Do Rural Banks Matter? Evidence from the Indian Social Banking Experiment

By Robin Burgess and Rohini Pande*

The question of whether state-led expansion of credit and savings facilities can reduce poverty has long been of interest to economists and policymakers. A large theoretical body of literature identifies different mechanisms through which access to such facilities can enable individuals to alter their production and employment choices, and thereby exit poverty (Philippe Aghion and Patrick Bolton, 1997; Abhijit Banerjee and Andrew Newman, 1993; Banerjee, 2004). The belief that governments can use public policy to alleviate financing constraints, and thereby engender development and reduce poverty, led to the widespread implementation of state-led rural credit and savings schemes in low-income countries in the postcolonial period. In most cases this was accomplished through government oversight of the banking sector, often aided by government ownership of banks.

Today, these schemes remain important in many developing countries (Timothy Besley, 1995). Many believe, however, that formal subsidized credit was ineffective in reaching the poor, and may even have undermined rural development and increased rural poverty. Some claim that the elite capture concentrated formal subsidized credit in the hands of the powerful few and worsened terms in the informal markets on which the poor depend (Dale W. Adams et al., 1984; Avishay Braverman and J. Luis Guasch, 1986). Others argue that state control led to political considerations determining credit allocation and made the banking sector susceptible to elite capture (Rafael La Porta et al., 2002; Paola Sapienza, 2004).

Credible evidence on whether state-led expansion of the banking sector can reduce poverty, however, remains limited. The central reason for this is the nonrandom nature of these programs. Specifically, banks favor opening branches in richer areas, while state-led bank branch expansion programs tend to target poorer areas. This makes identification of the causal impact of branch expansion on poverty outcomes problematic.[1] In this paper, we evaluate how a large state-led bank branch expansion program in India affected rural poverty. The policy rules underlying the program provide a credible source of exogenous variation in rural branch expansion.

This program is the largest branch expansion program undertaken by any single country. After bank nationalization in 1969, the Indian government launched an ambitious social banking program which sought to improve the access of the rural poor to formal credit and saving opportunities. The program ended in 1990. Between 1969 and 1990, bank branches were opened in roughly 30,000 rural locations with no prior formal credit and savings institutions (unbanked locations).[2]

An integral element of this program was branch expansion into rural unbanked locations.

* Burgess: Economics Department, London School of Economics, Houghton Street, London WC2A 2AE (e-mail: r.burgess@lse.ac.uk); Pande: Economics Department, Economic Growth Center, Yale University, P.O. Box 208269, New Haven, CT 06520 (e-mail: rohini.pande@yale.edu).
We thank Esther Duflo for very helpful and detailed comments. We have benefited from comments and suggestions from Abhijit Banerjee, Tim Besley, Richard Blundell, Bronwen Burgess, Anne Case, Ken Chay, Jonathan Murdoch, Atif Mian, Andrew Newman, Dominic Leggett, Debraj Ray, Mark Rosenzweig, Ken Sokoloff, Duncan Thomas, Robert Townsend, a co-editor, two anonymous referees, and numerous seminar participants. Juan de Laiglesia, Mattia Romani, Gaurav Shah, Heideeflower Stoller, Pataporn Sukontamarn, and Grace Wong provided exceptional research assistance.

[1] Bank expansion and economic growth are positively correlated in cross-country data (e.g., Robert King and Ross Levine, 1993). The fact that countries with greater growth potential may attract more banks, however, makes causal inference difficult.

[2] Throughout the paper, locations refer to villages, towns, and cities as defined by the Indian Census. The Census defines a location with fewer than 10,000 persons as rural. The same holds for rural and urban poverty definitions.

The stated aim was to open bank branches in the most populous unbanked rural locations, and over time move down the population distribution of locations. India is a federation of states, and more of the targeted locations were situated in states with fewer bank branches per capita pre-program (financially less developed states). To further encourage rural branch expansion, the Indian Central Bank announced a new branch licensing policy in 1977. It mandated that to obtain a license for a branch opening in a location with one or more branches (a banked location) a bank must open branches in four eligible unbanked locations. This policy remained in place until 1990.

Our research design exploits the policy-driven nature of branch expansion across Indian states. We show that between 1977 and 1990, rural branch expansion was relatively higher in financially less developed states. The reverse was true before 1977 and after 1990. The timing and nature of these trend reversals suggest they were caused by the introduction and removal of the 1:4 branch licensing policy. By using the deviations, between 1977 and 1990 and post-1990, from the pre-program linear trend relationship between a state's initial financial development and rural branch expansion as instruments, we are able to identify the policy-driven element of rural branch expansion. This allows us to address the problem of nonrandom branch placement. Our research design assumes that other state-specific economic and policy variables, which affect poverty outcomes, did not exhibit similarly timed trend reversals. We show that potentially confounding variables, such as states' economic performance, poverty alleviation policies, and other credit programs, did not show similar patterns.

This paper's main finding is that branch expansion into rural unbanked locations in India significantly reduced rural poverty. We show that this effect was, at least partially, mediated through increased deposit mobilization and credit disbursement by banks in rural areas. In contrast, the rural branch expansion program left urban poverty outcomes unaffected.

The paper is organized as follows. Section I describes the Indian rural branch expansion program and the data we use; Section II describes our research design; Section III presents the results; and Section IV concludes.

I. The Program

Nationalization in 1969 brought the 14 largest commercial banks under the direct control of the Indian Central Bank. Following this, the Central Bank launched an ambitious branch expansion program, which sought both to expand the rural bank branch network and equalize individual access to banks across Indian states.

This program encouraged branch openings in rural unbanked locations. Banks were required to select unbanked locations for branch expansion from a list circulated by the Central Bank. This list identified all unbanked locations with a population above a certain number. As the same population cut-off was applied across India, the list featured relatively more locations from states with a lower initial stock of bank branches per capita. Further, within a state, more locations were targeted in districts with fewer bank branches per capita pre-program.[3] The list was updated, with a lower population cutoff, every three years.

The 1949 Banking Regulation Act requires banks to obtain a license from the Indian Central Bank before opening a new branch. To ensure that targeted rural unbanked locations received bank branches, the Central Bank introduced a new branch licensing policy in 1977. It mandated that a bank can obtain a license to open a branch in an already banked location only if it opened branches in four unbanked locations. This 1:4 licensing policy was aimed at forcing banks wishing to expand in already banked locations to open branches in unbanked locations. The 1:4 licensing policy was discontinued in 1990. Since then, Central Bank policy has stated that branch expansion should reflect the "need, business potential, and financial viability of the location" (Government of India, 1991). Banks cannot, however, close a rural branch if it is the only one serving a given location.

To ensure that rural branch expansion translated into increased credit and savings opportunities for the rural population, the Central Bank regulated banks' deposit-taking

[3] In each Indian district, one commercial bank was selected by the Central Bank to be the lead bank, which was responsible for coordinating branch expansion activities in that district.

and lending policies. Between 1969 and 1990, rural lending rates were kept below urban lending rates, with the opposite being true of savings rates. After bank nationalization, the Central Bank also mandated that banks' lending portfolios meet lending targets with respect to "priority" sectors. These included loans to small businesses and small-scale entrepreneurs, and to agriculture. Finally, to ensure that banks did not concentrate their lending in urban areas, the Central Bank required that every bank branch maintain a credit-deposit ratio of 60 percent within its geographical area of operation.

Our focus is on examining the impact of the branch-expansion program on rural poverty. To measure rural branch expansion we use a branch-level dataset provided by the Indian Central Bank (Reserve Bank of India, 2000).[4] This dataset identifies the opening date and location of every Indian bank branch and whether it is in a rural location. We classify the first branch opening in a rural location as an opening in a rural unbanked location. A branch opening in a census location, which already has one or more bank branches, is classified as an opening in a banked location.

We aggregate the branch data to construct an annual state-level panel for the 16 main Indian states, 1961–2000.[5] We identify a state's initial financial development by the number of bank branches per capita in the state in 1961. We measure rural branch expansion and branch expansion in already banked locations by the cumulative number of branches per capita opened in rural unbanked and already banked locations in a state, respectively. Between 1961 and 2000, the number of branches opened in rural unbanked locations in our sample states increased from 105 to 29,109. Eighty percent of this expansion occurred between 1977 and 1990.[6] After 1990, there was no further expansion into unbanked rural locations.

Indian national household survey data document a dramatic rise in the importance of banks as a source of rural household credit. Between 1961 and 1991, bank borrowing as a share of total rural household debt increased from 0.3 percent to 29 percent. This rise came largely at the expense of borrowing from moneylenders, the share of which fell from 60.9 percent to 15.7 percent. (For details, see Burgess and Pande, 2003.) To examine whether rural branch expansion contributed to this rise in rural credit flows and savings mobilization, we use data on the shares of total outstanding bank credit and savings accounted for by rural branches (rural credit share and rural savings share, respectively).

Finally, to examine how rural branch expansion affected rural household welfare, we focus on rural poverty outcomes. As national household expenditure surveys have been regularly conducted in India since the 1950s, we can construct consistent and comparable annual state-level rural and urban poverty measures. Throughout, we measure poverty by the headcount ratio, which measures the proportion of population below the Indian poverty line. Across our sample period, the average rural and urban headcount ratios were 48 percent and 40 percent. We also use data on agricultural wages, an important income source for the rural poor, as an alternative measure of rural household welfare. Agricultural wage and poverty data are independently collected by separate government agencies.[7]

II. Research Design

We are interested in using our state-level panel of data on the number of bank branches, rural credit and saving shares, and poverty

[4] Each branch in the dataset is a distinct physical entity (typically a concrete building), which undertakes deposit-taking and lending activities. It is usually staffed by an officer, two clerks (one of whom is the cashier), and a security guard.

[5] These cover over 95 percent of the Indian population. State-wise summary statistics are in Table A1 of the Appendix, available at http://www.e-aer.org/data/june05_app_burgess.pdf.

[6] In Figure A1 of the Appendix we show that branch expansion lowered and equalized population per bank branch, across Indian states.

[7] We are grateful to Gaurav Datt and Martin Ravallion for providing the state-level poverty figures for 1961–1994 (see Berk Ozler et al., 1996), and to Gaurav Datt for the 1994–2000 data. The year 1961 is the first, and earliest, census year preceding bank nationalization for which annual poverty series are available. Figures A2 and A3 in the Appendix show the state-wise evolution of rural credit and savings shares, and of rural and urban poverty outcomes, respectively.

outcomes to identify whether the branch expansion program affected rural poverty. The simplest way is to estimate, for an Indian state i in year t, an OLS regression of the form:

$$(1) \qquad y_{it} = \alpha_i + \beta_t + \phi B^R_{it} + \varepsilon_{it}$$

where y_{it} denotes the rural headcount ratio, B^R_{it} cumulative branch openings in rural unbanked locations per capita, and α_i and β_t state and year fixed effects. Causal interpretation of the estimated ϕ parameter, however, is problematic. Absent policy constraints on branch placement, we would expect relatively greater branch expansion in richer states. If richer states are more effective at reducing poverty, then ϕ would be an overestimate of the true poverty impact of rural branch expansion. On the other hand, if the Indian Central Bank succeeded in forcing banks to open relatively more branches in poorer states, then the logic above suggests that ϕ would underestimate the true poverty impact of rural branch expansion.

This problem can be solved if we have instruments for rural branch expansion. Arguably, the imposition and removal of the 1:4 branch licensing policy, which linked branch expansion in unbanked locations to that in already banked locations, can provide such instruments. Between 1977 and 1990, this policy, if effective, should have caused more rapid branch expansion in financially less developed states since they contained more unbanked locations. Outside this period the opposite should have held if locations in financially less developed states offered banks lower profits and were therefore less attractive to banks. These trend reversals between 1977 and 1990, and post-1990, in how a state's initial financial development affects rural branch expansion, constitute valid instruments for branch openings in rural unbanked locations if, relative to the pre-1977 trend, these trend reversals were significant and had no direct impact on poverty outcomes. In the remainder of this section, we examine the validity of both these assumptions. We start by estimating:

$$(2) \qquad B^R_{it} = \alpha_i + \beta_t + \gamma_t \times B_{i1961} + \delta_t \times X_{i1961} + \varepsilon_{it}.$$

B_{i1961}, our measure of initial financial development, denotes the number of bank branches per capita in state i in 1961. This variable enters the regression interacted with year dummies, with γ_t denoting the year-specific coefficients. The difference between γ_{t+1} and γ_t tells us how a state's initial financial development affected rural branch growth between years t and $t + 1$. X_{i1961} denotes a vector of initial state conditions, which includes log real state income per capita, population density, and the number of rural locations per capita, all measured in 1961. These enter the regression with year-specific coefficients δ_t.

The circles on the solid line in Figure 1 graph the γ_t coefficients from this regression (the reference year is 1961). Consistent with the idea that financially more developed states offered banks greater profit opportunities, we observe more branch openings in rural unbanked locations in these states between 1961 and 1977. This is reflected in a positive trend in γ_t coefficients. This trend is reversed in 1977, precisely when the 1:4 license policy was imposed. Between 1977 and 1990, the γ_t coefficients decrease with time—financially less developed states witness higher growth of branch openings in rural unbanked locations. After 1990, branch expansion into rural unbanked locations ends. The shape of this graph is unaltered by the exclusion of the X_{61} controls (see Burgess and Pande, 2003). We also observe identical trend reversals at the district level in 1977 and 1990. This indicates that the 1:4 licensing policy caused banks to target financially less developed districts within a state.[8]

We summarize these trend reversals by a linear trend break model:

$$(3) \qquad B^R_{it} = \alpha_i + \beta_t + \gamma_1(B_{i1961} \times [t - 1961]) + \gamma_2(B_{i1961} \times [t - 1977]) + \gamma_3(B_{i1961} \times [t - 1990]) + \gamma_4(B_{i1961} \times P_{1977}) + \gamma_5(B_{i1961} \times P_{1990}) + \varepsilon_{it}.$$

[8] For the district-level analysis, see Figure A4 in the Appendix.

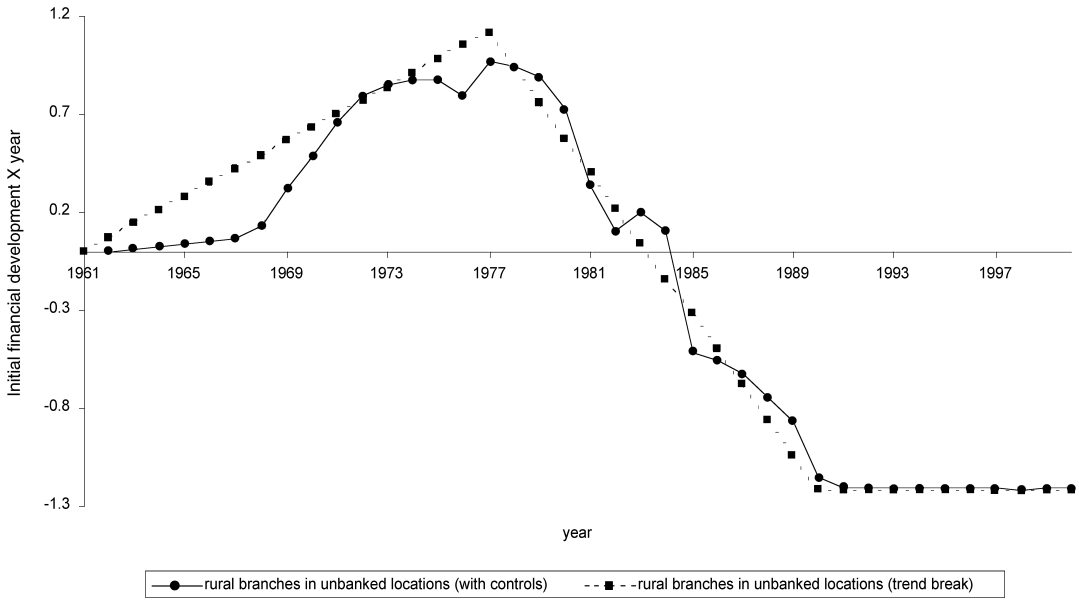

FIGURE 1. INITIAL FINANCIAL DEVELOPMENT AND RURAL BRANCH EXPANSION

Notes: The series "rural branches in unbanked locations (with controls)" graphs the annual coefficients on initial financial development (as measured by the number of bank branches per capita in 1961) from a regression of the form described in equation (2). The series "rural branches in unbanked locations (trend break)" graphs the annual coefficients implied by the trend break model, column (1), Table (1). In both cases, the dependent variable is the cumulative number of rural branches opened in unbanked locations.

State and year fixed effects account for permanent differences across states and national events which may affect branch expansion. $[t - 1961]$, $[t - 1977]$, and $[t - 1990]$ are linear time trends, which switch on in 1961, 1977, and 1990, respectively. These enter the regression interacted with our measure of a state's initial financial development, B_{i1961}. P_{1977} and P_{1990} are dummy variables which equal one from 1977 and 1990, respectively.

The main coefficients of interest γ_1, γ_2, and γ_3 measure the average 1961–1977 trend relationship between a state's initial financial development and rural branch expansion, and the subsequent changes in this trend relationship (between 1977 and 1990, and between 1990 and 2000). Finally, γ_4 and γ_5 measure the intercept changes in this relationship in 1977 and 1990, respectively. The set of additional controls, X_{i1961}, enters the regression in the same way as B_{i1961}. The inclusion of these controls ensures that any observed trend reversals in B_{i1961} do not proxy for trend breaks in a state's economic and demographic characteristics (as measured by X_{i1961}). To account for possible serial correlation in errors, we cluster standard errors by state (see Marianne Bertrand et al., 2004).

Column 1 of Table 1 reports the results. Between 1961 and 1977, one additional point of initial financial development increased branch openings in rural unbanked locations per capita in a state by 0.07 annually. There was a significant trend reversal in 1977. Between 1977 and 1990, one additional point of initial financial development reduced annual branch expansion by 0.18 branches per capita. Finally, after 1990, a state's level of initial financial development and rural branch expansion were unrelated.

The squares on the dotted line in Figure 1 show the γ_t coefficients implied by these estimates. The pattern of coefficients for the unrestricted model and linear trend break model are extremely similar and an F test shows that the imposed restrictions do not cause any significant loss in overall fit.[9]

[9] The value of the F-statistic is 0.04; see William Greene (1993, p. 208) for the test.

TABLE 1—BANKING AS A FUNCTION OF INITIAL FINANCIAL DEVELOPMENT

	Branches in rural unbanked locations	Rural bank		Branches in banked locations	Credit share	
		Credit share	Savings share		Priority sector	Cooperative
	(1)	(2)	(3)	(4)	(5)	(6)
Number of bank branches per capita in 1961*(1961–2000) trend	0.07**	0.18	−0.03	0.14***	−0.08	0.41
	(0.03)	(0.21)	(0.24)	(0.01)	(0.62)	(0.34)
Number of bank branches per capita in 1961*(1977–2000) trend	−0.25***	−1.09**	−0.82***	−0.07***	0.08	−0.02
	(0.03)	(0.43)	(0.25)	(0.02)	(0.86)	(0.42)
Number of bank branches per capita in 1961*(1990–2000) trend	0.17***	0.87***	0.43*	0.10**	−0.18	0.03
	(0.04)	(0.26)	(0.23)	(0.04)	(0.33)	(1.00)
Post-1976 dummy*(1977–2000) trend	0.34	−0.30	−0.17	0.53**	−3.37	−3.64
	(0.25)	(1.50)	(0.78)	(0.19)	(2.40)	(2.22)
Post-1989 dummy*(1990–2000) trend	−0.24	1.95	0.44	−0.40***	−0.05	−3.15
	(0.15)	(1.49)	(0.53)	(0.10)	(1.86)	(2.61)
State and year dummies	YES	YES	YES	YES	YES	YES
Other controls	YES	YES	YES	YES	YES	YES
Adjusted *R*-squared	0.96	0.88	0.87	0.98	0.86	0.81
F-test 1	16.87	12.8	25.67	8.97	0	5.75
	[0]	[0]	[0]	[0]	[0.99]	[0.03]
F-test 2	0.49	0.1	9	27.22	1.79	0.17
	[0.49]	[0.76]	[0]	[0]	[0.20]	[0.69]
Observations	636	512	512	636	512	491

Notes: Standard errors clustered by state are reported in parentheses; *p*-values are in square brackets. *F*-test 1 and *F*-test 2 are the joint significance test for coefficients in the first two rows and first three rows, respectively. Rural bank credit (saving) share is the percentage of total bank credit (saving) accounted for by rural branches. Priority credit share is share of bank lending going to priority sectors. Cooperative credit share is primary agricultural cooperative credit as a percentage of total cooperative and bank lending. Explanatory variables reported are bank branches in 1961 per 100,000 persons interacted with (row-wise) (a) a time trend, (b) a post-1976 time trend, (c) a post-1989 time trend. Other controls include state population density, log state income per capita, and log rural locations per capita, all measured in 1961. They enter the regression in the same way as branches per capita in 1961. The Data Appendix describes the data sources and the time period for which each data series is available. * Significant at 10-percent level. ** Significant at 5-percent level. *** Significant at 1-percent level.

The rural branch expansion program sought to increase rural household access to formal sector credit and saving opportunities. In Figure 2, we graph the estimated γ_t coefficients from a regression of the form described by equation (2), where the dependent variable is the share of total bank credit accounted for by rural branches. Similar to the pattern observed for rural branches, rural credit shares are initially higher in more financially developed states, but this pattern is reversed between 1977 and 1990, when we see that the share of lending accounted for by rural bank branches is greater in states with lower initial financial development. After 1990, the relationship reverts to being positive. Column 2 of Table 1 reports the corresponding results for the linear trend-break model. Prior to 1977, rural credit share and initial financial development are uncorrelated. Between 1977 and 1990, however, these two variables are negatively correlated. The correlation is, again, reversed between 1990 and 2000. In column 3 we see that the rural savings share exhibits a similar trend reversal in the mid-1970s. This suggests that the rural branch expansion associated with the 1:4 branch license policy increased savings mobilization and credit disbursement in rural India.

We now provide further evidence that the reversals observed in columns 1 to 3 are

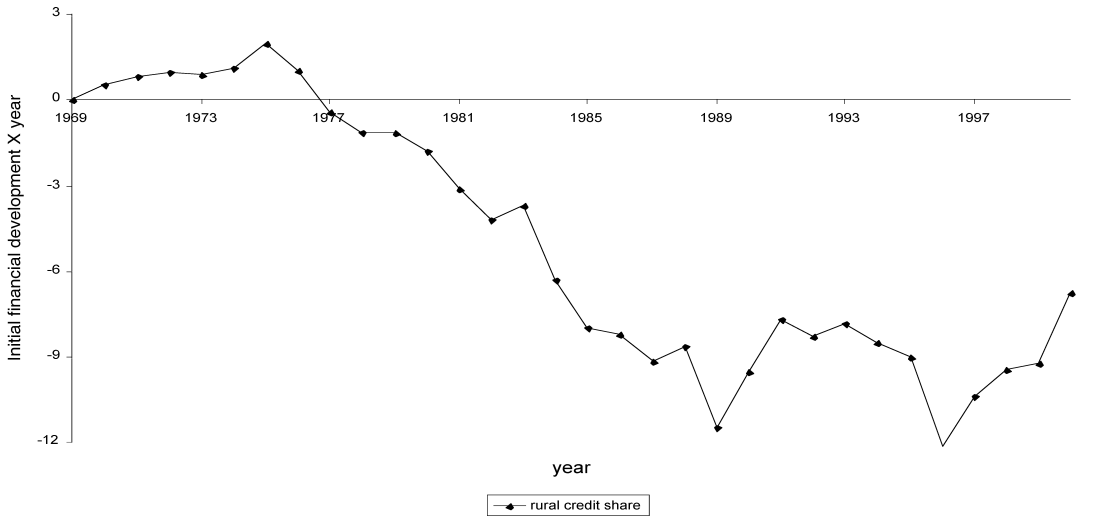

FIGURE 2. INITIAL FINANCIAL DEVELOPMENT AND RURAL BANK CREDIT SHARE

Notes: The series "rural credit share" graphs the annual coefficients on initial financial development (as measured by the number of bank branches per capita in 1961) from a regression of the form described in equation (2). The dependent variable is the share of total bank credit disbursed by rural bank branches.

policy driven. In the absence of policy constraints we would expect banks to choose the locations that offered them the highest expected profits. Between 1961 and 2000, banks were free to choose where to locate branch openings in already banked locations. In column 4 of Table 1 we observe that, throughout our sample period, more of such branch openings occurred in more financially developed states. This indicates that these states were more attractive to banks and that regulation was needed to coerce banks to locate elsewhere. We also observe that the rate of branch expansion into already banked locations was lower between 1977 and 1990. This makes sense, because during this period, branch openings in bank locations were less profitable, as each such branch opening had to be accompanied by four branch openings in unbanked locations.

We also check whether bank and state-level policies, which should be unaffected by the 1:4 licensing policy, exhibit trend reversals in 1977 and 1990. In column 5, we look at the fraction of bank credit going to priority sectors (small-scale industries, services, and agriculture). Priority sector targets were binding at the bank level and remained independent of the state-wise distribution of a bank's rural and urban branches. In column 6, we look at the fraction of total bank and cooperative credit accounted for by primary agricultural cooperatives. Cooperative credit policy is controlled by state governments. In neither case do we find evidence of trend breaks. Burgess and Pande (2003) also show that important state economic, political, and policy variables, which have the potential to affect rural poverty, did not exhibit similarly timed trend breaks. When they looked at state political representation, center-state alignment, passage of land reforms, public food distribution, and spending on health and education and on other development programs, they found no evidence of trend breaks in the relationship with initial financial development.

III. Results

This section presents our main results. We start with reduced form evidence on the relationship between a state's initial financial development and poverty outcomes, and then

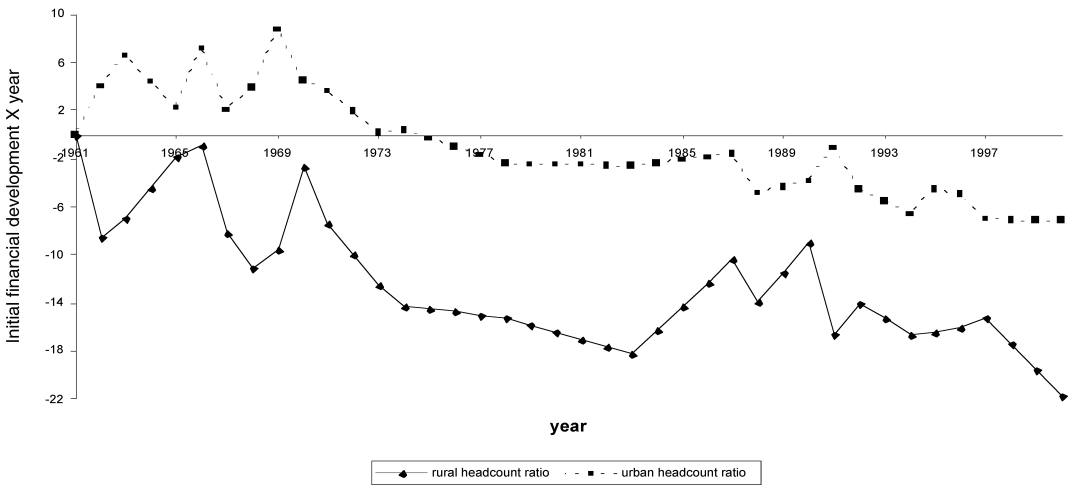

FIGURE 3. INITIAL FINANCIAL DEVELOPMENT AND POVERTY

Notes: The series "rural headcount ratio" and "urban headcount ratio" graph the annual coefficients on initial financial development (as measured by the number of bank branches per capita in 1961) from regressions of the form described in equation (2). The dependent variables are the rural and urban headcount ratios, respectively.

provide instrumental variable estimates of how increases in the number of branches in rural unbanked locations affected poverty outcomes.

A. *Reduced Form Evidence*

We estimate a regression of the form:

(4)

$$y_{it} = \alpha_i + \beta_t + \lambda_t \times B_{i1961} + \delta_t \times X_{i1961} + \varepsilon_{it}$$

and report the findings in Figure 3. The diamonds on the solid line depict the λ_t coefficients when y_{it} is the rural headcount ratio, while the squares on the dotted line depict the λ_t coefficients when y_{it} is the urban headcount ratio.[10] Between 1970 and 1978, and after 1990, both rural and urban poverty declines were pronounced in more financially developed states. Between 1978 and 1990, however, the relationship differs by poverty measure. Urban poverty and a state's initial financial development are largely uncorrelated. In contrast, between 1983 and 1990, rural poverty reductions are more pronounced in states with lower initial financial development. The graph for rural poverty is thus the inverse of that for rural branch expansion. To see this more clearly, we estimate a regression of the form:

$$\lambda_t = a + b\gamma_t + c_1 P_{1977} + c_2 P_{1990} + \varepsilon_t \quad (5)$$

where λ_t are the annual coefficients from a regression of the form described in equation (4), where the dependent variable is the rural headcount ratio. Similarly, γ_t are the annual coefficients from a regression of the form described in equation (2), where the dependent variable is the branch openings in rural unbanked locations. The regression allows for intercept changes in this relationship in 1977 and 1990. Column 1 of Table 2 demonstrates a strong inverse relationship between λ_t and γ_t.

The remainder of Table 2 reports results from the linear trend break regression model for alternative poverty outcomes. Column 2 shows that rural poverty reduction was more rapid in

[10] The rural and urban head-count ratios are defined as the percentage of rural and urban households with per capita monthly expenditures below the rural (49 rupees at 1973–June 1974 all-India rural prices) and urban (57 rupees at 1973–June 1974 all-India urban prices) poverty lines.

TABLE 2—BANK BRANCH EXPANSION AND POVERTY: REDUCED FORM EVIDENCE

	Annual coefficients rural headcount ratio	Headcount ratio			Wage	
		Rural	Urban	Aggregate	Agricultural	Factory
	(1)	(2)	(3)	(4)	(5)	(6)
Annual coefficients for branches in rural unbanked locations	−4.71*** (1.01)					
Number of bank branches per capita in 1961*(1961–2000) trend		−0.77*** (0.23)	−0.27 (0.24)	−0.71*** (0.22)	−0.004 (0.006)	0.01 (0.02)
Number of bank branches per capita in 1961*(1977–2000) trend		1.15** (0.42)	0.15 (0.26)	0.99*** (0.33)	−0.01 (0.01)	−0.01 (0.02)
Number of bank branches per capita in 1961*(1990–2000) trend		−1.15*** (0.34)	−0.31 (0.38)	−1.04*** (0.31)	0.05** (0.02)	−0.02 (0.01)
Post-1976 dummy*(1977–2000) trend		−3.77* (1.94)	−2.76 (2.29)	−3.53* (1.71)	0.09* (0.05)	0.04 (0.05)
Post-1989 dummy*(1990–2000) trend		1.2 (2.39)	0.5 (0.96)	0.62 (1.82)	−0.03 (0.05)	0.01 (0.02)
State and year dummies		YES	YES	YES	YES	YES
Other controls		YES	YES	YES	YES	YES
Adjusted *R*-squared		0.84	0.91	0.88	0.90	0.70
F-test 1		1.5 [0.24]	0.37 [0.55]	1.76 [0.20]	23.95 [0]	0.23 [0.64]
F-test 2		2.97 [0.11]	3.95 [0.07]	4.15 [0.06]	1.88 [0.19]	6.07 [0.03]
Observations	39	627	627	627	545	553

Notes: Standard errors clustered by state are in parentheses; *p*-values are in square brackets. In column (1), the dependent and explanatory variables are the annual coefficients on the initial financial development variable from running a regression of the form in equation (4) for the rural headcount ratio, and equation (2) for branches opened in unbanked locations. The column (1) regression includes the post-1976 and post-1990 dummies as controls. Headcount ratio is the percentage population with expenditure below the poverty line. Agricultural wage is log real male daily agricultural wage, and factory wage is log real remunerations per worker in registered manufacturing. The definitions of explanatory variables, other controls, and *F*-tests for columns (2) to (6) are in the notes to Table 1. The Data Appendix describes the data sources and the time period for which each data series is available. * Significant at 10-percent level. ** Significant at 5-percent level. *** Significant at 1-percent level.

more financially developed states before 1977 and after 1990. Specifically, before 1977 and after 1990, a one-point increase in initial financial development reduced rural poverty by an additional 0.77 points annually. This trend was reversed between 1977 and 1990—a one-point decrease in financial development reduced rural poverty by an additional 0.38 points annually. Consistent with the fact that branch expansion into unbanked locations was predominantly rural, we observe in column 3 that a state's initial financial development and urban poverty outcomes are unrelated. Results for aggregate poverty mirror those for rural poverty (column 4). In column 5 we observe that, between 1977 and 1990, wages for agricultural laborers, a marker of the welfare of the poorest group in the countryside, also increased more rapidly in less financially developed states. The reverse is true after 1990. In contrast, wages in factories (which are located mainly in urban areas) show no relationship with a state's initial financial development (column 6).

B. *Instrumental Variables Evidence*

Column 1 of Table 3 reports estimates from an OLS regression of branch openings in rural unbanked locations on the rural headcount ratio (equation [1]). The coefficient on branch

TABLE 3—BANK BRANCH EXPANSION AND POVERTY: INSTRUMENTAL VARIABLES EVIDENCE

	Headcount ratio								Wage	
	Rural			Urban	Aggregate	Rural			Agricultural	Factory
						1961-1989	1977-2000	Survey years		
	OLS		IV	IV	IV	IV	IV	IV	IV	IV
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Number branches opened in rural unbanked locations per capita	2.09**	1.16	−4.74**	−0.66	−4.10**	−4.70**	−6.84**	−4.21*	0.08*	0.05
	(0.79)	(1.02)	(1.79)	(1.07)	(1.46)	(1.82)	(2.81)	(2.26)	(0.04)	(0.08)
Number of bank branches per capita in 1961*(1961–2000) trend		−0.43***	−0.48*	−0.26*	−0.46*	−0.43	−0.80*	−0.46	−0.007	0.01
		(0.17)	(0.27)	(0.13)	(0.23)	(0.26)	(0.45)	(0.28)	(0.004)	(0.01)
Post-1976 dummy*(1977–2000) trend		−0.31	−1.42	−2.06	−1.39	−2.13		−1.31	0.04	0.03
		(1.23)	(2.30)	(1.65)	(2.03)	(2.59)		(3.32)	(0.06)	(0.06)
Post-1989 dummy*(1990–2000) trend		5.38**	−1.08	−0.47	−1.55		−0.45	−0.79	0.11	−0.05
		(2.47)	(2.33)	(1.01)	(1.76)		(2.90)	(2.61)	(0.07)	(0.05)
State and year dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Other controls	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
Overidentification test			[0.99]	[0.99]	[0.99]			[1]	[0.98]	[0.99]
Adjusted *R*-squared	0.81	0.83	0.76	0.92	0.82	0.80	0.81	0.73	0.87	0.70
Observations	627	627	627	627	627	460	375	375	545	553

Notes: Standard errors clustered by state are in parentheses; *p*-values are in square brackets. The definitions of the dependent and explanatory variables are in the notes to Table 2 and Table 1, respectively. In the IV regressions, the instruments are the number of bank branches per capita in 1961 interacted with (a) a post-1976 time trend and (b) a post-1989 time trend, respectively. Table 1, column (1), reports the corresponding first-stage regression. In the second row of columns 6 and 7, the number of bank branches per capita is interacted, respectively, with a (1961–1989) and a (1977–2000) trend. The overidentification test we employ is due to John Denis Sargan (1958). The number of observations times the *R*-squared from the regression of the stage-two residuals on the instruments is distributed chi-squared ($T + 1$) where T is the number of instruments. The Data Appendix describes the data sources and the time period for which each data series is available. * Significant at 10-percent level. ** Significant at 5-percent level. *** Significant at 1-percent level.

openings in rural unbanked locations is positive and significant. This is consistent with a program-based explanation, wherein poorer, financially less developed states attracted more rural branches between 1977 and 1990. The result highlights the pitfalls of using OLS estimation to assess the impact of rural branch expansion on poverty. Inclusion of the interaction between a state's initial financial development and a time trend, and the vector of state initial conditions as additional covariates, renders this relationship statistically insignificant (column 2).

Our IV regressions exploit the documented trend reversals between 1977 and 1990 and between 1990 and 2000 (relative to the 1961–1977 trend) in the relationship between a state's initial financial development and rural branch expansion as instruments for branch openings in rural unbanked locations. The first stage regression is as in column 1 of Table 1. The second stage regression takes the form

$$\begin{aligned} y_{it} = {} & \alpha_i + \beta_t + \phi B_{it}^R \\ & + \eta_1([t - 1961] \times B_{i1961}) \\ & + \eta_2(P_{1977} \times B_{i1961}) \\ & + \eta_3(P_{1990} \times B_{i1961}) + u_{it}. \end{aligned}$$

Deviations from the linear state-specific trend, $[t - 1961] \times B_{i1961}$, which we characterize as $[t - 1977] \times B_{i1961}$ and $[t - 1990] \times B_{i1961}$, are our instruments for B_{it}^R.

Columns 3 to 5 of Table 3 report IV estimates for poverty outcomes. A one-point increase in per capita branch openings in rural unbanked locations is associated with a 4.74-percent reduction in rural poverty (column 3). Evaluated at the sample average, our results imply that rural branch expansion in India can explain a 17-percent reduction in the headcount ratio. In contrast, rural branch expansion did not affect urban poverty (column 4).[11] Opening a bank branch in an additional rural location per 100,000 persons lowers aggregate poverty by 4.10 percentage points (column 5). In columns 6 and 7, we exclude the post-1990 period and pre-1977 period, respectively, to demonstrate the robustness of our results to using a single instrument ($[t - 1977] \times B_{i1961}$, and $[t - 1990] \times B_{i1961}$, respectively). In column 8, we show that our results are robust to restricting our sample to years in which National Sample Surveys (on which the poverty measures are based) were carried out.

Finally, we consider alternative measures of household welfare. As agricultural laborers constitute one of the largest and poorest occupation groups, their wages constitute an important independent marker of rural welfare (Jean Dreze and Anindita Mukherjee, 1991; Angus Deaton and Dreze, 2002). In column 9, we see that a branch opening in an unbanked rural location increases the wages of agricultural laborers. Wages of factory workers, who typically reside in urban areas, are unaffected (column 10). The fact that wage data come from independent data sources makes this a useful robustness check.

In Table 1, we saw that rural credit and saving shares exhibited trend reversals in their relationship with states' initial financial development in 1977 and, in the case of rural credit, in 1990 as well. This implies that we can replicate the above IV procedure for rural credit and savings shares. The first-stage regressions are in columns 2 and 3 of Table 1. The IV estimates in Table 4 tell us that increases in rural credit and savings shares reduce rural poverty. A 1-percentage-point increase in the share of credit disbursed by rural branches reduces rural poverty by 1.52 percentage points (column 1). Similarly, a 1-percentage-point increase in the share of savings held by rural banks reduces poverty by 2.22 percentage points (column 2). In columns 3 and 4, we see that urban poverty is unaffected by increases in rural credit and savings shares. Columns 5 and 6 confirm that policy-induced increases in rural credit and savings shares reduce aggregate poverty.

Finally, in Table 5 we check that our IV poverty results are robust to controlling for an array of time-varying political and policy variables. In column 1, we include multiple measures of state policy activism. These include the cumulative land reform acts passed in a state,

[11] Consistent with this, we also find that rural branch expansion reduces the gap between rural and urban poverty—a variable that exhibits no clear trend over the period.

TABLE 4—RURAL CREDIT AND SAVINGS AND POVERTY: INSTRUMENTAL VARIABLES EVIDENCE

	Headcount ratio					
	Rural		Urban		Aggregate	
	(1)	(2)	(3)	(4)	(5)	(6)
Rural bank credit share	−1.52** (0.69)		−0.67 (0.47)		−1.37** (0.59)	
Rural bank savings share		−2.22** (0.78)		−1.05 (0.67)		−2.01*** (0.65)
Number bank branches per capita in 1961*(1961–2000) trend	−1.01* (0.50)	−1.51** (0.54)	−0.70** (0.25)	−0.96** (0.34)	−0.96** (0.41)	−1.42*** (0.44)
Post-1976 dummy*(1977–2000) trend	−2.89 (1.68)	−2.05 (2.34)	−1.59 (1.98)	−1.23 (2.55)	−2.6 (1.68)	−1.84 (2.52)
Post-1989 dummy*(1990–2000) trend	4.4 (2.64)	2.13 (2.65)	2.87 (2.35)	1.88 (1.31)	3.53 (2.35)	1.47 (1.98)
State and year dummies	YES	YES	YES	YES	YES	YES
Other controls	YES	YES	YES	YES	YES	YES
Overidentification test	[0.99]	[0.99]	[0.99]	[0.99]	[0.99]	[0.99]
Adjusted *R*-squared	0.69	0.60	0.90	0.88	0.75	0.67
Observations	503	503	503	503	503	503

Notes: Standard errors clustered by state are in parentheses; *p*-values are in square brackets. The definitions of the dependent and explanatory variables are in the notes to Table 2 and Table 1, respectively. The notes to Table 3 describe the instruments and the overidentification test. Table 1, columns (2) and (3), report the first-stage regressions for rural banks credit and savings share, respectively. The Data Appendix describes the data sources and the time period for which each data series is available. * Significant at 10-percent level. ** Significant at 5-percent level. *** Significant at 1-percent level.

and state spending on health, education, and other development programs. (Other development spending includes spending on agriculture, rural development, irrigation, public works, and community development programs.) In line with previous studies, we find increases in land reform and development spending reduce rural poverty (Besley and Burgess, 2000). The effect of branch expansion on rural poverty, however, remains negative and significant. In column 2, we control for the political make-up of state legislatures. While political parties differ with respect to both their commitment to redistribution and the groups in whose favor they redistribute, the political make-up of state legislatures does not affect rural poverty outcomes, and the negative effect of rural banks on rural poverty is robust to the inclusion of these controls. Evaluated at the sample mean, the coefficient in column 2 implies that rural branch expansion can explain a 14-percentage-point decline in the rural headcount over the 1961–2000 period. In columns 3 and 4, we find no impact of rural bank branch expansion, land reform, development spending, or political composition on the urban headcount ratio.

IV. Conclusion

The main contribution of this paper is to test whether state-led rural branch expansion was associated with poverty reduction in India. The widespread use of these programs, the mixed opinions on them, and the lack of previous evaluation make this an issue of considerable interest. We provide robust evidence that opening branches in rural unbanked locations in India was associated with reduction in rural poverty.

Between 1977 and 1990, the 1:4 licensing policy caused commercial banks to open more bank branches in less financially developed states. A similar pattern exists for districts within Indian states with more rural branch openings in less financially developed districts between 1977 and 1990. The licensing policy,

TABLE 5—BANK BRANCH EXPANSION AND POVERTY REDUCTION: ROBUSTNESS CHECKS

	Rural headcount ratio		Urban headcount ratio	
	(1)	(2)	(3)	(4)
Number branches opened in rural unbanked locations per capita	−4.12**	−3.77**	−1.05	−0.81
	(1.54)	(1.54)	(1.06)	(0.91)
Cumulative land reform	−1.75**	−1.87**	0.41	0.27
	(0.70)	(0.68)	(0.29)	(0.30)
Health and education spending	−10.97	−3.31	23.52	23.74
	(30.91)	(28.40)	(14.53)	(14.80)
Other development spending	−40.84***	−37.32**	6.31	5.73
	(12.39)	(13.37)	(12.08)	(11.89)
Fraction legislators from:				
Congress parties		−13.07		0.22
		(8.90)		(3.14)
Janata parties		−11.62		1.62
		(6.90)		(3.18)
Hindu parties		6.15		9.61
		(12.91)		(8.36)
Hard Left parties		−14.81		1.76
		(9.07)		(3.72)
Regional parties		−15.11		−2.34
		(12.91)		(4.60)
State and year dummies	YES	YES	YES	YES
Other controls	YES	YES	YES	YES
Overidentification test	[0.99]	[0.99]	[0.99]	[0.99]
Adjusted *R*-squared	0.80	0.82	0.91	0.92
Observations	605	603	605	603

Notes: Standard errors clustered by state are in parentheses; *p*-values are in square brackets. The definitions of the dependent and bank variables are in the notes to Table 2 and Table 1, respectively. Cumulative land reform is the total number of land reform acts passed by an Indian state. Health and education spending is the fraction of total state spending on health and education. Other development spending is the fraction of total state spending on agriculture, rural development, irrigation, public works, and community development programs. Fraction Congress, Janata, Hindu, Hard Left, and Regional refer to number of seats held in state legislatures by parties in these political groupings. The notes to Table 3 describe the instruments and the overidentification test. The Data Appendix describes the data sources and the time period for which each data series is available. * Significant at 10-percent level. ** Significant at 5-percent level. *** Significant at 1-percent level.

therefore, helped increase and equalize bank branch presence across and within Indian states. We also find that the reductions in rural poverty were linked to increased savings mobilization and credit provision in rural areas. Taken together, these findings suggest that the Central Bank's licensing policy enabled the development of an extensive rural branch network, and that this, in turn, allowed rural households to accumulate more capital and to obtain loans for longer-term productive investments. Starting from a low base at nationalization, the number of rural savings and loan accounts increased to 126 million and 25 million, respectively, by 2000 (Reserve Bank of India, 2001). Interest rates on loans and deposits are attractive relative to those available in informal markets (Banerjee, 2004; Banerjee and Esther Duflo, 2004).

It is not possible to discern, in the state panel data we use, who has access to these credit and savings accounts. Rural household data for the 1980s and 1990s, however, demonstrate that poor households had some success in obtaining loans from banks and were more likely to do so during periods when banks were being extended into rural India (Burgess et al., 2005). The probability of a household obtaining a commercial bank loan, which was relatively uniformly distributed across the per capita expenditure distribution, moved sharply upward during periods of

rural branch expansion.[12] This stands in stark contrast to evidence reported for other developing countries, e.g., Brazil and Costa Rica (see Besley, 1995). The 1:4 licensing policy, which coerced banks into opening branches in less financially developed states (and districts), and the stipulation that banks reserve 40 percent of their lending for the priority sectors of small-scale industries, services, and agriculture, help us to understand the pattern we observe in the household data. We are unable, however, to disentangle the respective roles of trickle down and direct access by the poor to credit and savings accounts in explaining the reductions in poverty we observe.

Our focus has been on poverty outcomes. In Burgess and Pande (2003), we report evidence that rural branch expansion significantly affected economic growth. Using the same IV procedure, we find that rural bank branch expansion, savings mobilization, and credit disbursement increased total per capita output. Nonagricultural output and, in particular, small-scale manufacturing and services were most affected by rural branch expansion. These are important sources of employment in rural areas.

Evaluated at the sample mean, we find that rural branch expansion can explain a 14 to 17 percentage point decline in rural headcount—roughly half the overall fall across the period. Economic growth overall, and of nonagricultural output in particular, has been linked to rural poverty reduction over the period (see Gaurav Datt and Martin Ravallion, 2002). Rural branch expansion promoted growth in sectors, which have been shown to affect rural poverty most strongly. Our findings are also consistent with recent evidence that returns to capital in low-income countries, and in India in particular, are extremely high (Banerjee and Duflo, 2004). For example, Banerjee and Duflo (2003) find that annual returns to capital for Indian firms borrowing from commercial banks exceed 90 percent. Using simulations parameterized on Thai household data, Robert Townsend and Kenichi Ueda (2003) show that increased participation in formal financial institutions significantly increased economic growth between 1976 and 1990.

To achieve this reduction in poverty, the Indian state invested substantial resources in the development of a state banking sector. Both saving and borrowing activities of commercial banks entail a significant element of subsidy from the Central Bank via interest rate subsidies and the refinancing of loss making branches. In 2000, the value of deposits in commercial banks constituted 39 percent of GDP, and the value of loans outstanding constituted 21 percent of GDP.[13] Whether state monies invested in the banking sector would have generated greater poverty reduction if spent elsewhere is not a question we can address. Absence of consistent data on program costs, or on alternative programs, prevents us from comparing the cost effectiveness of this program relative to potential alternatives. Indeed, the fact that bank loan default rates were in the range of 40 percent during the 1980s, and that this led to the demise of the rural branch expansion program, should make us sanguine about the advisability of attempting such a program without careful consideration of both costs and benefits. Working out how nongovernmental organizations (NGOs) and private and state-run financial institutions can best design cost-effective interventions, which improve access to credit and saving opportunities, remains an important task for future research.

Data Appendix

Our dataset covers 16 Indian states, spans the years 1961–2000,[14] and comprises a number of different types of variables.

[12] Data from the Indian Central Bank reveal a similar picture with respect to landholdings. In 1985, marginal farmers (those with fewer than 2.5 acres of land) accounted for 12.2 percent of operational land holdings but 33 percent for bank short-term agricultural credit. In contrast, large farmers (with more than five acres of land) controlled 73.7 percent of operational land holdings but only received 38 percent of the short-term credit (RBI, 1989).

[13] Data on resource flows from the Central Bank to commercial banks are unavailable. The size of the Indian banking sector, however, is testimony to the state subsidy being substantial.

[14] Sample states are Andhra Pradesh, Assam, Bihar, Gujarat, Haryana (enters in 1965), Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal. The total possible number of observations is thus 636.

Banking: Bank branch data are from Reserve Bank of India (2000).[15] All bank branch variables are normalized by 1961 state population. Rural credit, rural saving, and priority sector data span 1969–2000 and are from an annual publication entitled *Statistical Tables Relating to Banks in India* (Reserve Bank of India). Cooperative data span 1969–1992 and are from the same source.

Poverty: Rural, urban, and aggregate headcount figures for 1961–1994 are from Berk Ozler et al. (1996). Data extended to 2000, using the same methodology, were provided by Gaurav Datt.[16] These measures are based on 25 rounds of the National Sample Survey (NSS).

Wages: Agricultural wage data, which span 1961 to 1998, are from Agricultural Wages in India (Ministry of Agriculture).[17] Factory wages for 1961 to 1995 are from the Annual Survey of Industries (Central Statistical Organization).

Policy and Politics: Education, health, and other development expenditures data, which span 1961 to 1999, are from Public Finance Statistics (Ministry of Finance) and the Report on Currency and Finance (Reserve Bank of India). The land reform variable, which spans 1961 to 2000, is from Besley and Burgess (2000). Political variables, which span 1961 to 2000, are from the State Election Reports (Election Commission of India). For detail on construction of Congress, Janata, Hard Left, and Regional political groupings, see Besley and Burgess (2000).

Deflators and Population: Deflators used are the Consumer Price Index for Agricultural Laborers (CPIAL) and Consumer Price Index for Industrial Workers (CPIIW) (reference period October 1973–March 1974) from Ozler et al. (1996), and have been extended to 2000. Population and rural location data are from decennial Indian censuses 1961–2001 (Census of India, Registrar General). Rural locations are defined as towns with fewer than 10,000 persons and villages with between 2,000 and 10,000 persons.

[15] It includes branch information on five types of commercial banks: (1) State Bank of India and its associates, (2) nationalized banks, (3) regional rural banks, (4) private sector banks, and (5) foreign banks.

[16] Post-1991 data are missing for Jammu-Kashmir, giving a total of 627 observations.

[17] No separate wage data exist for Haryana, and data are unavailable for Jammu and Kashmir. Data are missing for Kerala after 1992, and for Orissa in 1968. This gives a total of 545 observations.

REFERENCES

Adams, Dale W.; Graham, Douglas H. and Von Pischke, J. D. *Undermining rural development with cheap credit*. Boulder: Westview Press, 1984.

Aghion, Philippe and Bolton, Patrick. "A Theory of Trickle-Down Growth and Development." *Review of Economic Studies*, 1997, *64*(2), pp. 151–72.

Banerjee, Abhijit. "Contracting Constraints, Credit Markets and Economic Development," in Mathias Dewatripont, Lars P. Hansen and Steven Turnovsky, eds., *Advances in economics and econometrics: Theory and applications*. Eighth World Congress (Vol. 3). Cambridge: Cambridge University Press, 2004, pp. 1–46.

Banerjee, Abhijit and Duflo, Esther. "Do Firms Want to Borrow More? Testing Credit Constraints Using a Directed Lending Program." Bureau for Research in Economic Analysis of Development, BREAD Working Paper: No. 005, 2003.

Banerjee, Abhijit and Duflo, Esther. "Growth Theory through the Lens of Development," in Philippe Aghion and Steven Durlauf, eds., *Handbook of economic growth.* Amsterdam: Elsevier Science North-Holland (forthcoming).

Banerjee, Abhijit V. and Newman, Andrew F. "Occupational Choice and the Process of Development." *Journal of Political Economy*, 1993, *101*(2), pp. 274–98.

Bertrand, Marianne; Duflo, Esther and Mullainathan, Sendhil. "How Much Should We Trust Differences-in-Differences Estimates?" *Quarterly Journal of Economics*, 2004, *119*(1), pp. 249–75.

Besley, Timothy. "Savings, Credit and Insurance," in Jere Behrman and T. N. Srinivasan, eds., *Handbook of development economics* Vol. 3A. Amsterdam: Elsevier Science, North-Holland, 1995, 2123–2207.

Besley, Timothy and Burgess, Robin. "Land Reform, Poverty Reduction, and Growth: Evidence from India." *Quarterly Journal of Economics*, 2000, *115*(2), pp. 389–430.

Braverman, Avishay and Guasch, J. Luis. "Rural Credit Markets and Institutions in Developing Countries: Lessons for Policy Analysis from Practice and Modern Theory." *World Development*, 1986, *14*(10–11), pp. 1253–67.

Burgess, Robin and Pande, Rohini. "Do Rural Banks Matter? Evidence from the Indian Social Banking Experiment." Bureau for Research in Economic Analysis of Development, BREAD Working Paper: No. 037, 2003.

Burgess, Robin; Pande, Rohini and Wong, Grace. "Banking for the Poor: Evidence from India." *Journal of the European Economic Association* (forthcoming).

Datt, Gaurav and Ravallion, Martin. "Is India's Economic Growth Leaving the Poor Behind?" *Journal of Economic Perspectives*, 2002, *16*(3), pp. 89–108.

Deaton, Angus and Dreze, Jean P. "Poverty and Inequality in India: A Re-examination." *Economic and Political Weekly*, 2002, *37*(36), pp. 3729–48.

Dreze, Jean P. and Mukherjee, Anindita. "Labour Contracts in Rural India: Theory and Evidence," in Sukhamony Chakravarty, ed., *The balance between industry and agriculture in economic development*. Proceedings of the Eighth World Congress of the International Economic Association, Delhi, India. New York: Macmillan, 1991.

Government of India. "Report of the Narsimhan Committee on the Financial Sector." New Delhi: Ministry of Finance, 1991.

Greene, William. *Econometric methods*. 2nd Ed., New York: Macmillan, 1993.

King, Robert G. and Levine, Ross. "Finance and Growth: Schumpeter Might Be Right." *Quarterly Journal of Economics*, 1993, *108*(3), pp. 717–37.

La Porta, Rafael; Lopez-de-Silanes, Florencio and Shleifer, Andrei. "Government Ownership of Banks." *Journal of Finance*, 2002, *57*(1), pp. 265–301.

Ozler, Berk; Datt, Gaurav and Ravallion, Martin. "A Data Base on Poverty and Growth in India." Unpublished Paper, 1996.

Reserve Bank of India. *Review of the agricultural credit system in India: Report of the Agricultural Credit Review Committee (Khusro Committee)*. Bombay: Reserve Bank of India, 1989.

Reserve Bank of India. *Directory of commercial bank offices in India*. Mumbai: Reserve Bank of India, 2000.

Reserve Bank of India. *Banking statistics 2000. (Basic statistical returns of scheduled commercial banks in India) Vol. 29*. Mumbai: Reserve Bank of India, http://www.rbi.org.in/sec7/54920.pdf, 2001.

Reserve Bank of India. "Statistical Tables Relating to Banks in India," http://www.rbi.org.in/index_stat.asp?secid=7&s1secid=8&s2secid=2?

Sapienza, Paola. "The Effects of Government Ownership on Bank Lending." *Journal of Financial Economics*, 2004, *72*(2), pp. 357–84.

Sargan, John Denis. "The Estimation of Economic Relationships Using Instrumental Variables." *Econometrica*, 1958, *26*(3), pp. 393–415.

Townsend, Robert M. and Ueda, Kenichi. "Financial Deepening, Inequality, and Growth: A Model-Based Quantitative Evaluation." International Monetary Fund, IMF working papers: No. 03/193, 2003.