

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

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Introduction

- ▶ This paper evaluates how a large state-led bank branch expansion program in India affected rural poverty
- ▶ Can state-led expansion of credit and savings facilities reduce poverty?
- ▶ Theoretical literature identifies mechanisms through which it can: altering production and employment choices (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.

Introduction

- ▶ 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.

The Program

- ▶ Largest branch expansion program undertaken by any single country
- ▶ Between 1969 and 1990, bank branches were opened in roughly 30,000 rural locations with no prior formal credit and savings institutions (unbanked locations)
- ▶ 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.

The Program

- ▶ Nationalization in 1969 brought the 14 largest commercial banks under the direct control of the Indian Central Bank
- ▶ 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 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.

Institutional Context

- ▶ To ensure that rural branch expansion translated into increased credit and savings opportunities for the rural population, the Central Bank regulated banks' deposit-taking 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.
- ▶ 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% within its geographical area of operation.

Data

- ▶ Branch-level dataset provided by the Indian Central Bank (Reserve Bank of India, 2000): opening date and location of every Indian bank branch and whether it is in a rural location.
- ▶ Aggregate the branch data to construct an annual state-level panel for the 16 main Indian states, 1961-2000: state's initial financial development identified by the number of bank branches per capita in the state in 1961.
- ▶ Rural branch expansion and branch expansion in already banked locations measured by the cumulative number of branches per capita opened in rural unbanked and already banked locations in a state, respectively.
- ▶ Poverty measured by the headcount ratio, which measures the proportion of population below the Indian poverty line. (State-wise time series based on NSS)

Identification

- ▶ Objective is to identify whether the branch expansion program affected rural poverty. Simple OLS regression

$$(1) \quad y_{it} = \alpha_i + \beta_t + \phi B_{it}^R + \varepsilon_{it}$$

- ▶ y_{it} denotes the rural headcount ratio, B_{it}^R denotes cumulative branch openings in rural unbanked locations per capita
- ▶ State and year fixed effects account for permanent differences across states and national events which may affect branch expansion
- ▶ Causal interpretation of the estimated ϕ parameter is problematic: selection bias.
- ▶ 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 instruments for rural bank expansion.

Identification

- ▶ 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.

Examining Trend Reversals

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

- ▶ B_{i1961} , our measure of initial financial development, denotes the number of bank branches per capita in state i in 1961.
- ▶ γ_t denotes 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 $t + 1$.

Figure 1: Annual Coefficients on Initial Financial Development

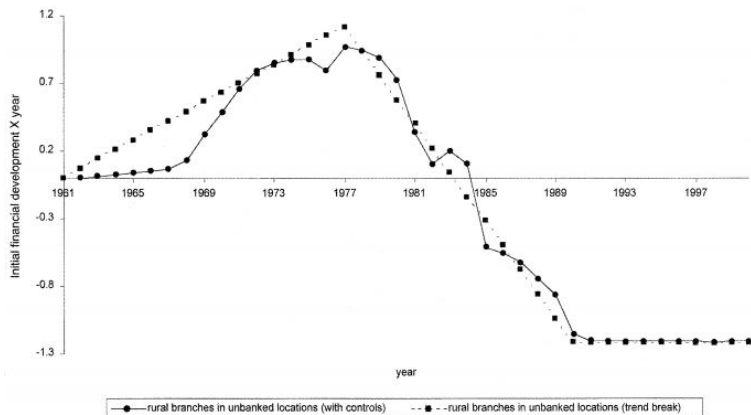


FIGURE 1. INITIAL FINANCIAL DEVELOPMENT AND RURAL BRANCH EXPANSION

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.

Examining Trend Reversals

- ▶ More branch openings in rural unbanked locations in financially more developed states between 1961 and 1977 (positive trend in γ_t coefficients.)
- ▶ Trend is reversed in 1977: financially less developed states witness higher growth of branch openings in rural unbanked locations.
- ▶ After 1990, branch expansion into rural unbanked locations ends.

Linear Trend Break Model

$$\begin{aligned}(3) \quad B_{it}^R &= \alpha_i + \beta_t + \gamma_1(B_{i1961} \times [t - 1961]) \\ &\quad + \gamma_2(B_{i1961} \times [t - 1977]) \\ &\quad + \gamma_3(B_{i1961} \times [t - 1990]) \\ &\quad + \gamma_4(B_{i1961} \times P_{1977}) \\ &\quad + \gamma_5(B_{i1961} \times P_{1990}) + \varepsilon_{it}.\end{aligned}$$

- ▶ Variables $[t - 1961]$, $[t - 1977]$, and $[t - 1990]$ are linear time trends, which switch on in 1961, 1977, and 1990, respectively.
- ▶ 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).

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** (0.03)	0.18 (0.21)	-0.03 (0.24)	0.14*** (0.01)	-0.08 (0.62)	0.41 (0.34)
Number of bank branches per capita in 1961*(1977–2000) trend	-0.25*** (0.03)	-1.09** (0.43)	-0.82*** (0.25)	-0.07*** (0.02)	0.08 (0.86)	-0.02 (0.42)
Number of bank branches per capita in 1961*(1990–2000) trend	0.17*** (0.04)	0.87*** (0.26)	0.43* (0.23)	0.10** (0.04)	-0.18 (0.33)	0.03 (1.00)
Post-1976 dummy*(1977–2000) trend	0.34 (0.25)	-0.30 (1.50)	-0.17 (0.78)	0.53** (0.19)	-3.37 (2.40)	-3.64 (2.22)
Post-1989 dummy*(1990–2000) trend	-0.24 (0.15)	1.95 (1.49)	0.44 (0.53)	-0.40*** (0.10)	-0.05 (1.86)	-3.15 (2.61)
State and year dummies	YES	YES	YES	YES	YES	YES
Other controls	YES	YES	YES	YES	YES	YES
Adjusted <i>R</i> -squared	0.96	0.88	0.87	0.98	0.86	0.81
<i>F</i> -test 1	16.87 [0]	12.8 [0]	25.67 [0]	8.97 [0]	0 [0.99]	5.75 [0.03]
<i>F</i> -test 2	0.49 [0.49]	0.1 [0.76]	9 [0]	27.22 [0]	1.79 [0.20]	0.17 [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.

Linear Trend Break Model

- ▶ 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.
- ▶ After 1990, a state's level of initial financial development and rural branch expansion were unrelated.
- ▶ F test shows that the imposed restrictions do not cause any significant loss in overall fit.

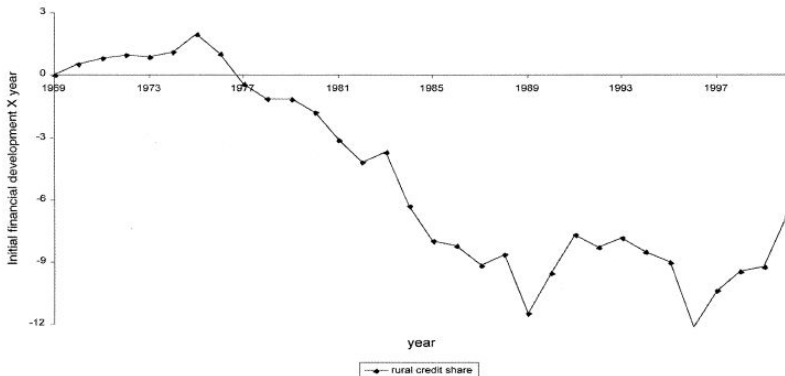


FIGURE 2. INITIAL FINANCIAL DEVELOPMENT AND RURAL BANK CREDIT SHARE

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.

Reduced Form Evidence

(4)

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

- ▶ y_{it} is the rural/urban headcount ratio
- ▶ Between 1970 and 1978, and after 1990, both rural and urban poverty declines were pronounced in more financially developed states.
- ▶ Between 1978 and 1990, the relationship differs by poverty measure; between 1983 and 1990, rural poverty reductions are more pronounced in states with lower initial financial development.

Reduced Form Annual Coefficients

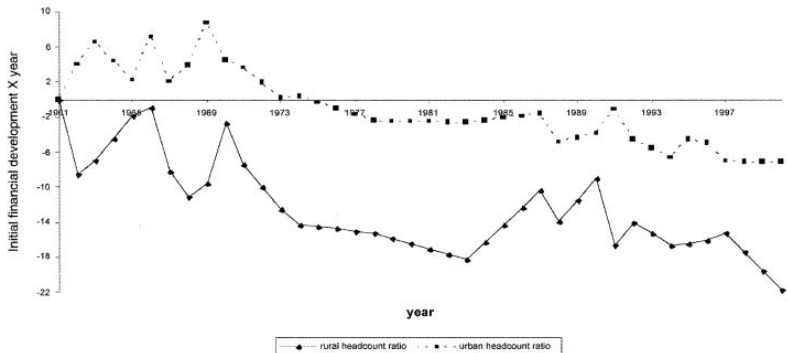


FIGURE 3. INITIAL FINANCIAL DEVELOPMENT AND POVERTY

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.

Reduced Form Evidence

$$(5) \quad \lambda_t = a + b\gamma_t + c_1P_{1977} + c_2P_{1990} + \varepsilon_t$$

- ▶ λ_t are the annual coefficients from a regression of the form described in equation (4), γ_t from equation (2) [Column 1, Table 2]
- ▶ Also estimate linear trend break regression model for alternative poverty outcomes.
- ▶ Rural poverty reduction was more rapid in more financially developed states before 1977 and after 1990; between 1977 and 1990-a one-point decrease in financial development reduced rural poverty by an additional 0.38 points annually

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 <i>R</i> -squared		0.84	0.91	0.88	0.90	0.70
<i>F</i> -test 1		1.5 [0.24]	0.37 [0.55]	1.76 [0.20]	23.95 [0]	0.23 [0.64]
<i>F</i> -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.

Instrumental Variables Evidence

- ▶ 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.
- ▶ We have already seen first stage results in Table 1 (Column 1).
- ▶ Deviations from the linear state-specific trend, $[t - 1961] \times B_{i1961}$, which are $[t - 1977] \times B_{i1961}$ and $[t - 1990] \times B_{i1961}$ are our instruments for B_{it}^R .

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

IV Estimates: Number of Bank Branches

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

	Headcount ratio							Wage		
	Rural		Urban	Aggregate	Rural			Agricultural	Factory	
	OLS	IV	IV	IV	1961-1989	1977-2000	Survey years	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** (0.79)	1.16 (1.02)	-4.74** (1.79)	-0.66 (1.07)	-4.10** (1.46)	-4.70** (1.82)	-6.84** (2.81)	-4.21* (2.26)	0.08* (0.04)	0.05 (0.08)
Number of bank branches per capita in 1961*(1961-2000) trend		-0.43*** (0.17)	-0.48* (0.27)	-0.26* (0.13)	-0.46* (0.23)	-0.43 (0.26)	-0.80* (0.45)	-0.46 (0.28)	-0.007 (0.004)	0.01 (0.01)
Post-1976 dummy*(1977-2000) trend		-0.31 (1.23)	-1.42 (2.30)	-2.06 (1.65)	-1.39 (2.03)	-2.13 (2.59)		-1.31 (3.32)	0.04 (0.06)	0.03 (0.06)
Post-1989 dummy*(1990-2000) trend		5.38** (2.47)	-1.08 (2.33)	-0.47 (1.01)	-1.55 (1.76)		-0.45 (2.90)	-0.79 (2.61)	0.11 (0.07)	-0.05 (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 <i>R</i> -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.

IV Estimates: Rural Bank Credit and Savings Shares

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 <i>R</i> -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.

Robustness Checks

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** (1.54)	-3.77** (1.54)	-1.05 (1.06)	-0.81 (0.91)
Cumulative land reform	-1.75** (0.70)	-1.87** (0.68)	0.41 (0.29)	0.27 (0.30)
Health and education spending	-10.97 (30.91)	-3.31 (28.40)	23.52 (14.53)	23.74 (14.80)
Other development spending	-40.84*** (12.39)	-37.32** (13.37)	6.31 (12.08)	5.73 (11.89)
Fraction legislators from:				
Congress parties		-13.07 (8.90)		0.22 (3.14)
Janata parties		-11.62 (6.90)		1.62 (3.18)
Hindu parties		6.15 (12.91)		9.61 (8.36)
Hard Left parties		-14.81 (9.07)		1.76 (3.72)
Regional parties		-15.11 (12.91)		-2.34 (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.

Conclusion

- ▶ This paper provides robust evidence that opening branches in rural unbanked locations in India was associated with reduction in rural poverty.
- ▶ 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.
- ▶ Between 1977 and 1990, the 1:4 licensing policy caused commercial banks to open more bank branches in less financially developed states, helping increase and equalize bank branch presence across and within Indian states.
- ▶ Reductions in rural poverty were linked to increased savings mobilization and credit provision in rural areas.

Limitations

- ▶ It is not possible to discern who has access to these credit and savings accounts: authors are unable 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.
- ▶ 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; absence of consistent data on program costs prevents us from comparing the cost effectiveness of this program relative to potential alternatives.