

Finance and Poverty: Evidence from India

Meghana Ayyagari

Thorsten Beck

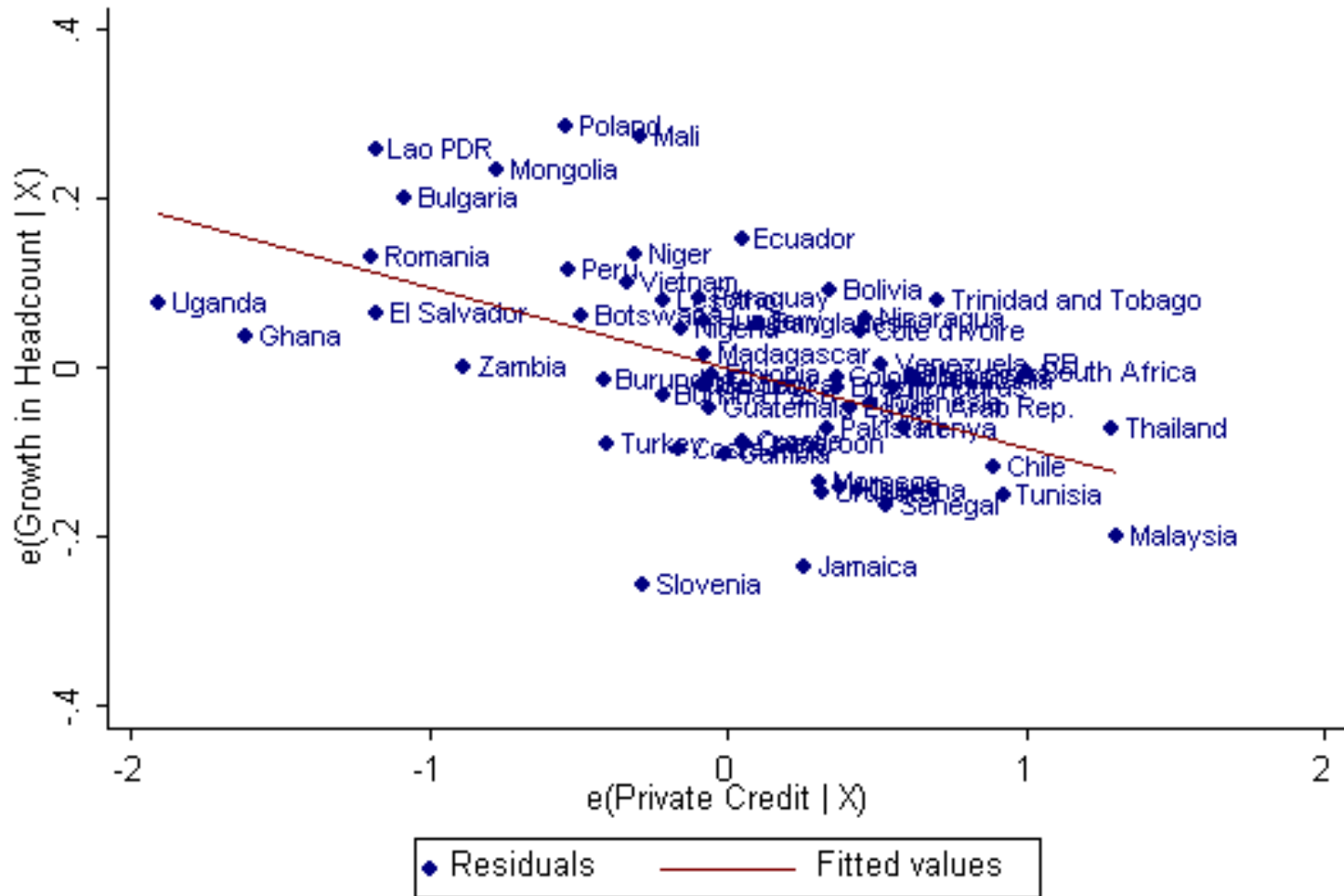
Mohammad Hoseini



Motivation

- Large literature on positive effect of finance and growth
- Distributional repercussions of financial deepening?
- Theory ambiguous:
 - Credit constraints are particularly binding for the poor (Banerjee and Newman, 1993; Galor and Zeira, 1993; Aghion and Bolton, 1997)
 - Finance helps overcome barriers of indivisible investment (McKinnon, 1973)
 - Only rich can pay “entry fee” into financial system (Greenwood and Jovanovic, 1993)
 - Credit is channeled to incumbent and connected and not to entrepreneurs with best opportunities (Lamoreaux, 1986; Haber, 1991)
- Cross-country-level: Beck, Demirguc-Kunt and Levine (2007), but challenges of
 - Identification
 - Measurement
 - Channels

Beck, Demirguc-Kunt and Levine (2007)



Questions remain

- Correlation or causality?
 - Identification strategies on cross-country level have limitation
- Mechanisms
 - Financial deepening alleviates credit constraints on the poor allowing them accumulate human capital
 - Galor and Zeira (1993)
 - Financial deepening alleviates credit constraints on the poor allowing them to become entrepreneurs and realize profitable projects
 - Banerjee and Newman (1993)
 - Muhamed Yunus (Grameen Bank)
 - Financial deepening lowers cost of capital of non-financial sector, which raises marginal product of labor, wages and demand for labor...

Some preliminary evidence

- Gine and Townsend (2004)
 - Financial liberalization led to shift in labor from subsistence agriculture to urban manufacturing; first increase, then reduction in income inequality
- Beck, Levine and Levkov (2011)
 - Branch deregulation led to increase in labor demand for unskilled workers, resulting in reduced wage (income) gap between skilled and unskilled labor, explaining reduction in income inequality following deregulation
- Microcredit impact assessments
 - Mixed picture – how much does direct access to credit help reduce income inequality and poverty?
 - More on this later...

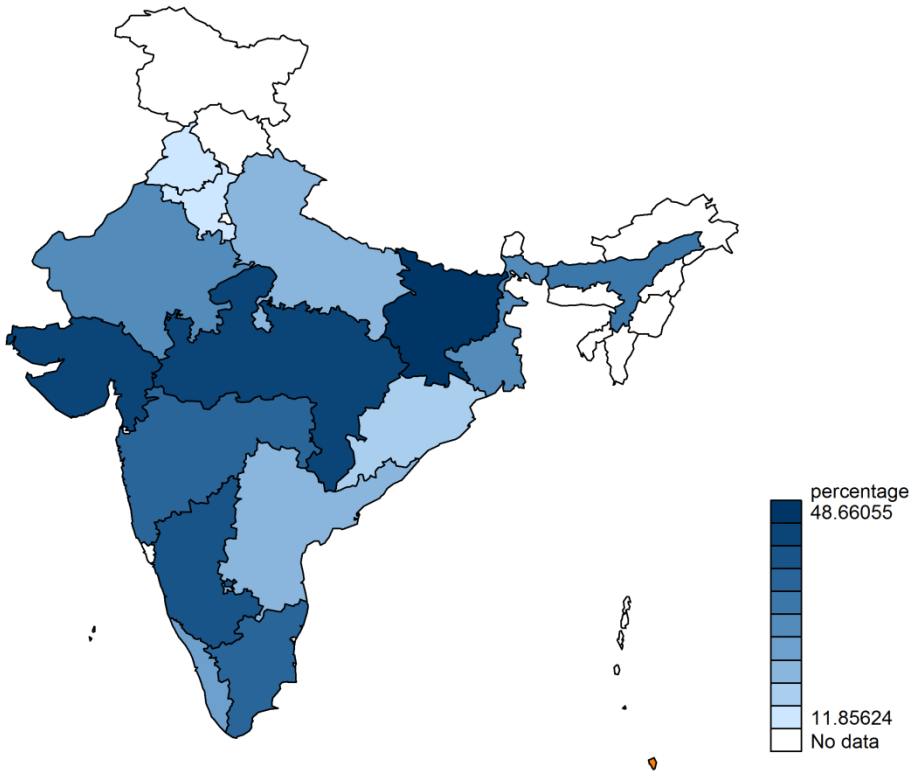
This paper

- Assesses the relationship between financial development and poverty across 15 Indian states over 25 years
- Uses reform in 1991 as identification strategy for cross-state and cross-time differences in financial depth, as well as social banking reform as instrument for cross-state and cross-time differences in branching
- Main results:
 - Negative relationship between financial deepening and outreach and rural (but not urban) poverty levels
 - Effect of depth (credit, deposit) seems more robust than effect of outreach (branches)

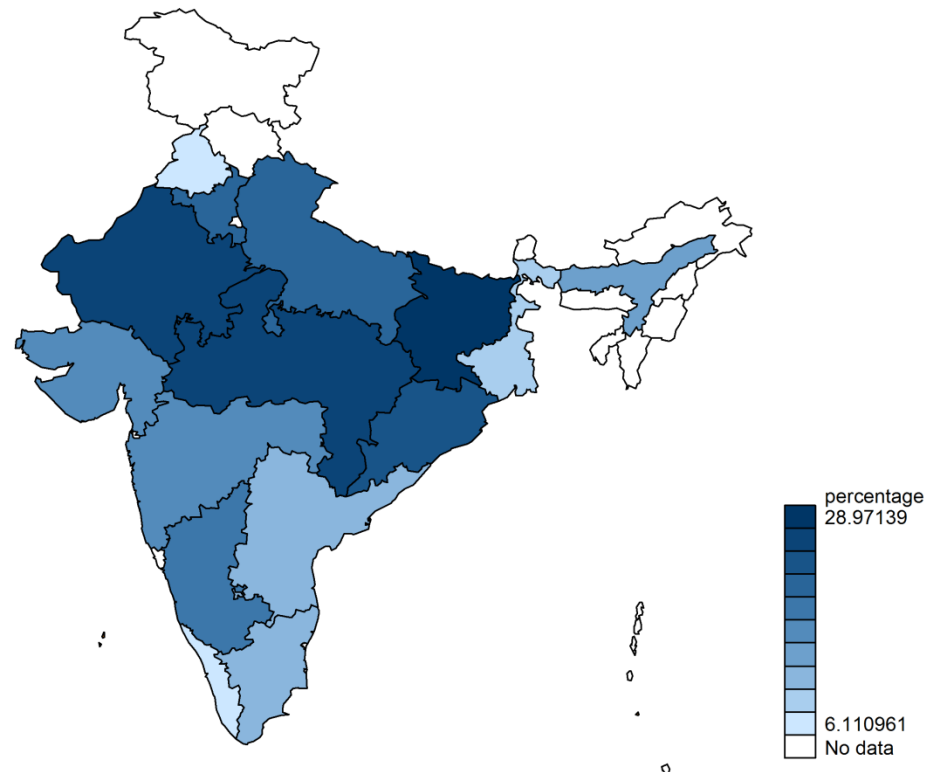
Rural Poverty

Pre and Post-Reform

Rural poverty in 1990
(pre-reform)



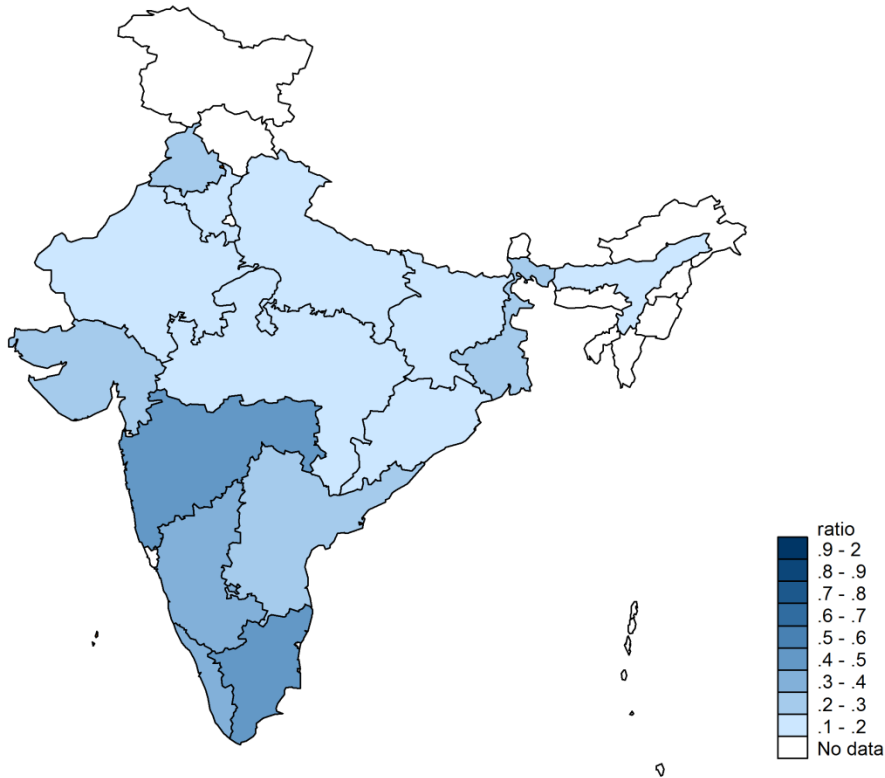
Rural poverty in 2005
(post-reform)



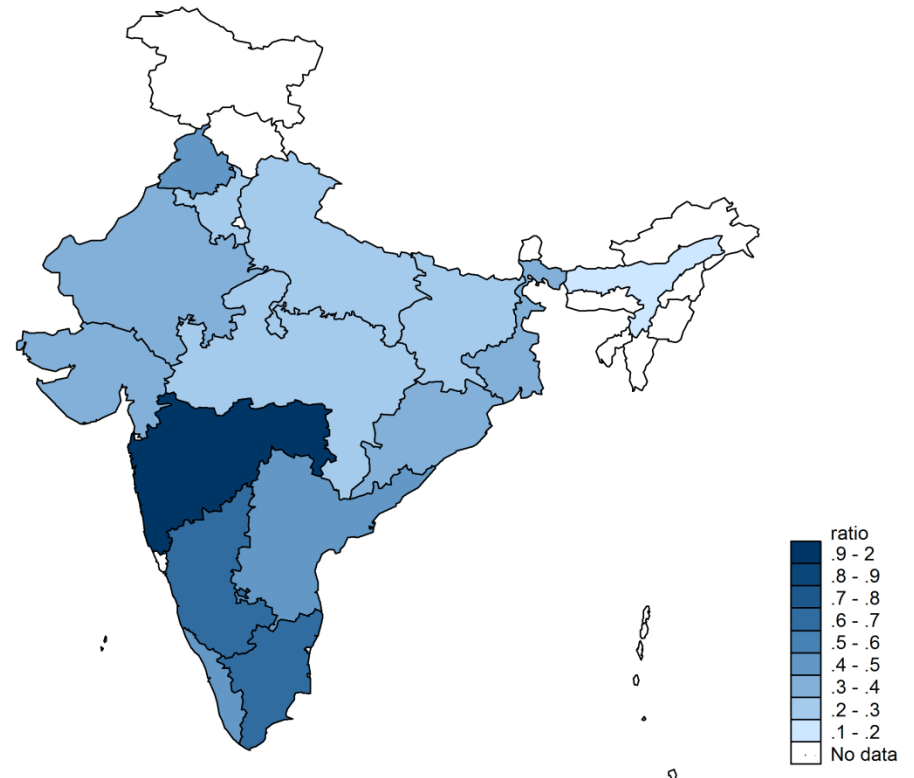
Commercial Bank Credit

Pre and Post-Reform

Commercial bank credit over GDP in 1990
(pre-reform)

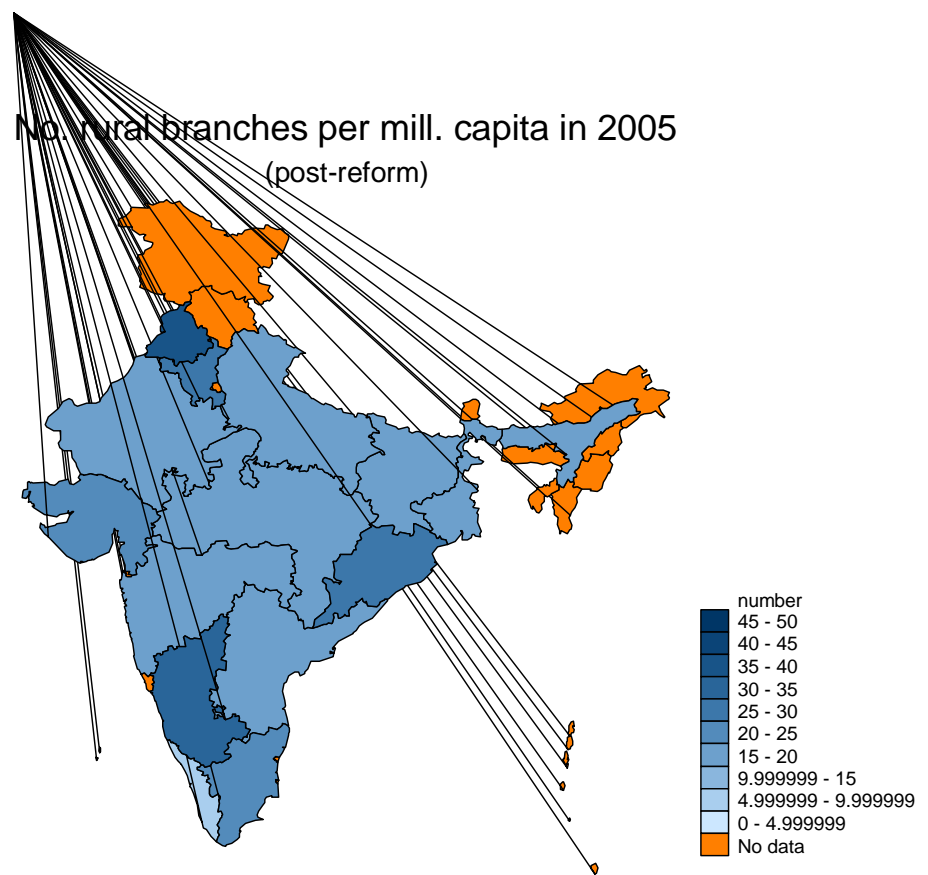
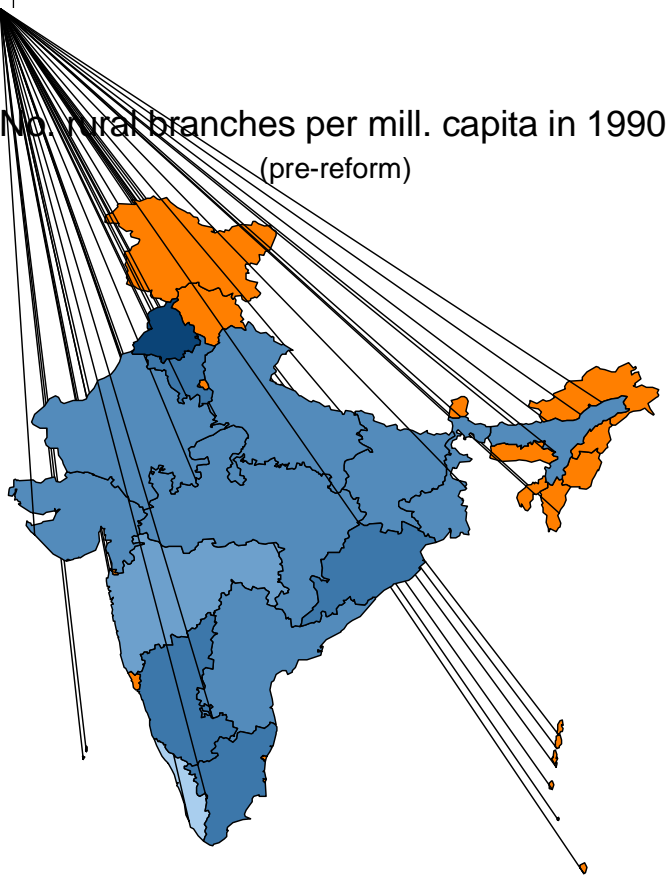


Commercial bank credit over GDP in 2005
(post-reform)



Bank Branches

Pre and Post-Reform



Data

- Data for 15 states over period 1980 to 2005 (95% of Indian population)
- Poverty data based on annual household surveys (NSSO)
 - Headcount, separated by rural and urban
 - Poverty gap
- Financial sector indicators from RBI:
 - Credit to SDP
 - Deposits to SDP
 - Rural Branches per capita

Methodology

- Annual data 1980-2005, differences in differences, i.e. state and year-fixed effects

$$y(i, t) = \alpha(i) + \lambda(t) + \beta FD(i, t) + \gamma C(i, t) + e(i, t)$$

- Y = rural/urban head count or poverty gap
- State and year fixed effects
- Errors clustered on state-level
- Time-varying state-level control variables:
 - SDP per capita
 - Share rural population
 - Government expenditures/SDP
 - Literacy rate

Correlation table

	Rural Poverty	Credit/ SDP	Deposit /SDP	Rural Branches (Mill. Capita)	SDP/Capita	Rural population	Government exp. /SDP
Credit/SDP	-0.22**						
Deposit/SDP	-0.48**	0.72**					
Rural Branches	-0.25**	-0.02	-0.02				
SDP/Capita	-0.74**	0.46**	0.63*	0.14**			
Rural population	0.31**	-0.78**	-0.59**	-0.23**	-0.49**		
Government exp. /SDP	-0.08	-0.14**	0.07	-0.08	0.047	0.32**	
Literacy rate	-0.46**	0.52**	0.60**	-0.09	0.53**	-0.46**	0.16**

** Significant at 5% level

OLS – differences-in-differences (1)

	Rural Headcount				
	(1)	(2)	(3)	(4)	(5)
L.Bank Credit /SDP	-23.366* (11.053)			-17.066** (7.905)	
L.Bank Deposits /SDP		-21.781* (11.611)			-24.555** (8.273)
L.Rural branches /mill.capita			-1.302*** (0.351)	-1.215*** (0.323)	-1.348*** (0.331)
L.Log(SDP /capita)	-0.677 (5.509)	-3.425 (6.072)	-2.167 (6.391)	-3.654 (6.002)	-8.097 (6.002)
L.rural population ratio	-43.191 (68.386)	-30.607 (73.470)	62.309 (39.945)	28.026 (46.202)	32.510 (39.415)
L.literacy rate	0.112 (0.197)	0.013 (0.196)	0.021 (0.222)	0.039 (0.221)	-0.073 (0.210)
L.Government exp. / SDP	29.854 (24.278)	33.082 (24.334)	19.310 (19.114)	18.566 (19.194)	20.038 (19.650)
Constant	78.303 (57.725)	91.366 (73.847)	23.391 (57.083)	62.792 (57.619)	98.785 (57.532)
Observations	375	375	375	375	375
R-squared	0.909	0.908	0.918	0.920	0.922
Adjusted R-squared	0.897	0.896	0.907	0.910	0.912
# of States	15	15	15	15	15

Economic effects

- One SD in credit: 3.5 pp reduction in rural headcount
- One w/in SD in credit: 1.3 pp reduction in rural headcount (26% of w/in variation)
- One SD in rural branches: 9.5 pp reduction in rural headcount
- One w/in SD in credit: 2.1 pp reduction in rural headcount (42% of w/in variation)

OLS – differences-in-differences (2)

	Rural Poverty Gap				
	(1)	(2)	(3)	(4)	(5)
L.Bank Credit /SDP	-11.045** (4.469)			-8.921** (3.198)	
L.Bank Deposits /SDP		-10.293** (4.516)			-11.273** (3.888)
L.Rural branches /mill.capita			-0.455** (0.171)	-0.410** (0.161)	-0.476** (0.161)
L.Log(SDP /capita)	1.689 (3.132)	0.391 (3.247)	1.462 (3.565)	0.686 (3.476)	-1.260 (3.627)
L.rural population ratio	-23.175 (29.885)	-17.222 (33.890)	18.761 (20.655)	0.839 (23.204)	5.080 (24.254)
L.literacy rate	0.069 (0.095)	0.023 (0.093)	0.035 (0.114)	0.045 (0.112)	-0.008 (0.106)
L.Government exp. / SDP	16.701 (9.702)	18.227* (9.482)	13.283 (7.737)	12.894 (7.405)	13.617* (7.237)
Constant	15.344 (30.721)	21.508 (36.673)	-10.483 (30.557)	10.114 (32.506)	24.129 (34.744)
Observations	375	375	375	375	375
R-squared	0.878	0.877	0.885	0.891	0.894
Adjusted R-squared	0.863	0.861	0.870	0.876	0.879
# of States	15	15	15	15	15

OLS – differences-in-differences (3)

	Urban Headcount				
	(1)	(2)	(3)	(4)	(5)
L.Bank Credit /SDP	1.951 (6.362)			3.990 (5.415)	
L.Bank Deposits /SDP		-11.577 (11.274)			-12.393 (11.281)
L.Rural branches /mill.capita			-0.373 (0.215)	-0.393* (0.207)	-0.396* (0.201)
L.Log(SDP /capita)	-5.727 (3.620)	-8.657* (4.711)	-7.038** (3.211)	-6.690* (3.225)	-10.030** (4.330)
L.rural population ratio	50.772 (42.017)	32.206 (41.759)	65.800** (23.450)	73.815** (27.978)	50.761* (25.864)
L.literacy rate	0.154 (0.127)	0.112 (0.133)	0.134 (0.130)	0.130 (0.131)	0.087 (0.133)
L.Government exp. / SDP	-22.832 (16.721)	-22.457 (16.549)	-26.659* (14.758)	-26.485* (14.828)	-26.292* (14.584)
Constant	44.081 (41.370)	84.143 (57.098)	48.273 (27.475)	39.062 (31.468)	86.324* (44.677)
Observations	375	375	375	375	375
R-squared	0.937	0.938	0.938	0.938	0.940
Adjusted R-squared	0.929	0.930	0.930	0.930	0.932
# of states	15	15	15	15	15

OLS – differences-in-differences (4)

	Urban Poverty Gap				
	(1)	(2)	(3)	(4)	(5)
L.Bank Credit /SDP	-2.812 (3.197)			-1.818 (2.696)	
L.Bank Deposits /SDP		-8.045 (4.706)			-8.492* (4.627)
L.Rural branches /mill.capita			-0.201 (0.117)	-0.192 (0.111)	-0.217** (0.097)
L.Log(SDP /capita)	-0.780 (1.329)	-2.390 (1.560)	-1.091 (1.203)	-1.250 (1.198)	-3.142** (1.393)
L.rural population ratio	10.075 (20.008)	4.500 (18.990)	24.969** (10.900)	21.317 (14.054)	14.663 (11.202)
L.literacy rate	0.070 (0.047)	0.038 (0.047)	0.057 (0.054)	0.059 (0.053)	0.025 (0.051)
L.Government exp. / SDP	-2.779 (6.322)	-2.129 (6.120)	-4.482 (4.974)	-4.561 (4.890)	-4.230 (4.767)
Constant	8.872 (15.999)	27.105 (20.860)	2.226 (10.281)	6.424 (13.526)	28.299* (14.787)
Observations	375	375	375	375	375
R-squared	0.911	0.917	0.915	0.915	0.922
Adjusted R-squared	0.900	0.906	0.904	0.904	0.912
# of states	15	15	15	15	15

Correlation vs. Causality

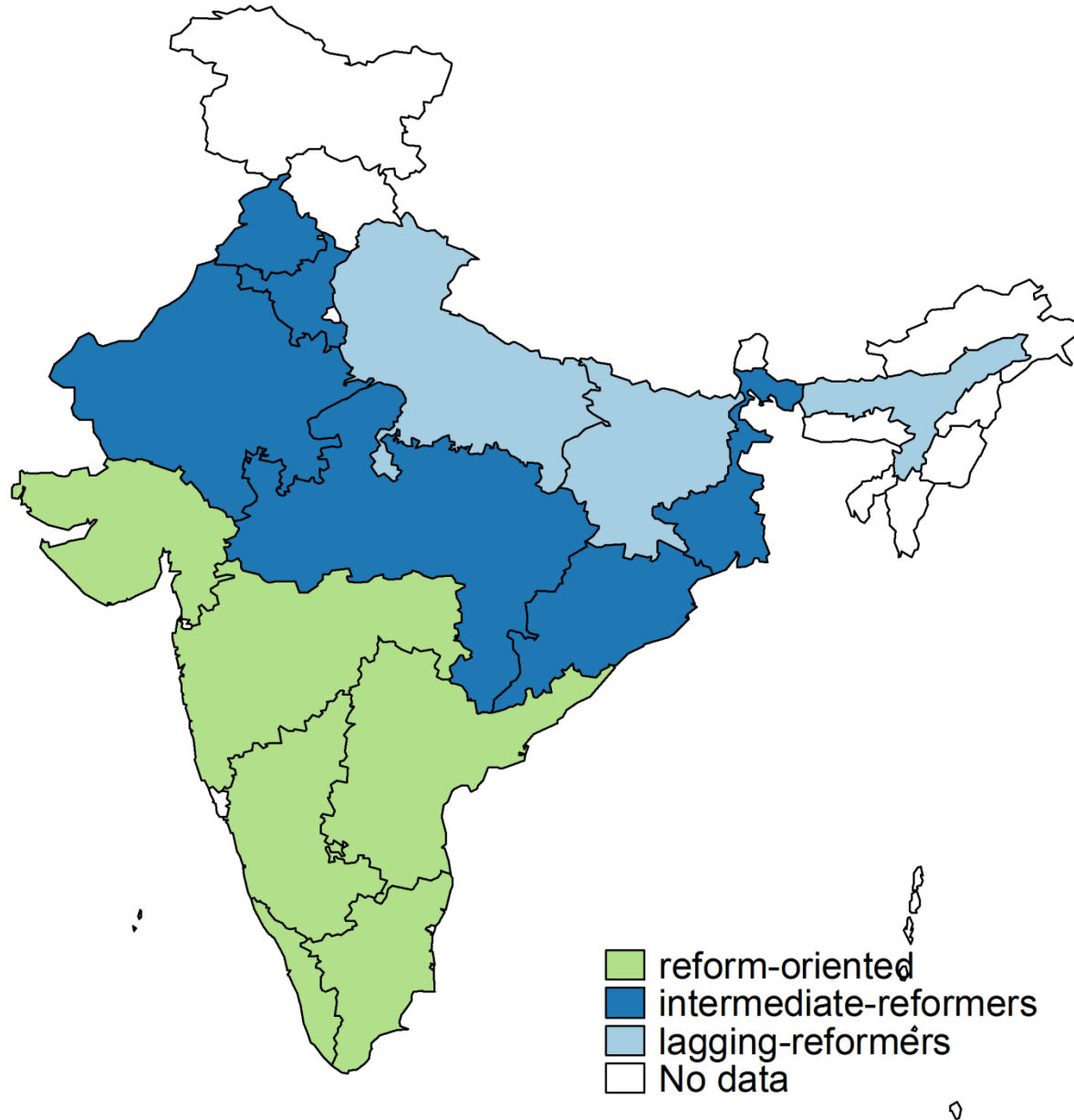
- Demand-side driven; reduction in poverty increases demand for financial services
- Omitted variable – control for fixed effects, still concern
- Mechanism?

Looking for instruments

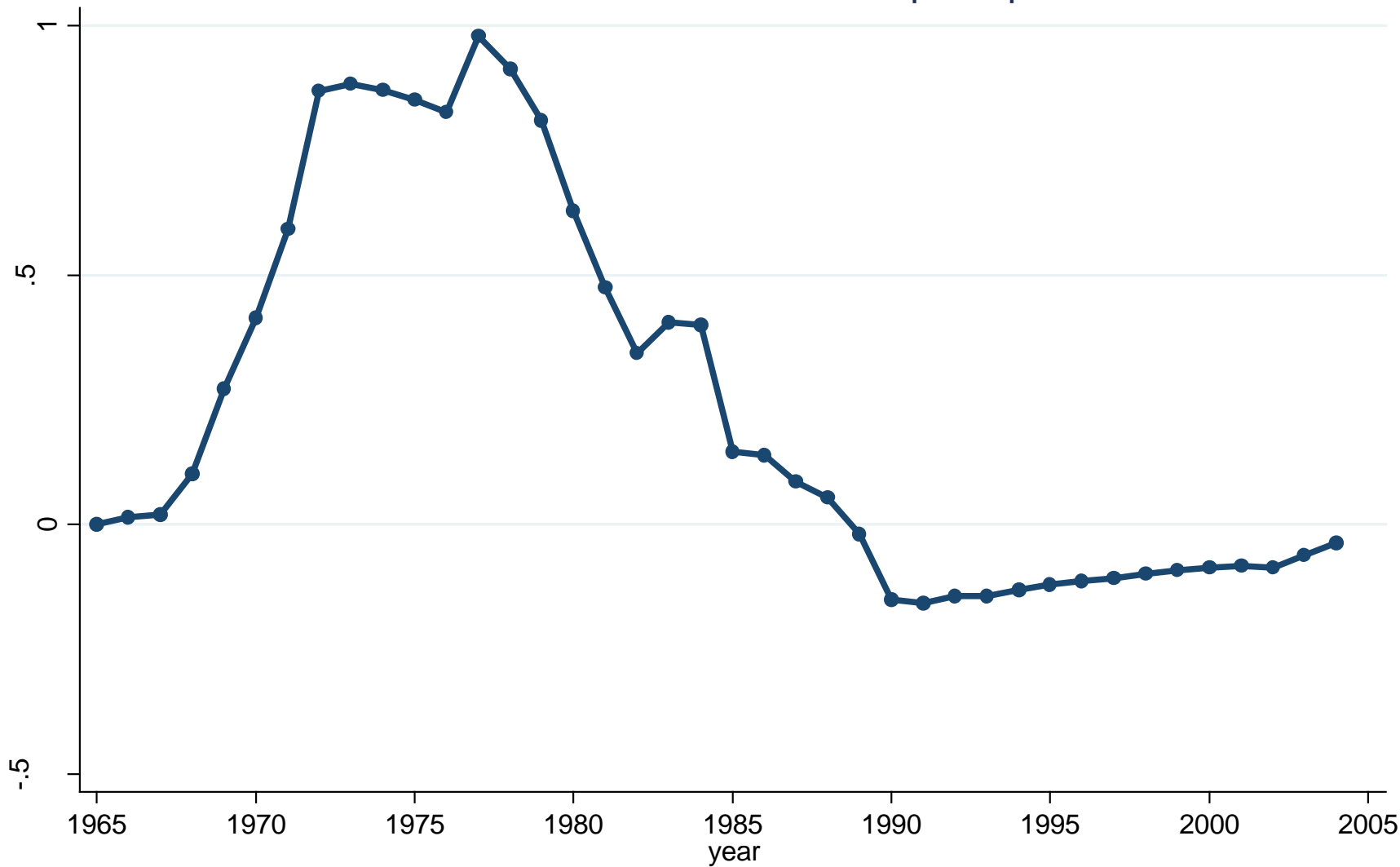
- Burgess and Pande: social branching experiment
 - 4:1 rule between 1976 and 1990 for new branches led to increase in branches in previously unbanked areas
 - Three time trend* initial rural branch penetration
- 1991 liberalization – differential effects across different states
 - Liberalization starting in 1991 led to more decentralized policy making, with different states using their opportunities at reform to different extent
 - Liberalization was broad, in the financial sector included interest rate liberalization and reductions in reserve requirements, private bank entry etc.
 - Reforms in areas of investment incentives, tax policy, power sector, infrastructure etc.
 - Bajpai and Sachs (1999) distinguish between three groups:
 - Reform-oriented: Andhra Pradesh, Gujarat, Karnataka, Kerala, Maharashtra and Tamil Nadu
 - Intermediate Reformers: Haryana, Orissa, Madhya Pradesh, Punjab, Rajasthan and West Bengal
 - Lagging Reformers: Assam, Bihar, and Uttar Pradesh
 - Three dummies – post 1991* reform category

Reform category of States

Based on Bajpai & Sachs (1998)



Year effect on rural branches percapita

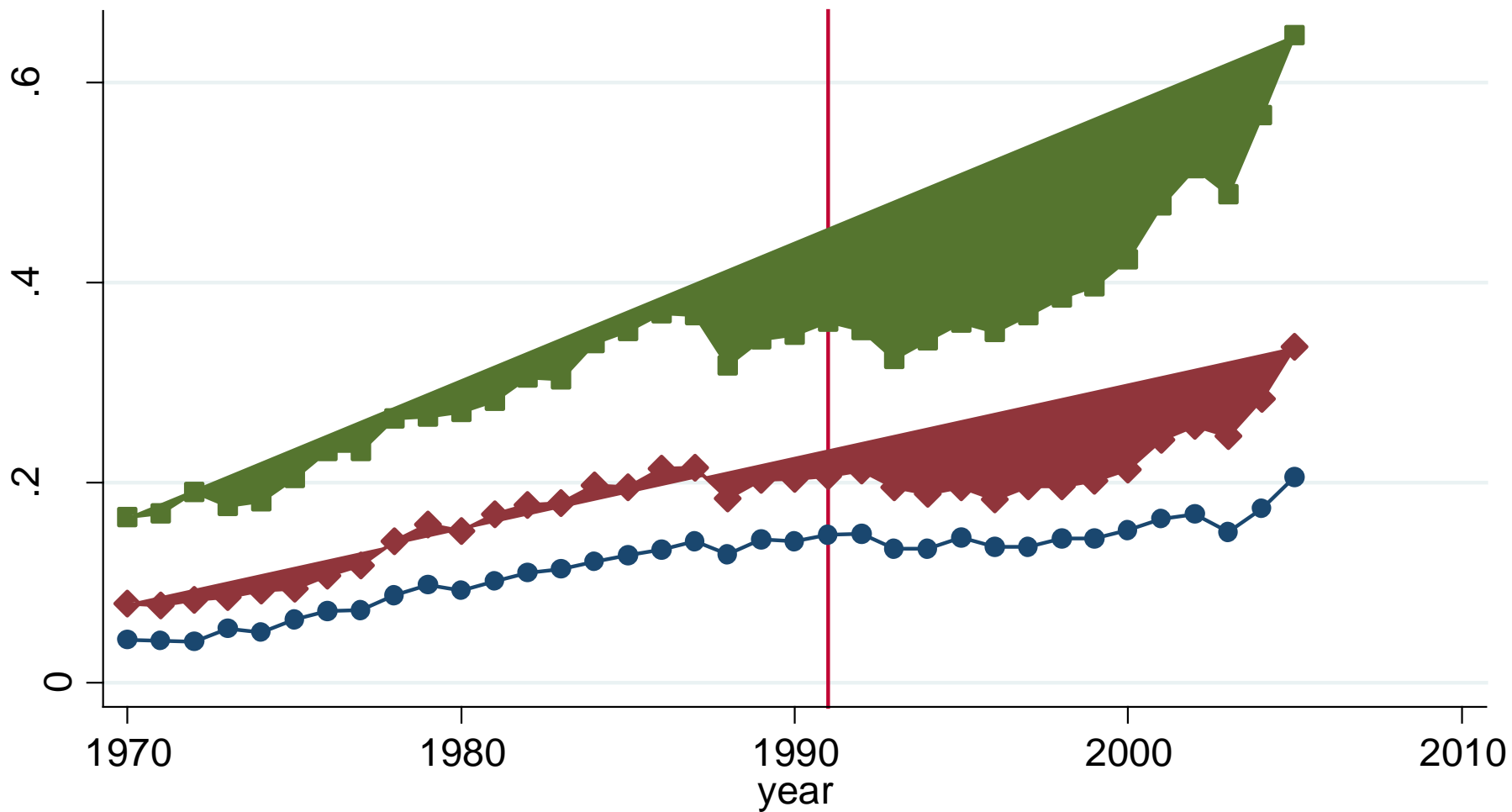


Time period: 1965-2005

Note: The coefficients are referenced and normalized by the first one.

The level of initial financial development is measured by rural branches per capita in 1965.

Credit_over_SDP



lagging-reformers

intermediate-reformers

reform-oriented

First stage regressions

	L.Rural branches /mill.capita	L.Bank Credit /SDP	L.Bank Deposits /SDP
	(1)	(2)	(4)
L.Dummy for post 1991 x Lagging Reformers Dummy	17.961*	0.629**	1.231***
L.Dummy for post 1991 x Intermediate Reformers Dummy	17.922	0.661**	1.245***
L.Dummy for post 1991 x Reform Oriented Dummy	18.919	0.733*	1.331***
L.(year-1965) x Rural Branches in 1965	0.447***	0.001	0.004***
L.(year-1977) x Rural Branches in 1965 x Dummy for post 1977	-0.606***	-0.001	-0.005***
L.(year-1990) x Rural Branches in 1965 x Dummy for post 1990	0.181*	0.000	0.004**
L.Log(SDP/capita)	-3.280	-0.225*	-0.368***
L.rural population ratio	51.580	-1.397**	-0.854
L.literacy rate	-0.058	0.000	-0.003
L.Government exp. / SDP	-8.810	-0.024	0.158
Constant	-2.477	2.895**	3.616***
Observations	375	375	375
R-squared	0.966	0.908	0.951
Adjusted R-squared	0.961	0.896	0.944
F_test	12.390	4.773	17.232
P_value	0.000	0.008	0.000
# of States	15	15	15

Standard errors not reported in above table

Second stage regressions

	Rural Headcount	Rural poverty gap	Urban Head count	Urban poverty gap	Rural Headcount	Rural poverty gap	Urban Head count	Urban poverty gap
	1	2	3	4	5	6	7	8
L.Bank Credit /SDP	-116.862*	-44.974*	-41.069	-22.899				
L.Rural branches /mill.capita	-2.274	-0.468	-0.937	-0.083	-2.248**	-0.467	-0.741	-0.047
L.Bank Deposits /SDP					-89.685***	-33.889***	-44.576	-19.729*
L.Log(SDP /capita)	-17.011*	-3.174	-12.92*	-3.079	-26.140**	-6.566	-18.649**	-5.285**
L.rural population ratio	-94.918	-59.625	21.542	-21.130	-8.102	-24.953	25.755	-8.459
L.literacy rate	0.056	0.069	0.134	0.081	-0.365	-0.091	-0.052	-0.008
L.Government exp. / SDP	-1.093	8.961	-36.00**	-5.460	14.379	14.798*	-28.113*	-2.024
Constant	291.92**	93.154*	142.460	55.097	298.128**	93.613*	184.909*	62.960
Observations	375	375	375	375	375	375	375	375
R-squared	0.826	0.794	0.911	0.870	0.887	0.858	0.928	0.906
Adjusted R-squared	0.803	0.766	0.899	0.852	0.872	0.839	0.919	0.893
Sargan	2.513	1.310	17.072	10.867	3.249	2.653	11.483	8.803
p_value	0.642	0.860	0.002	0.028	0.517	0.617	0.022	0.066
# of States	15	15	15	15	15	15	15	15

Standard errors not reported in above table

Conclusions

- Negative relationship between financial development and rural poverty across states and over time
- New instruments: reform variation across states after 1991 liberalization
- Instrumenting confirms results on financial depth (credit and deposits)
- Horse race shows more robustness for depth than for outreach (branch penetration)