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REPLICATION

Do rural banks matter that much? Burgess and Pande (2005) reconsidered

Nino Buliskeria[1] | **Jaromir Baxa[1,2]**

[1]Institute of Economic Studies of the Faculty of Social Sciences, Charles University, Opletalova 26, Prague, 110 00, Czech Republic

[2]Institute of Information Theory and Automation, The Czech Academy of Sciences, Pod Vodarenskou Vezi 4, Prague, 182 00, Czech Republic

Correspondence
Nino Buliskeria, Institute of Economic Studies, Charles University, Opletalova 26, Prague 110 00, Czech Republic.
Email: nino.buliskeria@fsv.cuni.cz

Summary

We replicate Burgess and Pande's (2005) analysis of the effect of India's state-led bank expansion on poverty. The authors instrument rural bank branch expansion by its trend reversal explained by the 1977 licensing rule and find that the bank expansion decreased poverty. However, the authors do not consider other licensing rule amendments and concurrent policies. Thus, their instrument is not necessarily exogenous to poverty. We show that the significant effect of bank expansion on poverty disappears after summarizing the trend reversal with more breaks linked to the bank licensing policy.

KEYWORDS

access to finance, finance and development, rural poverty

1 | INTRODUCTION

Over the years, easing access to financial services has become a widely accepted approach to reducing poverty and enhancing overall economic growth. Although Banerjee and Duflo (2011) have questioned the transformative power of microfinance, a focus on access to finance has been incorporated into many development strategies. Several alternative policies have already been carried out worldwide, including credit subsidies for the poor, microfinance, and bank expansion programs (Gertler et al., 2009; Khandker, 2005; Robinson, 2001). India was a pioneer in implementing large-scale state-led financial expansion programs at the end of the 20th century to expand virtually nonexistent rural banking and decrease poverty (Burgess & Pande, 2005; Kochar, 2011; Panagariya, 2008).

Burgess and Pande (2005) is one of the most influential papers studying the effect of easier access to credit and saving facilities on poverty. The authors study India's state-led bank expansion from 1961 to 2000 and find that bank expansion decreased rural poverty. Their paper has been acknowledged in policy publications (i.e., Claessens & Feijen, 2007; Honohan & Beck, 2007; Jahan & McDonald, 2011) and is mentioned in the Handbook of Development Economics (Rodrik & Rosenzweig, 2010). However, due to the identification issues of the causal effect between bank expansion and poverty, Panagariya (2008), Kochar (2011), and Fulford (2013) remain skeptical of the findings presented in Burgess and Pande (2005).

Fulford (2013) points to different effects of credit on poverty across different time horizons. Contrary to Burgess and Pande (2005), Fulford (2013) finds that the Indian bank expansion initially decreasing poverty and increasing consumption, but increasing poverty and decreasing consumption in the long run, when the debts need to be repaid. Consequently, the increase in branches per capita in rural areas caused a slight increase in rural poverty.

The main challenge for identification is the potential endogeneity between where banks are willing to expand and poverty levels. Since banks prefer areas with increasing business opportunities, bank expansion is not exogenous to poverty. Burgess and Pande (2005) addressed the causal inference by instrumenting the bank expansion with the imposition and removal of the 1977 bank branch licensing rule, which required banks to open four branches in unbanked locations for each newly opened branch in a banked location (1:4 rule). However, Kochar (2011) and Panagariya (2008) point out that the rules linking rural and urban financial development were introduced at the beginning of the 1960s and amended multiple times, including once in 1977. The authors argue that the 1977 amendment was not significantly different from the past rules (see Panagariya, 2008, p. 224) and was updated only two years later in 1979 to bank-to-population targeting. Hence, for most of the treatment period of 1977–1989, the bank licensing rules were different from the 1977 update. Kochar (2011) further asserts the importance of concurrent credit subsidizing policies, while Burgess and Pande (2005) do not discuss them thoroughly. However, such policies could have influenced trend reversal in the rural bank expansion while targeting poverty. Therefore, the selection of the 1977 update of licensing policy to instrument the bank expansion appears unclear, and its exogeneity to poverty is questionable.

In this paper, we successfully replicate the empirical results of Burgess and Pande (2005) first and next analyze their identification strategy. After switching 1977 with other hypothetical trend break years, we find significant trend reversals almost every year between 1970 and 1984. Some of these years coincide with the introduction of other programs targeting poverty reduction rather than bank expansion.

Next, we analyze the impact of inclusion of additional trend reversal along with the one in 1977. These results show that with an additional cut-year around 1985, when the government reduced the pace of rural expansion, the effect of bank expansion on poverty decreases and becomes statistically insignificant. The impact of bank expansion on poverty also becomes insignificant when using a more trend reversals of rural branch openings as the instrument. Therefore, the main finding of Burgess and Pande (2005) that the state-led bank expansion decreased poverty is not robust to sensible modifications of the instrumental variable. The main reason is that the trend reversal, summarized by the imposition and removal of the 1977 rule, is neither an accurate description of exogenous shifts in bank licensing policies nor exogenous to the confounding variables simultaneously driving poverty and bank expansion. These findings cast doubt on the estimated effects of bank expansion on poverty provided in the original paper.

The remainder of this paper is organized as follows. Section 2 reviews the history of Indian poverty-alleviating policies. Section 3 presents the replication of Burgess and Pande (2005). Section 4 discusses the instrument's relevance and exogeneity, and finally, Section 5 concludes.

2 | THE INDIAN POLICIES OF THE LATE 20TH CENTURY

The Indian government initiated numerous policies for expanding banking sector outreach and formal credit access across the country with the aim to decrease poverty. Under the Nationalization Act of 1969, the Reserve Bank of India (RBI) took over the 14 largest commercial banks and launched an extensive bank expansion program aiming at equal access to financial services for the poor (Burgess & Pande, 2005; Banerjee et al., 2004; Kochar, 2011).

Between 1969 and 1979, the banks were expected to comply with the required urban to rural bank branch opening ratios.[1] Although the ratio was modified multiple times, the bank expansion rules of before 1979 were considered inefficient at reducing poverty (Kochar, 2011; Panagariya, 2008). Therefore, in 1979, the Government of India took over and nationalized six additional banks (Banerjee et al., 2004; Cole, 2009) and updated the bank licensing policy to target the population-to-rural bank branch ratio instead of the rural-to-urban branch opening ratio (Panagariya, 2008). The highest rate of branch expansion since the 1960s was reached over the next five years from 1980 to 1985.

However, with the first wave of liberalization in 1985, the speed of rural branch openings fell dramatically. After 1985, the government aimed to strengthen the rural banking system and reduce the pace of branch expansion, which caused increasing losses (Mohanty & Acharya, 2006). The government started to introduce programs that would ease access to credit using existing banking networks. Therefore, while the expansion of branches decelerated, deposits and advances increased considerably relative to the previous periods.

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[1]In 1970, the RBI adopted a 1:3 ratio of banked to unbanked branch openings. In September 1971, the rule was updated to a (1+1):3 ratio; that is, banks had to open three rural branches for every branch opened in metropolitan and urban locations. Since the "1:4" rule was, in reality, the (1+1):4 rule, it was less demanding than the rule introduced in 1970 and only slightly more demanding than the (1+1):3 rule of 1971 (see Panagariya, 2008, for a more detailed description).

Along with the bank branch expansion rules, other poverty elimination policies were adopted. In 1978, the government introduced the Integrated Rural Development Programme (IRDP) to increase productive assets in rural locations via credit subsidies. By the end of 1980, this program was one of the prominent tools in fighting countrywide poverty. According to Kochar (2011), the IRDP affected both the poverty and potential patterns of bank expansion, making it nearly impossible to disentangle the poverty-alleviating effects of credit subsidizing and bank expansion programs. The National Rural Employment Programme was also introduced in 1980 to address both poverty and unemployment in rural areas by providing wage employment during the slack agricultural season. While the bank expansion program was gradually abandoned from the mid-1980s, it was finally discontinued in 1990, as the RBI stopped interfering in the banks' expansion decisions (Burgess & Pande, 2005; Kochar, 2011; Panagariya, 2008). Nevertheless, the decrease in poverty accelerated in the 1990s even without bank expansion policies (Figure S1.3, Appendix S1).

3 | REPLICATION OF THE WORK

3.1 | Data

Following Burgess and Pande, we use Indian National Survey Data (Datt et al., 1996) on bank branch opening dates, locations, and state characteristics (poverty, wages, expenditure, land reform, and population) for 1961 to 2000 and 16 Indian states. The authors categorize the branch openings into two classes: openings in rural unbanked and banked locations. The first classification refers to branches that opened in a previously unbanked rural location; the latter refers to openings in areas with one or more branches. The number of branches per capita in each state in 1961 is used as the proxy for initial financial development, while branches per capita in each state over time measures the level of branch expansion. Finally, Burgess and Pande (2005) use a poverty headcount ratio (the share of the population below the poverty line) from national household expenditure surveys to measure poverty.

3.2 | Methodology

To evaluate the state-led bank expansion effect on poverty, Burgess and Pande (2005) first address the potential endogeneity problem. Without limitations, banks are willing to expand into wealthier states. Since richer states are more successful in tackling poverty, the impact of bank expansion on poverty could be overestimated. In contrast, if the RBI successfully forced banks into opening branches in poorer states, the effect of branch expansion on poverty could be underestimated.

Burgess and Pande (2005) address the identification problem by instrumenting rural expansion with the imposition and removal of the 1:4 branch licensing policy, introduced in 1977. This policy should have caused speedier branch openings in rural versus urban locations from 1977–1990 relative to other periods. The validity of this instrument requires significant trend reversal in bank branch expansion caused by the exogenous policy change.

3.3 | Bank expansion and initial financial development

To test the validity of the instrumental variable, the authors first study the effect of initial financial development on the trend of bank branch opening[2]:

$$B_{it}^R = \alpha_i + \beta_t + \sum_{k=1961}^{2000} (B_{i1961} * D_k)\gamma_k + \sum_{k=1961}^{2000} (X_{i1961} * D_k)\delta_k + \varepsilon_{it}, \tag{1}$$

where B_{it}^R is the number of banks opened in rural areas in state i and year t. B_{i1961} measures the 1961 financial development level in state i; this variable enters the regression interacting with time fixed effects D_k, which equal one if $k = t$ and zero otherwise. The set of coefficients γ_k show the year-specific effect of the initial financial development on branch openings (Figure 1a, solid line). X_{i1961} is a vector of initial state conditions—log real state income per capita, population density,

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[2]In this section, we used the methodology in line with the Stata code accompanying Burgess and Pande (2005). In fact, the equations reflect the working paper (Burgess & Pande, 2003) rather than the version published in the AER.
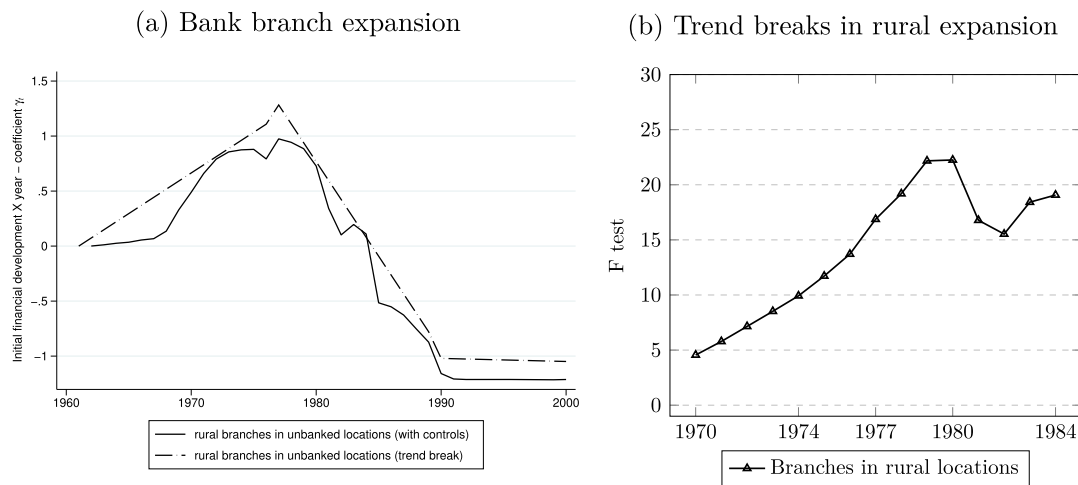
(a) Bank branch expansion | (b) Trend breaks in rural expansion

FIGURE 1 Initial Financial Development and Rural Bank Branch Expansion. (a) The series "rural branches in unbanked locations (with controls)" shows the annual coefficients of the effect of initial financial development on branch expansion from Equation (1). The series "rural branches in unbanked locations (trend break)" graphs the trends obtained from Equation (2) and correspond to the results reported in Table S1.1, column 1 in Appendix S1. Burgess and Pande (2005) disregard the impact of pulse dummies in their Figure 1. The reference year is 1961. The figure correspond to Figures 1 in Burgess and Pande (2005), p. 784. (b) F statistics of a restriction that in Equation (2) the coefficients $\gamma_1 + \gamma_2 = 0$ (F test 1 in Table S2.1.1, Appendix S2) in any of the sample years. For all years, the signs of the coefficients switch as well, so the trend reversal is statistically significant

and the number of rural locations per capita, all measured for 1961. These values enter the regression interacting with year dummies and year-specific coefficient δ_t.

Next, Burgess and Pande (2005) summarize the dynamics of the impact of initial financial development on bank expansion using the linear trend break model.

$$
\begin{aligned}
B_{it}^R = \alpha_i + \beta_t &+ \gamma_1(B_{i1961}^R[t-1961]) + \gamma_2(B_{i1961}^R[t-1976]P_{1977}) + \gamma_3(B_{i1961}^R[t-1990]P_{1990}) \\
&+ \gamma_4(B_{i1961}^R P_{1977}) + \gamma_5(B_{i1961}^R P_{1990}) + F(X_{i1961}) + \varepsilon_{it}
\end{aligned}
\tag{2}
$$

State and year fixed effects α_i and β_t account for differences in state and time-specific characteristics. Linear time trends $[t-1961]$, $[t-1977]$, and $[t-1990]$ switch on in 1961, 1977, and 1990 and enter the regression interacted with the measure of the state's initial financial development, B_{i1961}. P_{1977} and P_{1990} are dummy variables that equal one from 1977 and 1990 to 2000, respectively.[3] The inclusion of additional controls X_{i1961} ensures that observed trend reversal in B_{i1961} does not reflect trend breaks in a state's economic and demographic characteristics. The standard errors are clustered by state to account for possible serial correlations.

We successfully replicate all estimations in Burgess and Pande (2005) (Appendix S1). To summarize, the trend reversals in 1977 and 1990 are statistically significant. There is a significant downward sloping trend in the effect of initial financial development on bank expansion after 1977, so more bank branches opened in previously unbanked locations, and the trend disappears after 1990 when the bank licensing policy was removed. These results are confirmed by the F tests of restrictions $\gamma_1 + \gamma_2 = 0$ and $\gamma_1 + \gamma_2 + \gamma_3 = 0$ (F tests 1 and 2; Table S1.1).[4]

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[3]The corresponding equation (3) in Burgess and Pande (2005) does not include pulse dummies P_{1977} and P_{1990} in the interaction terms with the trends, although they are included in the authors' code. These dummies ensure that the trends affect only the respective time periods: without them, the trends would be negative for preceding periods.

[4]Following Burgess and Pande (2005)'s exogeneity check, we confirm the absence of significant trend reversals in credit flows to priority sectors and primary agricultural cooperatives (columns 5 and 6, Table S1). Analogously, the main state economic and policy variables that influence rural poverty do not exhibit a trend reversal similar to that shown in Figure 1a. Therefore in Burgess and Pande (2005), the imposition and removal of the 1:4 rule are assumed to be valid instruments since the trend breaks of the effect of initial financial development on rural branch expansion are significant, and there are no structural breaks in other political and policy variables.

TABLE 1 Bank branch expansion and poverty: instrumental variables evidence

	Headcount ratio				
	Rural			Urban	Aggregate
	OLS	IV	IV	IV	IV
	(1)	(2)	(3)	(4)	(5)
Number of bank branches opened in rural unbanked locations per capita	2.09**	1.16	−4.74**	−0.66	-4.10**
	(0.785)	(1.024)	(1.790)	(1.066)	(1.464)
Number of bank branches per capita 1961*(1961–2000) trend		−0.43**	−0.48*	−0.26*	−0.46*
		(0.165)	(0.269)	(0.134)	(0.226)
Number of bank branches per capita in 1961*Post-1976 dummy[†]		−0.31	−1.42	−2.06	−1.39
		(1.229)	(2.297)	(1.654)	(2.034))
Number of bank branches per capita in 1961*Post-1989 dummy[a]		5.38**	−1.08	−0.47	−1.55
		(2.468)	(2.334)	(1.015)	(1.759)
State and year dummies	YES	YES	YES	YES	YES
Other controls	YES	YES	YES	YES	YES
Overidentification test			[0.99]	[0.99]	[0.99]
Adjusted R-squared	0.807	0.834	0.760	0.915	0.818
Observations	627	627	627	627	627

Note: The IV estimates correspond to Equation (3) for different dependent variables. Other controls include state population density, log state income per capita, log rural locations per capita, all measured in 1961. The over-identification is tested using the conventional Sargan test. Robust standard errors in parentheses. Source: This table is a replication of tab. 3 in Burgess and Pande (2005), p. 789. For replication we used data and methodology provided by the authors.

[a]Original paper contains Post-1976 dummy*(1977–2000) trend and Post-1989 dummy*(1990–2000) trend instead, which is not consistent with the text and the stata code. Therefore, we have changed the variable names accordingly.

*$p < 0.1$.

**$p < 0.05$.

***$p < 0.01$.

3.4 | Impact of bank branch expansion on poverty

To analyze the effect of bank branch expansion on India's rural poverty, the authors estimate Equation (3).

$$y_{it} = \alpha_i + \beta_t + \phi B_{it}^R + \mu_1([t - 1961]B_{i1961}) + \mu_2(P_{1977}B_{i1961}) + \mu_3(P_{1990}B_{i1961}) + u_{it} \quad (3)$$

They first run a simple OLS regression (columns 1 and 2 of Table 1), and next proceed to the two-stage IV estimation. The first stage regression coincides with Equation (2), and the second stage corresponds to Equation (3) based on the fitted values of B_{it}^R from Equation (2).

Columns 3 to 5 of Table 1 present the replicated IV estimates for poverty outcomes as shown in Burgess and Pande (2005). A one-point increase in per capita branch opening in rural unbanked locations explains a 4.74% reduction in rural poverty (column 3), which evaluated at the sample average implies a 17% decrease in the poverty headcount ratio. Moreover, this process had no impact on urban poverty (column 4). Aggregate poverty in rural locations decreases by 4.10 percentage points, with every additional branch opening in a rural location per 100,000 persons (column 5).

Furthermore, we verify that the main results given in column 3 of Table 1 are robust even after controlling for time-varying political and policy variables (Table S1.4, Appendix S1). Thus, the negative and significant relationship between rural branch expansion and rural poverty persists even after controlling for increased land reform and development spending, which is known to reduce rural poverty (Besley & Burgess, S1.4, S1). Thus, the negative and significant relationship between rural branch expansion and rural poverty persists even after controlling for increased land reform and development spending, which is known to reduce rural poverty (Besley & Burgess, 2000).

4 | SENSITIVITY CHECK: DIFFERENT CUT-YEARS

The results and the policy implications of Burgess and Pande (2005) are heavily conditional on the assumption that their instrument, imposition, and removal of the 1977 bank licensing policy provide a credible source of exogenous variation

in rural bank expansion. Thus, the trend reversal in bank expansion should be driven solely by the 1:4 rule and not by any other simultaneous policy interventions targeting rural poverty.[5]

Nevertheless, Panagariya (2008) and Kochar (2011) assert that the poverty-alleviating effect of state-led bank branch expansion cannot be evaluated without considering coexisting credit subsidizing policies and other amendments of the bank branch expansion rules. Since these policies affected poverty and enhanced access to credit, they may have created additional incentives for the expansion, aside from licensing rule requirements. Therefore, these concurrent policies make the exogeneity of the imposition and removal of the 1:4 rule questionable.

We start addressing the instrument validity concerns by re-estimating Equation (2) with different hypothetical trend break years (instead of 1977) as the instruments for bank expansion in Equation (3). These alternative trend breaks often coincide with other changes in the bank licensing rules or implementations of other poverty-alleviating policies, most notably the IRDP. Next, as if the most prominent policies affecting bank expansion were unknown, we test for which years the F statistics of these trend breaks are significant and maximized.

4.1 | Different cut-year than 1977

We find that the trend reversals are significant for virtually all cut-years in the sample, and there is little difference between the F tests of 1977 and surrounding years (Figure 1b and Table S2.1.1, Appendix S2). It can be argued that the significance of trend breaks around 1977 can be driven by the policy reversal of 1977 due to autocorrelation in the series of rural branch expansion. However, the other years are linked to different policies, so the contrary may also be true—the significance of the trend break in 1977 could be driven by the success of other policies. Additionally, the importance of other policies is supported by the F-statistics, that peaks in 1979 and 1980, when the IRDP was introduced. The significance of those cut-years increases suspicion of the importance of different poverty targeting policies for the dynamics of the banking network. Interestingly, although these trend reversals are not necessarily exogenous to the poverty rate, they lead to virtually the same implications as the estimates based on the cut-year of 1977.[6]

Since the rule of 1977 was an update of existing policy, the 1977 trend break merely summarizes the long run dynamics of rural bank expansion (Figure 1a). From this perspective, and in the absence of the credit subsidizing policies of the early 1980s, any cut-year effectively summarizing the trend reversal of the rural bank expansion could be an acceptable instrument, particularly when linked to other changes of licensing rules. Despite some uncertainty about the coefficient's value, the estimated effect of bank expansion on poverty would remain conceivable with different cut years as well (Figure 2a and Table S2.3.1, Appendix S2). However, the credit subsidizing and employment policies of the early 1980s (summarized in Copestake, 1996) were conceptually different from the bank expansion program. Through these policies, the Indian government provided paid labor and cheap credit to poor households, thus making treated unbanked areas more attractive for expansion. Therefore, these credit subsidizing policies may have affected the trend reversal of rural branch expansion, even without the expansion rules, casting doubt on the validity of the original instrument.

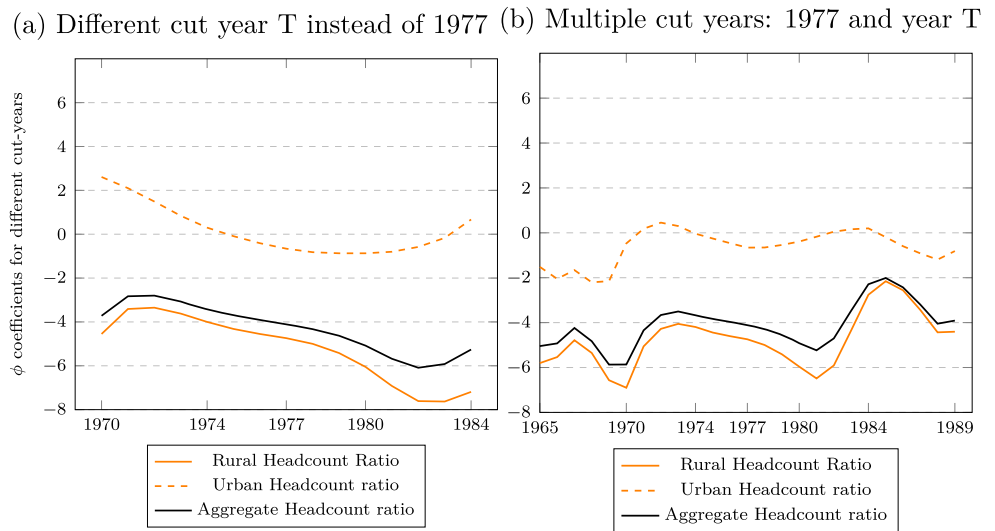## 4.2 | One additional cut-year along with 1977 & 1990

We add another cut-year to summarize the trend of rural branch openings better (solid line in Figure 1a) and to check the robustness of the original results. If the 1:4 rule of 1977 was prominent for the rural bank expansion as suggested by Burgess and Pande (2005), the inclusion of the additional cut-year, associated with other bank licensing rules, should neither influence the significance of 1977 cut-year nor change the final results for the effect of bank branch expansion on poverty.

The inclusion of additional cut-years before 1977 affects the significance of the 1977 trend reversal, but the final result of the poverty-alleviating effect of rural branch expansion remains similar. The trend breaks in 1973 to 1975 are significant, and the inclusion of the 1975 cut-year makes one in 1977 insignificant. These results indicate that the trends in unbanked branch expansion already changed before introducing the 1977 rule (Appendix S3).

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[5]As mentioned in Burgess and Pande (2005), the requirements for IV validity are "no direct effect on poverty outcomes" and the significance of the trend reversal.

[6]The quantitative results for different cut-years are shown in Tables S2.1.1 to S2.5.2, Appendix S2, while the plots of the trend reversals are presented in Figure S1.6 in Appendix S1. We also analyzed the effects of trend reversals for different cut-years on credit flows to the priority and cooperative sectors, and we do not identify significant trend reversals. According to Burgess and Pande (2005), this should be an indication of the exogeneity of specific trend breaks. As it appears, an absence of similar trend reversals in credit flows and other variables is not a sufficient condition for the exogeneity of the trend break in bank expansion with respect to poverty. These results are available upon request.

FIGURE 2 Impact of bank branch expansion on headcount poverty (IV regression). (a) The coefficient ϕ from Equation (3) for different cut-year T instead of 1977; (b) the coefficient ϕ when including additional cut-year T along with 1977 in Equation (3). In both cases, the cut-year in 1990 is included as well. The coefficients shown in Figure 2 are presented in Tables S3.3.1–S3.3.3, Appendix S3

(a) Different cut year T instead of 1977

(b) Multiple cut years: 1977 and year T

Rural Headcount Ratio
Urban Headcount ratio
Aggregate Headcount ratio

On the other hand, the inclusion of additional cut-years from 1977 onwards had diverse effects. While the 1977 break year remains statistically significant, the significance of trend reversal in the effect of initial financial development on poverty disappears[7] (Tables S3.1.1 and S3.2.1, columns 10–24, Appendix S3). Notably, after including an additional cut-year between 1984 and 1987, the poverty-alleviating effect of rural branch expansion weakens and becomes statistically insignificant (see Table S3.3.1, columns 20–24, Appendix S3). These cut-years coincide with the Seventh Five-Year Plan of 1985 and the first wave of liberalization.

4.3 | Additional cut-years according to historical events

According to Panagariya, (2008) and Mohanty and Acharya (2006)'s detailed analysis of Indian supply-driven policies, bank licensing rule amendments happened in 1967, 1972, 1977, 1980, and 1985 and ended in 1990.[8] Therefore, we summarize the trend reversal in rural branch opening using these five cut-years (similarly to regression 2). Since these cut-years are reasonably exogenous, we use them as an instrument to estimate the impact of branch expansion on poverty (based on Equation (3)). As a result of this exercise, the poverty-alleviating effect of state-led bank expansion in rural areas becomes positive but statistically insignificant.[9] Similar results were obtained with 1968, 1973, 1979, 1984, and 1989 cut-years recommended by the Bai and Perron (2003) test for multiple unknown breaks—no significant effect of the branch expansion on poverty.[10]

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[7]The significance of this trend reversal in the case of poverty is recognized as additional evidence for the trend break being a relevant instrument in Burgess and Pande (2005).

[8]In 1967, Gandhi's Ten-Point Programme was announced, paving the path towards priority sector lending, the nationalization of commercial banks, and other interventions. The bank licensing policy was applied in the same year, requiring a specific ratio of new rural bank branches per every urban branch opening. The 1971 war between Pakistan, partnered by the United States and India, supported by the Soviet Union, pushed India towards "socialist" interventionist policies. The bank licensing rules were updated and tightened in February 1970 and September 1971. Later, in 1974, the RBI introduced additional guidelines for banks to provide a minimum of one-third of aggregate advances to priority sectors, covering small-scale industry. Next, in 1977, the 1:4 expansion rule, highlighted by Burgess and Pande (2005), was implemented, while in 1980, the Integrated Rural Development Programme was fully extended, and the National Rural Employment Programme was launched. The year 1985 marks the start of the Seventh Five-Year Plan with strengthened though not yet systematic liberalization efforts and the year in which the low profitability of rural bank branches started to be addressed. Finally, a major liberalization plan was proposed in 1990, just before the balance of payments crisis of 1991 became apparent.

[9]The estimated coefficient is 1.66 (Table S4.3, column 3, Appendix S4) while Burgess and Pande (2005)'s estimate is −4.74, as reported in Table 1.

[10]Notably, initial conditions (in 1961) play an essential role in Burgess and Pande (2005)—the first-stage regression, Equation (2), estimates how the branch openings depend on initial financial development and several other initial conditions, like rural locations, population, and income. Moreover, Ravallion and Datt (2002) find that non-farm growth benefits the poor more in states with initially higher literacy, farm productivity, rural living standards, and lower landlessness and infant mortality. Burgess and Pande (2005) consider only urbanization rate and initial output as controls for the level of initial financial development. Once the set of controls is extended with the initial levels of infant mortality, literacy, crop production per farm worker, and percent of laborers of rural farmworkers, the estimated effect of initial financial development on branch openings (Figure 1a) changes dramatically. The trend reversal appears at the beginning of the 1980s, and the estimated impact of bank expansion on rural poverty remains negative but becomes statistically insignificant. The results of this additional exercise are available in Online Appendix S5.

5 | CONCLUSION

We replicated the study on the impact of bank branch expansion in previously unbanked areas on poverty by Burgess and Pande (2005). Using trend reversals in 1977 and 1990 as instruments, we successfully identified significant trend reversals in bank branch expansion and obtained the same negative effect of new branch openings on poverty as in the original study. Then, to assess validity of identification of the effect of bank branch expansion on poverty with trend reversals, we review the history of the Indian banking policies and repeated Burgess and Pande (2005)'s exercise with other hypothetical policy introduction years of 1970–1984. Our results imply that any cut-year from 1974 to 1981 leads to similar results to those with a cut-year in 1977. These results hold even though some of the hypothetical breaks are also associated with policies targeting poverty and not bank expansion. Therefore, the trend reversal in rural bank expansion of 1977 could be caused by other policies rather than by the 1977 bank licensing rule itself, which casts doubt on the instrument validity used for identification of the effect of bank branch expansion on poverty.

Next, as additional robustness checks, we introduced additional trend breaks, along with that of 1977, based on a sequence of primary policy shifts or Bai and Perron (2003)'s test for multiple unknown breaks. Notably, upon adding a break in the middle of the 1980s (i.e., the years when liberalization efforts increased and the rate of rural bank branch expansion decreased), the impact of rural branch expansion on poverty decreases, and while remaining positive, it loses statistical significance.

We conclude that Burgess and Pande (2005)'s central challenge of disentangling the effect of rural bank branch expansion from the effects of other policies on poverty has not been reliably addressed. The prominence of the 1979–1980 thresholds in the rural branch expansion and sensitivity of the final results to different instrumental variable specifications suggests that it is not possible to identify the poverty-alleviating impact of the bank branch expansion separate from the effect of the credit subsidizing programs (i.e., the IRDP). Consequently, situating banks in unbanked locations is unlikely to have results similar to those given in Burgess and Pande (2005) without further subsidizing credit and aiding with other policies. In conclusion, the 1977 and 1990 trend reversals' validity as the instrumental variable of branch expansion is highly debatable due to its potential correlation with poverty outcomes caused by policies different from the 1977 bank licensing policy. Therefore, our results imply that the final effect of bank branch expansion on poverty is not properly estimated.

From a policy perspective, our results further amplify doubts expressed in the working paper version of Burgess and Pande (2005) (Burgess & Pande, 2003) on the effectiveness and cost-efficiency of the state-led bank branch expansion relative to potential alternatives. Despite the inclination towards bank branch expansion in fighting poverty, critical lessons from the Indian experience, including high default rates when using credit as a redistribution tool, must not be overlooked. Therefore, development strategies should consider more efficient policies in mitigating poverty and not rely on easier access to banking alone.

CONFLICT OF INTEREST
The authors declare no conflict of interest.

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ORCID

Nino Buliskeria https://orcid.org/0000-0001-6708-8519
Jaromir Baxa https://orcid.org/0000-0002-9768-209X

REFERENCES

Bai, J., & Perron, P. (2003). Computation and analysis of multiple structural change models. *Journal of Applied Econometrics*, *18*(1), 1–22.

Banerjee, A., Cole, S., & Duflo, E. (2004). Banking reform in India. *India Policy Forum*, *1*(1), 277–332.

Banerjee, A., & Duflo, E. (2011). *Poor economics: A radical rethinking of the way to fight global poverty*. New York: Public Affairs.

Besley, T., & Burgess, R. (2000). Land reform, poverty reduction, and growth: Evidence from India. *The Quarterly Journal of Economics*, *115*(2), 389–430.

Burgess, R., & Pande, R. (2003). Do rural banks matter? evidence from the Indian social banking experiment. BREAD Working Paper: No. 037, http://ibread.org/bread/working/37

Burgess, R., & Pande, R. (2005). Do rural banks matter? Evidence from the Indian social banking experiment. *American Economic Review*, *95*(3), 780–795. https://doi.org/10.1257/0002828054201242

Claessens, S., & Feijen, E. (2007). *Financial sector development and the millennium development goals*. World Bank Working Paper No. 89. World Bank. https://openknowledge.worldbank.org/handle/10986/7145

Cole, S. (2009). Fixing market failures or fixing elections? agricultural credit in India. *American Economic Journal: Applied Economics*, *1*(1), 219–50.

Copestake, J. G. (1996). The resilience of IRDP: Reform and perpetuation of an Indian myth. *Development Policy Review*, *14*(1), 51–68. https://doi.org/10.1111/j.1467-7679.1996.tb00410.x

Datt, G., Ozler, B., & Ravallion, M. (1996). *A database on poverty and growth in India*. Washington DC: World Bank Development Research Group.

Fulford, S. L. (2013). The effects of financial development in the short and long run: Theory and evidence from India. *Journal of Development Economics*, *104*, 56–72.

Gertler, P., Levine, D. I., & Moretti, E. (2009). Do microfinance programs help families insure consumption against illness?. *Health Economics*, *18*(3), 257–273.

Honohan, P., & Beck, T. (2007). *Making finance work for Africa*. World Bank.https://openknowledge.worldbank.org/handle/10986/6626

Jahan, S., & McDonald, B. J. (2011). A bigger slice of a growing pie: Developing the financial sector accelerates economic growth and can enhance income equality. *Finance & Development*, *48*, 003.

Khandker, S. R. (2005). Microfinance and poverty: Evidence using panel data from Bangladesh. *The World Bank Economic Review*, *19*(2), 263–286.

Kochar, A. (2011). The distributive consequences of social banking: A microempirical analysis of the Indian experience. *Economic Development and Cultural Change*, *59*(2), 251–280.https://doi.org/10.1086/657122

Mohanty, A. K., & Acharya, S. C. (2006). *Operational analysis of regional rural banks*. Gyan Publishing House.

Panagariya, A. (2008). *India: The emerging giant*. Oxford University Press.

Ravallion, M., & Datt, G. (2002). Why has economic growth been more pro-poor in some states of India than others? *Journal of Development Economics*, *68*(2), 381–400. https://doi.org/10.1016/S0304-3878(02)00018-4

Robinson, M. (2001). *The microfinance revolution: Sustainable finance for the poor*. World Bank Publications.

Rodrik, D., & Rosenzweig, M. (Eds.). (2010). *Handbook of development economics* (1st ed., Vol. 5). Elsevier.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of the article.