Disentangling the Impact of Financial Inclusion on Households and Firms: The Business Finance Channel*

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Abstract

Using a bank expansion policy in India that increased bank branches in "under-banked" districts and granular data on households and firms, we study whether bank expansion affects the real economy by increasing household access to credit or by facilitating productive investment. We show that bank expansion increases consumption spending and reduces poverty in urban households but does not impact rural households. The improvement in household consumption and poverty is accompanied by a decrease in household indebtedness. For example, we find that urban households are less likely to borrow to finance consumption expenses such as weddings, take out fewer loans overall from informal and formal sources, and have lower overall debt, even as they increase usage of other financial services such as investments in financial assets. Instead, we find that bank expansion increases borrowing and employment by urban firms, with a corresponding increase in the wage income earned by urban households. These results suggest that the positive impact of bank expansion on jobs and wage income reduces household indebtedness. We also show that bank expansion directs capital to formal rather than informal firms, and to urban firms in manufacturing and services and not rural firms in agriculture. Our results provide disaggregated evidence of how banks facilitate urbanization, formalization, and structural change in emerging markets.

Keywords: Financial Inclusion, Bank Branch Deregulation, Regression Discontinuity, Household Consumption, Structural Change, Urbanization

JEL Codes: G21, G38, G51

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1 Introduction

A large literature finds that bank expansion raises household consumption, reduces poverty, and increases economic growth (see for example Jayaratne and Strahan (1996); Levine and Zervos (1998); Cetorelli and Gambera (2001); Burgess and Pande (2005); Beck, Demirgüç-Kunt, and Levine (2007); Beck, Demirguc-Kunt, and Peria (2007); Bruhn and Love (2014); Agarwal et al. (2017); Célerier and Matray (2019); Barboni, Field, and Pande (2022)). The two main mechanisms by which credit expansion is understood to affect the real economy are the household demand channel (Mian and Sufi, 2018; Mian, Sufi, and Verner, 2020), where banks increase household access to credit (Burgess and Pande, 2005), and the business finance channel, where banks ease financial constraints for firms (Chodorow-Reich, 2014; Bai, Carvalho, and Phillips, 2018; Dehejia and Gupta, 2022; Fonseca and Matray, 2022).

Under the household demand channel, credit expansion affects the real economy by increasing credit access to households (Mian and Sufi, 2018; Mian, Sufi, and Verner, 2020). However, the long-run effects of increasing credit access for households in developing countries are ambiguous. For example, studying the rural branch banking intervention in Burgess and Pande (2005), Fulford (2013) finds that the consumption effects were short-lived and rural poverty increased when the loans had to be repaid, suggesting that the policy unsustainably increased household debt.

Under the business finance mechanism, bank expansion eases financial constraints for firms (Chodorow-Reich, 2014; Bai, Carvalho, and Phillips, 2018; Young, 2017; Dehejia and Gupta, 2022; Fonseca and Matray, 2022), which affects households through the labor market (Bruhn and Love, 2014; Barboni, Field, and Pande, 2022). In this paper, we study whether the household demand or business finance channels are operative during a banking sector expansion in a major emerging market to improve our understanding of the real economic impact of banks in emerging markets.

We investigate the causal mechanisms through which bank expansion affects the real economy with a regression discontinuity (RD) design. The RD design is built upon a major policy intervention that oversaw the nationwide expansion of bank branches in India. In 2005, the Indian Central Bank incentivized commercial banks to open new branches in under-banked districts with a population-to-branch ratio above the national average. Five years after the bank branch expansion policy, the number of branches increased by nearly 20%. The RD design was first pioneered by Young (2017) to study credit growth in agricultural and manufacturing firms, agricultural yield, and economic activity. We follow the approach of Cramer (2021), who combines the regression

discontinuity design with household and firm data, also used in this paper, to study the impact on household health outcomes and access to credit for health service providers.

Our main contributions are as follows: First, by using data on both households and firms, we can separate the household demand and business finance channels by which bank expansion affects the real economy, and we show evidence supporting the latter mechanism. Second, we show that the benefits of the nationwide bank expansion policy are heavily skewed towards urban households with no impact on rural households and that the consumption increase is highest for the poorest and most socially marginalized urban households. Third, we show that bank expansion reduces borrowing among urban households, who are less likely to borrow to finance consumption, take out fewer loans overall from formal or informal sources, and have lower aggregate household debt, even while increasing their usage of other financial services such as investments in financial securities. Fourth, we show that bank expansion increases enterprise borrowing and employment in urban firms, and importantly, urban household wage earnings increase, capturing the labor market effects on households. Lastly, we provide disaggregated evidence of how banks facilitate urbanization, formalization, and structural change in emerging markets by directing capital to formal rather than informal firms, and to urban firms in manufacturing and services and not rural firms in agriculture. Our results suggest that the positive labor market effects of bank expansion on household jobs and wages reduce household dependence on borrowing to finance consumption expenses.

We show four main results. First, we show that banks increase household consumption expenditures consistent with the literature (Burgess and Pande, 2005; Jensen and Johannesen, 2017; Célerier and Matray, 2019; Cramer, 2021; Barboni, Field, and Pande, 2022). We add to this literature by showing that the effects are concentrated in urban households, with little impact on rural households. We find that urban households increase real consumption expenditures, are more likely to purchase durable goods, and experience a significant decrease in poverty. Importantly, our results show that among urban households, the poorest and socially marginalized groups increase consumption the most, suggesting that bank expansion may reduce inequality within urban areas. These effects are not explained by the selective expansion of banks into urban areas of treated districts.

Second, we find that following bank expansion, urban households take out fewer consumption loans to finance expenses such as weddings, pay lower monthly interest on loans, have fewer loans overall from either formal or informal sources, and have lower aggregate household debt. There is no impact on rural household borrowing or debt. These effects are not explained by a lack of financial

access since households increase usage of other financial services including investments in financial securities, as we describe below. In contrast, the literature on bank branch expansion (Burgess and Pande, 2005; Barboni, Field, and Pande, 2022) and microfinance (Kaboski and Townsend, 2012) finds that credit expansion increases short-term borrowing to fund consumption, and studying the same policy experiment Cramer (2021) finds a positive but insignificant impact on the likelihood that households take out a bank loan. Our results show that the bank expansion policy does not increase household indebtedness, as appears to have been the case in previous banking reforms (Fulford, 2013).

Third, we show that bank expansion increases household take-up of financial services, including life insurance, long-term interest-bearing accounts, and investments in financial securities such as stocks and bonds, with the effects concentrated in urban households. These results show that lower access of households to financial services does not explain the decrease in household borrowing. These measures capture household financial market participation on the intensive margin, which is important to show because, in emerging markets, households may have accounts but not use them (Dupas and Robinson, 2013; Badarinza, Balasubramaniam, and Ramadorai, 2019). Our results on increased household investments in financial securities and life insurance products add to the findings of Agarwal et al. (2017), which show that a massive financial inclusion program in 2014 in India increased the use of bank accounts for safekeeping and liquidity management and reduced borrowing from informal sources. We observe that both rural and urban households are more likely to have a savings account, which shows that the heterogeneous effects are not caused by selective branch expansion in urban areas.

Fourth, in contrast to the microfinance literature, which has struggled to find an impact of microfinance expansion on employment and business growth (Banerjee et al., 2015), we find that bank expansion benefits households through the business finance mechanism. Specifically, we show that firms increase borrowing from financial institutions and hire more workers, and that household-owned enterprises earn higher business revenues. Importantly, we observe a positive impact on household wage earnings, which provides general equilibrium evidence of the positive labor market impact of credit expansion on households. These results suggest that the positive labor market effects of bank expansion reduce the need for households to borrow to finance short-run consumption needs.

Our findings extend the literature showing that bank expansion eases financial constraints for firms (Chodorow-Reich, 2014; Bai, Carvalho, and Phillips, 2018; Young, 2017; Dehejia and Gupta,

2022; Fonseca and Matray, 2022; Kulkarni, Mahajan, and Ritadhi, 2023; Chandar, Jiao, and Mo, 2023) by showing the impact of increased jobs and wages on household consumption and debt. By studying the direct impact of bank expansion on enterprise borrowing and employment, we also add to the literature that studies the employment effect on households using consumption expenditures (Cramer, 2021), or wages (Kaboski and Townsend, 2012; Barboni, Field, and Pande, 2022).

While bank expansion increases bank borrowing and business revenues of both rural and urban firms, we find that only urban firms increase employment, and only urban households have higher wage earnings. These results provide disaggregated evidence on how bank branch expansion facilitates urbanization, which is associated with a decline in poverty (Datt, Ravallion, and Murgai, 2016), by increasing borrowing and employment by urban firms, and raising wage earnings and lowering poverty among urban households. These effects are not driven by selective branch openings in urban areas of treated districts since both rural and urban firms increase borrowing.

India has one of the highest rates of informality in the world, with 85% of non-agricultural workers employed informally (Mehrotra, 2019). We find that the bank expansion policy increases borrowing by formal firms, which are more productive (ILO, 2018), and has no impact on informal firms. Our results contrast with the findings of Bruhn and Love (2014), who show that bank expansion targeted at low and middle-income households in Mexico increases informal but not formal entrepreneurship, and with the findings of Barboni, Field, and Pande (2022), who show that rural self-employment increases with bank branch expansion. These results complement Dehejia and Gupta (2022) who study the impact of bank presence on the occupational choices of Indian households and show that it reduces informal self-employment and increases formal wage employment.

Lastly, studying the heterogeneous impact of banks across industrial sectors, we show that bank expansion increases borrowing by urban firms across all sectors, but only service sector firms borrow more in rural areas. These results expand on Young (2017) who shows that bank expansion increases credit growth in agriculture and manufacturing sectors, whereas we find that the effects are concentrated in urban firms across all sectors, study the impact on employment and business revenues, and link the labor market effects to household finances. India's growth story is one of service-sector-led growth, and Fan, Peters, and Zilibotti (2023) show that productivity growth is highest in urban, service-sector Indian firms. Our results directly show how the financial market can facilitate this structural change by channeling capital to more productive uses.

1.1 Related Literature

We contribute to the large literature on financial inclusion and household financial characteristics (Burgess and Pande, 2005; Fulford, 2013; Agarwal et al., 2017; Brown, Cookson, and Heimer, 2019; Célerier and Matray, 2019; Badarinza, Balasubramaniam, and Ramadorai, 2019; Breza and Kinnan, 2021; Suri, Bharadwaj, and Jack, 2021; Cramer, 2021; Barboni, Field, and Pande, 2022; Dubey and Purnanandam, 2023) by using granular data on both households and firms, which allows us to disentangle the household demand and business finance mechanisms.[1] For example, Burgess and Pande (2005) use an instrumental variable strategy to show that bank branch deregulation in India decreases state-level rural poverty and increases rural household borrowing, but do not discuss the mechanisms by which poverty decreases.[2] In contrast, using a different nationwide bank expansion policy, we find no impact on rural households and no change in rural household debt.

We also show that consumption and poverty outcomes for urban households remain positive in the long-run, six years after the policy change, which is in contrast to Fulford (2013) who studies the same policy intervention as Burgess and Pande (2005) and shows that the consumption effects are short-lived and rural poverty increases in the long-run when the loans have to be repaid. Our results further show that bank expansion benefits households through the labor market by easing financial constraints for firms, which borrow more and hire more workers, increasing household wage earnings. Our results suggest that the positive impact on household jobs and wages reduces household dependence on debt to finance consumption, and lowers household indebtedness.

Relatedly, Barboni, Field, and Pande (2022) use randomized branch placement across 870 Indian villages in 3 rural districts of the southern Indian state of Tamil Nadu and use household data to show that bank expansion increases formal borrowing, reduces poverty, increases income and wealth, and improves the mental health of rural households. Our results find a decrease in urban household debt, increase in urban household consumption, wages, and financial investments, but no impact on rural households, suggesting that nationwide bank expansion, such as the intervention we study, does not benefit rural households. Additionally, we find that the poorest households in urban areas increase consumption the most, whereas Barboni, Field, and Pande (2022) find that most of the income gains from access to formal credit accrue to the richest rural households. Lastly, our paper uses data on firms to study the business finance channel directly.

[1] For example, Dubey and Purnanandam (2023) study the impact of digital payments in India. Our focus is on bank lending and provides complementary evidence on the impact of financial intermediation on households.

[2] Burgess and Pande (2005)'s results have been disputed by Panagariya (2008) and Kochar (2011) who argue that the opening of bank branches accompanied a program of rural investment targeted at the same areas.

Our paper uses the same RD design, first used by Young (2017), and household survey and economic census data as Cramer (2021), who shows that bank presence improves household health outcomes by increasing access to health insurance and consumption expenditures and by channeling credit to health care providers. Cramer (2021) also shows that bank expansion increases household consumption and savings, and has a positive but insignificant impact on the likelihood of taking out a bank loan. Our focus is different. We study the household demand and business finance channels by which bank expansion affects the real economy and find evidence supporting the latter. Our results suggest that the positive impact of bank expansion on households is driven by the labor market effects of bank expansion, where firms borrow more and hire more workers, increasing household income and reducing household dependence on debt.

Studying the impact of lending to low and middle-income households in Mexican cities, Bruhn and Love (2014) show that it reduces financial constraints for informal businesses, while our results show that a nationwide branch expansion program channels credit to formal firms in India. In contrast to our results on household borrowing, Célerier and Matray (2019) find that bank branch deregulation increases household consumption and borrowing in the United States, which suggests that the impact of expanding bank access is likely to vary across developed and developing economies.

We also contribute to the literature on the effect of financial access on firms and labor markets. These findings extend the literature showing that bank expansion eases financial constraints for firms (Chodorow-Reich, 2014; Bai, Carvalho, and Phillips, 2018; Young, 2017; Dehejia and Gupta, 2022; Fonseca and Matray, 2022; Kulkarni, Mahajan, and Ritadhi, 2023; Chandar, Jiao, and Mo, 2023) by studying the impact of increased jobs and wages on households. For example, Young (2017) is the first to use this policy and RD design to show that credit growth increases in agricultural and manufacturing firms. Using the same RD design as Young (2017), in contemporaneous work as our paper, Chandar, Jiao, and Mo (2023) find an increase in capital accumulation, employment, and revenues in manufacturing firms, and labor reallocation from agriculture to manufacturing, and Kulkarni, Mahajan, and Ritadhi (2023) show that capital expenditures and credit growth increase in small and young manufacturing firms, driven by proximity to lenders. Relatedly, Fonseca and Matray (2022) show that bank deregulation in Brazilian cities increases investment, output, employment and wages of firms. We add to these studies by connecting these labor market effects to households.

Lastly, our paper is related to the large literature examining the effects of access to credit

and bank deregulation, which finds that bank entry may affect firms' access to credit (Petersen and Rajan, 1995; Beck, Demirgüç-Kunt, and Maksimovic, 2004), economic growth (Jayaratne and Strahan, 1996; Cetorelli and Gambera, 2001), and, entrepreneurship (Black and Strahan, 2002), and the literature on financial development and growth (Beck, Demirguc-Kunt, and Peria, 2007; Bruhn and Love, 2014; Rajan and Zingales, 1998; Fisman and Love, 2004; Bekaert, Harvey, and Lundblad, 2005; Gupta and Yuan, 2009). We contribute to this literature with granular data on households and firms, which allows us to shed light on the disaggregated impact of banks on the economy.

2 Identification

2.1 Bank Expansion Policy

In 2005, India's central bank, the Reserve Bank of India (RBI), announced a nationwide bank expansion policy that stated that commercial banks would be more likely to get licenses from the RBI to open new branches in already banked locations if they opened new consumer-facing bank branches in under-banked districts. The criteria for being an under-banked location was based on the condition that the district had a population-to-branch ratio higher than the national average (as per the 2001 census and district boundaries). The RBI announced a list of under-banked districts in July 2006.[3] The list of under-banked districts has remained unchanged since 2006.

The RBI policy stated that commercial banks were more likely to get licenses from the RBI to open new branches in already banked locations if they opened new branches in under-banked districts, defined as those districts with a population-to-branch ratio above the national average. The policy incentivized banks to open more branches in districts on the under-banked side of the cutoff to get more licenses to open branches in richer, banked areas.

We exploit this bank expansion policy to study the underlying channels by which banks affect the real economy using a regression discontinuity design. The regression discontinuity design based on the 2005 policy was first used by Young (2017) who studies the impact on agricultural and manufacturing firms and economic activity, using data from the Annual Survey of Industries, Ministry of Agriculture, and night-lights data. We follow Cramer (2021) who combines the RD design with IHDS data on households and Economic Census data on firms, also used in our paper, to study the impact on household health outcomes and credit to health service providers.

[3] See RBI Policy Document.

2.2 Regression Discontinuity Design

The district-level branch-to-population ratio underlying the bank expansion policy allows for a regression discontinuity design. Since the district-level ratios are not reported in the RBI policy document denoting under-banked districts, we construct this ratio using district-level population from the 2001 Census and the number of scheduled commercial bank branches operating in a district in the first quarter of 2006 from the RBI, which announced the policy in September 2005. Young (2017) uses branch data from 2005, and Cramer (2021) uses branch data from 2006 to construct the running variable in their analyses.

We use the cross-sectional variation in the district-level population-to-branch ratio in 2006 as the running variable, where the cut-off is the national average of the district population-to-branch ratio in the regression discontinuity design. The identification assumption is that districts with a population-to-branch ratio close to the national average of this ratio are similar in the absence of bank expansion.

The national average population-to-branch ratio at the district level is estimated to be about 14,780 people per branch. Districts above this cut-off are defined as treated (under-banked) and districts below the cut-off are defined as control (banked) districts. We check for manipulation around the cut-off with the standard McCrary (2008) density test to show that districts do not select into treatment or control groups and there are a similar number of districts to the right and left of the cut-off. The results from the McCrary discontinuity test are reported in the right panel of Figure 1. The estimate is -0.1996 with a p-value of 0.8418, indicating no manipulation around the cut-off.

In the left panel of Figure 1, we plot the likelihood that a district is denoted as under-banked in the 2006 list, to district population per branch around the national average, and observe a large jump in the probability that a district is listed as under-banked when the district's population to bank branch ratio crosses the national average.

The RD design guides the size of the optimal bandwidth for each robust bias-corrected inference of the outcome variables (Calonico, Cattaneo, and Farrell, 2020; Cattaneo and Vazquez-Bare, 2017; Imbens and Kalyanaraman, 2012). We find that the majority of the optimal bandwidths in our data are in the range of ±4,000 relative to the cut-off. This differs slightly from Young (2017) and Cramer (2021), whose optimal bandwidths mainly fall within ±3,500 and ±3,000, respectively.

Out of the 593 districts in the data classified as under-banked or banked by the RBI, the national

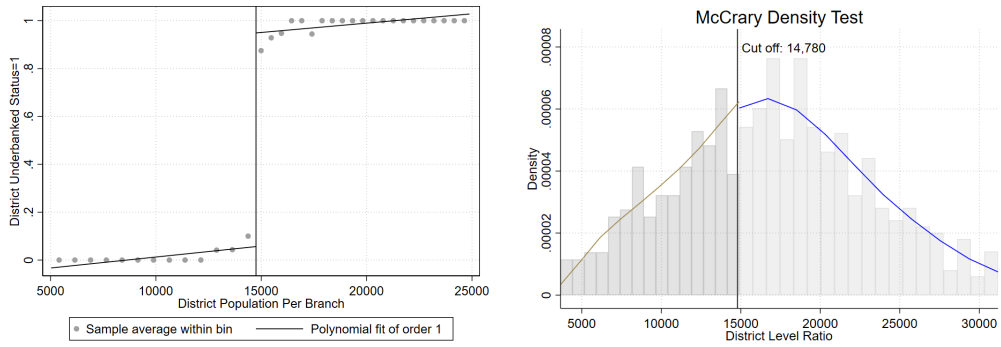


Figure 1: Likelihood of being under-banked and McCrary manipulation test. The left panel shows likelihood that a district is classified as under-banked if the population to branch ratio exceeds the national average, and the right panel shows the McCrary manipulation test, where the McCrary discontinuity estimate is -0.1996 with a p-value of 0.8418.

average correctly predicts the status of under-bankedness for 581 districts. We cannot perfectly predict the status of 12 districts. Since the RBI could have used their discretion for classifying the remaining 12 districts, we estimate local average treatment effects with a uniform Kernel using a fuzzy RDD design (Lee and Lemieux, 2010):

$$Y_{h,d} = \alpha + \gamma_1 Treated_d + f(Population\ per\ Branch - Cutoff)_d + \epsilon_d, \tag{1}$$

where $Y_{h,d}$ is a banking, household, or enterprise outcome in district d, $Treated_d$ is an indicator variable that is equal to 1 if a district's $Population\ per\ Branch_d - Cutoff > 0$, satisfying the rule for assignment to under-banked status, which incorporates a stringent threshold and an adaptable fuzzy element; $f(Population\ per\ Branch - Cutoff)$ is a flexible functional form estimating the fuzzy approach; and ϵ_d is an idiosyncratic error term at the district, household or firm level.

Equation 1 describes the fuzzy RD design estimated using two-stage least squares, with the probability of a district's under-banked status instrumenting for actual assignment. The coefficient of interest is γ_1, and the estimator shows the local average treatment effects (LATE) of being in an under-banked district. Under the standard continuity assumptions, the 'unadjusted' local linear estimator is consistent for the continuity-based RD treatment effect, and the robust bias-corrected inferences (Cattaneo, Keele, and Titiunik, 2021; Cattaneo and Titiunik, 2022), we therefore do not adjust the RD robust regressions with any covariates in the main estimates.[4]

We conduct uniform tests and tests for conditional moment equality to estimate heterogeneous

[4]We use the covariate-adjusted RD estimator for the figures shown in Appendix Figures 3-5, which describe the pre and post-policy changes in branches and licenses, and is consistent for the fuzzy RD treatment effect while reducing variance (Cattaneo, Keele, and Titiunik, 2021; Calonico et al., 2019).

treatment effects using a sub-sample of rural and urban areas. In addition, we check if the proportion of compliers is large enough for each sub-sample and if the sub-sample local average treatment effect estimator of the first stage is strong before conducting the heterogeneity analysis on rural and urban sub-samples. In Section 4, we test the assumptions of the RD model.

3 Data

We use three sources of data in the analysis: (i) RBI's Master Office File (1997-2016) and Basic Statistical Returns (2005-2015) data, (ii) India Human Development Surveys 2005 and 2011-2012, and (iii) Economic Census, 2005 and 2013. Next, we discuss the variables derived from each of the data sets.

3.1 RBI's Master Office File & Basic Statistical Returns

RBI's Master Office File (MOF) provide data on the number of commercial bank branches and licenses in a given district.[5] Summary statistics for annual district-level credit and deposits by year, and by rural and urban status in banked and under-banked districts are reported in Appendix Table A1. These data are from RBI's Basic Statistical Returns (BSR) database.

3.2 India Human Development Survey Panel

We obtain data on households from the India Human Development Survey (IHDS)[6], which is a nationally representative panel data survey of over 40,000 households in 1,420 villages and 1,042 urban neighborhoods across India.[7] Note that only two rounds of this survey exist, which were conducted between 2004-2005 and 2011-2012. Desai et al. (2020) shows that demographic characteristics of households in the IHDS are very similar to other nationally representative surveys, including the National Sample Survey Organization.

The first round of the survey was conducted in 2004-2005, and the second round was conducted in 2011-2012. The second round successfully re-interviewed approximately 83% of the 41,554 house-

[5] We thank Kim Cramer for sharing the data on district-level branches and licenses from the RBI, which are no longer publicly available on the RBI website for these years.

[6] IHDS is a collaborative survey conducted by the University of Maryland, the National Council of Applied Economic Research (NCAER), Indiana University, and the University of Michigan. It covers all Indian states and union territories except for the union territory islands of Lakshadweep and Andaman and Nicobar Islands. The IHDS sample is designed to be nationally representative along a number of dimensions, including geographic, religious, ethnicity, and language (Heyes and Saberian, 2022). See https://www.icpsr.umich.edu/icpsrweb/content/DSDR/idhs-II-data-guide.html for the data guide.

[7] We thank Keera Allendorf for helpful discussions about the IHDS data.

holds that were interviewed in 2005 with additional replacement households, and covered 64% of districts in 2005 and 65% of districts in 2012 (Desai and Vanneman, 2018). We obtain household financial characteristics from these surveys. Since IHDS-1 was conducted a year before the branch expansion policy, we used it to measure pre-policy smoothness in the outcome variables. IHDS-2 was conducted six years after the policy and provides the estimates for post-policy discontinuity in the outcome variables.

Merging the IHDS data with the RBI data, we observe 220 under-banked districts and 151 banked districts.[8] The IHDS survey has sufficient observations for the rural and urban sub-sample analyses. See Cramer (2021) for a district map showing geographic coverage of the IHDS data.

We use three measures of household consumption and poverty: *Consumption Expenditures*, defined as annual per capita real consumption expenditures in rupees;[9] *Poverty*, which is an indicator variable that is equal to one if the household's consumption expenditures are above the state poverty line, and zero otherwise; [10] and, *Motor Vehicle Ownership*, which is an indicator variable equal to one if the household owns a motor vehicle, and zero otherwise. All rupee variables are deflated using the panel survey estimator and trimmed at the 10^{th} and 90^{th} percentiles.

We use three measures of household borrowing: *Monthly Interest Loan*, which is the average monthly interest rate paid on loans; *Number of Loans*, which is the total number of loans per household; *Consumption Loan*, which is an indicator variable that is equal to one if the household has taken out a consumption loan (eg., for wedding expenses), and zero otherwise; and *Outstanding HH Debt*, which is total outstanding household debts in rupees.

We use four measures of household savings and investments: *Bank Savings*, which is equal to one if the household has a savings or current account with a bank, and zero otherwise; *Life Insurance*, which is equal to one if the household head owns a life insurance product from the government or private sources, and zero otherwise; *Securities and Investments*, which is equal to one if the household has assets in mutual funds, Unit Trust, stock market, bonds, or post office accounts, and zero otherwise; and *Long Term Deposits*, which is equal to one if the household has a fixed deposit account with a bank, a pension fund, or other savings schemes, and zero otherwise.

Lastly, we observe *Household Wage Earnings*, which is annual real household wage income from

[8] Merging IHDS with RBI data we lose 8 districts because in the IHDS data, Delhi is divided into 8 districts, but in the RBI data, it is one district. However, as all districts in Delhi fall into the banked category, identification is not affected. After the final merge, we observed 371 districts.

[9] We divide real annual household consumption expenditures by the OECD per capita equivalent measure of household consumption (EM), where EM = 1 + 0.7*(Number of Adults - 1) + 0.5*(Number of Children).

[10] See https://ihds.umd.edu/poverty for a discussion of the poverty line.

employment, and *Business Revenues*, which are annual real revenues earned by household-owned small businesses.

Table 1 reports summary statistics for all household characteristics in each survey round for the full sample. We report summary statistics for the sub-samples of rural and urban households in Appendix Tables A2.

3.3 Economic Census (2005 and 2013)

We also use the National Economic Census (EC, 2005 and 2013), which describes the universe of Indian enterprises. There are 4 rounds of the EC available (1990, 1998, 2005, and 2013), of which the last two rounds coincide with the immediate pre- and post-policy period of the bank expansion policy. This survey covers all districts. From the Economic Census, we construct the following variables: *Enterprise Loan*, which is equal to one if the enterprise's loans from a financial institution (instead of money lenders, government, micro-finance, or family) are a major source of finance, and zero otherwise; *Enterprise Loan: EF*, which constructs the same variable for the sub-sample of firms seeking external finance;[11] *Total District Employment*, which is annual enterprise employment aggregated to the district level, winsorized at the 10^{th} and 90^{th} percentiles; and, *Total Enterprise Employment: EF*, which is the annual total number of employees at the firm-level for the sub-sample of firms that seek external sources of finance. We describe the summary statistics for these variables for each of the two rounds of the Economic Census in Table 1. Summary statistics by rural and urban sub-samples are reported in Appendix Table A3.

To assess the influence of bank expansion on access to institutional finance for formal and informal businesses, we adopt the categorization from the Sixth Economic Census, distinguishing between organized/formal sector firms (with 10 employees or more) and unorganized/informal sector firms (with fewer than 10 employees). We also classify enterprises into primary, secondary, and service-based sectors. We report summary statistics by sector for rural and urban sub-samples in Appendix Table A4.[12]

[11] We analyze a sub-sample of firms actively seeking external finance to assess the effect of bank expansion on financially constrained firms. This sub-sample includes firms that have borrowed from financial institutions, moneylenders, micro-finance institutions, government, employers, family, and others. Limiting the sample to firms needing external finance does not introduce bias to the district-level RD design because the number of districts remains constant within this sub-sample.

[12] Heterogeneity analysis of enterprises does not introduce bias to the regression discontinuity (RD) design because it does not significantly reduce the number of districts under examination.

3.4 Mapping District Boundaries

India's district borders changed between the decadal censuses of 2001 and 2011. Census 2001 had 593 districts while Census 2011 had 640 districts. We use district boundaries from Census 2001 and make adjustments in merging the 581 districts for which the RBI data is available. We use Economic Census 2003 and IHDS 2005 as the pre-policy years and IHDS 2012 and Economic Census 2013 as the post-policy years in the RD estimates. See Young (2015) for a timeline on the bank expansion policy and Cramer (2021) for a timeline on the IHDS and EC datasets and bank expansion policy.

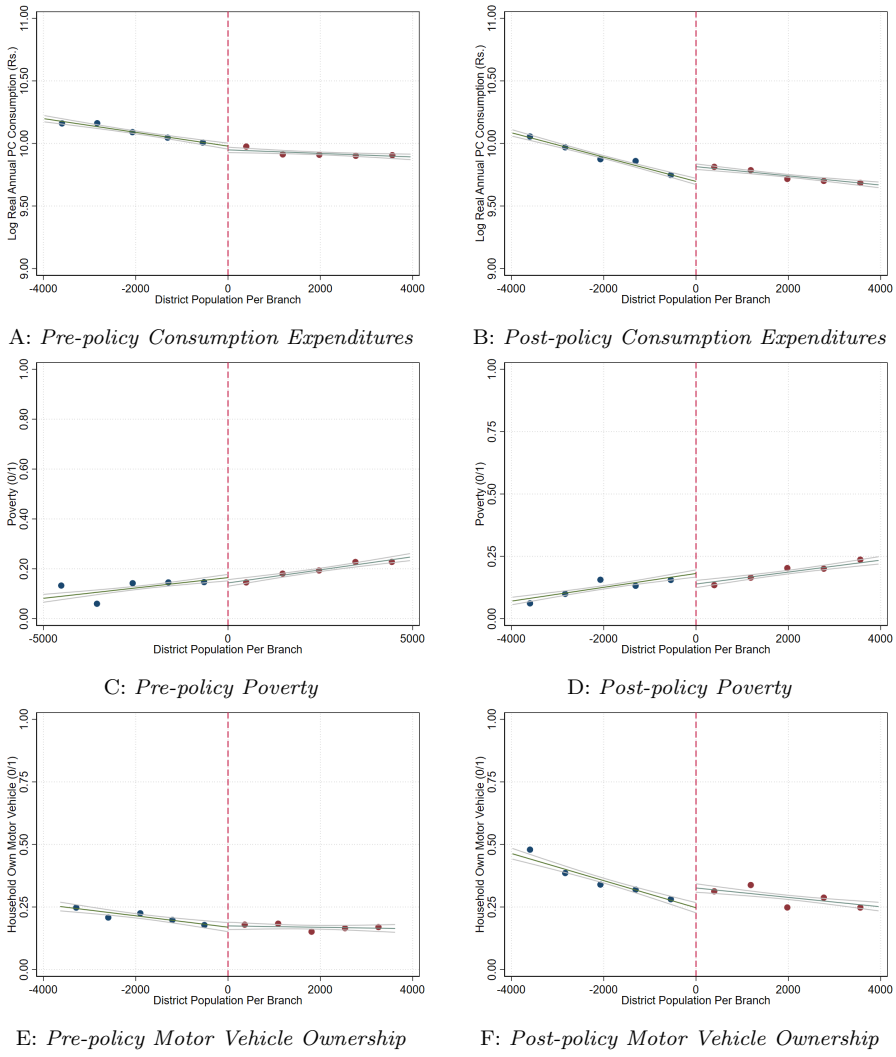
4 Testing assumptions of the regression discontinuity model

The regression discontinuity approach requires that treated and control group districts are similar prior to the policy change. As described below, we test this assumption and show pre-policy smoothness in bank branches, bank licenses, household, and firm-level outcomes. For example, the assumption of continuity of all characteristics in the sample will be violated if agents manipulated the population-to-bank ratio in the district. However, Young (2017) notes that such manipulation is very unlikely since the district population is from the 2001 census, which is four years before the announcement of the policy by the RBI in 2005. Cramer (2021) shows that there is negligible household migration into under-banked districts, and that there is no correlation between the 2005 RBI policy and contemporaneous national-level public policies that may confound the effects of bank presence.

We show that the rural and urban sub-sample analysis satisfies the assumptions of the RD design (Feir, Lemieux, and Marmer, 2016; Hsu and Shen, 2019). We test for the non-random distribution of the rural-urban sample and in Appendix Table A5 and show that the treatment effect is not conditional on the sub-sample.

Like Young (2017) and Cramer (2021), we find that the policy increases bank branches and licenses. We describe the linear RD fit graphically in Appendix Figures A1-A3. Appendix Figure A1 shows pre-policy smoothness in bank branches and licenses before 2005 and the discontinuous jump post-policy in 2010, corresponding to an increase of 19% in bank branches and 21% in bank licenses in under-banked districts five years after the policy. Bank branch openings and licenses decreased post-2010 because of the RBI's shift from promoting bank expansion at the district level to expansion at the village/town level (RBI, 2016). In Appendix Figure A2, we show the RD estimates

of the percentage increase in credit and deposits, respectively, for all scheduled commercial banks in the pre-and post-treatment periods. We show the dynamic trend in bank branches post-policy in Appendix Figure A3.



A: *Pre-policy Consumption Expenditures*

B: *Post-policy Consumption Expenditures*

C: *Pre-policy Poverty*

D: *Post-policy Poverty*

E: *Pre-policy Motor Vehicle Ownership*

F: *Post-policy Motor Vehicle Ownership*

Figure 2: Pre-policy smoothness and post-policy discontinuity in household consumption and poverty.

5 Impact of bank expansion on household consumption and poverty

We report the results from estimating the RD regression described in specification (1) in Table 2 using the following outcome variables: *Consumption Expenditures*, which are annual real household

expenditures on consumption; *Poverty*, which is an indicator variable equal to 1 if the household is below the state-level poverty line, and zero otherwise; and, *Motor Vehicle Ownership*, which is an indicator variable equal to 1 if the household owns a motor vehicle, and 0 otherwise.

In Panel A of Table 2, we report the post-policy RDD estimates for the full sample. From the results reported in column (1) of Table 2, we observe that in the post-policy period, households in treated districts had 13% higher real consumption expenditures than the control group, relative to the sample mean, similar to the consumption effects found in Cramer (2021). In column (2), the estimated coefficient of *Poverty* is negative but not statistically significant.[13] Lastly, we show that bank expansion increases household purchases of durable products. In column (3), households in treated districts have a 9% higher likelihood of owning a motor vehicle than the control group, relative to the sample mean.

We report the pre-policy RD estimates for household outcomes in Appendix Table A6, which show pre-policy smoothness between treated and control group households for all the measures. In Figure 2 we graphically show the pre-policy smoothness and post-policy discontinuity for each variable. The figures show the post-policy discontinuity in *Consumption Expenditures* (Panel B) and *Motor Vehicle Ownership* (Panel F).

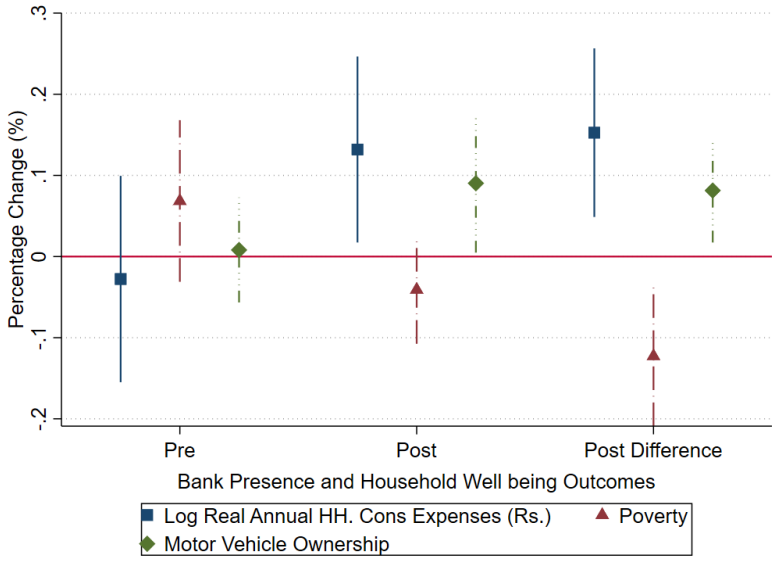
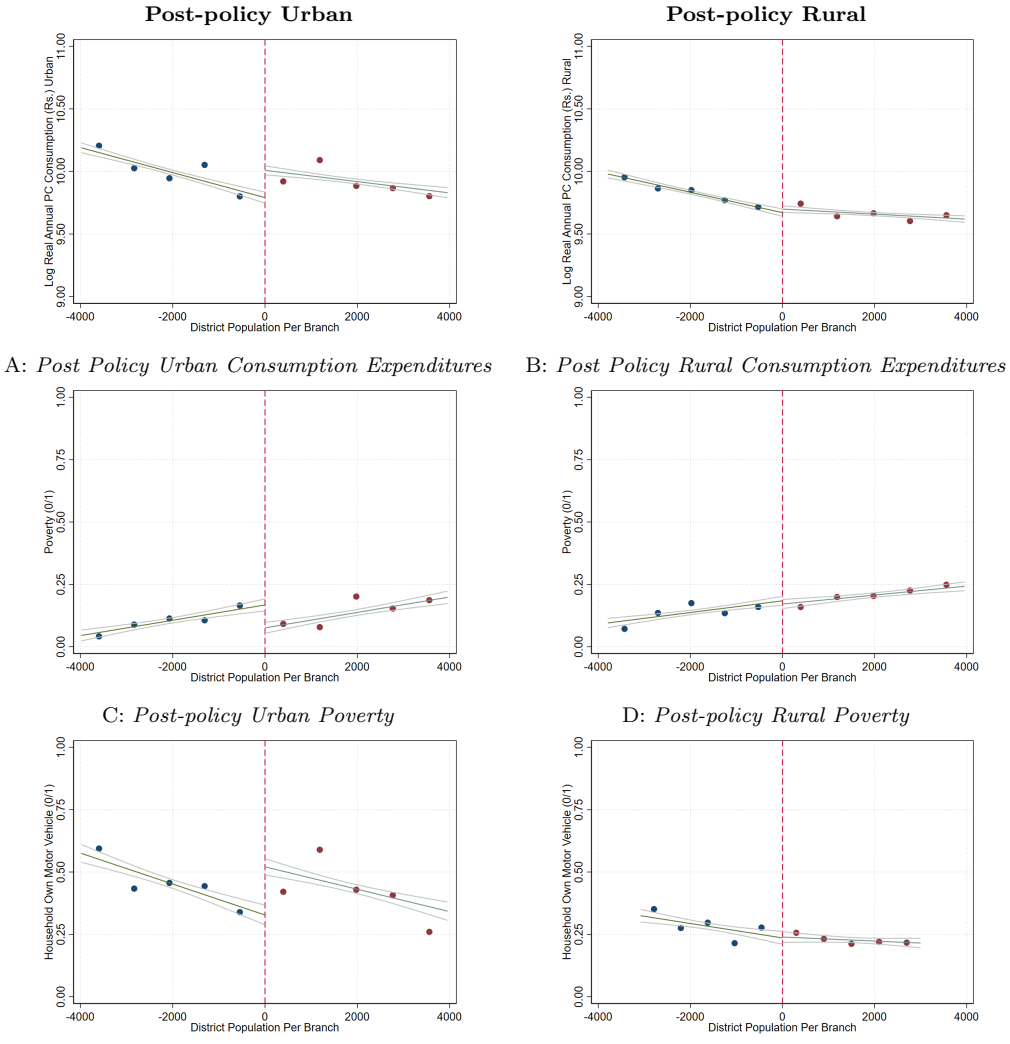


Figure 3: Pre-policy and post-policy differences in treatment on household outcomes

[13] Below, we find that bank expansion results in a statistically significant decline in urban household poverty.

The panel household survey data also allows us to estimate pre- and post-policy differences in household outcomes. We estimate a fixed effects specification in the RD framework and graphically describe the results in Figure 3. We use the first difference of the outcome variable to measure the growth rates of *Consumption Expenditures*, *Poverty*, and *Motor Vehicle Ownership* in the pre-treatment period. Figure 3 shows that the policy significantly increases the growth rates of consumption expenditures, reduces the likelihood of being poor, and increases the likelihood of owning a motor vehicle. These estimates provide additional support for the post-policy cross-sectional estimates reported in Table 2.



A: *Post Policy Urban Consumption Expenditures* B: *Post Policy Rural Consumption Expenditures*

C: *Post-policy Urban Poverty* D: *Post-policy Rural Poverty*

E: *Post-policy Urban Motor Vehicle Ownership* F: *Post-policy Rural Motor Vehicle Ownership*

Figure 4: Post-policy discontinuity in household outcomes in urban and rural areas.

Urban and rural household consumption and poverty

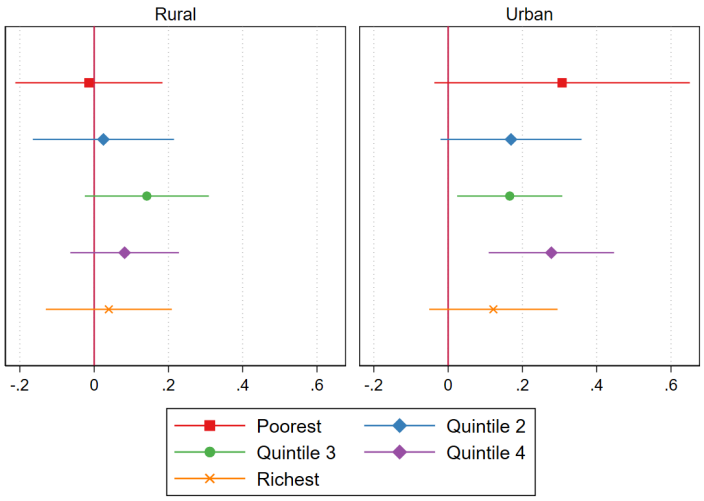
Next, we study the impact of the bank expansion policy on rural and urban households. We report the post-policy RD estimates in Panels B and C of Table 2 for the urban and rural household sub-samples, respectively. These results show a stark difference in the impact of bank expansion on rural versus urban households. Comparing the RD estimates for *Consumption Expenditures* in column (1) across rural and urban households, we find that bank expansion significantly increases real consumption expenditures for urban households (Panel B), but has no impact on rural households (Panel C). From the RD estimates we note that bank expansion reduced the likelihood of being poor (Panel B, column (2)) and increased the likelihood of owning a motor vehicle (Panel B, column (3)) for treated urban households compared to urban households in the control group. The economic magnitude of these effects for urban households is also larger than those reported for the full sample in Panel A. For example, treated urban households are 10% less likely to be below the poverty line compared to urban households in the control group, whereas the impact on poverty was not significant in the full sample in Panel A. Our results show that the benefits of expanding bank access nationally are heavily skewed to urban households.

In Figure 4 we graphically show the post-policy discontinuities in the household outcomes in rural and urban areas. The figures show no clear discontinuities in outcomes in rural areas, and clear discontinuities in urban areas. Appendix Figure A5 shows the pre-policy smoothness in the outcome variables. We report the pre-policy coefficients in Appendix Table A7, which show smoothness in the household variables in the rural and urban sub-samples prior to the implementation of the policy.

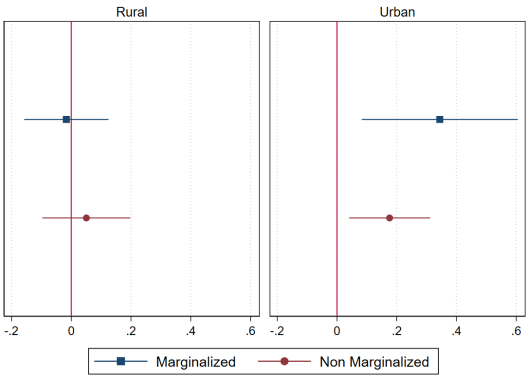
5.1 Household consumption by income, marginalization, and education status

We explore the heterogeneous impact of the branch expansion policy based on household income, marginalized social status, and education. Specifically, we use income quintiles, where *Poorest* denotes households in the lowest income quintile; *Marginalization*, which categorizes marginalized households as those belonging to disadvantaged castes and aboriginal tribes; and *Literate*, which denotes whether the household has a literate adult.

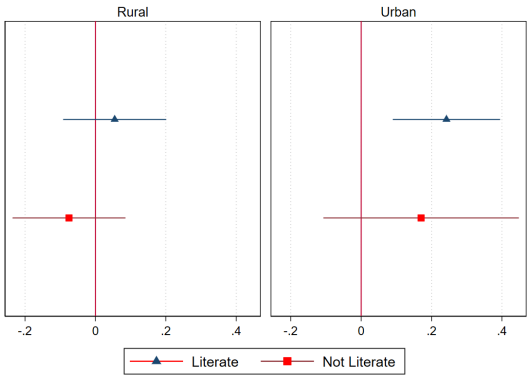
In Figure 5 we graphically describe the local average treatment effect of the bank expansion policy on *Consumption Expenditures* in rural and urban areas, disaggregated by household income quintiles (Panel A), social group (Panel B), and education (Panel C). The percentage change in



A: *Treatment Effect by Income Quintiles*



B: *Treatment Effect by Marginalization*



C: *Treatment Effects by Education*

Figure 5: Local average treatment effects on rural and urban household consumption expenditures. The figure shows the RD robust local average treatment effects of the bank expansion policy on (log) *Consumption Expenditures* of households in rural and urban areas by income quintile in Panel A, social group status in Panel B, and literacy in Panel C. X-axis measures percentage (%) change.

consumption expenditures is reported on the x-axis. Panel A shows that for all income quintiles, the impact of the policy is larger in urban areas than in rural areas. However, the poorest urban households have the greatest increase in consumption, whereas there is no effect on the poorest rural households (Panel A). Panel B shows that the policy increases consumption expenditures of urban socially marginalized households, but has no impact on marginalized rural households. Lastly, Panel C shows that both literate and non-literate households increase consumption in the post-policy period, but the impact is larger for literate urban households.

5.2 Household borrowing and debt

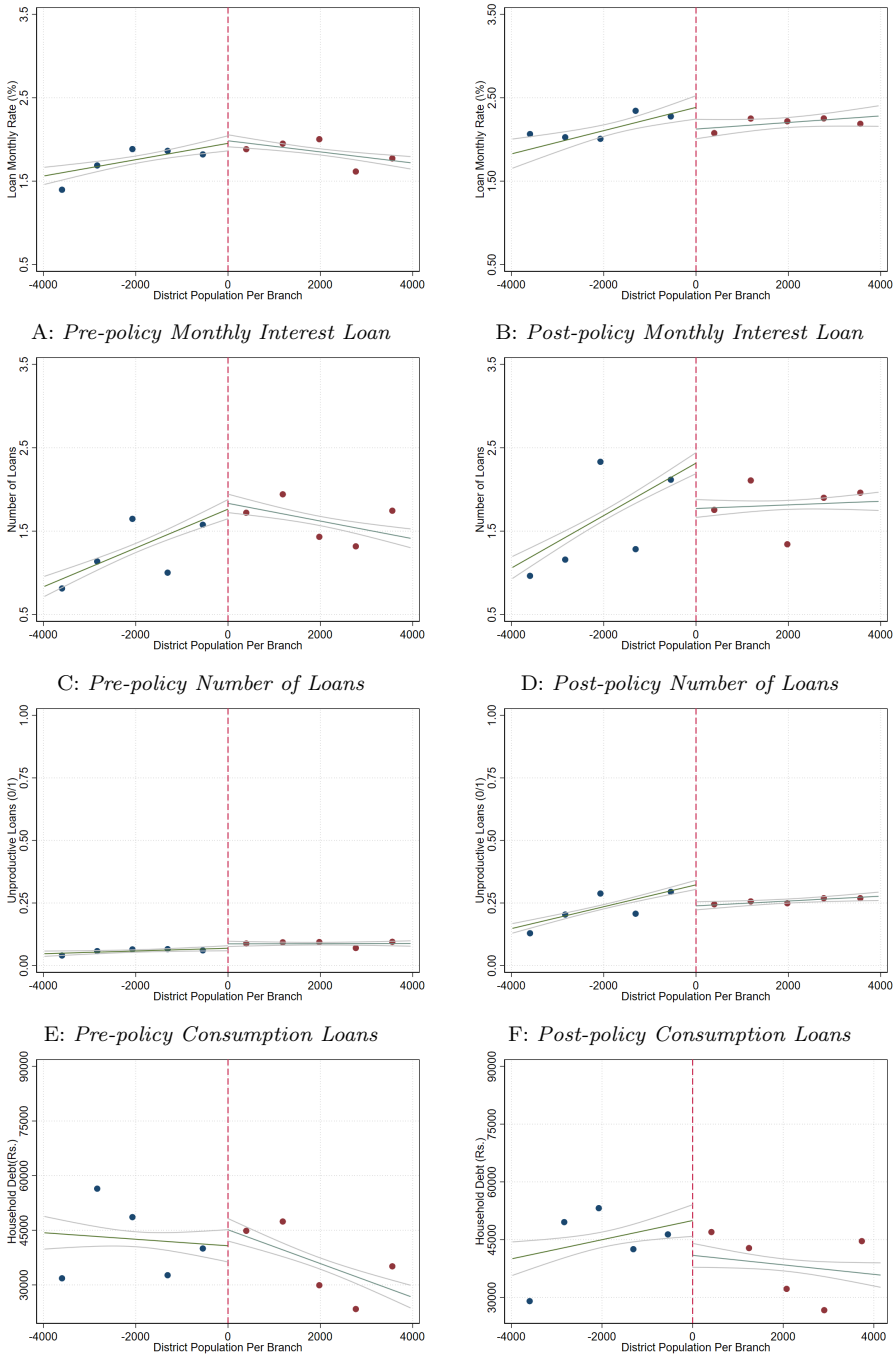
To study the impact of the bank branch expansion policy on household debt we estimate the RD regression described in specification (1) with the following household borrowing outcomes: *Monthly Interest Loan*, which is the interest paid monthly on outstanding loans by households in percentage; *Number of Loans*, which is the total number of loans that households have taken over the previous five years from financial institutions, money lenders, and family; *Consumption Loans*, which is an indicator variable that is equal to one if the household has taken a loan to finance expenses such as weddings, and zero otherwise; and, *Outstanding HH Debt*, which is total real outstanding household debt in rupees. The results for the full sample are reported in Panel A of Table 3.

Our results show that bank expansion lowers the interest rate on loans, decreases the likelihood that households take out loans to finance short-run consumption expenses, like weddings, and does not affect the total number of household loans from informal or formal sources or aggregate household indebtedness. For example, from the RD estimates reported in column (1) of Panel A, we find that treated households pay 23% (0.5 percentage points) lower monthly interest than the control group relative to the sample mean. We do not observe a significant change in the total number of loans (column (2)). In Panel A, column (3) of Table 3, we show that treated households take out fewer consumption loans than the control group and are 8.2% significantly less likely to borrow money to finance consumption expenses like weddings. These findings are in contrast to evidence that microfinance increases borrowing for short-run consumption needs (Kaboski and Townsend, 2012), and show that unlike previous bank deregulations (Fulford, 2013), the 2005 bank policy reduces household indebtedness.

We graphically describe the household borrowing measures' pre-policy smoothness and post-policy discontinuity in Figure 6. The graphs show clear post-policy discontinuities in *Monthly Interest Loan*, *Number of Loans*, *Consumption Loans*, and *Outstanding HH Debt*. The pre-policy RD estimates for the household borrowing variables are reported in Appendix Table A8.

Urban and rural household borrowing and debt

We also observe a heterogeneous impact of the bank expansion policy on borrowing by urban and rural households in Panels B and C of Table 3, respectively. The results reported in Panel B show that treated urban households pay lower interest (column (1)), take out fewer loans from informal or formal sources (column (2)), are less likely to borrow to finance consumption (column (3)), and have lower outstanding aggregate debt (column (4)). The economic magnitudes are also



A: *Pre-policy Monthly Interest Loan* B: *Post-policy Monthly Interest Loan*

C: *Pre-policy Number of Loans* D: *Post-policy Number of Loans*

E: *Pre-policy Consumption Loans* F: *Post-policy Consumption Loans*

G: *Pre-policy Outstanding HH Debt* H: *Post-policy Outstanding HH Debt*

Figure 6: Pre-policy smoothness and post-policy discontinuity for household borrowing measures.

higher for the urban sample than for the full sample reported in Panel A of Table 3. In contrast, we do not find a significant impact of bank expansion on the borrowing and debt of treated rural households (Panel C, Table 3).

Below, we show that the impact of bank access on household debt is not explained by a lack of household financial access.

5.3 Household savings and investments

To study the impact of bank expansion on household savings and investment we estimate specification (2) using the following outcome variables: *Bank Savings*, which is equal to one if the household has a savings or current account with a bank, and zero otherwise; *Life Insurance*, which is equal to one if the household head has a life insurance product from the government or private sources, and zero otherwise; *Securities and Investments*, which is equal to one if the household has bought any assets in stocks and bonds, and zero otherwise; and *Long Term Deposits*, which is equal to one if the household has a fixed deposit (long-term interest bearing) account with a bank, a pension fund, or other savings schemes. The results are reported in Panel A of Table 4 for the full sample.

From columns (1) and (3) of Table 4, Panel A, we observe that treated households have a 21.3 percentage points higher likelihood of having a savings account and 9.8 percentage points higher likelihood of opening up a long-term interest-bearing account, compared to control group households. Cramer (2021) also finds an increased likelihood of having a savings account. In columns (2) and (4), we find that the likelihood of buying insurance and investing in financial securities is higher for treated households but not significantly different from the control group at conventional levels. The latter results capture participation in financial markets on the intensive margin, which is important to show since, in many emerging markets, households may have accounts but not use them (Dupas and Robinson, 2013; Badarinza, Balasubramaniam, and Ramadorai, 2019). Our results show that bank expansion increases access to financial services for households.

Urban and rural household savings and investments

We report the impact of bank savings and investments on urban and rural households in Panels B and C of Table 4, respectively. The results reported in Panel B show that following bank expansion, treated urban households are more likely to have a savings account (column (1)), own life insurance (column (2)), have long-term deposit accounts (column (3)), and invest in financial securities (column (4)). We note that treated rural households are more likely to have a savings

account (Table 4, Panel C, column (1)), but none of the other investment measures are significantly different.

In Appendix Figure A4, we graphically show the post-policy discontinuity of the household investment measures in urban versus rural areas. Compared to the control group, we observe sharp post-policy discontinuities in the likelihood of having a savings account, insurance policies, long-term deposit accounts, and securities for treated urban households. Since the investment data is only available in IHDS-2, we are unable to provide pre-policy estimates for investment variables.

6 Labor Market Effects of the Bank Expansion Policy

We investigate the "business finance" mechanism by examining the impact of the bank expansion policy on firm-level borrowing and employment. We then study the impact on household wage earnings and household-owned business revenues. We also examine the heterogenous impact in urban and rural areas, formal and informal firms, and industrial sectors.

6.1 Enterprise borrowing and employment

We estimate specification (1) using firm-level borrowing and employment measures and report the results for the full sample in Panel A of Table 6. We measure firm-level borrowing using *Enterprise Institutional Loan*, which is an indicator variable equal to one if loans from a financial institution (instead of money lenders, government sources, micro-finance, and family) are a major source of borrowing for the firm, and zero otherwise. We report the pre-policy estimates in Appendix Table A11, which show that the likelihood of relying on a bank loan as the major source of borrowing does not differ significantly between treated and control group enterprises in the pre-policy period.

From the results for the full sample of firms reported in Panel A of Table 6, column (1), we observe that the likelihood of relying on financial institution loans as the main source of external funds is higher for treated firms, although the difference is not statistically significant. Below, we show that treated urban enterprises are significantly more likely to borrow from financial institutions in the post-policy period.

In column (2) of Table 6, Panel A, we focus on the sub-sample of financially constrained firms that seek external finance from any source.[14] The results show that post-policy, treated firms that

[14]The identification strategy is identical to that of the full sample since we compare the sub-sample of firms that borrow from any source (banks, government, money lenders, micro-finance, and family) in treated districts to the sub-sample in control group districts, within the optimal bandwidth.

seek external finance are 58% more likely than control group firms that seek external finance to rely on financial institution loans as a major source of external funds.

Lastly, in columns (3) and (4) of Table 6, Panel A we investigate the impact of the bank expansion policy on total employment aggregated to the district level for the full sample of firms (*Total District Employment*), and total employment at the firm level (*Total Enterprise Employment:EF*) for the sub-sample of financially constrained firms, respectively. The pre-policy estimates for the variables are reported in Appendix Table A11 and show the pre-policy smoothness of the employment variables. Column (3) in Table 6 shows a positive impact on aggregate employment in treated districts, although this is not significant at conventional levels. Focusing on financially constrained firms in column (4), the results show that treated firms that seek external funding employ 25% more workers compared to control group firms that seek external funding, relative to the sample mean.

6.2 Household employment earnings and business revenues

To study the impact of bank expansion on household earnings from employment, we estimate specification (1) using the following outcome variables: *Household Wage Earnings*, which is real annual household wage income from employment; and *Business Revenues*, which are annual real revenues earned by household-owned small businesses. The post-policy RD estimates are reported for the full sample of households in Panel A of Table 7. In Appendix Table A10, we report pre-policy covariates for these variables, which show that there are no significant differences in wage income and business revenues between treated and control group households.

From the results reported in column (1) of Panel A, Table 7 for the full sample, we find that household earnings from employment, *Household Wage Earnings*, are 15% higher for treated households compared to the control group. The results reported in column (2) show that the revenues of household-owned small businesses are 60% higher for treated households compared to the control group. The wage results provide general equilibrium evidence of the impact of labor markets on households.

Our results support the "business finance" mechanism that bank expansion increases firm-level borrowing and employment and raises household wage income. The positive effect of bank expansion on jobs and income reduces household reliance on debt to finance short-run consumption needs.

Urban and rural labor markets

Is the differential impact on household consumption in rural versus urban areas explained by differences in bank lending to rural versus urban firms? In Panels B and C of Table 6, we report the post-policy coefficients for borrowing and employment in urban and rural enterprises, respectively. In Appendix Tables A12 and A13 we report the pre-policy coefficients for the urban and rural sub-samples. The results reported in columns (1) and (2) of Table 6 show that both treated urban (Panel B) and treated rural (Panel C) enterprises are significantly more likely to rely on institutional loans as a major source of finance, although the effects appear to be larger for urban firms.

We also investigate if the impact of bank expansion on employment varies across rural and urban firms. We describe the impact on aggregate employment at the district level in column (3) for urban firms in Panel B and for rural firms in Panel C of Table 6. From Panel B, column (3), we observe that aggregate employment at the district level is 88% higher in treated urban districts than in control group urban districts, relative to the mean. We also study the impact on employment at the firm level for external finance-seeking urban firms in column (4). The results in Panel B, column (4) show that employment in urban firms that seek external funds from any source is 30% higher for treated firms than the control group, relative to the mean.

Despite the increase in bank borrowing by rural firms (columns (1) and (2), Panel C, Table 6), the results show that the bank expansion policy does not have a significant impact on either aggregate district-level employment in rural areas (column (3)), or on employment at the firm-level in rural firms that seek external funding (column (4)).

Lastly, we study the impact of bank expansion on household employment earnings and on household-owned business revenues of urban and rural households in Panels B and C of Table 7, respectively. The results in column (1), Panel B of Table 7, show that wage earnings are 22% higher for treated urban households than the control group in the post-policy period. There is no impact on rural wage earnings (Panel C, column (1)). The results in column (2), Panels B and C, show that the policy led to significantly higher business revenues for treated household enterprises in both urban and rural districts compared to the control group.

We show that urban firms borrow more and employ significantly more workers, which increases wage earnings for urban households. The policy does not increase employment in rural areas at the aggregate or firm level, and has no impact on rural household earnings. The heterogeneous impact on urban compared to rural household income supports the business finance mechanism for why bank expansion benefits urban but not rural households.

6.3 Sectoral impact of bank expansion

In India, about 90% of the workforce is employed in the unorganized sector Mehrotra (2019), also known as the informal sector or the shadow economy, and most unorganized enterprises are in primary or agricultural sectors in rural areas. According to the International Labor Organization, the informal sector is less productive and pays lower wages than the formal sector in emerging markets (ILO, 2018). We study whether bank expansion increases efficiency in capital allocation by channeling capital to more productive firms.

We disaggregate the impact of the bank expansion policy on firm-level borrowing by the organized/unorganized status, location, and industry of firms and report the results in Table 8. The results reported in Panel A of Table 8 show that bank expansion increases the likelihood of relying on bank loans as the major source of funds by 4% for organized firms (column (1)), but has no impact on unorganized firms (column (4)).[15] Disaggregating by rural and urban location, we show that both organized and unorganized firms have a higher likelihood of relying on bank loans in urban districts (columns (3) and (6)), whereas only organized firms benefit in rural districts (column (2)).

In Panel B of Table 8, we study the impact of the bank expansion policy on the borrowing behavior of firms based on industry and rural-urban location. The results show that in rural districts, only service sector firms have a higher likelihood of relying on bank loans as the major source of external funds(column (3)), whereas urban firms across all sectors increase their reliance on bank loans (columns (4)-(6)).[16]

Studying the sectoral sources of economic growth in India, Fan, Peters, and Zilibotti (2023) show that higher productivity growth in the service sector drives improvements in living standards in India, and that the welfare gains are concentrated among urban households. Our results suggest a financial sector mechanism for urbanization and service sector growth. Specifically, we show that bank expansion channels credit to more productive urban firms in industrial and service sectors.

[15] Identified in the Economic Census, *Unorganized Enterprise* is a dummy variable that is equal to 1 if the enterprise is not a registered enterprise and zero otherwise. *Organized Enterprise* denotes enterprises that are registered with the government.

[16] Primary sectors include agriculture and mining; Secondary sectors include manufacturing, energy, construction, etc.; Services include trade, transportation, food services, information, finance, etc. These activities constituted 86% of the national GDP in 2012.

7 Additional Tests

We show that our results are robust to quadratic estimations. In Appendix Tables A14–A17, we report the results from estimating quadratic approximations of the RD coefficients (Gelman and Imbens, 2019). The results are similar to the linear estimates described in the main analysis. Table A18 shows RD estimates at five different placebo cut-offs (-3000, -1000, 0, 1000 and 3000). At any other cut-off, except the national branch-to-population ratio, normalized to zero, the RD estimates are insignificant.

Second, we aggregate the household outcomes at the community (village/primary sampling unit) and check for robustness in the policy impact. The results reported in Table A19 shows that bank presence has a significant positive impact on households at the aggregate community level.

8 Conclusion

We use a nationwide natural experiment to increase bank branches in under-banked areas in India to study the impact of financial inclusion on household consumption, debt, securities and investments, and income. Using a regression discontinuity design and rich panel data on a wide range of household outcomes, we show that bank branch expansion has a significant positive impact on household consumption and usage of financial services including savings and investments, but reduces household loans to finance consumption, overall household borrowing from informal or formal sources, and aggregate household debt. Studying the causal impact of bank expansion on households and firms, we show that financial inclusion has important spillover effects on the wider economy, which benefits households through increased employment and wages. Our results suggest that the positive labor market effects of bank expansion on households reduce household indebtedness.

We find that the benefits of bank expansion are heavily skewed towards urban households, with no impact on rural households. We find that bank expansion channels capital to formal rather than informal firms, and to urban firms in manufacturing and services and not rural firms in agriculture. Our results suggest a financial sector mechanism for urbanization and show that the bank expansion policy improved efficiency in capital allocation by channeling credit to more productive regions and firms.

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Table 1: Summary Statistics for Household Characteristics

Table 1 provides summary statistics of household characteristics from the two rounds of the IHDS survey. *Consumption Expenditures* is real annual per capita household consumption expenditures in Rupees; *Poverty* is an indicator variable equal to one if the household is below the state poverty line, and zero otherwise; *Motor Vehicle Ownership* is an indicator variable that is equal to one if the household owns a motor vehicle, and zero otherwise; *Monthly Interest Loan (%)* is the monthly interest paid by households on outstanding debt; *Number of Loans* is the total number of loans taken by the household; *Consumption Loans* is an indicator variable that is equal to one if the household has taken a loan to finance a consumption expense, such as weddings, and zero otherwise; *Life Insurance* is an indicator variable that is equal to one if the household has a life insurance policy, and zero otherwise; *Outstanding HH Debt* is household debt in Rupees; *Household Wage Earnings* is real annual earnings of households from wage or salary work in Rupees; *Business Revenues* is real annual business receipts of household-owned enterprises, in Rupees. *Enterprise Institutional Loans* is an indicator variable that is equal to one if an enterprise has an institutional loan, and zero otherwise; *Enterprise Institutional Loans: EF* is an indicator variable that is equal to one if an enterprise has an institutional loan, and zero otherwise, conditional on the enterprise seeking external finance; *Total Employment Enterprise* is the total enterprise level employment of adult men and women. All rupee variables are deflated.

	IHDS 1			**IHDS 2**		
	Observations	*Mean*	*SD*	*Observations*	*Mean*	*SD*
Household Outcomes						
Consumption Expenditures	32,187	25,059	14,572	31,789	21,130	13,108
Poverty (0/1)	39,973	0.22	0.41	39,994	0.16	0.37
Motor Vehicle Ownership	39,993	0.18	0.38	39,998	0.29	0.45
Household Debt						
Monthly Interest Loan (%)	17,367	2.05	1.97	12,881	2.32	2.27
Number of Loans	40,017	1.34	2.62	39,942	1.64	2.75
Consumption Loans	40,018	0.07	0.26	40,018	0.25	0.43
Outstanding HH Debt	31,941	34,645	75,810	36,678	37,361	83,657
Household Labor Market						
Household Wage Earnings	25,420	25,332	23,207	35,169	18,911	20,144
Business Revenues	7,913	121,422	109,496	7,687	94,650	98,311
Household Securities and Investments						
Bank Savings	-	-	-	39,871	0.57	0.49
Life Insurance	39,943	0.21	0.40	39,903	0.30	0.45
Long-Term Deposits	-	-	-	40,018	0.22	0.41
Securities and Investments	-	-	-	40,018	0.12	0.33
	EC 2005			**EC 2013**		
Enterprise Loans and Employment						
Enterprise Institutional Loans	40,025,274	0.033	0.181	55,004,630	0.020	0.141
Enterprise Institutional Loans: EF	4,047,800	0.335	0.472	11,065,880	0.101	0.302
Total Employment Enterprises	40,025,274	2.342	15.867	55,004,630	2.209	22.844
Total Employment Enterprises: District	581	87444.43	83425.37	581	72095.81	68192.07
Total Employment Enterprises: EF	4,047,800	4.603	35.481	11,065,880	3.084	33.773

Table 2: Impact of Bank Branch Expansion on Household Consumption and Poverty

Table 2 reports results from the RD robust regression of the impact of the bank expansion policy on household consumption and poverty in the post-policy period. *Consumption Expenditures* is real annual per capita household consumption expenditures in Rupees; *Poverty* is an indicator variable equal to one if the household is below the state poverty line, and zero otherwise; and, *Motor Vehicle Ownership* is an indicator variable that is equal to one if the household owns a motor vehicle, and zero otherwise. Standard errors, indicated in parentheses, are clustered at the district level. Significance levels are $*p < 0.1$, $**p < 0.05$, $***p < 0.01$.

	(1)	(2)	(3)
	Consumption Expenditures	*Poverty*	*Motor Vehicle Ownership*
Full Sample			
RD Robust Estimate	3,095**	-0.040	0.090*
	(1,468)	(0.040)	(0.052)
Dependent Variable Mean	23,858	0.122	0.36
Two Stage q value	0.044	0.187	0.063
Observations	31,789	39,994	39,998
Urban Households			
RD Robust Estimate	4,755**	-0.0993**	0.188**
	(2,058)	(0.0430)	(0.0805)
Dependent Variable Mean	24,965.49	0.109	0.429
Two stage q values	0.033	0.017	0.016
Observations	10,060	11,804	11,807
Rural Households			
RD Robust Estimate	1,348	-0.0116	0.00775
	(1,714)	(0.0549)	(0.0546)
Dependent Variable Mean	19,162.17	0.195	0.429
Two stage q values	0.467	0.782	0.966
Observations	21,729	28,190	28,191

Table 3: Impact of Bank Branch Expansion on Household Borrowing

Panel A reports results for the full sample of firms, Panel B for the urban sub-sample, and Panel C for the rural sub-sample. Table 3 reports results from the RD robust regression of the impact of the bank expansion policy on household borrowing and debt. *Monthly Interest on Loan* measures the percentage of interest on a loan paid monthly on an outstanding loan by households; *Number of Loans* measures the total number of loans that households have taken in the past five years; *Consumption Loans* is a binary variable with a value of one if the household has taken a loan to finance consumption, and zero otherwise; and, *Outstanding HH debt* in Rupees is the total amount of debt that a household owes to others. Standard errors in parentheses clustered at the district level. $*p < 0.1$, $**p < 0.05$, $***p < 0.01$.

	(1)	(2)	(3)	(4)
	Monthly Interest Loan (%)	*Number of Loans*	*Consumption Loans*	*Outstanding HH Debt*
Full Sample				
RD Robust Estimate	-0.503*	-0.488	-0.082*	-2,393
	(0.287)	(0.632)	(0.0493)	(12,989)
Dependent Variable Mean	2.183	1.424	0.216	63,888
Two Stage q value	0.061	0.418	0.077	0.938
Observations	12,881	39,942	40,018	36,678
Urban Households				
RD Robust Estimate	-0.975**	-1.039**	-0.149**	-29,563**
	(0.426)	(0.528)	(0.063)	(16,002)
Dependent Variable Mean	2.30	1.351	0.192	44,768
Two stage q values	0.021	0.048	0.026	0.032
Observations	3,099	11,791	11,813	10.692
Rural Households				
RD Robust Estimate	-0.342	-0.115	-0.047	13,221
	(0.323)	(0.834)	(0.059)	(15,241)
Dependent Variable Mean	2.12	1.613	0.225	44,500
Two stage q values	0.187	0.911	0.327	0.301
Observations	9,782	28,151	28,205	25,986

Table 4: Impact of Bank Branch Expansion on Household Savings and Investments

Panel A reports results for the full sample of firms, Panel B for the urban sub-sample, and Panel C for the rural sub-sample. Table 4 reports results from the RD robust regression of the impact of the bank expansion policy on household savings and investments. *Bank Savings* is a binary variable that is equal to one if the household has a bank savings account, and zero otherwise; *Insurance* is an indicator variable that is equal to one if the household has a life insurance policy, and zero otherwise; *Long-Term Deposits* is an indicator variable that is equal to one if the household owns fixed deposit accounts, pension funds, or participates in other saving schemes, and zero otherwise; and, *Securities and Investments* is an indicator variable that is equal to one if the household has invested in financial instruments like Mutual Funds, Unit Trusts, Share Markets, Bonds, or Post Office Accounts, and zero otherwise. Due to data unavailability, we do not observe pre-policy estimates for savings and investment variables. Standard errors in parentheses are clustered at the district level. $*p < 0.1$, $**p < 0.05$,$***p < 0.01$.

	(1)	(2)	(3)	(4)
	Bank Savings	*Life Insurance*	*Long-Term Deposits*	*Securities and Investments*
A: Full Sample				
RD Robust Estimate	0.213**	0.044	0.098*	0.044
	(0.085)	(0.041)	(0.053)	(0.044)
Control Mean	0.59	0.35	0.27	0.14
Two stage q value	0.011	0.348	0.054	0.511
Observations	39,871	39,903	40,018	40,018
B: Urban Households				
RD Robust Estimate	0.294**	0.134*	0.169*	0.138***
	(0.125)	(0.070)	(0.088)	(0.052)
Control mean	0.63	0.44	0.34	0.13
Two stage q value	0.019	0.081	0.058	0.006
Observations	11,770	11,782	11,813	11,813
C: Rural Households				
RD Robust Estimate	0.204**	-0.026	0.057	0.011
	(0.096)	(0.033)	(0.047)	(0.060)
Control Mean	0.56	0.30	0.24	0.14
Two stage q value	0.021	0.248	0.233	0.978
Observations	28,101	28,121	28,205	28,205

Table 5: Impact of Bank Branch Expansion on Enterprise Borrowing and Employment

Panel A reports results for the full sample of firms, Panel B for the urban sub-sample, and Panel C for the rural sub-sample. Table 6 reports results from the RD robust regression of the impact of the bank expansion policy on firm-level borrowing and employment. *Enterprise Institutional Loans* is a binary variable that is equal to one if the enterprise relies on loans from financial institutions as their major source of borrowing, and zero otherwise; *Enterprise Institutional Loans: EF* is the same variable for the sub-sample of firms that seek external sources of finance; *Total District Employment* is annual enterprise employment aggregated to the district-level; and, *Total Enterprise Employment: EF* is the total number of employees at the firm-level for the sub-sample of firms that seek external sources of finance. Standard errors in parentheses are clustered at the district level. $*p < 0.1$, $**p < 0.05$,$***p < 0.01$.

	(1)	(2)	(3)	(4)
	Enterprise Institutional Loans	*Enterprise Institutional Loans: EF*	*Total District Employment*	*Total Enterprise Employment: EF*
A: Full Sample				
RD Robust Estimate	0.009	0.068**	21,448	0.631*
	(0.007)	(0.034)	(16,782)	(0.377)
Dependent Variable Mean	0.025	0.116	87,321	2.54
Two stage q values	0.165	0.045	0.158	0.04
Observations	55,004,630	11,065,880	581	11,065,880
B: Urban				
RD Robust Estimate	0.014**	0.086*	33,682**	0.927*
	(0.006)	(0.046)	(15,835)	(0.557)
Dependent Variable Mean	0.025	0.159	88,877	3.40
Two stage q values	0.031	0.053	0.018	0.077
Observations	21,542,706	3,538,447	478	3,538,447
C: Rural				
RD Robust Estimate	0.010*	0.057*	9,537	0.278
	(0.006)	(0.032)	(22,528)	(0.276)
Dependent Variable Mean	0.025	0.121	84,577	1.94
Two stage q values	0.091	0.078	0.931	0.578
Observations	33,461,924	7,527,433	576	7,527,433

Table 6: Impact of Bank Branch Expansion on Enterprise Borrowing and Employment

Table 6 reports results from the RD robust regression of the impact of the bank expansion policy on firm-level borrowing and employment for the full sample of enterprises (Panels A and C), and for the sub-sample of enterprises that borrow from external finance sources including banks, government, and money lenders (Panels B and D). Post-policy estimates are reported in column (2). *Enterprise Institutional Loans* is a binary variable that is equal to one if the enterprise relies on loans from financial institutions as their major source of borrowing, and zero otherwise; *Enterprise Institutional Loans: EF* is the same variable for the sub-sample of firms that seek external sources of finance; *Total District Employment* is annual enterprise employment aggregated to the district-level; and, *Total Enterprise Employment: EF* is the total number of employees at the firm-level for the sub-sample of firms that seek external sources of finance. Standard errors in parentheses are clustered at the district level. $*p < 0.1$, $**p < 0.05$,$***p < 0.01$.

	(1)	(2)	(3)	(4)
	Enterprise Institutional Loans	*Enterprise Institutional Loans: EF*	*Total District Employment*	*Total Enterprise Employment: EF*
A: Full Sample				
RD Robust Estimate	0.009	0.068**	21,448	0.631*
	(0.007)	(0.034)	(16,782)	(0.377)
Dependent Variable Mean	0.025	0.116	87,321	2.54
Two stage q values	0.165	0.045	0.158	0.04
Observations	55,004,630	11,065,880	581	11,065,880
B: Urban				
RD Robust Estimate	0.014**	0.086*	33,682**	0.927*
	(0.006)	(0.046)	(15,835)	(0.557)
Dependent Variable Mean	0.025	0.159	88,877	3.40
Two stage q values	0.031	0.053	0.018	0.077
Observations	21,542,706	3,538,447	478	3,538,447
C: Rural				
RD Robust Estimate	0.010*	0.057*	9,537	0.278
	(0.006)	(0.032)	(22,528)	(0.276)
Dependent Variable Mean	0.025	0.121	84,577	1.94
Two stage q values	0.091	0.078	0.931	0.578
Observations	33,461,924	7,527,433	576	7,527,433

Table 7: Impact of Bank Branch Expansion on Household Wage Income and Business Revenues

Table 7 reports results from the RD robust regression of the impact of the bank expansion policy on household wage earnings and household-owned small business revenues. *Household Wage Earnings* is real annual earnings in Rupees of households from wage or salary work; and, *Business Revenues* is real annual business receipts in Rupees of household-owned small businesses. In Panel (A), the baseline control variable is days worked in a year. Standard errors in parentheses are clustered at the district level. $*p < 0.1$, $**p < 0.05$, $***p < 0.01$.

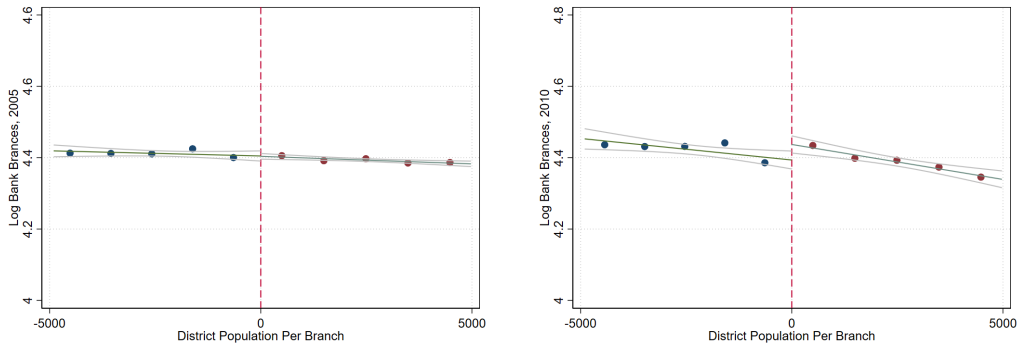
	(1)	(2)
	Household Wage Earnings	*Business Revenues*
A: Full Sample		
RD Robust Estimate	4,093*	65,932***
	(3,016)	(22,059)
Control Mean	28,134	106,822
Two stage q values	0.076	0.001
Observations	28,147	7,687
B: Urban		
RD Robust Estimate	8,135**	52,802**
	(3,931)	(20,609)
Dependent Variable Mean	37,510	133,050
Two stage q values	0.023	0.013
Observations	6,852	3,496
C: Rural		
RD Robust Estimate	2,813	44,044**
	(3,444)	(21,700)
Dependent Variable Mean	23,941	80,188
Two stage q values	0.488	0.041
Observations	21,295	4,191

Table 8: Impact of Bank Expansion on Enterprise Borrowing by Sector

Table 8 reports results from the RD robust regression of the impact of bank expansion on enterprise borrowing measured using *Enterprise Institutional Loan*, which is an indicator variable equal to one if loans from a financial institution (instead of money lenders, government sources, micro-finance, and family) are a major source of borrowing for the firm, and zero otherwise. Results for the sub-sample of all *Organized* firms are reported in Panel A column (1), rural organized firms in column (2), and urban organized enterprises in column (3), where *Organized* firms are classified by the Economic Census as those with 10 or more workers. Results for the sub-sample of all *Unorganized* enterprises are reported in Panel A column (4), rural unorganized firms in column (5), and urban unorganized firms in column (6), where *Unorganized* firms are classified by the Economic Census as those with fewer than 10 workers. In Panel B, we report results for the rural firms sub-sample by sector in columns (1)-(3), and urban firms sub-sample by sector in columns (4)-(5), where *Primary* denotes firms in agriculture and mining; *Secondary* indicates firms in manufacturing, energy, water supply, construction, etc., and *Services* indicate firms in trade, transportation, food services, information, finance and insurance, real estate, power and water supply, etc. Standard errors in parentheses clustered at the district level. $*p < 0.1$, $**p < 0.05$,$***p < 0.01$.

	(1)	(2)	(3)	(4)	(5)	(6)
	Organized			Unorganized		
	All	Rural	Urban	All	Rural	Urban
A: Enterprise Institutional Loans						
RD Robust Estimate	0.0414**	0.0540**	0.0400**	0.00878	0.010	0.014**
	(0.018)	(0.025)	(0.019)	(0.007)	(0.006)	(0.006)
Control Mean	0.08	0.09	0.09	0.024	0.024	0.024
Two stage q values	0.035	0.042	0.019	0.437	0.643	0.025
Observations	722,363	329,975	392,388	54,282,267	33,131,949	21,150,318
	Rural			Urban		
	Primary	Secondary	Services	Primary	Secondary	Services
B: Enterprise Institutional Loans						
RD Robust Estimate	0.0133	0.006	0.015*	0.008*	0.019**	0.013*
	(0.008)	(0.010)	(0.008)	(0.004)	(0.007)	(0.007)
Control Mean	0.012	0.027	0.037	0.010	0.022	0.027
Two stage q values	0.365	0.885	0.093	0.068	0.021	0.057
Observations	11,623,782	5,821,063	16,017,079	1,022,318	4,998,381	15,522,007

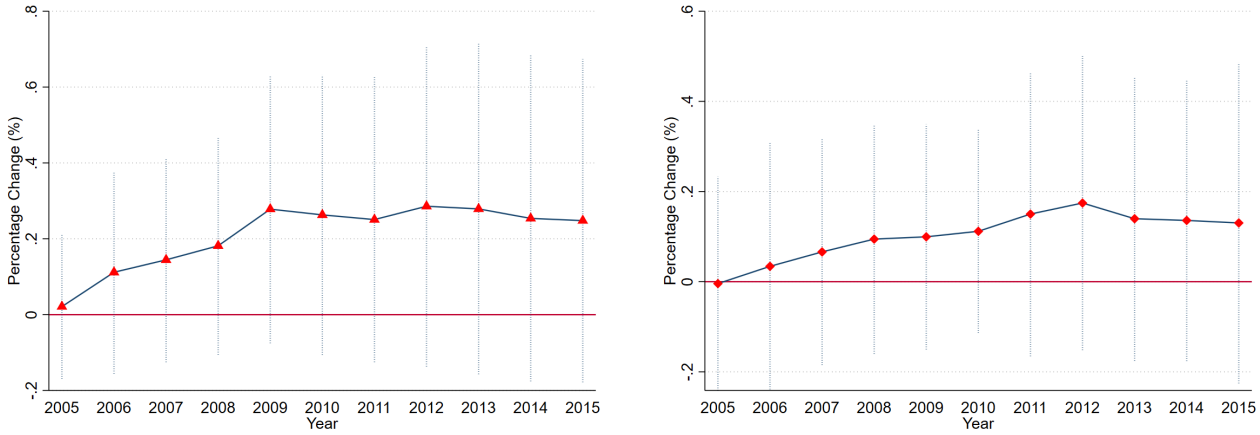
Appendix



A: *Pre-policy Log Number of Branches*

B: *Post-policy Log Number of Branches*

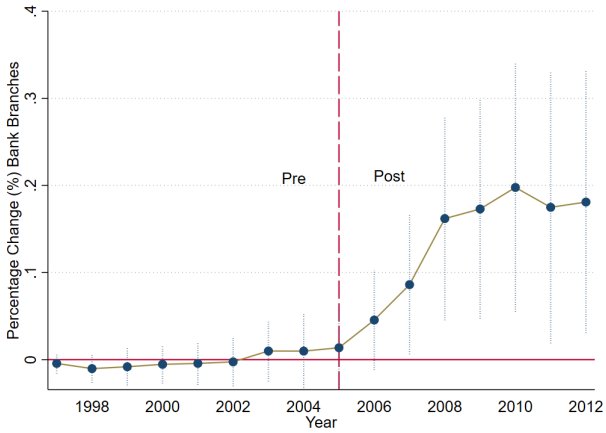
Figure A1: Pre- and post-policy RD estimates of impact on bank branches. Panel A shows pre-policy smoothness, and Panel B shows post-policy discontinuity in bank branches.



A: Total Credit

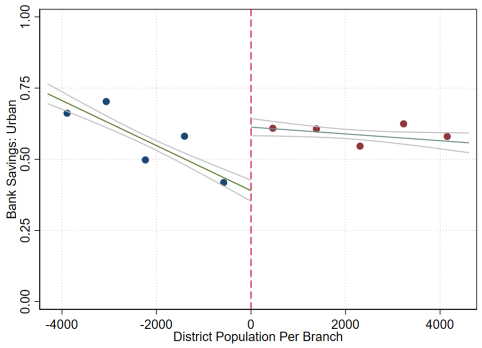
B: Total Deposit

Figure A2: Expansion in credit and deposits. The outcome variables are (log) total annual credit (Panel A) and deposits (Panel B) at the district level for all scheduled commercial banks. Confidence intervals are at 95% level of significance.

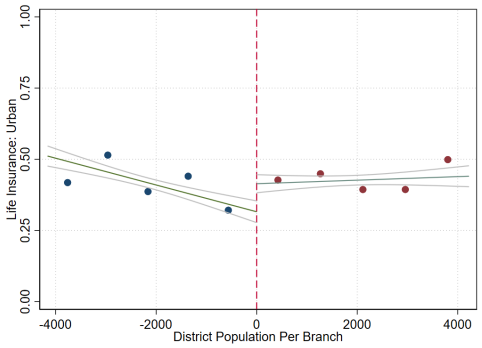


Branch Branches

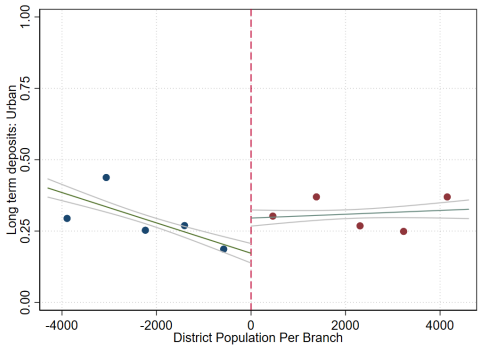
Figure A3: Bank branch expansion. The outcome variables are (log) number of bank branches at the district level for all scheduled commercial banks. Confidence intervals are at a 90% level of significance.



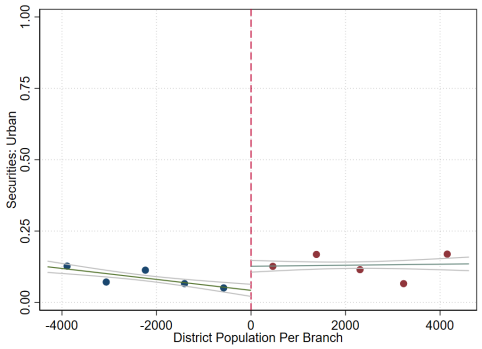
A: *Post-Policy Urban Households Bank Savings*



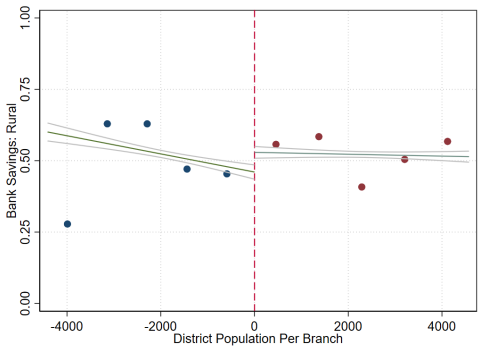
B: *Post-Policy Urban Households Insurance*



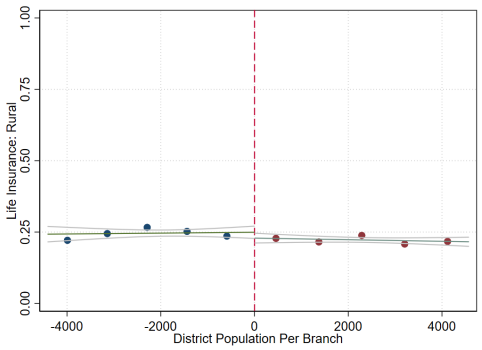
C: *Post-Policy Urban Households Long-Term Deposits*



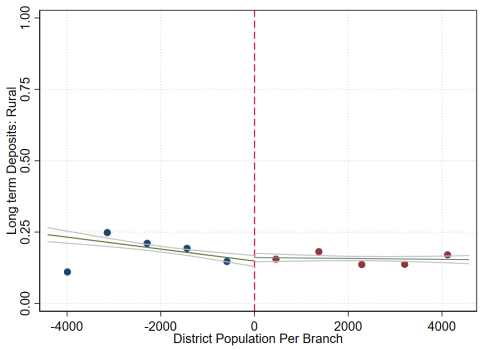
D: *Post-Policy Urban Households Securities and Investments*



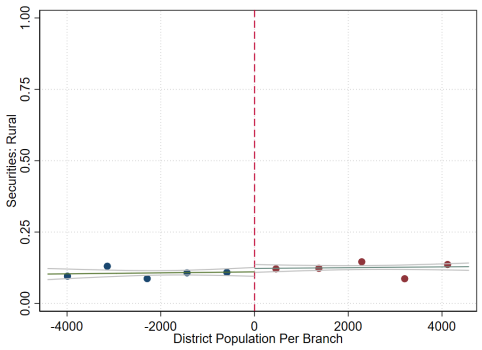
E: *Post-Policy Rural Households Bank Savings*



F: *Post-Policy Rural Households Insurance*

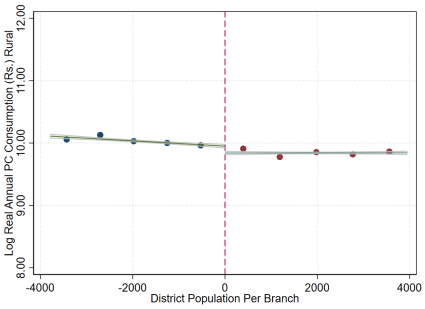


G: *Post-Policy Rural Households Long Term Deposits*

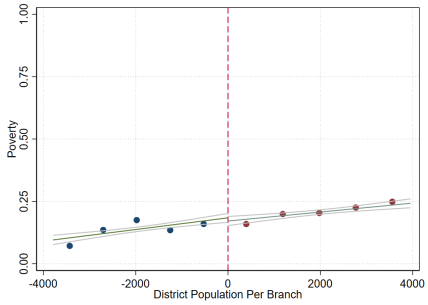


H: *Post-Policy Rural Households Securities and Investments*

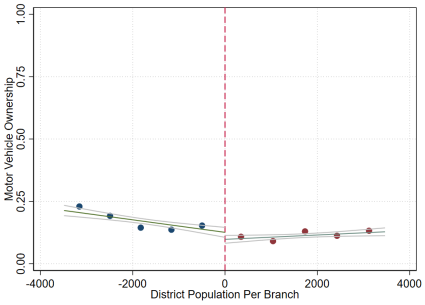
Figure A4: Post-policy discontinuity in household savings and investments in rural and urban areas. The figure describes the results reported in Table 4.



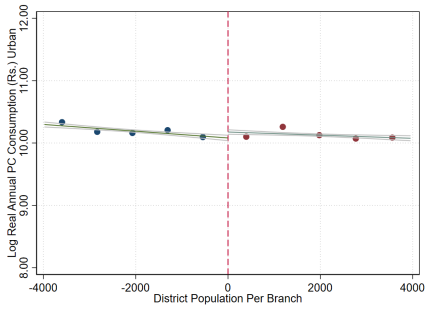
A: *Pre-policy Rural Consumption Expenditures*



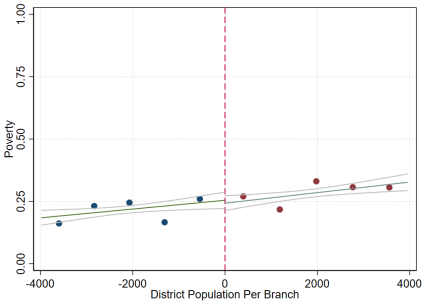
B: *Pre-policy Rural Poverty*



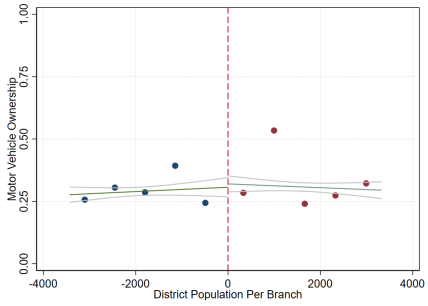
C: *Pre-policy Rural Motor Vehicle Ownership (0/1)*



D: *Pre-policy Urban Consumption Expenditures*



E: *Pre-policy Urban Poverty (0/1)*



F: *Pre-policy Urban Motor Vehicle Ownership (0/1)*

Figure A5: Pre policy smoothness in household outcomes in rural and urban areas. Figures A-C correspond to rural districts, and Figures D-F correspond to urban districts.

Table A1: District level credit and deposit of scheduled commercial banks (2005-2015)

Data from the annual balance sheet report of the Reserve Bank of India for all scheduled commercial banks. Log credit and deposit variables are derived by winsorizing and trimming the respective level variables at 10th and 90th percentiles and then taking natural log of the level variables.

	Log annual total credit						**Log annual total deposit**					
	Banked			**Under-banked**			**Banked**			**Under-banked**		
	Obs.	**Mean**	**SD**	**Obs.**	**Mean**	**SD**	**Obs.**	**Mean**	**SD**	**Obs.**	**Mean**	**SD**
Urban												
2005	62	10.78	0.60	120	9.95	1.05	62	11.43	0.61	120	10.89	0.89
2006	76	10.96	0.74	165	10.12	0.82	76	11.52	0.66	165	10.95	0.73
2007	77	11.22	0.71	166	10.31	0.83	76	11.73	0.64	167	11.11	0.72
2008	77	11.31	0.97	165	10.45	0.85	78	11.80	0.94	165	11.31	0.72
2009	77	11.39	1.22	165	10.61	0.87	77	12.06	0.88	165	11.55	0.69
2010	77	11.67	0.90	165	10.79	0.87	77	12.27	0.76	165	11.71	0.68
2011	75	11.85	0.89	165	10.95	0.88	76	12.43	0.75	164	11.86	0.67
2012	76	11.79	1.10	164	11.12	0.84	79	12.50	0.88	162	12.02	0.64
2013	75	12.06	1.05	162	11.27	0.84	76	12.69	0.81	160	12.16	0.63
2014	72	12.26	0.87	163	11.46	0.82	74	12.87	0.79	161	12.31	0.64
2015	73	12.28	1.24	163	11.60	0.81	76	12.93	1.17	160	12.44	0.63
Semi-urban												
2005	136	9.41	1.00	336	9.24	0.90	193	10.51	1.42	360	10.00	1.06
2006	138	9.64	0.92	333	9.40	0.84	195	10.68	1.28	368	10.16	1.02
2007	138	9.84	0.89	333	9.65	0.81	198	10.81	1.26	369	10.34	1.00
2008	139	10.06	0.89	332	9.81	0.82	198	10.99	1.28	369	10.52	1.01
2009	138	10.20	0.86	333	9.94	0.82	198	11.20	1.27	368	10.76	0.97
2010	138	10.38	0.88	333	10.13	0.82	198	11.33	1.24	368	10.93	0.95
2011	140	10.52	0.92	330	10.24	0.83	196	11.48	1.24	367	11.10	0.96
2012	142	10.68	0.96	329	10.43	0.83	197	11.67	1.23	369	11.24	0.98
2013	140	10.81	0.99	331	10.58	0.87	196	11.82	1.23	368	11.37	1.04
2014	141	11.01	1.00	330	10.77	0.88	196	11.99	1.24	367	11.52	1.00
2015	142	11.17	0.99	329	10.93	0.87	197	12.11	1.25	369	11.65	1.02
Rural												
2005	210	9.48	0.99	377	9.28	0.87	159	10.25	0.64	312	10.03	0.64
2006	210	9.66	0.93	377	9.43	0.83	153	10.29	0.65	318	10.09	0.64
2007	210	9.87	0.93	377	9.62	0.84	154	10.40	0.66	317	10.20	0.65
2008	210	10.04	0.93	377	9.79	0.85	155	10.59	0.65	316	10.36	0.63
2009	210	10.13	0.96	377	9.89	0.87	154	10.78	0.62	317	10.54	0.64
2010	210	10.31	0.96	377	10.08	0.88	160	10.90	0.64	311	10.70	0.62
2011	209	10.46	0.98	377	10.21	0.90	158	11.06	0.64	312	10.86	0.63
2012	210	10.64	1.00	377	10.39	0.90	158	11.21	0.63	313	10.99	0.62
2013	210	10.83	1.01	377	10.54	0.92	160	11.35	0.64	310	11.14	0.62
2014	210	10.99	1.01	377	10.71	0.90	158	11.48	0.65	311	11.29	0.63
2015	210	11.11	1.04	377	10.84	0.92	156	11.64	0.64	314	11.42	0.64

Table A2: Descriptive Statistics of Rural and Urban Household Characteristics

This table provides summary statistics of household borrowing and borrowing measures for rural and urban sub-samples from the two rounds of the IHDS survey (2004/2005 (columns (1–6), and 2011/2012 (columns (7–12). Real values are winsorized and trimmed at 10^{th} and 90^{th} percentile.

	IHDS 1						IHDS 2					
	Rural			Urban			Rural			Urban		
	Obs.	Mean	SD	Obs.	Mean	SD	Obs.	Mean	SD	Obs.	Mean	SD
Consumption Expenditures	22,980	23,009	13,463	9,207	30,175	15,915	21,005	19,393	12,189	10,784	24,882	14,195
Poverty (0/1)	28,184	0.23	0.42	11,789	0.21	0.41	27,293	0.19	0.39	12,701	0.10	0.31
Motor Vehicle Ownership (0/1)	28,157	0.12	0.33	11,776	0.30	0.46	27,294	0.22	0.41	12,704	0.42	0.49
Monthly Interest Loan (%)	13,217	2.10	1.98	4,150	1.88	1.93	9,618	2.38	2.26	3,263	2.14	2.29
Number of Loans	28,205	1.49	2.74	11,812	0.98	2.27	28,151	1.82	2.01	11,791	1.21	2.29
Consumption Loans	28,205	0.08	0.27	11,813	0.06	0.25	28,205	0.27	0.44	11,813	0.20	0.40
Outstanding HH Debt	22,981	34,481	73,572	8,960	35,066	81,272	25,986	37,443	81,204	10,692	37,161	89,343
Household Wage Earnings	18,751	22,238	20,406	6,669	34,032	27,919	25,281	16,743	17,616	9,888	24,455	24,639
Business Revenues	4,466	92,665	95,013	3,447	158,681	115,629	4,191	71,807	84,430	3,496	122,035	106,457
Bank Savings	-	-	(-)	-	-	(-)	28,101	0.54	0.49	11,770	0.62	0.48
Life Insurance	28,172	0.15	0.36	11,771	0.34	0.47	28,121	0.24	0.43	11,782	0.43	0.48
Long-Term Deposits	-	-	(-)	-	-	(-)	28,205	0.18	0.38	11,813	0.17	0.47
Securities and Investments (0/1)	-	-	(-)	-	-	(-)	28,205	0.12	0.33	11,813	0.13	0.32

Table A3: Descriptive Statistics of Enterprise Borrowing and Enterprise Employment

This table provides descriptive statistics on enterprise borrowing from the Economic Census.

Variable	Obs.	Mean	Std. dev.
Economic Census, 2005			
Banked			
Enterprise Institutional Loans	17,650,614	0.040	0.196
Enterprise Institutional Loans (Rural)	9,992,916	0.041	0.199
Enterprise Institutional Loans (Urban)	7,657,698	0.038	0.192
Total Employment Enterprises (District)	207	110,013	97,003
Total Employment Enterprises (District, Rural)	202	117,640	114,970
Total Employment Enterprises (District, Urban)	201	102,374	100,804
Under-banked			
Enterprise Institutional Loans	22,374,659	0.028	0.167
Enterprise Institutional Loans (Rural)	15,150,453	0.027	0.162
Enterprise Institutional Loans (Urban)	7,224,206	0.032	0.178
Total Employment Enterprises (District)	374	74,953	72,015
Total Employment Enterprises (District, Rural)	373	95,057	90,722
Total Employment Enterprises (District, Urban)	365	56,277	66,497
Economic Census, 2013			
Banked			
Enterprise Institutional Loans	22,665,299	0.025	0.157
Enterprise Institutional Loans (Rural)	11,810,794	0.025	0.157
Enterprise Institutional Loans (Urban)	10,854,505	0.025	0.157
Total Employment Enterprises (District)	207	87,321	76,740
Total Employment Enterprises (District, Rural)	203	84,577	81,283
Total Employment Enterprises (District, Urban)	204	88,877	87,240
Under-banked			
Enterprise Institutional Loans	32,339,331	0.016	0.128
Enterprise Institutional Loans (Rural)	21,651,130	0.016	0.162
Enterprise Institutional Loans (Urban)	10,688,201	0.018	0.134
Total Employment Enterprises (District)	374	63,669	61,469
Total Employment Enterprises (District, Rural)	373	79,160	74,411
Total Employment Enterprises (District, Urban)	374	48,372	59,672

Table A4: Descriptive Statistics of Banked and Under-banked Samples by Sector

Table A4 shows the number of primary, sector and service sector enterprises in banked and under-banked districts. The table also shows the total number of organized and unorganized enterprises for banked and under-banked districts.

	Banked			**Under-banked**		
Variable	Obs	Mean	Std. dev.	Obs	Mean	Std. dev.
Primary Sector						
All	5,514,930	0.012	0.109	7,131,170	0.011	0.102
Rural	4,894,364	0.012	0.110	6,729,418	0.011	0.102
Urban	620,566	0.011	0.103	401,752	0.011	0.105
Secondary Sector						
All	4,344,677	0.025	0.156	6,474,767	0.015	0.122
Rural	1,911,853	0.027	0.163	3,909,210	0.014	0.119
Urban	2,432,824	0.023	0.150	2,565,557	0.017	0.128
Service Sector						
All	12,805,692	0.031	0.174	18,733,394	0.020	0.140
Rural	5,004,577	0.037	0.190	11,012,502	0.020	0.141
Urban	7,801,115	0.028	0.164	7,720,892	0.019	0.138
Organized Sector						
All	363,630	0.088	0.284	358,733	0.073	0.261
Rural	133,168	0.092	0.289	196,807	0.079	0.270
Urban	230,462	0.086	0.280	161,926	0.067	0.249
Unorganized Sector						
All	22,301,669	0.024	0.154	31,980,598	0.016	0.126
Rural	11,677,626	0.025	0.155	21,454,323	0.016	0.124
Urban	10,624,043	0.024	0.154	10,526,275	0.018	0.132

Table A5: Bank expansion validity with survey sub-samples

Notes: This table checks if the aggregate, rural or urban sub-samples when analyzed separately satisfy the randomization required to estimate the causal effects. Since the β_1 coefficient from equation **??** in Table A5 is not significant for the aggregate, rural and urban sub-samples, we can say that the full sample and the sub-sample analysis for rural and urban households does not bias the RD design. $*p < 0.1$, $**p < 0.05$, $***p < 0.01$. Standard errors in parentheses clustered at the district level.

	(1)	(2)	(3)
	Full Sample	Rural Sample	Urban Sample
RD Robust Estimate	-0.005	-0.002	0.003
	(0.150)	(0.183)	(0.165)
Two stage q values	0.991	0.994	0.892
Bandwidth	4,339	4,126	4,798
Baseline Controls	No	No	No
Observations	581	581	581

Table A6: Impact of Bank Branch Expansion on Household Characteristics (Pre-policy)

Table A6 reports results from the RD robust regression of the impact of the bank expansion policy on household consumption and poverty in the pre-policy period. *Consumption Expenditures* is real annual per capita household consumption expenditures in Rupees; *Poverty* is an indicator variable equal to one if the household is below the state poverty line, and zero otherwise; and, *Motor Vehicle Ownership* is an indicator variable that is equal to one if the household owns a motor vehicle, and zero otherwise. Standard errors, indicated in parentheses, are clustered at the district level. Significance levels are $*p < 0.1$, $**p < 0.05$, $***p < 0.01$.

	Consumption Expenditures	*Poverty (0/1)*	*Motor Vehicle Ownership*
RD Robust Estimate	-104.6	0.0758	0.00809
	(1,759)	(0.0534)	(0.0393)
Control Mean	28615	0.133	0.238
Two Stage q values	0.788	0.341	0.826
Observations	32,187	39,973	39,933

Table A7: Impact of Bank Expansion on Urban and Rural Household Characteristics (Pre-Policy)

Table A7 reports results from the RD robust regression of the impact of the bank expansion policy on household consumption and poverty for rural and urban sub-samples in the pre-policy period. *Consumption Expenditures* is real annual per capita household consumption expenditures in Rupees; *Poverty* is an indicator variable equal to one if the household is below the state poverty line, and zero otherwise; and, *Motor Vehicle Ownership* is an indicator variable that is equal to one if the household owns a motor vehicle, and zero otherwise. Standard errors in parentheses are clustered at the district level. Significance levels are $*p < 0.1$, $**p < 0.05$, $***p < 0.01$.

	(1)	(2)	(3)
	Consumption Expenditures	Poverty	Motor Vehicle Ownership
Urban			
RD Robust Estimate	2,920	-0.0142	0.0550
	(2,495)	(0.0726)	(0.0697)
Dependent Variable Mean	30,175.48	0.219	0.308
Two stage q values	0.426	0.982	0.661
Observations	9,207	11,789	11,776
Rural			
RD Robust Estimate	-2,282	-0.0116	-0.0480
	(2,112)	(0.0549)	(0.0432)
Dependent Variable Mean	23,009.4	0.230	0.129
Two stage q values	0.512	0.733	0.422
Observations	22,980	28,190	28,157

Table A8: Impact of Bank Branch Expansion on Household Borrowing (Pre-policy)

Table A8 reports results from the RD robust regression of the impact of the bank expansion policy on household borrowing and debt. *Monthly Interest on Loan* measures the percentage of interest on a loan paid monthly on an outstanding loan by households; *Number of Loans* measures the total number of loans that households have taken in the past five years; *Consumption Loans* is a binary variable with a value of one if the household has taken a loan to finance consumption, and zero otherwise; and, *Outstanding HH debt* in Rupees is the total amount of debt that a household owes to others. Standard errors in parentheses clustered at the district level. $*p < 0.1$, $**p < 0.05$, $***p < 0.01$.

	Monthly Interest Loan (%)	*Number of Loans*	*Consumption Loans*	*Outstanding HH Debt*
RD Robust Estimate	-0.312	0.183	0.0281	12,076
	(0.350)	(0.823)	(0.0192)	(10,187)
Dependent Variable Mean	1.761	0.931	0.061	39,904
Two Stage q value	0.726	0.932	0.420	0.432
Observations	17,367	40,017	40,018	31,941

Table A9: Impact of Bank Branch Expansion on Rural and Urban Household Borrowing (Pre Policy)

Table A9 reports results from the RD robust regression of the impact of the bank expansion policy on household borrowing and debt for rural and urban sub-samples in the pre-policy period. *Monthly Interest on Loan* measures percentage of interest on loan paid monthly on an outstanding loan by households; *Number of Loans* measures the total number of loans that households have taken in the past five years; *Consumption Loans* is a binary variable with value one if household is has taken a loan to finance consumption, and zero otherwise; and, *Outstanding HH debt* in Rupees is the total amount of debt that a household owes to others. Standard errors in parentheses clustered at the district level. $*p < 0.1$, $**p < 0.05$, $***p < 0.01$.

	(1)	(2)	(3)	(4)
Variables	*Monthly Interest Loan (%)*	*Number of Loans*	*Consumption Loans*	*Outstanding HH Debt*
Urban				
RD Robust Estimate	-0.613	-0.665	0.00415	4,017
	(0.418)	(0.671)	(0.0315)	(13,378)
Dependent Variable Mean	1.94	0.871	0.059	39,876
Two stage q values	0.370	0.558	0.911	0.893
Observations	4,150	11,812	11,813	8,960
Rural				
RD Robust Estimate	-0.210	0.526	0.0376	16,806
	(0.460)	(1.208)	(0.0230)	(12,692)
Dependent Variable Mean	1.66	0.967	0.062	39,920
Two stage q values	0.783	0.663	0.212	0.287
Observations	13,217	28,205	28,205	22,981

Table A10: Impact of Bank Branch Expansion on Household Wage Income and Business Revenues (Pre-policy)

Table A10 reports results from the RD robust regression of the impact of the bank expansion policy on household wage earnings and household-owned small business revenues for the full sample and for rural and urban sub-samples. *Household Wage Earnings* is real annual earnings in Rupees of households from wage or salary work; and, *Business Revenues* is real annual business receipts in Rupees of household-owned small businesses. Control variable for *Household Wage Earnings* is days worked in a year. Standard errors in parentheses are clustered at the district level. $*p < 0.1$, $**p < 0.05$, $***p < 0.01$.

	Household Wage Earnings	*Business Revenues*
A: Full Sample		
RD Robust Estimate	3,485	38,098
	(2,823)	(36,053)
Dependent Variable Mean	35,151	139,086
Two stage q values	0.311	0.316
Observations	21,219	7,913
B: Urban		
RD Robust Estimate	2,650	6,702
	(2,517)	(31,409)
Dependent Variable Mean	46,905	166,950
Two stage q values	0.363	0.878
Observations	5,010	3,447
C: Rural		
RD Robust Estimate	3,314	28,978
	(3,358)	(33,082)
Dependent Variable Mean	29,995	107,075
Two stage q values	0.406	0.427
Observations	16,191	4,466

Table A11: Impact of Bank Branch Expansion on Enterprise Borrowing and Employment (Pre-policy)

Table A11 reports results from the RD robust regression of the impact of the bank expansion policy on firm-level borrowing and employment for the full sample of enterprises (columns (1) and (3)) and for the sub-sample of enterprises that borrow from external finance sources including banks, government, and money lenders (columns 2 and 4). *Enterprise Institutional Loans* is a binary variable that is equal to one if the enterprise relies on loans from financial institutions as their major source of borrowing, and zero otherwise; *Enterprise Institutional Loans: EF* is the same variable for the sub-sample of firms that seek external sources of finance; *Total District Employment* is annual enterprise employment aggregated to the district-level; and, *Total Enterprise Employment: EF* is the total number of employees at the firm-level for the sub-sample of firms that seek external sources of finance. Standard errors in parentheses are clustered at the district level. $*p < 0.1$, $**p < 0.05$,$***p < 0.01$.

	Enterprise Institutional Loans	*Enterprise Institutional Loans: EF*	*Total District Employment*	*Total Enterprise Employment: EF*
RD Robust Estimate	0.007	0.024	-3,348	-0.387
	(0.015)	(0.081)	(29,861)	(0.559)
Control Mean	0.040	0.374	110,013	5.04
Two-stage q values	0.711	0.545	0.919	0.712
Observations	40,025,273	4,047,799	581	4,047,799

Table A12: Impact of Bank Branch Access on Rural and Urban Enterprise Borrowing (Pre-Policy)

Table A12 reports results from the RD robust regression of the impact of the bank expansion policy on firm-level borrowing for rural and urban enterprises and for sub-samples of rural and urban enterprises that borrow from external sources, including banks, government, money lenders, or family, in the pre-policy period. *Enterprise Institutional Loans* is a binary variable that is equal to one if the enterprise relies on loans from financial institutions as their major source of borrowing, and zero otherwise; *Enterprise Institutional Loans: EF* is the same variable for the sub-sample of firms that seek external sources of finance. Standard errors in parentheses are clustered at the district level. $*p < 0.1$, $**p < 0.05$,$***p < 0.01$.

	(1)	(2)
Variables	*Enterprise Institutional Loans*	*Enterprise Institutional Loans (EF)*
Urban		
RD Robust Estimate	0.001	-0.018
	(0.011)	(0.086)
Dependent Variable Mean	0.039	0.440
Two stage q values	0.892	0.911
Observations	14,881,904	1,202,866
Rural		
RD Robust Estimate	0.010	0.046
	(0.017)	(0.092)
Dependent Variable Mean	0.041	0.352
Two stage q values	0.311	0.429
Observations	25,143,369	2,844,933

Table A13: Impact of Bank Branch Access on Rural and Urban Labor Markets (Pre-Policy)

Table A13 reports results from the RD robust regression of the impact of the bank expansion policy on firm employment for rural and urban sub-samples in the pre-policy period. *Total District Employment* is annual enterprise employment aggregated to the district-level, and *Total Enterprise Employment: EF* is the total number of employees at the firm-level for the sub-sample of firms that seek external sources of finance. Standard errors in parentheses are clustered at the district level. $*p < 0.1$, $**p < 0.05$,$***p < 0.01$.

	(1)	(2)
Variables	*Total District Employment*	*Total Enterprise Employment: EF*
A: Urban		
RD Robust Estimate	-10,151	-0.357
	(37,384)	(0.405)
Dependent Variable Mean	117,640	3.80
Two stage q values	0.677	0.683
Observations	575	2,844,933
B: Rural		
RD Robust Estimate	50.91	-0.293
	(31,263)	(1.227)
Dependent Variable Mean	102,374	7.23
Two stage q values	0.862	0.822
Observations	566	1,202,866

Table A14: Impact of Bank Expansion on Rural and Urban Household Characteristics: Polynomial 2 Regressions

This table reports "Polynomial 2 Regressions" with household consumption and poverty in rural and urban areas as the outcome variables, using a second-degree polynomial to estimate treatment effects near the cutoff (Imbens and Lemieux, 2008). It captures potential nonlinear relationships between the running variable and the outcome. The model takes the form: $Y_i = \alpha + \beta \cdot (X_i - c) + \gamma \cdot (X_i - c)^2 + \epsilon_i$. $*p < 0.1$, $**p < 0.05$,$***p < 0.01$. Standard errors in parentheses clustered at the district level.

	(1)	(4)	(6)
	Consumption Expenditures	*Poverty*	*Motor Vehicle Ownership*
(a): Full Sample IHDS			
RD Robust Estimate	3,383**	-0.0469	0.119*
	(1,697)	(0.0475)	(0.0651)
Observations	31,789	39,994	39,998
(b): Rural			
RD Robust Estimate	924	-0.012	0.018
	(1,855)	(0.061)	(0.064)
Observations	21,729	28,190	28,191
(c): Urban			
RD Robust Estimate	5,009**	-0.105**	0.193**
	(2,422)	(0.047)	(0.093)
Observations	10,060	11,804	11,807

Table A15: Impact of Bank Expansion on Labor Market Outcomes: Polynomial 2 Regressions

This table reports "Polynomial 2 Regressions" with enterprise borrowing, enterprise employment, household wage earnings, and household business revenues as the outcome variables, using a second-degree polynomial to estimate treatment effects near the cutoff (Imbens and Lemieux, 2008). It captures potential nonlinear relationships between the running variable and the outcome. The model takes the form: $Y_i = \alpha + \beta \cdot (X_i - c) + \gamma \cdot (X_i - c)^2 + \epsilon_i$. The β coefficient measures the treatment effect at the cutoff, while γ captures curvature. $*p < 0.1$, $**p < 0.05$,$***p < 0.01$. Standard errors in parentheses clustered at the district level.

	(1)	(2)	(3)	(4)	(5)	(6)
	Pre Policy			Post Policy		
	All	Rural	Urban	All	Rural	Urban
(a): *Enterprise Institutional Loans*						
RD Robust Estimate	0.005	0.014	-0.011	0.012*	0.011*	0.013**
	(0.019)	(0.0205)	(0.0218)	(0.008)	(0.007)	(0.007)
Baseline Controls	N	N	N	N	N	N
Observations	40,025,273	25,143,369	14,881,904	55,004,630	33,461,924	21,542,706
(b): *Enterprise Total Employment (District)*						
RD Robust Estimate	3,324	-4,666	11,510	25,802	13,281	39,267**
	(34,144)	(41,833)	(37,656)	(18,680)	(25,389)	(17,888)
Baseline Controls	N	N	N	N	N	N
Observations	581	575	566	581	576	578
(c): *Household Wage Earnings*						
RD Robust Estimate	3,763	3,599	2,099	3,267	327	9,660**
	(3,393)	(4,019)	(2,999)	(3,206)	(3,606)	(4,458)
Baseline controls	N	N	N	N	N	N
Observations	21,219	16,191	5,010	28,147	21,295	6,852
(d): *Business Revenue*						
RD Robust Estimate	42,369	32,210	7,552	71,307***	38,812*	60,354**
	(35,776)	(41,113)	(36,564)	(23,008)	(21,814)	(24,266)
Baseline controls	N	N	N	N	N	N
Observations	7,913	4,466	3,447	7,687	4,191	3,496

Table A16: Impact of Bank Expansion on Household Credit: Polynomial 2 Regressions

This table reports "Polynomial 2 Regressions" with household borrowing measures as the outcome variables, using a second-degree polynomial to estimate treatment effects near the cutoff (Imbens and Lemieux, 2008). It captures potential nonlinear relationships between the running variable and the outcome. The model takes the form: $Y_i = \alpha + \beta \cdot (X_i - c) + \gamma \cdot (X_i - c)^2 + \epsilon_i$. $*p < 0.1$, $**p < 0.05$,$***p < 0.01$. Standard errors in parentheses clustered at the district level.

	(1)	(2)	(3)	(4)
	Monthly Interest Loan (%)	*Number of Loans*	*Consumption Loans*	*Outstanding HH Debt*
(a) *Full Sample IHDS*				
RD Robust Estimate	-0.396	-0.625	-0.0949*	-2,415
	(0.307)	(0.734)	(0.0571)	(14,729)
Baseline controls	N	N	N	N
Observations	12,881	39,942	40,018	36,678
(b): *Rural*				
RD Robust Estimate	-0.191	-0.118	-0.0499	12,457
	(0.355)	(0.941)	(0.0660)	(16,830)
Baseline controls	N	N	N	N
Observations	9,782	28,151	28,205	25,986
(c): *Urban*				
RD Robust Estimate	-1.093**	-1.196*	-0.175**	-30,348*
	(0.490)	(0.624)	(0.0731)	(17,723)
Baseline controls	N	N	N	N
Observations	3,099	11,791	11,813	10,692

Table A17: Impact of Bank Expansion on Household Savings and Investments: Polynomial 2 Regressions

This table reports "Polynomial 2 Regressions" with household savings and investment measures as the outcome variables, using a second-degree polynomial to estimate treatment effects near the cutoff (Imbens and Lemieux, 2008). It captures potential nonlinear relationships between the running variable and the outcome. The model takes the form: $Y_i = \alpha + \beta \cdot (X_i - c) + \gamma \cdot (X_i - c)^2 + \epsilon_i$. $*p < 0.1$, $**p < 0.05$,$***p < 0.01$. Standard errors in parentheses clustered at the district level. All variables are described in Table **??**.

	(1)	(2)	(3)	(4)
	Bank Savings	*Life Insurance*	*Long Term-Deposits*	*Securities and Investments*
(a): *Full Sample IHDS*				
RD Robust Estimate	0.236**	0.0450	0.134*	0.0437
	(0.101)	(0.0511)	(0.0687)	(0.0550)
Baseline control	N	N	N	N
Observations	39,871	39,903	40,018	40,018
(b): *Rural*				
RD Robust Estimate	0.196*	-0.0486	0.0634	0.00150
	(0.109)	(0.0414)	(0.0580)	(0.0705)
Baseline control	N	N	N	N
Observations	28,101	28,121	28,205	28,205
(c): *Urban*				
RD Robust Estimate	0.322**	0.147*	0.208*	0.138**
	(0.141)	(0.081)	(0.113)	(0.061)
Baseline control	N	N	N	N
Observations	11,770	11,782	11,813	11,813

Table A18: Regression Discontinuity Estimates

Table A18 presents Regression Discontinuity (RD) estimates for different values of the running variable. Consumption Expenditures, Poverty, and Motor Vehicle Ownership are the outcome variables of interest. RD Robust Estimates along with standard errors in parentheses are reported. The values in rows (-3000, -1000, 0, 1000, 3000) correspond to different points around the cutoff. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

	1	2	3
Placebo Cut-offs	*Consumption Expenditures*	*Poverty*	*Motor Vehicle Ownership*
-3000	555,815	-7.039	0.889
	(526,746)	(9.035)	(0.953)
-1000	28,400	8.029	0.262
	(339,780)	(133.5)	(5.577)
0	3,095**	-0.0409	0.0903*
	(1,468)	(0.0405)	(0.0520)
1000	-564.6	-0.0354	-0.0287
	(10,794)	(1.342)	(0.758)
3000	-5,366	-0.0723	0.171
	(6,850)	(0.212)	(0.267)
Observations	31,789	39,994	39,998

Table A19: Bank Presence and Local Economic Development

Table A19 shows the impact of treatment on household outcomes averaged at the village/primary sampling unit level. Column (1) shows the natural log of *Consumption Expenditures*. Columns (2) and (3) show household likelihood of being poor and motor vehicle ownership averaged at the village/primary sampling unit. $*p < 0.1$, $**p < 0.05$,$***p < 0.01$. Standard errors in parentheses clustered at the district level.

	(1)	(2)	(3)
	Log Consumption Expenditures	*Poverty*	*Motor Vehicle Ownership*
(a): *Full Sample IHDS*			
RD Robust Estimate	0.259***	-0.0568**	0.104***
	(0.0688)	(0.0235)	(0.0274)
Observations	2,435	2,435	2,435
(b): *Rural*			
RD Robust Estimate	0.0544	-0.0320	0.0689**
	(0.0521)	(0.0272)	(0.0314)
Observations	1,465	1,465	1,465
(c): *Urban*			
RD Robust Estimate	0.231***	-0.0818***	0.125**
	(0.0634)	(0.0292)	(0.0584)
Observations	970	970	970