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.

World Bank (2008): *Finance For All? Policies and Pifalls in Expanding Access*, Washington D.C.

World Bank (2014). *Global Financial Development Report: Financial Inclusion*. Washington D.C.

Figure 1- Rural and urban poverty in India over time

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 definitions and sources of all variables are in the Appendix table A1.

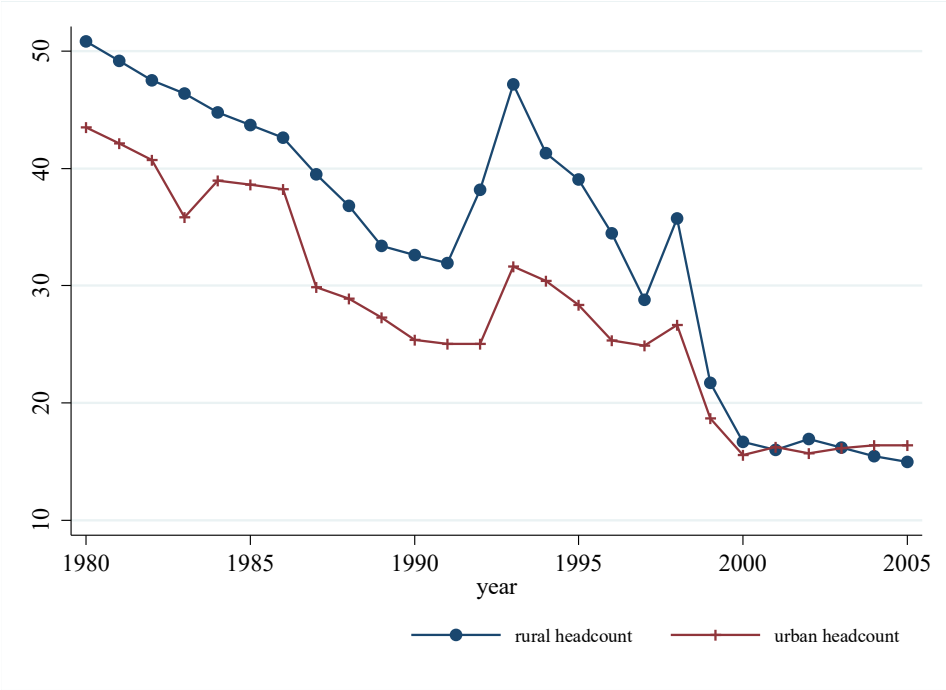


Figure 2- Decomposition of bank branches and total credit based on ownership.

This figure shows the percentage of total bank branches and total bank credit by bank ownership over time. The decomposition of credit based on ownership is not available earlier that 2001. As of 2013, of 89 commercial banks, 26 were public sector banks (20 nationalized banks and 6 State Bank of India and its Associates), 20 were domestic private sector banks, and 43 were foreign banks. Non-commercial banks includes 56 regional rural banks and more than 500 cooperative banks.

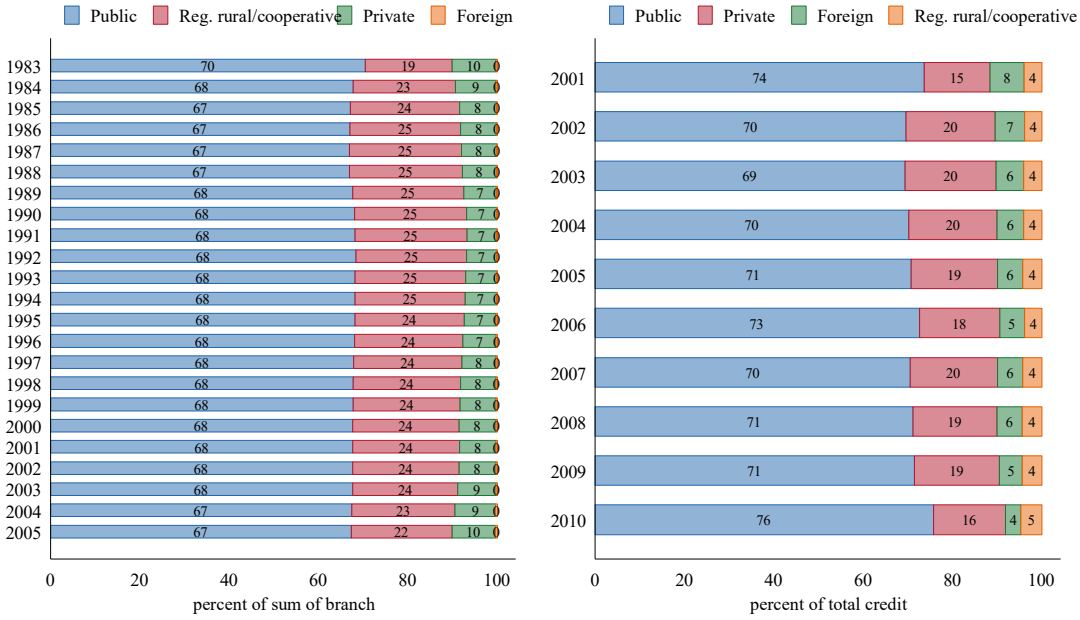


Figure 3- Decomposition of bank branches and total credit based on location.
This figure shows the percentage of total bank branches and total bank credit by location over time. The decomposition of credit based on location is not available earlier that 1991.

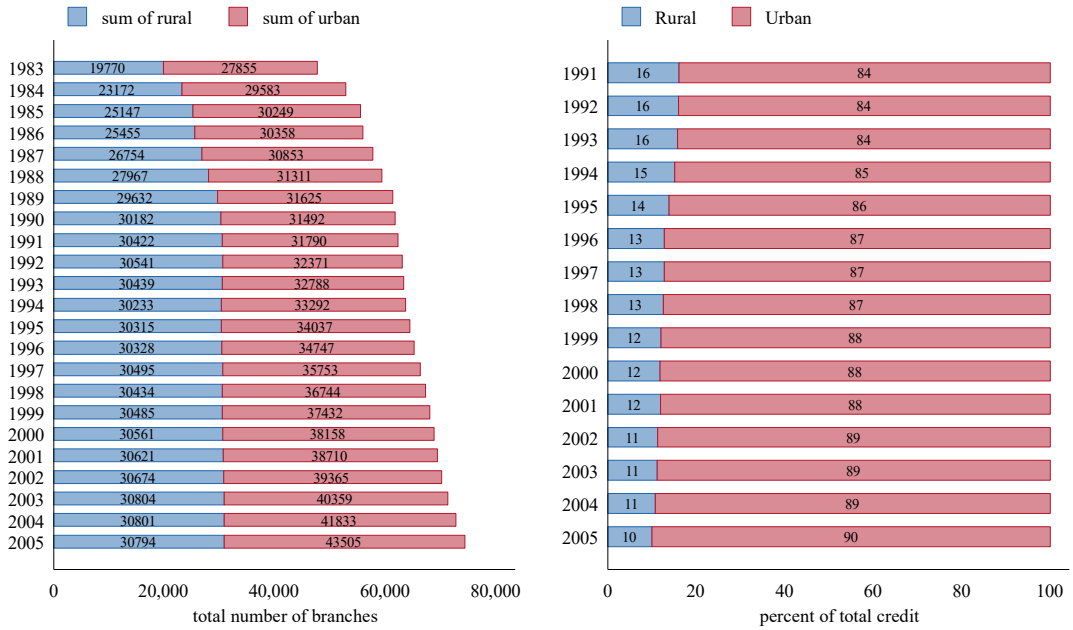


Figure 4- Credit to SDP in India over time
This figure shows the trend in the percentage of total commercial bank credit outstanding to net state domestic product. Commercial bank credit comprises term loans, cash credit, overdrafts and bills purchased and discounted. The definitions and sources of all variables are in the Appendix table A1.

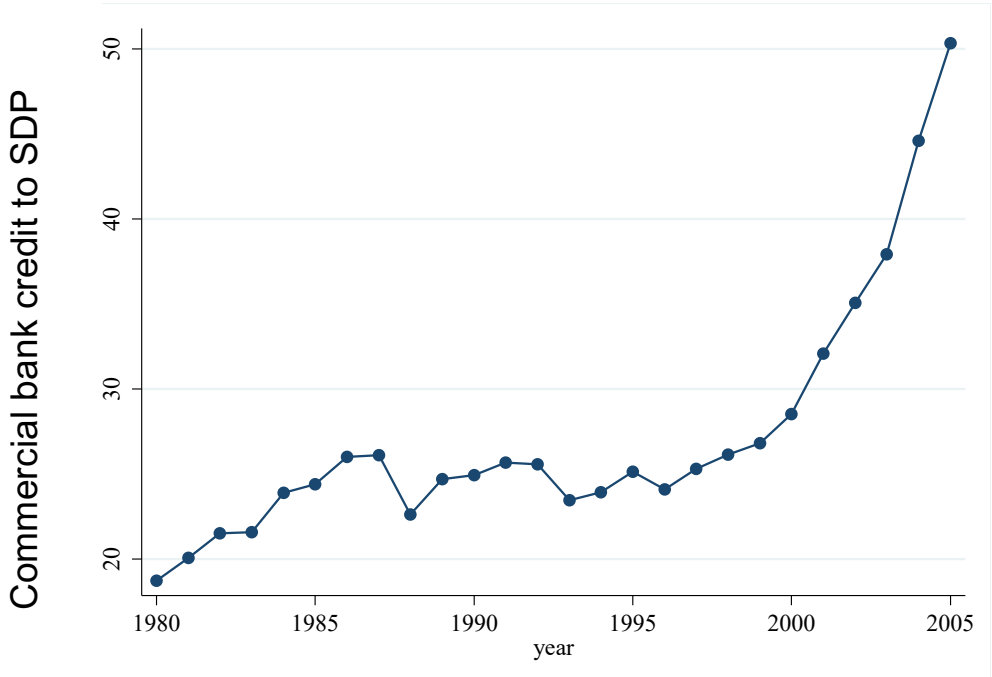


Figure 5- Bank branches per capita in India over time

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 definitions and sources of all variables are in the Appendix table A1.

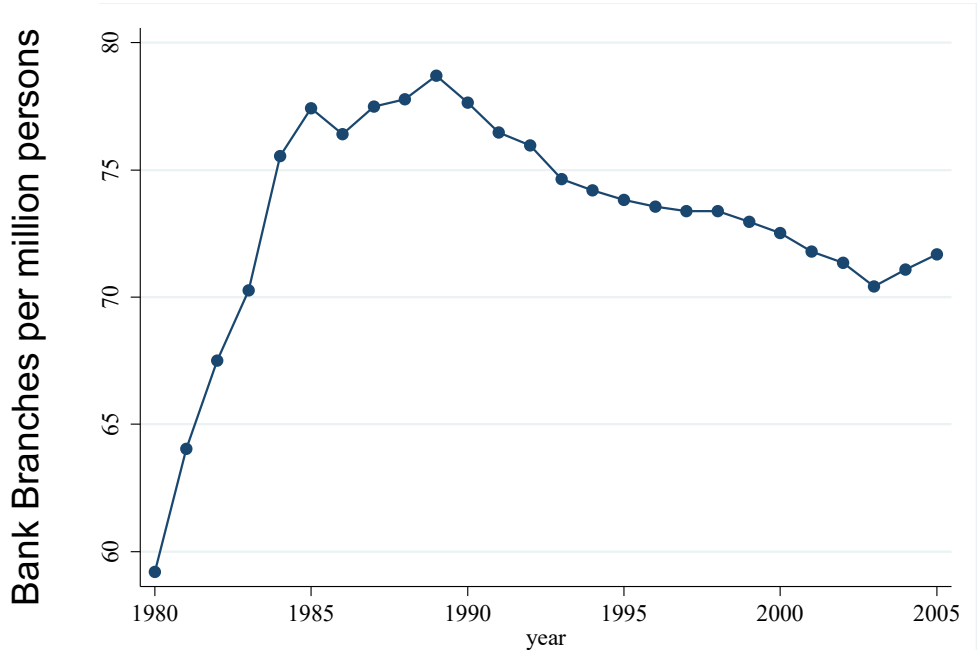


Figure 6- DRT establishment across India

This figure shows the timing of DRT establishment across different states of India. The tribunal of Delhi is established in July 94 but it is not in our sample.

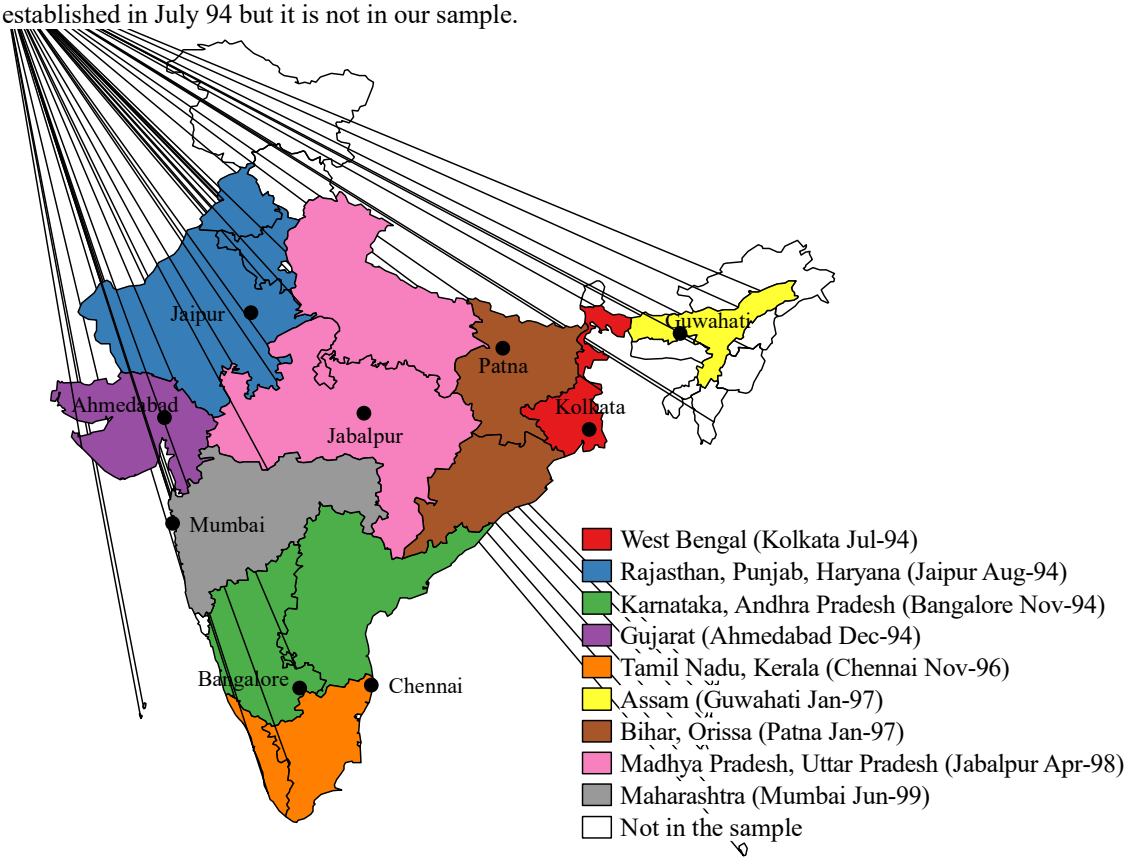


Figure 7 - DRT demand across India

This figure shows the total number of cases filed in the first year of establishment divided by the population (in millions) the tribunal covers. The sources of the variables are in the appendix.

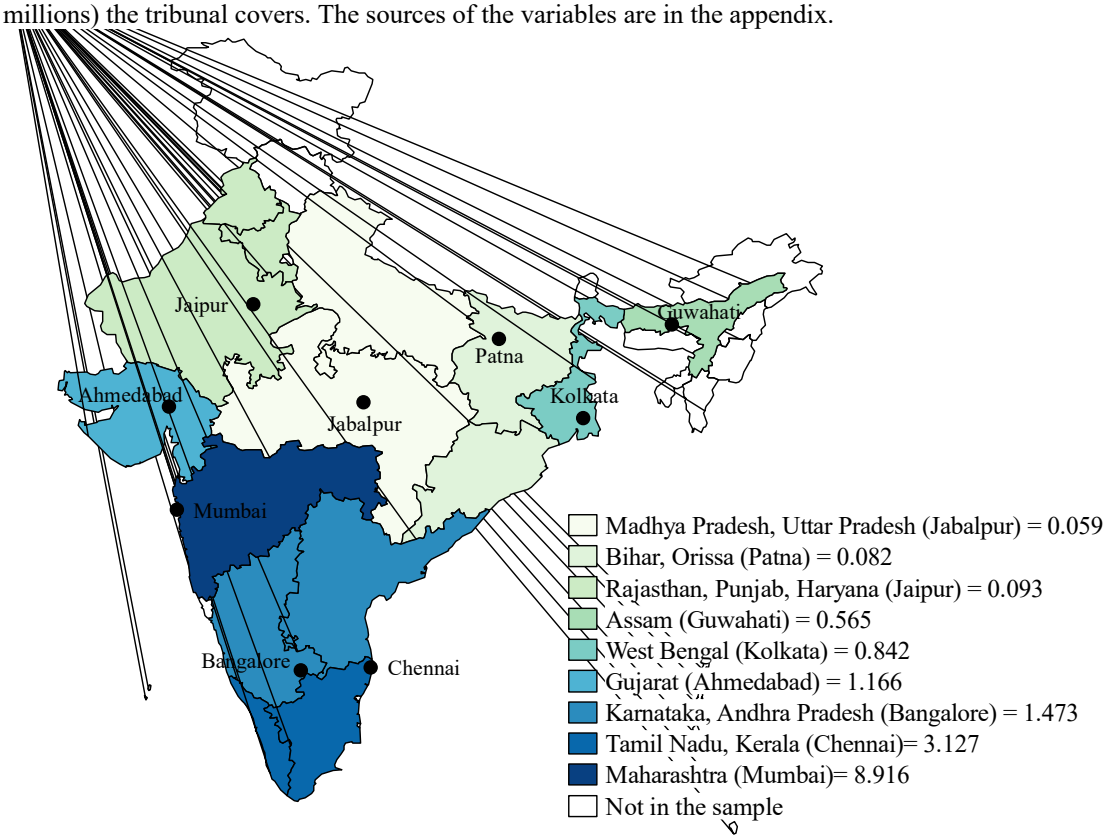


Figure 8- Financial depth and breadth and DRT establishment

The bars show the difference in credit/SDP between states above and below of the median of DRT cases per capita in the first year of establishment. For better illustration the bars are referenced by the year of DRT establishment in which the difference is 20.44. The connected line shows the difference in branches per capita between states above and below of the median of DRT cases per capita in the first year of establishment.

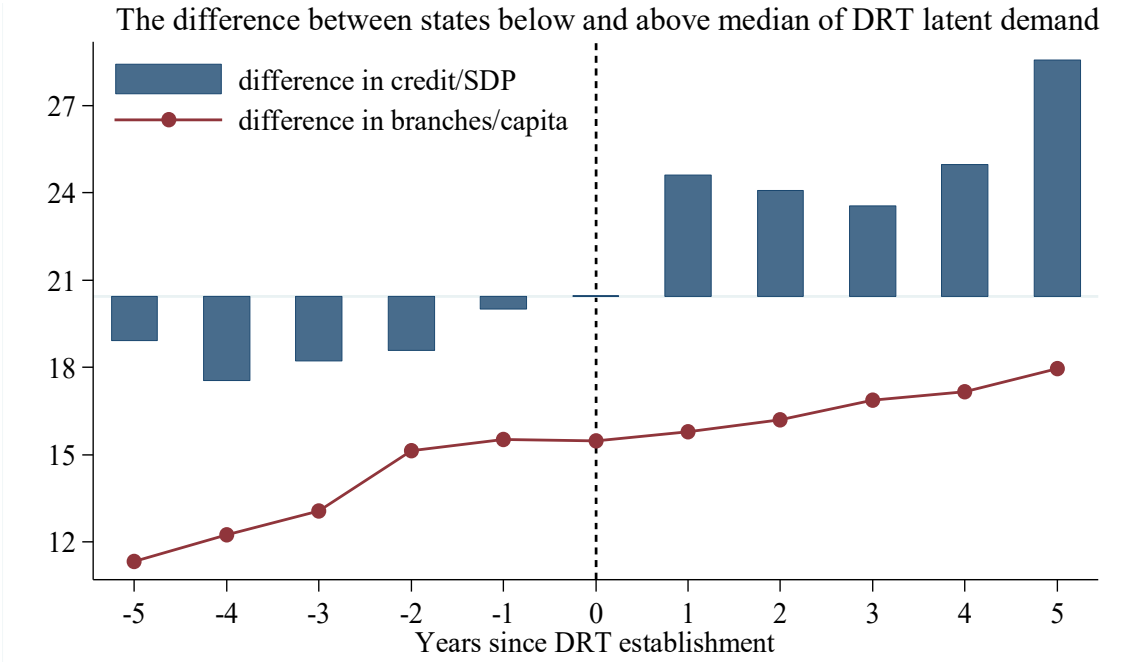


Figure 9 - Year effects of initial financial development on branch penetration

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 table A1.

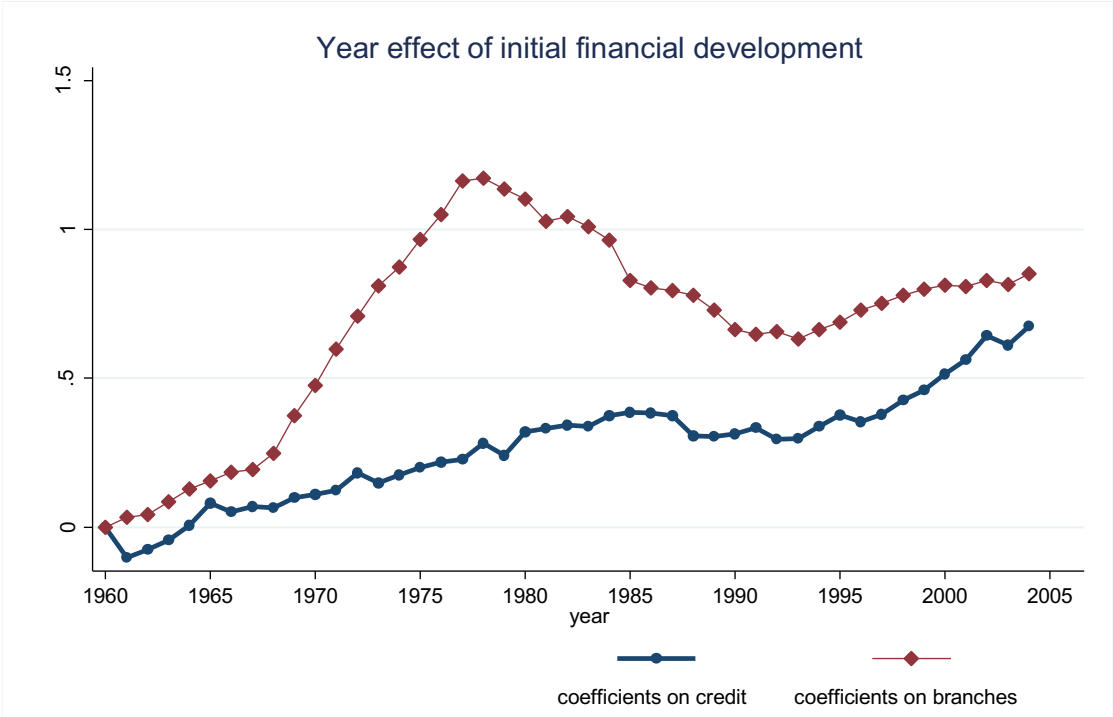


Figure 10- Sectoral credit to SDP in India over time

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 A1.

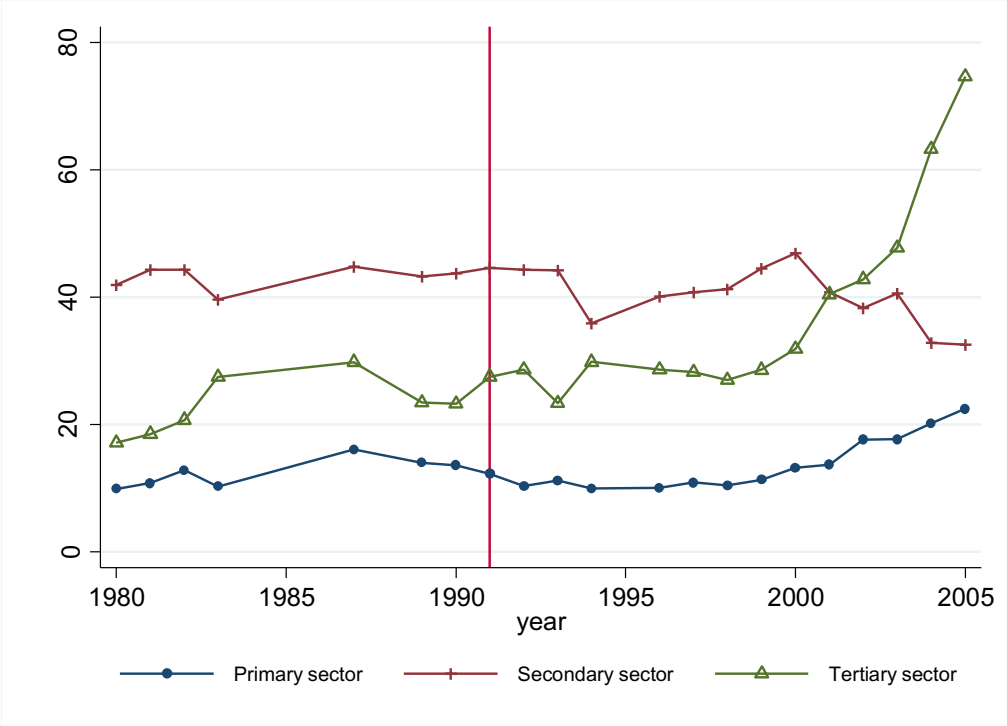


Table 1- Summary statistics

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 $(x_{sy} - m_y - m_s)$. The definitions and sources of all variables are in the Appendix table A1.

	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	DRT initial demand
Mean	31.935	7.521	25.890	6.515	26.962	74.100	8,781	74.487	19.274	55.981	1.417
SD	14.898	4.685	12.076	3.882	14.387	18.732	6,897	8.555	41.173	14.083	2.250
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	2.250
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	

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 table A1. *, **, 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***	1								
Urban Headcount	0.714***	0.717***	1							
Urban Poverty gap	0.693***	0.718***	0.970***	1						
Credit to SDP	-0.248***	-0.198***	-0.0708	-0.0234	1					
Branches per capita	-0.314***	-0.239***	-0.187***	-0.142***	0.405***	1				
SDP per capita	-0.699***	-0.655***	-0.622***	-0.564***	0.487***	0.263***	1			
Rural population	0.316***	0.247***	0.135**	0.112**	-0.757***	-0.553***	-0.53***	1		
Government exp./SDP	-0.0823	-0.133**	-0.112**	-0.126**	-0.0921*	-0.206***	0.0395	0.361***	1	
Literacy rate	-0.547***	-0.543***	-0.447***	-0.400***	0.537***	0.471***	0.660***	-0.467**	0.174***	1
DRT initial demand	0.0745	0.112**	0.108**	0.162***	0.767***	0.246***	0.207***	-0.59***	-0.229***	0.416***

Table 3- Finance, DRT and Branching Policy

This table shows the first stage estimation of the Instrumental variable regressions in Table 5. The regression equation estimated is: Credit to SDP (or Branches per capita)$_{it}$= $a_0 + \beta_1 DRT_{it}$ × number of DRT applications per million capita in the first year of establishment + β_2 (year-1960) × B60 + β_3 (year-1977) × B60 × D77 + β_4 (year-1990) × B60 × D90 + β_5 Log (SDP per capita) $_{it}$+ β_6Literacy Rate$_{it}$ + β_7Government exp./SDP$_{it}$ + β_8 DRT_{it} +s_i + y_t + e_{it}, where DRT_{it} is time dummy for DRT establishment, 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. 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 table A1.

	1982-2004				1964-2004	
	(1) Credit to SDP	(2) Branches per capita	(3) Rural Branches per capita	(4) Urban Branches per capita	(5) Credit to SDP	(6) Branches per capita
DRT dummy × applications per capita	3.770***	0.338	0.488*	0.035	4.125***	0.140
	(0.457)	(0.211)	(0.295)	(0.041)	(0.461)	(0.296)
(year-1960) × B60					0.062***	0.271***
					(0.013)	(0.064)
(year-1977) × B60 × D77	-0.012	-0.141***	-0.091***	-0.043*	-0.052***	-0.387***
	(0.018)	(0.022)	(0.022)	(0.022)	(0.009)	(0.061)
(year-1990) × B60 × D90	0.079***	0.140***	0.075***	0.045	0.027***	0.133***
	(0.025)	(0.028)	(0.023)	(0.027)	(0.007)	(0.016)
Constant	152.966***	21.551	16.371	-8.128	83.994	-10.174
	(25.161)	(32.843)	(20.836)	(13.158)	(56.889)	(49.622)
Observations	345	345	345	345	597	597
R-squared	0.956	0.992	0.992	0.982	0.944	0.982
Control variables	YES	YES	YES	YES	YES	YES
AP-chi2	132.680	53.353	23.321	9.881	87.534	338.264
P-value	0.000	0.000	0.000	0.007	0.000	0.000
Weak ID test	88.316	88.316	50.738	39.701	133.848	133.848

Table 4- Finance and Poverty: OLS estimations

The regression equation estimated is: $Poverty_{it} = a_0 + \beta_1 Credit\ to\ SDP_{it} + \beta_2 Branches\ per\ capita_{it} + \beta_6\ Log\ (SDP\ per\ capita)_{it} + \beta_7 Literacy\ rate_{it} + \beta_8 Government\ exp./SDP_{it} + s_i + y_t + e_{it}$ 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 table A1. *, **, and *** shows significance at 10%, 5% and 1% level.

	Rural Headcount	**Rural Poverty gap**	**Urban Headcount**	**Urban Poverty gap**	**Rural Headcount**	**Rural Poverty gap**	**Urban Headcount**	**Urban Poverty gap**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
lag of Credit to SDP	-0.103**	-0.074***	-0.032	-0.028	-0.089***	-0.070***	-0.040	-0.032
	(0.047)	(0.028)	(0.073)	(0.027)	(0.034)	(0.023)	(0.077)	(0.028)
lag of Branches per capita	-0.186	-0.081	-0.018	-0.021				
	(0.211)	(0.105)	(0.127)	(0.057)				
lag of Rural branches per capita					-0.456*	-0.171*		
					(0.234)	(0.095)		
lag of Urban branches per capita							0.502	0.183
							(0.365)	(0.176)
lag of Log(SDP per capita)	-1.589	0.386	-10.049**	-2.859*	-2.960	-0.099	0.502	0.183
	(6.195)	(3.783)	(5.022)	(1.660)	(6.114)	(3.806)	-10.095*	-2.838
lag of Literacy rate	0.330***	-0.021	0.410*	0.079	0.252*	-0.044	(5.456)	(1.874)
	(0.117)	(0.120)	(0.233)	(0.088)	(0.132)	(0.120)	0.397*	0.083
lag of Government exp./SDP	-0.034	-0.011	-0.225*	-0.081**	-0.087	-0.029	(0.207)	(0.081)
	(0.174)	(0.072)	(0.122)	(0.041)	(0.178)	(0.073)	-0.201	-0.069
Constant	56.458	16.567	106.301***	32.976***	72.771	21.529	97.186**	28.166*
	(45.732)	(32.223)	(38.974)	(11.558)	(49.645)	(32.514)	(45.074)	(15.350)
Observations	345	345	345	345	345	345	345	345
R-squared	0.896	0.857	0.890	0.852	0.899	0.861	0.892	0.854
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: $Poverty_{it} = a_0 + \beta_1 Instrumented\ value\ of\ Credit\ to\ SDP_{it} + \beta_2\ Instrumented\ value\ of\ Branches\ per\ capita_{it} + \beta_3\ Log\ (SDP\ per\ capita)_{it} + \beta_4 Literacy\ rate_{it} + \beta_5 Government\ exp./SDP_{it} + s_i + y_t + e_{it}$ 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 table A1. 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)	(7)	(8)
	Rural Headcount	Rural Poverty gap	Urban Headcount	Urban Poverty gap	Rural Headcount	Rural Poverty gap	Rural Headcount	Rural Poverty gap
lag of Credit to SDP	-0.168**	-0.082***	-0.135	-0.059	-0.152**	-0.076***	-0.375**	-0.160*
	(0.076)	(0.028)	(0.141)	(0.045)	(0.070)	(0.028)	(0.188)	(0.084)
lag of Branches per capita	-0.271	-0.129	0.089	0.036			-0.332***	-0.127**
	(0.244)	(0.119)	(0.174)	(0.095)			(0.076)	(0.055)
lag of Rural Branches per capita					-0.459	-0.195		
					(0.306)	(0.153)		
lag of Log(SDP per capita)	-2.016	0.233	-10.066**	-2.794*	-3.159	-0.217	-4.233	0.115
	(5.256)	(3.344)	(4.539)	(1.493)	(5.197)	(3.284)	(10.263)	(4.546)
lag of Literacy rate	0.271**	-0.048	0.446*	0.104	0.238*	-0.055	0.412*	0.134
	(0.124)	(0.114)	(0.233)	(0.098)	(0.141)	(0.117)	(0.242)	(0.154)
lag of Government exp./SDP	-0.064	-0.023	-0.221**	-0.074**	-0.099	-0.035	0.197	0.060
	(0.154)	(0.060)	(0.110)	(0.035)	(0.161)	(0.061)	(0.449)	(0.172)
Observations	345	345	345	345	345	345	597	597
Fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
OID test	0.935	0.260	0.451	0.033	0.839	0.193	1.195	0.983
OID P-value	0.334	0.610	0.502	0.856	0.360	0.660	0.274	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 table A1. 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	-0.136	-0.080**	-0.345**	-0.143***	-0.227**	-0.060	0.112	-0.014	0.241*	0.052
	(0.128)	(0.032)	(0.166)	(0.049)	(0.107)	(0.062)	(0.078)	(0.043)	(0.144)	(0.053)
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	119.549	118.951	118.978	119.231	119.072	119.885	119.027	119.369	118.005	117.450
OID test	0.473	0.261	0.952	0.898	0.694	0.562	1.616	1.070	0.632	6.813
OID P-value	0.790	0.878	0.621	0.638	0.707	0.755	0.446	0.586	0.729	0.033

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 table A1. 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	0.115***			-0.114			0.037			-0.032		
	(0.033)			(0.100)			(0.027)			(0.058)		
5 years lag of Credit to SDP		0.383*			-0.402*			0.020			0.008	
		(0.230)			(0.218)			(0.025)			(0.258)	
10 years lag of Credit to SDP			-1.283			-6.231			9.963			4.374
			(3.517)			(35.453)			(415.613)			(9.524)
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	109.359	14.010	0.288	109.359	14.010	0.288	109.359	14.010	0.288	109.359	14.010	0.288
OID test	1.361	0.169	1.466	2.584	4.984	0.323	2.111	1.616	0.073	3.369	2.506	0.029
OID P-value	0.506	0.919	0.480	0.275	0.083	0.851	0.348	0.446	0.964	0.186	0.286	0.985

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 table A1. 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 (1983-2005)

	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	-0.0029	-0.0059	0.0032*
	(0.0041)	(0.0044)	(0.0018)
Observations	345	344	330
Control	YES	YES	YES
Fixed Effects	YES	YES	YES
Weak ID test	130.7757	130.2100	123.1073
OID test	4.3150	2.0863	2.8783
OID P-value	0.1156	0.3523	0.2371

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 $Y_{k,i,t} = \beta_1 Diff\,[Credit\ to\ SDP)_{i,t}] + \beta_2 Diff[Log\ (SDP\ per\ capita)_{it}] + \beta_3 Diff[Literacy\ rate_{it}] + \beta_4 Diff[Government\ exp./SDP_{it}] + \beta_5 Diff[Rural\ population_{it}] + s_i + y_t + e_{it}$ 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 table A1. The reported coefficients are marginal effects and multiplied by 100 for better illustration. The definitions and sources of all variables are in the Appendix table A1. *, **, 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- 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 $population_{it} + s_i + y_t + e_{it}$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 similar to 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 table A1. 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	-0.116*	-0.058**	-0.040	-0.028
	(0.060)	(0.026)	(0.073)	(0.029)
lag of Branches per capita	-0.161	-0.087	0.044	0.067
	(0.175)	(0.076)	(0.059)	(0.059)
Observations	270	270	270	270
Controls	YES	YES	YES	YES
FixedEffects	YES	YES	YES	YES
OID test	0.559	0.099	0.394	0.072
OID P-value	0.455	0.752	0.530	0.788

Web Appendix A1: 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) + Besley & Burgess (2004) + updates from the Reserve Bank of India (RBI) (http://dbie.rbi.org.in)	Credit given by scheduled commercial banks over net state domestic product. Credit data is taken from Burgess & Pande (2005) till 2000 and updated to 2005 using RBI's data. Net state domestic product is provided in Besely & Burgess (2004) till 2002 and is available at EOPP website. For the remaining years it is updated using RBI's data.
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.
DRT cases per capita	http://drt.gov.in	Number of DRT application in the first year of establishment. Population data is drawn from EOPP
Credit/SDP -Primary sector	RBI's publications "Basic Statistical Returns of Banks" and "Banking	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

	Statistics 1972-2002". (http://dbie.rbi.org.in)	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 using NSSO surveys	Share of illiterates in total population
Proportion of up to primary		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 is 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
Development exp./SDP	EOPP + updates from RBI	State government development expenditures over net state domestic product
Trade openness	Marjit et al (2007)	A time varying index to measure the openness of states to trade with other countries. It is available from 1980 to 2002.
Labor regulation	Gupta et al (2009)	States are divided into flexible, neutral, and inflexible labor regulation. The categories are based on Besley and Burgess (2004).
Cost of power supply	Planning Commission (http://planningcommission.nic.in)	Unit cost of electric power supply in Paise/kwh. The data is drawn from two reports on the working of state electricity boards and electricity department (2001-02 and 2011-12), prepared by Planning Commission, (Power & Energy Division), Government of India. The first report in 2001-2 includes data between 1974 and 2001 and the second one covers 2007-2010. For 2002-2006 we generate data using linear interpolation.
Road density	Ghosh & Prabir (2005), + updates from CSO	Total length of roads in km per 1000 km^2. It includes both surfaced and unsurfaced roads. Data is available in Ghosh & Prabir (2005) for 1990-96. Updates for 1998-2008 are drawn from infrastructure statistics published by Central Statistical Organization (CSO) and available at: http://www.transportindia.org, and http://mospi.nic.in/

Table A2- Summary statistics across Indian States mean and standard deviation (in parentheses) of the main variables in each of the 15 states in India over the period 1983-2005.

	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 A3- Finance, DRT and Branching Policy: Including rural population share

This table shows the first stage estimation of the Instrumental variable regressions in Table 5. The regression equation estimated is: Credit to SDP (or Branches per capita)$_{it}$= $a_0 + \beta_1 DRT_{it}$ × number of DRT applications per million capita in the first year of establishment + β_2 (year-1960) × B60 + β_3 (year-1977) × B60 × D77 + β_4 (year-1990) × B60 × D90 + β_5 Log (SDP per capita) $_{it}$+ β_6Literacy Rate$_{it}$ + β_7Government exp./SDP$_{it}$ + β_8Rural population$_{it}$ + β_9 DRT_{it} +s_i + y_t + e_{it}, where DRT_{it} is time dummy for DRT establishment, 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. 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 table A1.

	1982-2004		**1964-2004**	
	(1)	(2)	(3)	(4)
	Credit to SDP	Branches per capita	Credit to SDP	Branches per capita
DRT dummy × applications per capita	3.688***	0.364	3.799***	0.113
	(0.475)	(0.229)	(0.506)	(0.278)
(year-1960) × B60			0.064***	0.272***
			(0.012)	(0.064)
(year-1977) × B60 × D77	-0.019	-0.139***	-0.065***	-0.388***
	(0.021)	(0.023)	(0.021)	(0.061)
(year-1990) × B60 × D90	0.067*	0.144***	-0.006	0.130***
	(0.035)	(0.026)	(0.031)	(0.015)
Constant	197.897***	7.154	256.556***	4.290
	(26.360)	(41.177)	(59.312)	(65.131)
Observations	345	345	597	597
R-squared	0.957	0.992	0.953	0.982
Control variables	YES	YES	YES	YES
AP-chi2	145.165	45.632	87.534	262.454
P-value	0.000	0.000	0.000	0.000
Weak ID test	74.626	74.626	136.002	136.002

Table A4- Finance and Poverty: OLS estimations including rural population share

The regression equation estimated is: $Poverty_{it} = a_0 + \beta_1 Credit\ to\ SDP_{it} + \beta_2 Branches\ per\ capita_{it} + \beta_6\ Log\ (SDP\ per\ capita)_{it} + \beta_7 Literacy\ rate_{it} + \beta_8 Government\ exp./SDP_{it} + \beta_9 Rural\ population_{it} + s_i + y_t + e_{it}$ 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 table A1. *, **, and *** shows significance at 10%, 5% and 1% level.

	Including rural population			
	(1) Rural Headcount	(2) Rural Poverty gap	(3) Urban Headcount	(4) Urban Poverty gap
lag of Credit to SDP	-0.082	-0.081***	0.034	-0.010
	(0.051)	(0.029)	(0.061)	(0.025)
lag of Branches per capita	-0.220	-0.070	-0.129	-0.053
	(0.182)	(0.100)	(0.110)	(0.042)
lag of Log(SDP per capita)	-0.664	0.082	-7.075	-2.015
	(5.395)	(3.575)	(4.782)	(1.489)
lag of Literacy rate	0.309***	-0.014	0.344	0.061
	(0.105)	(0.114)	(0.244)	(0.092)
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**
	(0.180)	(0.075)	(0.121)	(0.042)
Constant	33.430	24.142	32.318	11.982
	(52.666)	(33.875)	(48.542)	(16.350)
Observations	345	345	345	345
R-squared	0.896	0.857	0.894	0.855
Fixed effects	YES	YES	YES	YES

Table A8- Finance and Poverty: Instrumental Variable results including rural population share

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 $population_{it} + s_i + y_t + e_{it}$ 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 table A1. 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	-0.169**	-0.092***	-0.074	-0.046	-0.433*	-0.178*
	(0.082)	(0.033)	(0.126)	(0.045)	(0.228)	(0.096)
lag of Branches per capita	-0.276	-0.108	-0.041	0.009	-0.302***	-0.118**
	(0.197)	(0.097)	(0.151)	(0.090)	(0.080)	(0.054)
lag of Log(SDP per capita)	-1.524	-0.037	-8.093*	-2.348	-5.986	-0.405
	(4.553)	(3.224)	(4.506)	(1.458)	(8.125)	(3.823)
lag of Literacy rate	0.265***	-0.037	0.375	0.089	0.389*	0.127
	(0.095)	(0.101)	(0.234)	(0.100)	(0.227)	(0.145)
lag of Rural population	0.129	-0.076	0.544	0.122	-0.469	-0.139
	(0.451)	(0.182)	(0.382)	(0.161)	(1.093)	(0.389)
lag of Government exp./SDP	-0.071	-0.017	-0.260**	-0.082**	0.182	0.056
	(0.160)	(0.062)	(0.106)	(0.035)	(0.412)	(0.160)
Observations	345	345	345	345	597	597
Fixed effects	YES	YES	YES	YES	YES	YES
OID test	0.935	0.260	0.451	0.033	1.195	0.983
OID P-value	0.334	0.610	0.502	0.856	0.274	0.322

Table A6- Robustness check: first stage. The regressions are estimated similar to Table 3 with additional control variables.

	(1)	(2)	(3)	(4)
	Credit to SDP (%)			
Lag of DRT dummy × applications per capita	3.695***	3.005***	3.705***	3.682***
	(0.486)	(0.494)	(0.480)	(0.509)
(year-1977) × B60 × D77	-0.018	-0.019	-0.018	-0.019
	(0.020)	(0.027)	(0.021)	(0.022)
(year-1990) × B60 × D90	0.066*	0.072*	0.067*	0.068*
	(0.034)	(0.038)	(0.034)	(0.040)
development exp. / SDP (%)	-0.172			
	(0.346)			
trade openness index (N.A. after 2003)		-0.025		
		(0.148)		
unit cost of power supply (Paise/KWH)			-0.012**	
			(0.005)	
labor regulation type(flex=+1 neut=0 infl=-1) × post 91 trend dummy				-0.009
				(0.186)
Constant	196.843***	201.945***	206.178***	197.322***
	(27.722)	(48.279)	(26.008)	(23.624)
Observations	345	315	345	345
R-squared	0.957	0.963	0.958	0.957
Other Control	YES	1.000	1.000	1.000
Fixed Effects	1.000	1.000	1.000	1.000
APchi2	108.641	52.742	110.830	131.513
P_AP	0.000	0.000	0.000	0.000
WeakID_test	79.081	64.796	74.100	82.093

Table A7- Robustness test: second stage. The regressions are estimated similar to Table 5 with additional control variables.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Rural Headcount				Rural Poverty gap			
Lag of Credit to SDP	-0.162**	-0.23**	-0.176**	-0.159**	-0.090***	-0.12**	-0.1***	-0.09***
	(0.078)	(0.110)	(0.074)	(0.079)	(0.032)	(0.047)	(0.024)	(0.033)
Lag of Branches per capita	-0.285	-0.329*	-0.351*	-0.293	-0.111	-0.157*	-0.133	-0.112
	(0.212)	(0.188)	(0.198)	(0.212)	(0.098)	(0.088)	(0.106)	(0.101)
lag of development exp. / SDP (%)	-0.830***				-0.241**			
	(0.246)				(0.108)			
lag of trade openness index (N.A. after 2003)		0.167				0.153		
		(0.250)				(0.103)		
lag of labor regulation type(flex=+1 neut=0 infl=-1) × post 91 trend dummy			-0.136				-0.092*	
			(0.097)				(0.049)	
lag of unit cost of power supply (Paise/KWH)				-0.016*				-0.004
				(0.009)				(0.004)
Observations	345	315	345	345	345	315	345	345
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Over-identification test	1.066	0.369	1.412	1.152	0.256	0.046	0.819	0.390
Over-identification P-value	0.302	0.543	0.235	0.283	0.613	0.830	0.365	0.532

Table A8–Financial deepening and reasons for inter-state migration

This table presents multinomial logit estimation for households with inter-state migration. The regression equation is $Y_{k,i,t} = \beta_1 \text{Diff}\,[\text{Credit to SDP})_{i,t}] + \beta_2 \text{Diff}[\text{Log (SDP per capita)}_{it}] + \beta_3 \text{Diff}[\text{Literacy rate}_{it}] + \beta_4 \text{Diff}[\text{Government exp./SDP}_{it}] + \beta_5 \text{Diff}[\text{Rural population}_{it}] + s_i + y_t + e_{it}$ 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 table A1. *, **, 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 A9–Financial deepening and reasons for inter-state migration for the sample of migrants from rural to urban tertiary and below poverty line

This table presents multinomial logit estimation for households below poverty line with inter-state migration from rural areas to urban tertiary. The regression equation is $Y_{k,i,t} = \beta_1 Diff\,[Credit\ to\ SDP)_{i,t}] + \beta_2 Diff[Log\ (SDP\ per\ capita)_{it}] + \beta_3 Diff[Literacy\ rate_{it}] + \beta_4 Diff[Government\ exp./SDP_{it}] + \beta_5 Diff[Rural\ population_{it}] + s_i + y_t + e_{it}$ 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 table A1. *, **, 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	0.404***	-0.186*	-0.028	-0.014	-0.119**	-0.035	-0.036**	0.014
	(0.096)	(0.097)	(0.036)	(0.022)	(0.055)	(0.039)	(0.017)	(0.036)
lag of Difference in SDP per capita	0.095**	0.115***	-0.037***	0.003	-0.109***	-0.017	-0.037***	-0.012
	(0.041)	(0.041)	(0.014)	(0.008)	(0.022)	(0.014)	(0.010)	(0.015)
lag of Difference in Literacy rate	-0.002*	0.001	0.000	-0.000**	0.001*	0.000	0.000*	-0.000
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
lag of Difference in Rural population	-0.009	0.114	-0.067	0.015	0.038	-0.112	-0.126***	0.148**
	(0.208)	(0.209)	(0.069)	(0.042)	(0.106)	(0.077)	(0.042)	(0.072)
lag of Difference in Government expenditures/SDP	1.180***	-0.511*	0.131	-0.012	-0.734***	0.133	-0.085	-0.101
	(0.301)	(0.301)	(0.111)	(0.068)	(0.166)	(0.110)	(0.060)	(0.113)
Monthly per capita expenditure	0.021	-0.033**	0.015***	0.004*	0.001	-0.006	-0.002	-0.000
	(0.013)	(0.014)	(0.003)	(0.002)	(0.007)	(0.005)	(0.003)	(0.005)
Household size	-0.022***	-0.005	0.003***	0.001	0.017***	0.003**	0.001*	0.003**
	(0.004)	(0.004)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Observations	3219	3219	3219	3219	3219	3219	3219	3219

Table A10- Sector-wise financial development

The regression equation estimated is: Primary/Secondary/Tertiary Credit to SDP_{it} = a_0 + β_1 DRT_{it} × number of DRT applications per million capita in the first year of establishment + β_2 (year-1960) × B60 + β_3 (year-1977) × B60 × D77 + β_4 (year-1990) × B60 × D90 + β_5 Log (SDP per capita) $_{it}$+ β_6Literacy $Rate_{it}$ + β_7Government exp./SDP_{it} + β_8Rural $population_{it}$ + β_9 DRT_{it} +s_i + y_t + e_{it}, where DRT_{it} is time dummy for DRT establishment, 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. 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 table A1.

	(1) Credit/SDP -Primary sector	(2) Credit/SDP -Secondary sector	(3) Credit/SDP -Tertiary sector
Lag of DRT dummy × applications per capita	0.208	-1.120	6.359***
	(0.298)	(1.045)	(1.261)
(year-1977) × B60 × D77	-0.075**	0.004	-0.008
	(0.033)	(0.069)	(0.052)
(year-1990) × B60 × D90	0.143***	0.021	0.066
	(0.046)	(0.103)	(0.063)
Constant	110.002**	241.772*	197.938**
	(42.697)	(123.091)	(79.956)
Observations	270	270	270
R-squared	0.839	0.698	0.888
Control variables	YES	YES	YES
APchi2	5.611	43.709	91.438
P-value	0.373	0.001	0.000
Weak ID test	1.235	3.533	66.997

Web Appendix B: Construction of poverty and migration variables

Poverty and **migration** measures are calculated using socioeconomic surveys c

The National Sample Survey Office or NSSO is the largest organization in India co

regular socio-economic surveys. The schedule 1.0 of each round is a survey of h

consumer expenditures which has been carried out in India since 1950s. However,

1990s, they were not evenly spaced and sampled. The "thick" (large-sample) ro

conducted about every five years and some "thin" rounds are in between. Datt et a

provides the time series of state-wise headcount and poverty gap measures from 19

Since 1986, NSSO has started to conduct and make available "thin" surveys on an ann

and thick surveys every five years. We obtain the data of 20 rounds (38, 43, and 45 to

among them; the thick surveys are 38th, 43th, 50th, 55th, and 61th rounds. For the missi

we make use of Datt et al. (1996) data[41].

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

The NSSO's household expenditure survey has a variety of data at household

provides information on expenditure patterns, employment (self-employed, labo

education, occupation, and some other characteristics of households and individua

enable us to compute a variety of within group measures. It covers all Indian states and

the Indian Census definition of urban and rural areas. To be classified urban, an area

meet several criteria regarding size and density of the population, and the share of male

population engaged in non-agricultural pursuits. However, the surveys are not quite the s

[41] The data is available at: http://go.worldbank.org/YMRH2NT5V0. We use their data for 1960-82 and 19

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[42]. 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 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

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

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.

In order to estimate state-level headcount and poverty gap, we utilize the same **poverty line** as Datt et al. (1996) because our measures are updated for 1960-82 and 1984-87 using their data. The poverty line is recommended by the Planning Commission in 1993 based on calorie intake and adjusted for other years using price indices (for details, see notes of Datt et al, 1996). The Planning commission also has separate estimates of poverty line based on calorie intake in 1983, 1987, 1999, and 2004. As an alternative, we take these measures and interpolate the line using price indices for the years in between and re-estimate headcount and poverty gap. Our results are robust to this adjustment with a slight change in the level (not significance) of the coefficients. More recent poverty lines for 1993-04 and 2004-05 are presented in Radhakrishna et al. (2009). Compared to the older lines their estimates are based on normative expenditure on food, education, and health and are higher than calorie intake lines. Nevertheless, applying these lines (price adjusted for the other years) results in a parallel increase in the poverty measure across states with no change in the qualitative results of our regressions. Table B.1 shows the state-level headcount measures in 2004 using the two new poverty lines and compares it with official estimates. The small difference between the two groups is mainly due to seasonal adjustment because our estimates for 2004 includes the first half of 2004-05 and the second half of 2003-04 surveys. Table B.2 presents our main IV regressions with the poverty estimates by the two new lines which show that the poverty-reducing effect of credit is robust to different poverty lines.

Table B.1- Headcount ratio using different poverty lines.

Headcount ratio	our estimations (2004)			official estimations (2004-05)	
poverty line	Datt et al.	Planning Commission	Radhakrishna et al.	Planning Commission	Radhakrishna et al.
Andhra Pradesh	9.51	8.20	32.08	7.5	32.3
Assam	14.21	14.72	34.21	17	36.4
Bihar	29.94	31.34	50.30	32.9	55.7
Gujarat	14.87	12.54	37.70	13.9	39.1
Haryana	7.20	6.63	20.91	9.2	24.8
Karnataka	13.92	11.22	31.68	12	37.5
Kerala	8.16	8.40	16.48	9.6	20.2
Madhya Pradesh	23.17	25.64	46.93	29.8	53.6
Maharashtra	19.16	16.36	40.08	22.2	47.9
Orissa	28.28	35.24	56.29	39.8	60.8
Punjab	4.60	4.60	18.70	5.9	22.1
Rajasthan	18.12	11.73	33.20	14.3	35.9
Tamil Nadu	14.19	14.33	33.47	16.9	37.5
Uttar Pradesh	18.90	21.88	35.83	25.3	42.7
West Bengal	12.97	18.42	30.82	24.2	38.2

Table B.2- IV results of Table 5 using different poverty lines.

Poverty line	Planning commission		Radhakrishna et al.	
	Rural poverty	Rural poverty gap	Rural poverty	Rural poverty gap
Lag of Credit to SDP	-0.188**	-0.082**	-0.614**	-0.295**
	(0.083)	(0.036)	(0.270)	(0.137)
Lag of Branches per capita	-0.050	-0.094	0.412	0.200
	(0.246)	(0.107)	(0.711)	(0.293)
Observations	345	345	345	345
R-squared	-0.004	0.009	0.220	0.172
Over ID P-value	0.332	0.427	0.509	0.416

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.