Financial Access and Gender Gap in Entrepreneurship and Employment: Evidence from Rural India[1]

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Abstract

Can the gender-gap in economic activity be reduced by improving access to bank branches? To explore this issue, we construct a novel data of village-level financial access defined as distance of each un-banked village to the nearest banked-center from 1951-2019; and merge it with village-level enterprise data from Economic Censuses 1990, 1998, 2005 and 2013. Using a difference-in-difference research design, we find that proximity to a banked-center within 5km of an un-banked village between 2005 and 2013 (Treatment Group) increases female entrepreneurship in non-agricultural sector, whereas male entrepreneurship shifts from agricultural to non-agricultural sector. Employment for both male and female shifts from agricultural to non-agricultural enterprises as well. Overall, we find that the gender gap in entrepreneurship and employment reduces after proximity to a bank branch improves. Further, evidence suggests that this transition may be a consequence of credit uptake by enterprises from non-institutional sources. Results are robust to several additional tests.

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1. Introduction

Women, forming half of any society, are under-represented in economic activity. Women-led businesses are typically lesser in number; smaller in output, sales and employment; concentrated in less efficient sectors; and have lower survival rates than male-owned businesses (Coleman 2002; Fairlie and Robb 2009; Bardasi, Sabarwal, and Terrel 2011, Chaudhuri, Sasidharan, and Raj 2020). Similar concern of under-representation extends to workforce participation as well. This scenario results in a significant gender gap in entrepreneurship and employment.

Several factors may explain the lower presence and growth of women-owned businesses (Fairlie and Robb 2009; Langowitz and Minniti 2007). Among them, problem in acquiring financial resources is considered as one of the most important barriers to women entrepreneurship (Raghuvanshi, Agarwal and Ghosh 2017; Kairiza et al. 2017, and Panda 2018). However, cultural and social norms may restrict the benefits to women of infrastructure access, including financial resources (Marchand and Parpart, 1995). This raises a pertinent question—does access to financial services such as bank branches improve economic activity of women thereby alleviating the gender gap? Answering this question can deliver insights for debates on financial inclusion.

We explore this issue in the Indian context. Using a panel of Indian villages from Economic Censuses 1990, 1998, 2005 and 2013, we find lower presence of women in entrepreneurship, workforce and enterprise-level credit uptake in rural India. We merge this village-level panel data with a novel village-bank branch matched panel dataset which records the distance of each unbanked village to its nearest banked-center. We use the distance to the nearest banked-center as a measure of financial access. A large literature suggests the important role of proximity of public services on social outcomes[5]. In our data, an improvement in financial access, or equivalently a decrease in computed distance over time, would occur when a branch opens in a previously unbanked area. We use this property to understand how improved proximity to bank branches affects gender gap in economic activity.

[5] See Burde and Linden (2013) for schools; Nicholl et al. (2007) and Simmons, Anthopolos, and O'Meara (2021) for hospitals; Flögel (2018) and Lee and Brown (2017) for banks.

Starting from 2005, Reserve Bank of India (RBI) introduced several policies such as liberalized rules for branch expansion, and removal of Service Area Approach (SAA). Following these policy changes since 2005, we observe a significant expansion in branch network particularly in rural areas (Figure 1) as well as a significant decline in closure/merger/conversion of bank branches in rural and urban areas (Figure 2).

We exploit this expansion in bank branch network pre and post 2005 as a natural experiment for our study. Relying on a Difference-in-Difference (D-I-D) research design, we divide all un-banked villages into treated and control groups. The treated villages are those where the distance to the nearest banked-center was greater than 5kms pre-2005 but declined to 5kms or less post-2005. Villages where the distance remained above 5km up to 2013 constitute the control group.[6]

The first key result of our paper is that compared to men, women experience significant increase in entrepreneurship and employment due to improved financial access. Specifically, women-owned enterprises increase significantly by 0.549 units and women employment increases by 4.5 units in treated villages after the treatment. For men, on the other hand, no significant change occurs in overall entrepreneurship and employment. The paper closest to our study is Bruhn & Love (2011) which finds a larger improvement in women's earning relative to men after opening of Azteca branches in Mexico. In the Indian context, most papers do not identify the differential response for genders due to improve bank expansion (Burgess and Pande, 2005; Young, 2020) or do so only at the state or district-level (Menon and Rogers, 2011). To the best of our knowledge, our is the first paper to identify the causal impact of improved bank branch access on gender-gap at the village-level, which is the most granular administrative unit in India.

Our second contribution is to find evidence of structural transformation in rural economy due to financial access—a well-established research area. By observing this transformation for each gender separately, our results add several nuances to these

[6] The choice of using 5kms for classification is to segregate villages which either become proximate (Treated) or remain distant (Control) to a bank branch after 2005. In a recent policy proposal, RBI has recommended that every village must have a bank branch within 5km (RBI, 2019). To the extent that we can provide insights to this policy proposal, we used 5km threshold.

arguments. First, the nature of structural transformation differs by gender. Nearly all of the increase in female entrepreneurship in treated villages occurs in the non-agricultural sector, while female-owned agricultural enterprises do not change significantly. Male-owned enterprises on the other hand, grow less in agriculture by 0.95 units with a nearly equal increase in the non-agricultural sector, reflecting signs of structural transformation. Second, the exit of male-owners from agricultural sector and their entry into non-agricultural sector is higher compared to women entrepreneurs. Several constraints on women, other than banking access, such as restrictive social and cultural norms, higher risk aversion, lower investment in human capital formation etc. may be preventing an even larger entry into non-agricultural sector or faster exit from agricultural sector. Labour markets transformation reflect these changes. For both men and women, employment in non-agricultural sector increases and rises slowly in agricultural sector with respect to the control villages which remain distant from bank branch.

Our third and final contribution is in testing the mechanism of higher credit disbursement due to improved proximity of banks and borrowers (Peterson and Rajan, 1994). We find that enterprise uptake of institutional credit (commercial banks) is not significantly different between treated and control villages after expansion of bank branch network. However, the uptake of credit from non-institutional sources such as informal lenders and Self-Help Groups (SHGs) increases significantly in treated villages post-2005. This result survives even for states where presence of SHGs is low. This addresses a critical point on financial inclusion. Policy makers in India perceive formal financial services as a means to reduce rural dependence on informal lenders. However, some studies argue that low demand for formal finance may make supply side interventions ineffective (Kochar 1997; Kumar, Pal, and Pal 2019). Further, some studies such as Bell (1990) and Surendra (2020) record the role of these informal lenders as intermediaries in the credit markets who borrow from commercial sources and lend onward. Our results inform both these views—even though formal credit uptake does not increase after bank branch proximity, it may not be so because of lack of demand for credit. Rather, formal banking services may be impacting village-level economy through intermediation channels.

We conduct various robustness checks such as testing for parallel trends, presence of confounding alternative income-generating factors, growth in confounding socio-demographic factors and heterogeneity across states on SHG presence.[7] Our results survive these robustness checks. Specially, statistical tests reject divergence in pre-treatment trends for most of our outcome variables. For variables where pre-trends are not parallel, the bias runs in the opposite direction of our estimate providing a bound on the computed estimates. In other words, violation of parallel trends assumption, occurring for male-owned agricultural enterprises and employment in agriculture, does not pose a concern for the implications of our results, and if anything, indicates a higher treatment effect for these two variables.

In recent years, financial inclusion in India has received a major impetus due to *Pradhan Mantri Jan Dhan Yojana* (PMJDY), implemented in 2014, which ensure basic savings account to unbanked person. Nearly 77% of the population now has bank accounts in India (Demirguc-Kunt et. al., 2018). The experiment we study precedes PMJDY when no specific schemes were devised and advertised at a large scale. Even in the period prior to these large-scale targeted programs, we find substantial impact on entrepreneurship and employment of women due to bank branch proximity. Thus, our results bode well for proponents of these recent schemes and provide an insight into the potential impact of these new initiatives.

2. Expansion of bank branch network in India

Over the last 70 years, banking sector has expanded in urban as well as rural areas of India (Figure 1). The pace of its expansion varied under different policy regimes. Before Social Banking Period (Pre-1969), RBI adopted a demand-led model to guide entry of bank branches. Consequently, licenses were provided to branches in areas with adequate demand for financial services and with a goal of reaching 10,000 people per branch. In the social banking period (1969-1990), RBI devised mandatory location-

[7] SHG as a source of finance for an enterprise was first recorded only in Economic Census 2013, and not in previous rounds. For a uniform comparison, we have included SHG financing with non-institutional source.

based quotas for establishing new branches in rural areas. Consequently, there was a sudden jump in the rural branches.

Social banking period ended in 1990 with the withdrawal of mandatory quotas of opening bank branches (RBI, 2005). To ensure continuous progress of the rural and semi-urban regions of the country, the RBI had adopted a Service Area Approach (SAA) in 1989 in which all existing branches were designated a cluster of 15-25 villages based on contiguity and proximity between villages and banks (RBI 2004a). This designated branch, known as the Service Area Branch, was responsible for meeting the credit needs of the assigned villages. However, if a borrower wanted credit from a non-service area branch, it required a 'no-dues' certificate from the service area branch. This feature of the SAA limited the scope for banking operations. The branch-entry expansion reversed to urban areas, as opposed to what was observed in the social banking period.

Taking cognizance of low entry of branches, large closure/merger/conversion of branches and lop-sided growth, RBI devised new rules 2005 onwards. First, RBI withdrew the SAA (RBI 2004b). Now borrowers could seek credit from any branch outside their defined service area. This increased the market size of existing branches and provided more flexibility to people to access branch of their choice. Second, RBI also introduced the BC model to expand the financial access of people in rural areas. Third, RBI provided incentives for opening rural branches and predictability in approval process. Banks were now supposed to submit annual plans for branch expansion. Further, RBI committed to evaluating the plan and responding in 4 weeks. This was in stark contrast to the period from 1990 to 2005 when each application was approved on a case-by-case basis. Thus, a more predictable environment was created for banks to expand[8]. Following these measures, two main outcomes were observed. First, it reduced the number of branches getting closed/merged/converted. Second, it expanded the new branches in the country with faster expansion in rural areas as seen in Figures 1 and 2.

[8]See Young (2020)

3. Data

Outcome variable: Gender-wise ownership, Employment, and Credit Uptake

We obtain our outcome variables from the Economic Census (EC) of India which enumerates all non-farm enterprises in the country[9]. It collects indicators such as gender and caste of the owner, NIC code up to 3 digits, size and the gender composition of employment, and major source of finance among others. Six ECs have been conducted so far - 1977, 1980, 1990, 1998, 2005 and 2013. Gender-wise ownership was recorded only in the last three rounds.

To observe gender gap in ownership, we consider the total number of female and male-owned enterprises. Using NIC code, we classify each enterprise in agricultural or non-agricultural sector to understand the sectoral gender gap. Table 1 provides descriptive statistics for all three rounds of EC (1998, 2005, and 2013). The left (right) panel describes indicators for female-(male-) owned enterprises. We observe a sharp gender gap in ownership of enterprises in all years. The average number of male-owned enterprises (per village) is roughly 5 times higher than the female-owned enterprises in 2013. Across agricultural and non-agricultural sectors as well, a persistent gender gap is observed in entrepreneurship.

The 'major source of finance' of each enterprise has one of the following responses: Institutions, Non-Institutions, Self-Financed and Government aid. EC 2013 includes one more response - SHGs as major source of finance. We define two indicators to study uptake of credit – (i) Institutional finance which includes banks as major source of finance; and (ii) Non-institutional finance which includes moneylenders as the major source of finance and, for the year 2013, includes enterprises with either money lenders or SHGs as major source of finance.[10] Enterprises have low dependence on finance (of any type). Institutional finance, which includes loans from commercial banks, has

[9]The sectors not covered in EC are the following. In case of agricultural activity, establishments classified under 011 and 012 of Section A of NIC 2008; in case of non-agricultural activity, establishments engaged in Section O of NIC 2008 (public administration, defence, compulsory social security), Section T of NIC 2008 (territorial organization and bodies) and Section R of NIC 2008 (illegal gambling and betting activities)

[10] SHGs are not recorded explicitly in the EC rounds prior to 2013, although, it could be recorded in either institutional or non-institutional credit. A concern remains if it was recorded as institutional credit in previous EC rounds. To mitigate this, as a robustness check we analyze states where presence of SHGs is below average. This allows us to measure the impact on credit uptake from banks or money-lenders separately where the inclusion of SHGs is smaller.

higher prevalence for male-owned enterprises. This scenario reverses for female-owned enterprises where non-institutional finance (money-lenders or SHGs) has grown at much higher rate exceeding institutional finance. The growth of SHGs has been significant in rural parts of the country which, subsequently, may have led to a rise in financial access among female-owned enterprises. While we observe sharp gender gap in both type of financing sources, it is higher for institutional finance in 2013.

EC also provides the number of people employed in these enterprises. We use the employment numbers to compute females and males employed across different years. Employment also exhibits a persistent, though declining, gender gap (Table 2). Female employment increases from nearly three folds between 1990 and 2013.

To create a panel of villages, we use the Socioeconomic High-resolution Rural-Urban Geographic Dataset on India (SHRUG) created by Asher et al. (2019), which provides village-level identifiers compatible with Economic Censuses (1990, 1998, 2005 and 2013) and Population Census (1991, 2001, 2011).

Explanatory variables: Access to finance

Financial access is measured in several ways. These include geographic and demographic penetration of bank branches (Burgess and Pande 2005; Alessandrini et al 2010; Beck, Demirguc-Kunt, and Peria 2007, 2008); credit to private sector as a ratio of GDP (Rewilak 2017; Donou-Adonsou and Sylwester 2016); and household distance to the nearest bank branch (Koomson, A. Villano, and Hadley, 2020).

Our measure of financial access as the straight-line distance between unbanked village and the nearest banked village/town has two advantages. First, it captures the logistics cost for borrowers of accessing banking services. Second, proximity between banks and borrowers has been found to induce credit availability for small borrowers (Peterson and Rajan, 1994). Using three datasets—RBI Commercial Bank Directory[11] that provides

[11] The RBI Commercial Bank Directory is obtained as on October 31, 2019. It provides the details of each commercial bank branch in the country with the name of the state, district and rural center (roughly equivalent to a village) where the branch is situated. It also provides the year in which each bank branch got established among many other indicators.

exhaustive list of branches of commercial banks in the country, Population Census[12] 2011 and GIS-shape files[13] for boundary of Indian villages/towns—we compute this metric as follows.[14]

First, we matched RBI Bank Directory with Population Census to uniquely identify the villages/towns where each bank branch is present. We could match 1,51,104 out of 154,505 bank branches with 45,911 unique villages and towns, which gives us a match rate of 97.4% between two datasets. Villages which remain un-merged with RBI data are termed as un-banked villages. There were nearly 6,03,084 unbanked villages as on October 31, 2019.

Next, we incorporate GIS location of each banked and unbanked village in the dataset. We use this to compute the straight-line distance between centroid of un-banked villages to the centroid of the banked villages/towns using the user-written command *geonear* in STATA which identifies the nearest neighbour using geodetic distances (Picard, 2010). As the RBI directory specifies the date of opening of each bank branch establishment, we are able to compute this distance for each year from 1951-2019.

Appendix A1 describes in more detail how this measure was constructed, and what its limitations are. Using this measure, we find a significant improvement in bank access in rural areas, as the average computed distance has declined from 43.5kms in 1951 to 5kms in 2013 and further declined to 4.2kms in 2019. How much does this straight-line distance deviates from actual travel distance? Several studies in the field of health services find high correlation between these two types of measures of proximity across different contexts - in Yemen (Al-Taiar et al., 2010); in US census tracts (Boscoe, Henry and Zdeb, 2012) and in Montreal (Apparacio et al., 2008). Few exceptions are found in difficult terrain such as a shoreline, mountainous regions and other physical barriers (Leyshon et al, 2018). To further mitigate this concern, we computed travel distance

[12] Population Census is a decennial count of the population and its various characteristics. It is conducted by Ministry of Home Affairs, Govt. of India. It provides demographic and socioeconomic composition of the population, local amenities in rural and urban areas, among other indicators.

[13] The spatial data we use is the GIS shape files which provides us the location of each village in terms of latitude and longitudes of the boundary of each village. This data is obtained from the research team at the World Bank. These GIS shape files are compatible with Population Census 2011 (henceforth, PC 2011).

[14] The population census 2001 and 2011 also record whether a village has a bank or not, and if not, the distance to the nearest branch is recorded. However, the distance is measured in coarse intervals of 5 km such as 0-5km, 5-10km, and so on, which make it susceptible to biased responses and heaping effects (Holbrook et al. 2014).

between banked and un-banked villages for the state of Maharashtra, Punjab and Haryana for the year of 2021.[15] The mean and median travel distance was 5.64kms and 4.79kms respectively for villages with straight line distance from 0-5kms. While for villages with a straight-line distance above 5kms, the mean and median travel distance were 14.8kms and 10.84kms respectively. Therefore, what we consider more proximate to a banked center using straight line distance is also proximate by travel distance.

Other economic and social indicators

We include village level availability of roads, cooperative bank, agricultural credit society, post office, literacy rate, population size, availability of electricity for commercial purpose, distance to town. All these indicators are obtained from the Population Census of 2001 and 2011. Appendix A3 provides the list of all the variables.

4. Methodology

Identifying the impact of bank branches on rural economic activity in India is challenging. First, as explained above, RBI introduced several policies which may have collectively led to a significant expansion of bank branches. Importantly, unlike during social banking period, banks had more control in branch placement after 2005. Thus, endogeneity of bank branch location due to unobservable village factors poses a concern. Further, Indian rural economy experienced substantial changes in the period between 2005 and 2013, such as employment guarantee program, rural road construction etc. Such macro factors may also confound with economic activity.

To address unobservable village and macro factors, we use a difference-in-difference research design for our study. We construct the following treatment and control groups:

1. Control Group: This group consists of those unbanked villages which remained more than 5kms away from a banked centre in all years of study i.e., up to 2013. There are 187,814 such villages.

[15] The travel distance is calculated using *georoute* directory in STATA. It uses the background map API information from the website of https://developer.here.com. Given that this code uses real time map service, it is not possible to compute the travel distance for the past years. Therefore, we compute it on real time basis in August 2021.

2. Treatment Group: These unbanked villages were more than 5kms away from a banked centre up to 2005, but a new branch was opened within 5kms between 2006 and 2013. This group comprises of 74,444 villages.

In addition, there is a third group of 274,009 villages which had a bank branch within 5kms even before 2005. We do not include these villages in our analysis.

In Table 3, we present the distance measure. The average distance to the nearest banked-center for treated and control villages in 1998 were 8.45kms and 9.81kms, respectively. This distance metric remains nearly unchanged in 2005. By 2013, we observe a substantial improvement in proximity to banked-centers for treated villages with average distance declines to 3.25kms whereas control group villages still remain, on average, 8.43kms away from the nearest banked center. This indicates the strength of the treatment that proximate villages received.

We use the following specification:

$$y_{vt} = \alpha.Treated_v + \beta.Post - Treatment_t + \gamma.Treated_v * Post - Treatment_t + \varepsilon_{vt}$$

where, $Treated_v$ takes value 1 for villages which received treatment and 0 otherwise, $Post - Treatment_t$ is 1 for year 2013 and 0 prior to that. The coefficient, γ, on the interaction term measures the ATE on y_{vt} after bank branch becomes proximate. Given that we observe the outcome by gender, a higher ATE for female economic activity (entrepreneurship and employment) vis-à-vis male counterpart would indicate a decline in gender gap in that economic activity.

With this specification, we can control for unobservable village-level and year-level factors. The latter controls for confounding macro-economic changes in rural economy, while the former addresses time-constant village-level factors which could influence endogenous placement of bank branches.

Concerns for Identification

Admittedly, placement of bank branches is not entirely exogenous. While our specification can control for unobservable village-level fixed effects, time-varying

village-level factors may still bias our results if such factors influenced placement of bank branches. For example, banks might go to areas which were already growing faster. Alternatively, bank branch placement could be endogenous to concurrent village-level infrastructure such as paved roads or electricity, presence of close substitute of a commercial bank, socio-demographic characteristics such as literacy or population. These confounding factors can bias our estimates. To address these, we will conduct several robustness checks, such as testing for parallel pre-trends and testing for concurrent factors.

5. Results

a) Gender-wise Entrepreneurship and Employment

The expansion of banking services is likely to create a multiplier effect on economic activity. For example, access to credit or saving instruments may increase local purchasing power creating demand for goods and services, and thus, spurring economic activity.

For our first measure of economic activity, we use the number of female- and male-owned enterprises as dependent variables. Results are presented in Table 4A. The ATE for female-owned enterprises in column 1 is 0.562 with a standard error of 0.121. On adding village and year fixed effects in column 3, ATE rises to 0.592 and remains significant at 1% level. This impact is nearly 25.7% (0.592/2.3) of the pre-treatment mean of this indicator. The corresponding ATE for male-owned enterprises is positive but insignificant across specifications (columns 4-6).

Figures 3A and 3B visually depict the trends in treatment and control villages. Prior to the treatment, the trends for female-owned enterprises coincide and run parallel. Post-2005, we observe a steeper growth in female entrepreneurship in treated villages. For male-owned enterprises, we observe a notable difference across control and treated villages pre-2005. After 2005, there is a substantial increase in the level for this variable; however, the increase in treated group runs parallel to the control group and trends remain indistinguishable.

Next, we study the impact on female and male employment. Results are presented in Table 4B. After controlling for village and year fixed effects, the impact on female employment is 4.52, significant at 1% level. Therefore, a village experiences an increase of 4.5 female workers after access to a bank branch improves. Figure 4A graphically reports this impact where the size of female labour has increased in both groups of villages post-treatment, but the increase is steeper in treated villages. We do not find a statistically significant result for male employment. Though the coefficient is 2.46, it is insignificant.

As bank branch becomes proximate, more women become entrepreneurs as well as workers. Men, on the other hand, do not experience a significant change in either entrepreneurship or employment. What explains this differential response across genders? In rural India, women are less mobile in searching for economic opportunities, whereas men migrate to such opportunities (Mazumdar and Agnihotri, 2013). Women are also less likely to receive a loan (Chaudhuri, Sasidharan, and Raj, 2020). Thus, economic activity generated due to a more proximate financial access point is more likely to benefit the excluded section. Conversely, financial inclusion schemes targeted specifically toward women may yield a higher marginal impact. This result bodes well for the proponents of financial inclusion schemes and more generally, for traditional perspective on gender gap which suggests that providing access to adequate opportunities can eliminate gender gap (Boserup, 1970).

b) Sectoral Disaggregation of Gender-wise Entrepreneurship and Employment

A vast literature has recorded the role of financial sector in structural transformation of the economy. However, gender-wise variation of this transformation is relatively less well explored. In this section, we explore women's economic activity across agriculture and non-agriculture sectors, compared to men's activity.

Results show that bank proximity does not influence number of female enterprises in agricultural sector (Table 5A). In column 1, the coefficient on the interaction term is 0.002 with a standard error of 0.081. The results remain statistically insignificant with village fixed effects (Column 2) and village and year fixed effects (Column 3). The level and trend of this variable across two groups are indistinguishable post-treatment

(Figure 3C). For male enterprises, we observe a significant decline of 0.986 units in treated villages (Table 5A, Column 6). Figure 3D shows positive increase in both treated and control groups. However, the increase in treated group is lesser.

In Table 6A, we present treatment effects for non-agricultural enterprises. Female enterprises increase by 0.539 units after the treatment. This effect remains significant after including village fixed effects and year fixed effects and it is nearly 42.4% (0.539/1.27) as a share of the average. Male enterprises increase by 1.054 units in the treated villages. Figure 3E and 3F visually show the trends. For both indicators, the curve for treated villages becomes steeper after treatment, indicating the impact of proximity to a bank branch.

Labour markets reflect the overall changes in entrepreneurship. The proximity to a banked-center reduces the increase in female and male employment in agricultural enterprises by -1.096 and -1.211 respectively, both of which are significant at 1%. (Table 5B). It can be visually seen in figures 4C and 4D. In non-agricultural enterprises, we observe a significant increase of 5.57 and 4.38 for female and male employment respectively in a treated village post-treatment (Table 6B). Both the coefficients are significant at 1% level of significance after controlling for village and time fixed effects.

Banking and financial sector aids in structural transformation and occupational choices (Banerjee and Newman, 1993). However, gender plays a pivotal role in this relationship between financial and real side of the economy.

First, the nature of structural transformation varies for men and women. Increase in female entrepreneurship is fully driven by expansion in non-agricultural sector whereas men-owned enterprises shift away from agriculture and move toward non-agriculture. Thus, structural transformation for male entrepreneurship is qualitatively stronger.

Second, not only the nature, but magnitude of transformation varies as well. In the non-agricultural sector, male and female enterprises increase significantly. But this increase is higher for males. In agriculture, male entrepreneurs exit more than women. Women face several barriers, other than financial access, which may explain this distinction. Social norms may make women's occupational choices less elastic (Morrisson and

Jutting, 2005). Lower sector-specific human capital may also restrict women from entering more productive sectors (Aterido, Beck and Iacovone, 2013). Behaviorally, men may be less risk averse in exiting agriculture and entering more productive sectors. Langowitz and Minniti (2007) show that the subjective self-perception may account for the gender gap in entrepreneurial activity as women consider themselves in the entrepreneurial activity in less favorable light then men. Though women's presence in non-agricultural sector increases, presence of these factors may be inhibiting what could have been an even larger structural transformation. Benchmarking the impact of other factors against the impact of financial access may be an interesting area of further exploration.

Third, we find a stronger shift in labour market than entrepreneurship —men as well as women workers exit agriculture sector and enter non-agriculture sector. Interestingly, male workers exit more implying a decline in gender gap. In non-agricultural sector, women workforce experiences a larger change—nearly 5.5 additional women become employed in non-agricultural enterprises for 4.5 men in a treated village. This suggests an amelioration of gender gap in non-agricultural employment as well. Note that in agriculture sector, while we do not find any impact on women entrepreneurship, women employment reduces significantly with respect to the control villages. This indicates that it may be easier to switch labour supply than switching a self-employed occupation (i.e., an enterprise).

5.1 Mechanisms: Impact on credit uptake

Proximity to a financial service point such as banks can create economic impact through two main channels. Firstly, availability of venue for formal savings for excluded population may alleviate poverty (Burgess and Pande, 2005). Secondly, proximity between banks and borrowers reduces information asymmetry and, thus, increases lending (Rajan and Peterson, 1994).

We cannot test the deposit channel in our paper as our data does not tell us household saving behavior. However, given the major source of finance of each enterprise, we are able to test the second channel. As mention earlier, we consider finance from SHGs under non-institutional sources of finance.

a) Borrowing from Institutional Sources

Table 7A presents the ATE for number of female and male-owned enterprises that report institutional finance as major source of finance. We do not find any significant impact for either female or male enterprises in treated villages. The results hold when we control for village and time fixed effects.

In figures 5A and 5B, we graphically illustrate the time trends for this outcome variable in control and treated villages. Prior to 2005, the trends and level of this indicator for female-owned enterprises appear to be different. Post-treatment, it increases more in treated villages, however, the increase is not significantly different from that in control villages. Figure 5B shows peculiar results for the male-owned enterprises. While the indicator was increasing pre-treatment and the trends between treated and control villages also appear parallel, it declines after the treatment. A closer look at the figure shows that the decline is slightly lower in treated group, however not statistically different from the control group. Therefore, the interaction term has a positive coefficient of small magnitude but insignificant.

b) Borrowing from Non-Institutional Sources

Credit uptake from institutional sources remains muted in the treated village. What about other sources of credit such as informal moneylenders? Rural India has a higher reliance on non-institutional sources of credit. Ghosh and Vinod (2017) report that female headed households are less inclined to access formal finance and more inclined towards informal finance. With pooled data of 4 rounds of NSSO (1983, 1987-88, 1993-94, and 1999-2000) for 16 states, Menon and Rodgers (2011) find that the indebted households are three times as likely to have obtained their loan from an informal source as from a formal source. To test the impact of the treatment on borrowing from non-institutional sources, we use the number of female- and male-owned enterprises availing loans from money lenders or SHGs as outcome variables.

The coefficient on the interaction term is positive and significant for both female and male enterprises (Table 7B). Column 1 shows that proximity to a banked-center increases the number of female-owned enterprises with non-institutional finance (major

source) by 0.055 in a treated village. The effect increases slightly to 0.062 after controlling for village and year fixed effects (Columns 2 and 3). Figure 5C indicates that the pre-trends for this variable were slightly diverging but the effect is stronger in treated villages post-treatment.

For males, we observe persistence in uptake of non-institutional finance. Figure 5D shows that trend of this indicator appears parallel between treated and control group pre-treatment. They diverge and portray a decreasing trend post-treatment with a lesser decline in treated villages. This shows that the number of male enterprises with non-institutional credit have declined in treated villages, but not as much as in control villages. Table 7B reports the results of the model. The coefficient on the interaction is 0.081 (Table 7B, Column 6) upon including village and year fixed effects and remains significant at 1% level

Why do we observe an increase in non-institutional credit after improved proximity of a bank branch but not institutional credit even though the latter arises out of commercial banking sector? Evidence on the role of informal lenders as intermediaries between formal sources and borrowers may provide an explanation. Bell (1990) documents how wealthy suppliers in rural India borrow from banks and lend further. Moneylenders may have certain advantages over institutional sources such as banks. They possess relatively more accurate information about the creditworthiness of the local people. Moreover, money-lenders, compared to individual borrowers, are expected to have larger borrowing requirements and therefore, may turn out to be viable customers of a bank. Recently, Surendra (2020) recorded high dependence of moneylenders on banks which increases following high demand of credit from households during weather-induced shocks. Therefore, lending by informal channels may increase after presence of a bank branch in the vicinity, as the wealthier individuals borrow from banks in exchange of collateral, and offer to poorer households in the village at a higher rate.

5.2 Aggregate Average Treatment Effect of a Banked Center

The D-I-D coefficients in tables 4-6 are the treatment effects on one un-banked village due to establishment of at least one bank branch within 5km of that village. However, one branch can serve multiple villages. On average, there are 9.04 villages within 5km of

a banked center, and the median value is 6 (Table 8A). In other words, to cover 9.04 unbanked villages with a bank within 5kms, we need 1 banked-center on an average. Areas where the size of villages is small, one banked-center can cover as many as 75 un-banked villages. A bank, thus, can impact several villages at the same time. Using the average, we compute the aggregate average treatment effect in a neighborhood of 5kms of a banked-center in Table 8B as follows:

Aggregate average treatment effect = γ* average coverage of a banked center[16].

One banked-center expands the non-agriculture sector as 9.52 new male-owned enterprises are generated and number of agricultural enterprises slows nearly by 8.91 units. Given the higher output and employment multipliers of non-agricultural sector in India, this is likely to be a net gain. Similarly, 4.87 more female-owned enterprises are established in non-agricultural sector due to a bank branch entry. Although small in absolute value, the relative impact is much higher due to the lower average value of this indicator (Table 2). Female-ownership will also create substantial social impact.

The female and male employment show a slower increase in agricultural sector where the aggregate ATE is of similar magnitude at -9.908 and -10.93 respectively. However, the gain in feme and male employment of non-agriculture sector is much larger at 50.35 and 39.59 persons respectively. This shows that financial development brings transformation in labour market and in its gender-wise composition as well.

6. Robustness Checks

In this section, we provide various tests which address unobserved time-varying village factors. We also conduct some additional robustness checks.

a) Parallel Pre-Trends

Identification in D-I-D method requires the control group to serve as a counterfactual for the trend in treated group without the treatment. While this assumption remains untested, we conduct a parallel pre-trend test—whether the treated and control group

[16] We provide Aggregate Average Treatment Effect for all our dependant variables except for number of female enterprises with informal finance since the pre-trends for the treatment and control group were not parallel for this variable, and the ATE is, thus, biased.

villages moved parallel before the treatment. An absence of parallel pre-trends (or more importantly, diverging trends) would suggest that some pre-treatment unobservable factors were already affecting the outcome indicators of treated and control groups, weakening the argument for the effect of treatment.

Figures 3-5 illustrate the pre-trends visually. To test it empirically, we use the following empirical model on pre-treatment observations:

$$y_{vt} = \varphi_v + \sum \varphi_t + \sum \rho_t . \varphi_t . (Treated_v) + \varepsilon_{vt}$$

where, φ_v are village fixed effects. φ_t takes value 1 for each pre-treatment period and 0 otherwise. ρ_t measures the change in trend between the two groups of villages in year t compared to the base year[17]. An insignificant coefficient of the interaction term would indicate that the trends were not significantly different pre-treatment between treated and control villages.

Table 9 shows the results of the above test for overall female and male-owned enterprises (columns 1 and 2), in agricultural sector (columns 3 and 4) and in non-agricultural sector (columns 5 and 6). All outcome variables exhibit parallel pre-trends except for male-owned enterprises in agricultural sector. Noticeably, this indicator was on a steeper trajectory in treated villages, pre-treatment, which decelerates post-treatment. Thus, our estimate of ATE for this variable is an upper bound. In other words, bank branch proximity may have led to even slower growth in number of male-owned enterprises in agricultural sector than what we have estimated in Table 3.

Table 10 shows the results for employment indicators. The results confirm parallel pre-trends for male and female employment in non-agricultural enterprises as the interaction coefficient is insignificant. Employment in agricultural sector appears to diverge pre-treatment. However, the bias introduced due to diverging trend runs counter to our estimated treatment effect in Table 5B. Hence, the ATEs measured in columns 3 and 6 in Table 5B serve an upper bound, whereas the true treatment effect

[17] It should be noted that for employment variables, we have three pre-treatment periods (EC 1990, EC 1998 and EC 2005) but for the remaining variables pre-treatment observations are from EC 1998 and EC 2005.

may be further lower. In other words, the actual contribution of proximity to banks in shifting employment from agricultural to non-agricultural enterprises may be stronger.

Finally, Table 11 shows results for credit indicators. The parallel pre-trend assumption is met for institutional finance for both male and female-owned enterprises. For non-institutional finance, while the male-owned enterprises exhibit parallel pre-trend, we observe weak divergence (significant at 10%) for female-owned enterprises. It indicates that our result of post-treatment increase for the latter is biased upwards as the demand for non-institutional finance was increasing at higher rate in the pre-treatment period itself.

It is notable that finding evidence of parallel pre-trends does not rule out the mechanism of savings that may occur after a bank is established. Lack of available data does not allow us to test this channel.

b) Potential Concurrent Factors

Kahn-Lang and Lang (2018) argue that the failure to reject diverging trends is neither sufficient nor necessary to establish treatment effects. For example, alternative village-year effects which are correlated with presence of a bank branch may also improve economic activity or credit uptake. In such a case, the treatment effect could be biased upwards.

To address these concerns, we compare our treated and control villages across key variables before and after treatment. We include infrastructure variables (presence of paved roads, power for commercial use), other financial agencies (post offices, cooperative banks, and agricultural credit societies) and socio-economic variables (population, literacy and distance to towns). If our treated and control villages are diverging on these variables, then our treatment effect may be biased.[18]

Figure 6A-E (Appendix A2) plot the proportion of infrastructure indicators and other financial agencies in our treated and control group between 2001 and 2011. For none of

[18] Ideally, such variables should be included as controls in our main specification. However, we obtain these variables from Population Census 2001 and 2011 which are temporally not aligned with our Economic Censuses conducted in 1990, 1998, 2005 and 2013.

these factors, the trend for treated villages is diverging from control villages. Moreover, the differences on presence of roads and agricultural credit society have converged between 2001 and 2011. We test this more rigorously using the following specification:

$$I_{vt} = \alpha.Treated_v + \beta.Post - Treatment_t + \gamma.Treated_v * Post - Treatment_t + \varepsilon_{vt}$$

where, I_{vt} is an indicator which takes value 1 if village v had an infrastructure in year t, where t is either 2001 or 2011, and 0, otherwise. Table 12 shows the results. The interaction term in any of the columns is either insignificantly different from zero or significantly negative. The latter indicates that the respective village amenity is converging between two sets of villages over two points of time. Thus, our treatment effect is not biased by these variables.

On the contrary, the level and growth of socio-economic indicators such as literacy rate, size of population, and distance to town were significantly different between treated and control villages over 2001 and 2011. These variables, indicating higher economic potential, could bias our results. To address this, we re-estimate our results by including interactions of pre-treatment levels of these variables with time trends as suggested by Wing et. al. (2018).[19] These indicators proxy for the pre-treatment economic potential of a village. If the significance of ATE survives after inclusion of differential time trends, then the treatment effect is less likely to be biased by pre-treatment trajectory of economic potential of the village (Wing et. al. 2018). We use the following model:

$$y_{vt} = \gamma.Treated_v * Post - Treatment_t + Z_{v2001} * TT + \varphi_v + \varphi_t + \varepsilon_{vt}$$

where, Z_{v2001} is a set of village characteristics from 2001, which include population of the village, literacy rate and distance to the nearest town. We test if γ, coefficient on the interaction term, remains significant after inclusion of these time trends. Table 13-15 report the coefficient on the interaction term. Our results remain consistent with our baseline specifications from corresponding Tables 4-6. Results on institutional and non-

[19] Ideally, we would have wanted to include these variables as controls in our estimation equation. However, these data are available only for 2001 and 2011 population census rounds, making it difficult to use as controls for variables which are available for 1998, 2005 and 2013.

institutional credit also follow a similar pattern as observed in the baseline model. Thus, our average treatment effects are not solely driven by a differential trajectory of villages with higher pre-treatment levels of economic potential; an improved proximity to a bank branch provides an impetus.

c) Addressing lending by SHGs

As previously discussed, SHGs were not recorded explicitly as a source of credit in Economic Census rounds prior to 2013 even though SHG lending has been prevalent since early 1990s. For uniform comparison across all years, we have clubbed SHGs with non-institutional source in 2013. However, it may be incorrect if interviewers recorded SHGs as an institutional source in prior rounds. This concern is pertinent since SHGs themselves rely on commercial banks for credit.

To address this issue, we test our results on credit uptake after excluding states with an above average share of SHG lending as per EC 2013.[20] Table 16 provide the results for the remaining states. We still observe a positive impact on both female and male onwed-enterprises with non-institutional finance. The ATE for the former is 0.0715 with a standard error of 0.026, significant at 1% and the corresponding coefficient for the latter is 0.101, significant at 10%. For instititional finance, we find negative and insignificant coefficients on both female and male-owned enterprises.

7. Conclusion

Lack of financial access acts as one of the major hinderances in economic gains of women (Raghuvanshi, Agarwal and Ghosh 2017; Kairiza et al. 2017, Panda 2018, and Chaudhuri, Sasidharan, and Raj 2020). Proximate bank branch could, thus, benefit women more. How much, then, does improved financial access impact women's entrepreneurship and employment? RBI's policy of branch expansion and removal of Service Area Approach led to penetration of branches in all areas in general, and in semi-urban and rural areas in particular after 2005. We used this expansion as a natural

[20] On average, 12% of enterprises across states receive majority of their finances from SHGs. States with below average share, and thus included in table 13, are Assam, Bihar, Chattisgarh, Dadra & Nagar Haveli, Daman & Diu, Goa, Gujarat, Jammu & Kashmir, Lakshadweep, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and West Bengal.

experiment to understand the gendered response in entrepreneurship and employment due to improved financial access.

We construct a novel panel dataset of enterprises and employment in Indian villages with their distance to the nearest banked-center. Improved proximity to financial services points attenuates the gender gap in entrepreneurship. Number of women entreprenuers increases with most of this increase occuring in non-agricultural sector. Overall entrepreneurship for men does not undergo significant changes but sectoral distribution reveals a shift from agriculture to non-agriculture. Labour markets largely reflect these changes—female and male employment in agricultural enteprises grows at a slower rate with a more-than-compensating increase in non-agricutural enterprises. We find evidence of higher enterprise credit uptake from non-institutional sources, such as moneylenders, which may be one of the driving mechanism of our results.

Our paper contributes to several academic and policy debates. First, segregating our results by gender provides several key takeaways to the vast literature on gender studies. There are two competing views in this literature. The traditional view holds that the improving access to public goods and infrastructure will eliminate gender gap (Boserup, 1970). The modern view considers that unless restrictive patriarchal norms are overcome, gender gap will persist (Marchand and Parapart, 1995). An improvement in overall entrepreneurship and employment for women, vis-à-vis men, due to financial infrastructure weighs in favor of the traditional view. However, we cannot rule out the latter view either. Entrepreneurship of women in the non-agricultural sector does not increase by the same amount as that for men. Social norms may be disallowing what could have been an even larger structural transformation.

The benefits of financial inclusion are well recorded now. To yield these benefits, some argue for supply-side intervention such as banking access (Rajan and Zingales, 1998; Bruhn and Love, 2011, 2014) but others consider lack of preference for formal credit as an obstacle (Kochar, 2005; and Kumar, Pal and Pal 2019). Our paper adds nuance to these views. Financial infrastructure improves women's economic activity and aids transition in villages from agricultural to non-agricultural sector supporting the supply-side argument. Yet, we find no evidence of formal credit uptake. In contrast, the

informal lenders may be mediating credit by borrowing from nearby banks and lending onwards. Thus, while banking access is important, it needs to be coupled with smoother intermediation of credit.

The differential impact on institutional and non-institutional credit provides more policy-relevant insights. Government agencies strive to remove informal moneylenders in rural credit markets but several reasons, such as information advantage, flexible loan provision, lesser documentation requirement, social hesitancy of borrowers to access modern banking services, etc., may make these efforts untenable. Banks should attempt to overcome these barriers and spread more financial literacy and awareness among masses.

Our paper also suggests new areas of research. We do not observe saving behavior, scale and cost of credit, collateral offered, etc. These can be potential areas where gender discrimination is exercised. Additionally, higher economic well-being is a means to achieve the end of social well-being. What has been the impact of higher female entrepreneurship on intra-household bargaining, poverty rates, vulnerability to exogenous shocks, and social ills? Given that our indicator of financial access goes back till 1950, it can be used to study other village-level outcomes. We leave this for future work. Finally, our study highlights the need to analyze the substitution patterns between borrowing from informal lenders, SHGs and formal credit.

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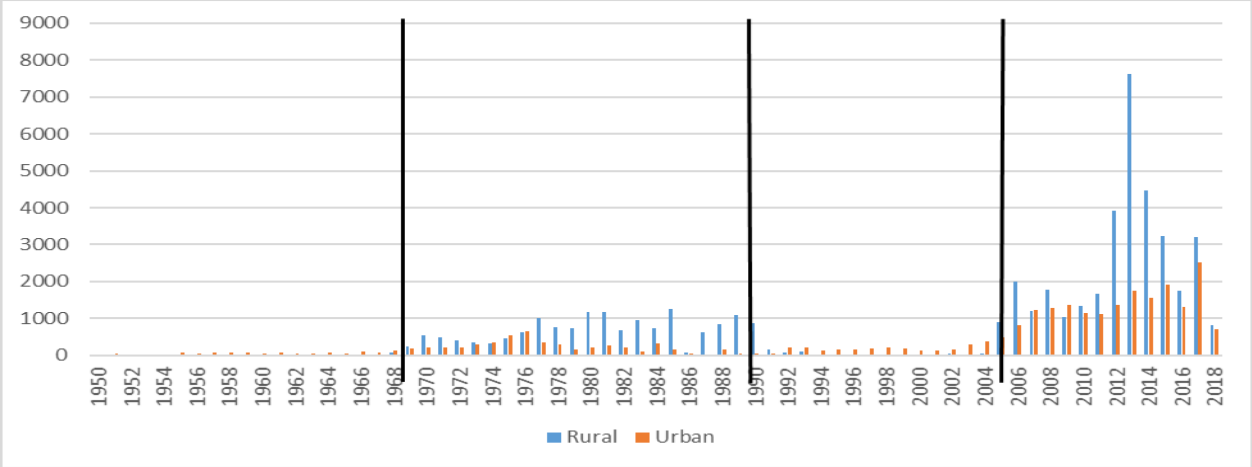
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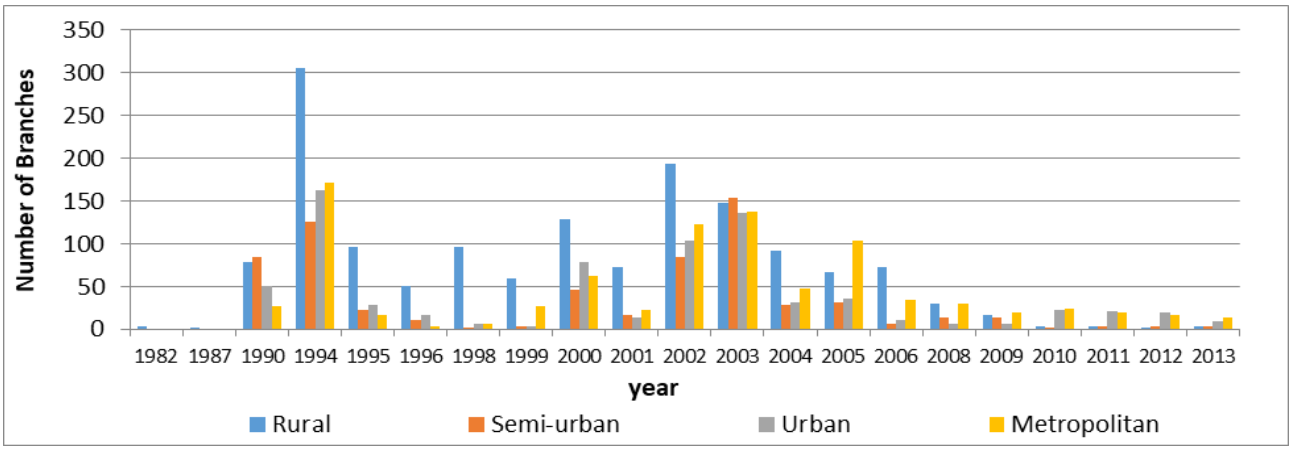
Figures

Figure 1: Number of New Branches Opened Each Year in Rural and Urban Areas: 1950-2019



Data Source: RBI Commercial Bank Directory as on October 2019.

Figure 2: The Size of Branch Closure/Merger/Conversion: All India Level



Data Source: Data obtained from RBI Branch Banking Statistics of various years.

Figure 3: Impact on Number of Enterprises: by Gender-wise Ownership

Figure 3A: Number of female-owned enterprises

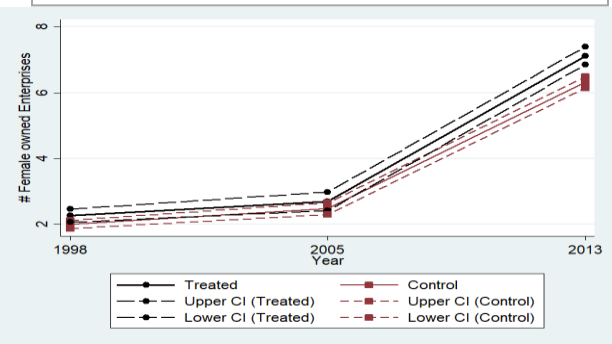


Figure 3B: Number of male-owned enterprises

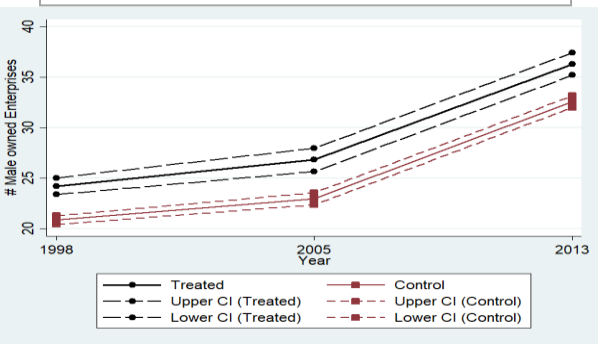


Figure 3C: Number of female-owned agricultural enterprises

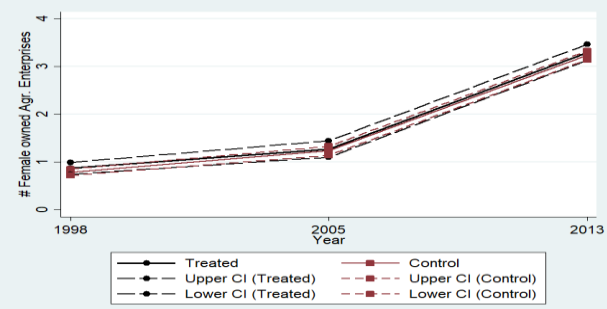


Figure 3D: Number of male-owned agricultural enterprises

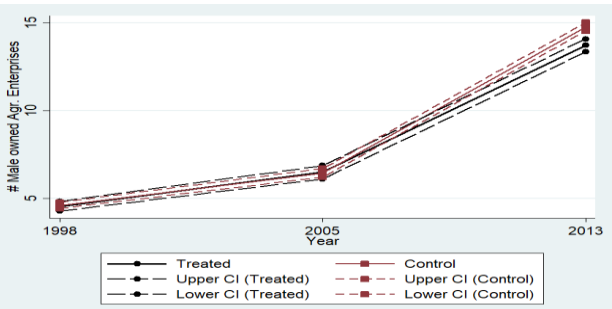


Figure 3E: Number of female owned non-agricultural enterprises

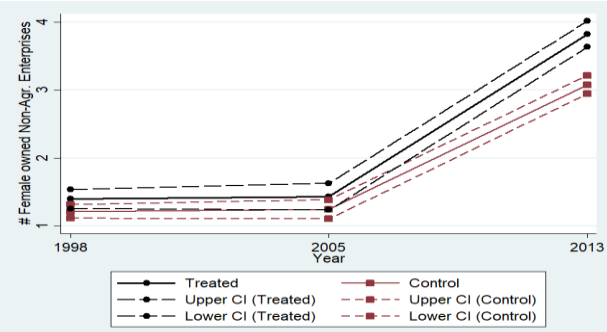
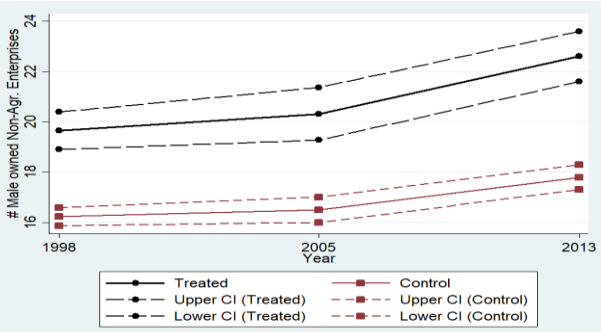


Figure 3F: Number of male owned non-agricultural enterprises



Notes: (i) This figure plots the comparison of economic activity indicators defined as number of female and male-owned total, agricultural and non-agricultural enterprises between treated and control villages. (ii) The treated villages are those un-banked villages which received a bank branch within 5kms between 2005 and 2013. (iii) Data Source: Enterprise level data is obtained from three rounds of Economic census - 1998, 2005, and 2013, and combined in to a panel using SHURG Ids; data on financial access is derived using spatial data, PC 2011 and RBI commercial bank directory.

Figure 4: Impact on Gender-wise Employment

Figure 4A: Number of female workers in all Enterprises

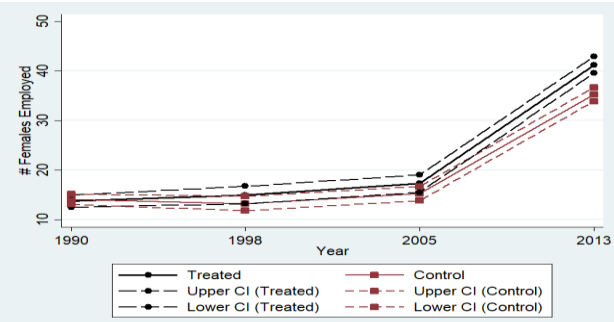


Figure 4B: Number of male workers in all Enterprises

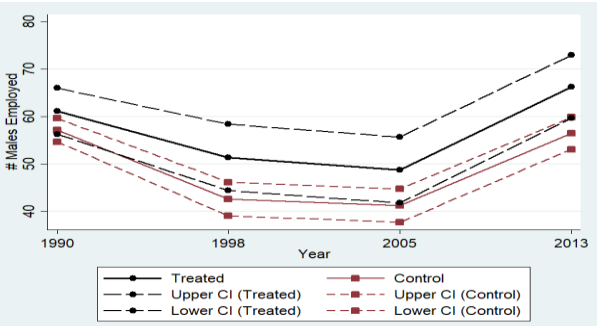


Figure 4C: Number of female workers in Agricultural Enterprises

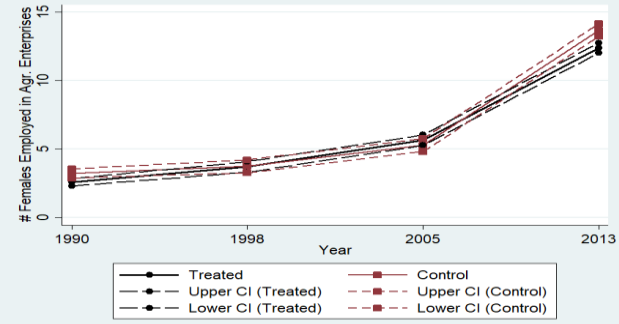


Figure 4D: Number of male workers in Agricultural Enterprises

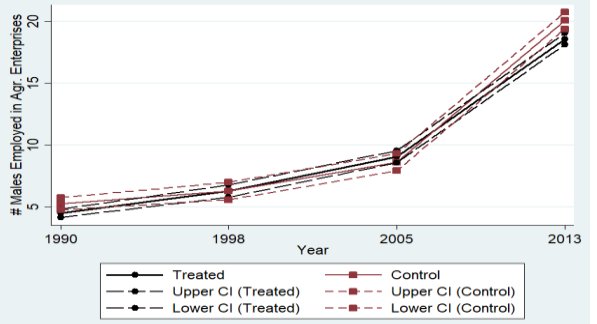


Figure 4E: Number of female workers in Non-Agricultural Enterprises

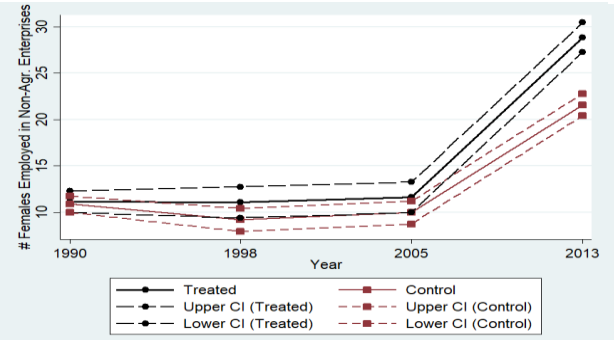
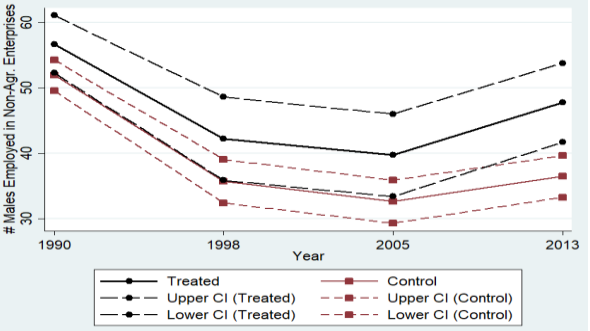


Figure 4F: Number of male workers in Non-Agricultural Enterprises



Notes: (i) This figure plots the comparison of number of female and male employed in all, agricultural and non-agricultural enterprises between treated and control villages. (ii) Data Source: Enterprise level data is obtained from four rounds of Economic census – 1990, 1998, 2005, and 2013.

Figure 5: Impact on Uptake of credit (Major Source of Finance)

Figure 5A: Number of female owned enterprises with institutional finance

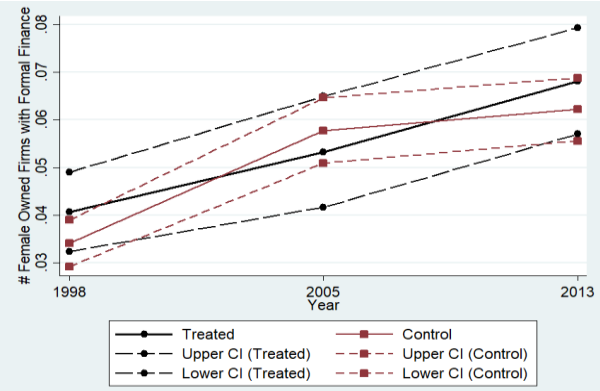


Figure 5B: Number of male owned enterprises with institutional finance

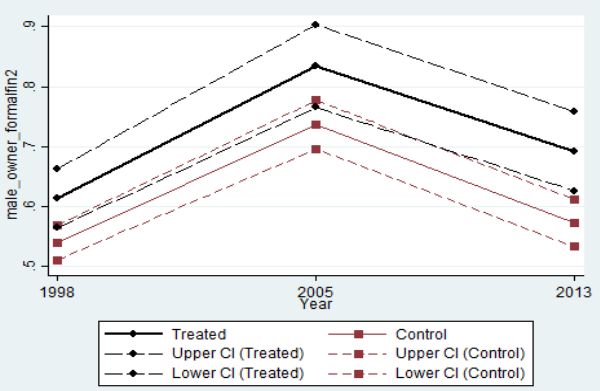


Figure 5C: Number of female owned enterprises with non-institutional finance

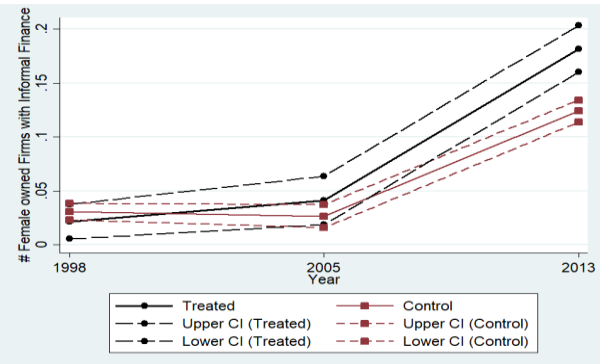
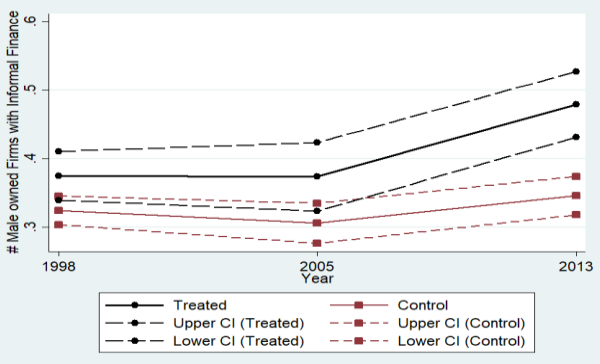


Figure 5D: Number of male owned enterprises with non-institutional finance



Notes: (i) This figure plots the comparison of number of female and male enterprises with their major source of finance between treated and control villages. (ii), (iii) Same as Figure 3.

Tables

Table 1: Summary Statistics

	1998	2005	2013	1998	2005	2013
	Female-owned enterprises			Male-owned enterprises		
Panel A						
# Enterprises	2.06	2.53	6.53	21.71	23.97	33.59
# Agri. Enterprises	0.80	1.24	3.25	4.59	6.47	14.51
# Non-Agri. Enterprises	1.25	1.29	3.28	17.12	17.50	19.08
Panel B						
# with Inst. Finance	0.035	0.056	0.063	0.559	0.762	0.604
# with Non-Inst. Finance	0.02	0.03	0.139	0.337	0.32	0.38

Data Source: Economic census rounds of 1998, 2005, and 2013.

Table 2: Summary Statistics: Employment Indicators

	1990	1998	2005	2013	1990	1998	2005	2013
	Female Employment				Male Employment			
# Employed	13.99	13.69	15.79	36.88	58.28	44.91	43.2	59.12
# Employed in Agriculture	3.03	3.72	5.38	13.34	5.07	6.31	8.74	19.65
# Employed in Non-Agricultural	10.95	9.68	10.41	23.5	53.21	37.4	34.45	39.4

Data Source: Economic census rounds of 1990, 1998, 2005, and 2013.

Table 3: Mean Distance of un-banked villages to the Nearest Banked Center (kms)

	1998	2005	2013
Treated	8.45	8.3	3.23
Control	9.81	9.84	8.42

Data Source: The financial access is derived using spatial data, PC 2011 and RBI commercial bank directory.

Table 4A: Impact on All Enterprises: Gender-wise Ownership

	Number of Female-owned Enterprises			Number of Male-owned Enterprises		
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	0.244***			3.613***		
	(0.091)			(0.398)		
Post-2005 dummy	4.075***	4.552***		10.669***	13.427***	
	(0.065)	(0.086)		(0.195)	(0.256)	
Treated*Post-2005	0.562***	0.593***	0.592***	0.132	0.070	0.068
	(0.121)	(0.161)	(0.161)	(0.422)	(0.549)	(0.549)
Mean	2.3			22.8		
Observations	6,85,575			6,85,575		
Fixed Effects	No	Village FE	Village and Year FE	No	Village FE	Village and Year FE

Notes: (i) The outcome variable is the number of female- and male-owned all enterprises. (ii) Following Bertrand et al (2004), standard errors are corrected for heteroscedasticity within villages. (iii) Standard errors are provided in parenthesis. (iv) */**/*** denote significance at 10/5/1% levels respectively. (v) Data Source: Same as Figure 3.

Table 4B. Impact on Gender-wise Employment in All Enterprises

	Number of Females Employed in all Enterprises			Number of Males Employed in all Enterprises		
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	1.078***			6.906***		
	(0.525)			(1.929)		
Post-2005 dummy	21.07***	22.55***		9.47***	13.08***	
	(0.160)	(0.524)		(0.894)	(1.042)	
Treated*Post-2005	4.888***	4.501***	4.52***	2.897	2.155	2.465
	(0.755)	(0.960)	(0.963)	(1.985)	(2.401)	(2.404)
Mean	14.5			48.8		
Observations	905,720			905,720		
Fixed Effects	No	Village FE	Village and Year FE	No	Village FE	Village and Year FE

Notes: (i) The outcome variable is the number of females and males employed in all enterprises. (ii) Following Bertrand et al (2004), standard errors are corrected for heteroscedasticity within villages. (iii) Standard errors are provided in parenthesis. (iv) */**/*** denote significance at 10/5/1% levels respectively. (v) Data Source: Enterprise level data is obtained from four rounds of Economic census – 1990, 1998, 2005, and 2013.

Table 5A: Impact on Agricultural Enterprises: Gender-wise Ownership

	Number of Female-owned Ent. in Ag Sector			Number of Male-owned Ent. in Ag. Sector		
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	0.059			-0.011		
	(0.051)			(0.103)		
Post-2005 dummy	2.222***	2.459***		9.237***	10.752***	
	(0.041)	(0.055)		(0.097)	(0.141)	
Treated*Post-2005	0.002	0.054	0.053	-1.047***	-0.984***	-0.986***
	(0.081)	(0.110)	(0.110)	(0.172)	(0.251)	(0.251)
Mean	1.03			5.55		
Observations	6,85,575			6,85,575		
Fixed Effects	No	Village FE	Village and Year FE	No	Village FE	Village and Year FE

Notes: (i) The outcome variable is the number of female- and male-owned agricultural enterprises. (ii) Following Bertrand et al (2004), standard errors are corrected for heteroscedasticity within villages. (iii) Standard errors are provided in parenthesis. (iv) */**/*** denote significance at 10/5/1% levels respectively. (v) Data Source: Same as Figure 3.

Table 5B. Impact on Male/Female Employment in Agricultural Enterprises

	Number of Females Employed in Agricultural Enterprises			Number of Males Employed in Agricultural Enterprises		
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	-0.134			-0.155		
	(0.136)			(0.197)		
Post-2005 dummy	9.604***	10.269***		13.300***	14.506***	
	(0.160)	(0.202)		(0.214)	(0.265)	
Treated*Post-2005	-1.173***	-1.081***	-1.096***	-1.321***	-1.187***	-1.211***
	(0.227)	(0.289)	(0.291)	(0.290)	(0.369)	(0.372)
Mean	4.05			6.71		
Observations	905,720			905,720		
Fixed Effects	No	Village FE	Village and Year FE	No	Village FE	Village and Year FE

Notes: (i) The outcome variable is the number of females and males employed in agricultural enterprises. (ii) Following Bertrand et al (2004), standard errors are corrected for heteroscedasticity within villages. (iii) Standard errors are provided in parenthesis. (iv) */**/*** denote significance at 10/5/1% levels respectively. (v) Data Source: Enterprise level data is obtained from four rounds of Economic census – 1990, 1998, 2005, and 2013.

Table 6A: Impact on Non-Agricultural Enterprises: Gender-wise Ownership

	Number of Female-owned Ent. in Non-ag Sector			Number of Male-owned Ent. in Non-ag Sector		
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	0.185***			3.624***		
	(0.070)			(0.368)		
Post-2005 dummy	1.853***	2.094***		1.432***	2.676***	
	(0.047)	(0.062)		(0.160)	(0.204)	
Treated*Post-2005	0.560***	0.539***	0.539***	1.179***	1.055**	1.054**
	(0.082)	(0.108)	(0.108)	(0.370)	(0.469)	(0.469)
Mean	1.27			17.3		
Observations	6,85,575			6,85,575		
Fixed Effects	No	Village FE	Village and Year FE	No	Village FE	Village and Year FE

Notes: (i) The outcome variable is the number of female- and male-owned enterprises in non-agricultural sector. (ii) Following Bertrand et al (2004), standard errors are corrected for heteroscedasticity within villages. (iii) Standard errors are provided in parenthesis. (iv) */**/*** denote significance at 10/5/1% levels respectively. (v) Data Source: Same as Figure 3.

Table 6B. Impact on Male/Female Employment in Non-agricultural Enterprises

	Number of Females Employed in Non-agricultural Enterprises			Number of Males Employed in Non-agricultural Enterprises		
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	1.260***			6.330***		
	(0.475)			(1.766)		
Post-2005 dummy	11.571***	12.390***		-3.640***	-1.241	
	(0.365)	(0.448)		(0.835)	(0.968)	
Treated*Post-2005	6.014***	5.537***	5.577***	4.951***	4.043*	4.385**
	(0.692)	(0.883)	(0.886)	(1.817)	(2.214)	(2.209)
Mean	10.35			41.7		
Observations	905,720			905,720		
Fixed Effects	No	Village FE	Village and Year FE	No	Village FE	Village and Year FE

Notes: (i) The outcome variable is the number of females and males employed in non-agricultural enterprises. (ii) Following Bertrand et al (2004), standard errors are corrected for heteroscedasticity within villages. (iii) Standard errors are provided in parenthesis. (iv) */**/*** denote significance at 10/5/1% levels respectively. (v) Data Source: Enterprise level data is obtained from four rounds of Economic census – 1990, 1998, 2005, and 2013.

Table 7A: Impact on Number of Enterprises with Institutional Credit as Major Source of Finance

	Female Enterprises			Male Enterprises		
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	0.001			0.086***		
	(0.004)			(0.024)		
Post-2005 dummy	0.016***	0.019***		-0.068***	-0.034*	
	(0.003)	(0.004)		(0.015)	(0.020)	
Treated*Post-2005	0.005	0.005	0.005	0.034	0.020	0.020
	(0.006)	(0.008)	(0.008)	(0.029)	(0.038)	(0.038)
Mean	0.052			0.641		
Observations	6,85,575			6,85,575		
Fixed Effects	No	Village FE	Village and Year FE	No	Village FE	Village and Year FE

Table 7B: Impact on Number of Enterprises with Non-institutional Credit (Money lenders + SHGs) as Major Source of Finance

	Female Enterprises			Male Enterprises		
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	0.003			0.059***		
	(0.004)			(0.014)		
Post-2005 dummy	0.096***	0.109***		0.031***	0.055***	
	(0.005)	(0.008)		(0.011)	(0.016)	
Treated*Post-2005	0.055***	0.062***	0.062***	0.074***	0.081**	0.081**
	(0.012)	(0.018)	(0.018)	(0.024)	(0.033)	(0.033)
Mean	0.029			0.33		
Observations	6,85,575			6,85,575		
Fixed Effects	No	Village FE	Village and Year FE	No	Village FE	Village and Year FE

Notes: (i) In panel 1, the outcome variable is the number of female- and male-owned enterprises which reported formal finance as their major source of finance. (ii) In panel 2, the outcome variable is the number of female- and male-owned enterprises which reported non-institutional source (moneylenders and SHGs) as their major source of finance. (iii) Standard errors are provided in parenthesis. (iv) */**/*** denote significance at 10/5/1% levels respectively. (v) Data Source: Same as Figure 3.

Table-8A: Coverage of a bank branch: Number of Un-banked Villages Within 5km of a Banked Center in 2013

	Min	25th Percentile	Median	75th Percentile	Mean	Max
Number of villages within 5km of a banked center	1	3	6	12	9.04	75

Note: Computed by authors using the financial access indicator for each unbanked village in 2013.

Table-8B: Aggregate Average Treatment Effect

	Enterprises in agricultural sector		Enterprises in non-agricultural sector		Employment in agricultural enterprises		Employment in non-agricultural enterprises	
	#Female-owned	#Male-owned	#Female-owned	#Male-owned	Females	Males	Females	Males
γ^	0.053	-0.98***	0.53***	1.054***	-1.096**	-1.21**	5.57***	4.38**
Aggregate Average Treatment Effect within 5km of a bank branch*	0.47912	-8.91344	4.87256	9.52816	-9.90784	-10.9384	50.3528	39.5952

Notes: (i) ^- Average Treatment Effect obtained from Tables 3 – 4. (ii) * is defined as multiplication of mean coverage (9.04) by γ.

Table-9: Pre-Trends for Number of Enterprises: Gender-wise Ownership

	Total Enterprises		Agricultural Enterprises		Non-agricultural Enterprises	
	#Female-owned	#Male-owned	#Female-owned	#Male-owned	#Female-owned	#Male-owned
	(1)	(2)	(3)	(4)	(5)	(6)
Treated*(Year=2005)	0.011 (0.259)	1.33 (1.305)	-0.0231 (0.122)	0.359* (0.212)	0.034 (0.218)	0.978 (1.26)
Observations	4,29,720	4,29,720	4,29,720	4,29,720	4,29,720	4,29,720

Notes: (i) The outcome variable is the number of aggregate, agricultural, and non-agricultural enterprises. (ii) Standard errors are provided in parenthesis. (iii) */**/*** denote significance at 10/5/1% levels respectively.

Table-10: Pre-Trends for Gender-wise Employment

	Employment in all Enterprises		Employment in Agricultural Enterprises		Employment in Non-agricultural Enterprises	
	Female	Male	Female	Male	Female	Male
	(1)	(2)	(3)	(4)	(5)	(6)
Treated*(Year=1998)	2.19 (2.08)	3.82 (8.29)	0.706 (0.485)	0.848 (0.753)	1.655 (1.88)	0.33 (7.49)
Treated*(Year=2005)	2.55 (1.98)	2.78 (7.12)	1.262*** (0.497)	1.523*** (0.741)	1.30 (1.867)	1.251 (7.000)
Observations	6,49,865	6,49,865	6,49,865	6,49,865	6,49,865	6,49,865

Notes: (i) The outcome variable is the size of female and male employment in all, agricultural, and non-agricultural enterprises. (iii) Standard errors are provided in parenthesis. (iv) */**/*** denote significance at 10/5/1% levels respectively. (v) Data Source: Enterprise level data is obtained from four rounds of Economic census – 1990, 1998, 2005, and 2013.

Table-11: Pre-Trends for Credit Uptake of Enterprises

	Non-Institutional Finance (Major Source)		Institutional Finance (Major Source)	
	Female-owned	Male-owned	Female-owned	Male-owned
	(1)	(2)	(3)	(4)
Treated*(Year=2005)	0.0279* (0.0156)	0.0464 (0.0497)	-0.0031 (0.0117)	0.0973 (0.0754)
Observations	4,29,720	4,29,720	4,29,720	4,29,720

Notes: (i) Based on authors' calculations. (ii) The outcome variable is the number of all, female and male enterprises, separated by their major source of finance. (iii) Standard errors are provided in parenthesis. (iv) */**/*** denote significance at 10/5/1% levels respectively.

Table-12: Significance of Potential Concurrent Factors: Village Amenities

	Roads	Cooperative Banks	Agricultural Credit Society	Post Office	Commercial Power
Treated	0.085***	-0.000	0.008***	0.075***	0.002
	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)
Post-Treatment	0.187***	0.013***	-0.001	0.160***	0.003***
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
Treated*Post-Treatment	-0.058***	0.000	-0.003***	-0.021***	0.001
	(0.003)	(0.001)	(0.001)	(0.003)	(0.001)
Observations	5,67,660	5,67,660	5,67,660	5,67,660	5,67,660

Notes: (i) The outcome variable is the village-level amenities captured as dummy (Yes – 1, No-0) (ii) The pre- and post-treatment period refers to the population census data of 2001 and 2011 respectively. (iii) Following Bertrand et al (2004), standard errors are corrected for heteroscedasticity within villages. (iv) Standard errors are provided in parenthesis. (v) */**/*** denote significance at 10/5/1% levels respectively. (vi) Data Source: Data on village amenities is obtained from two rounds of Population census of 2001 and 2011.

Table-13: Impact on Entrepreneurship after Including Differential Time-trends

	Female-owned Enterprises			Male-owned Enterprises		
	Total	Agricultural	Non-agricultural	Total	Agricultural	Non-agricultural
	(1)	(2)	(3)	(4)	(5)	(6)
Treated*Post-2005	0.044	-0.19*	0.233**	-1.49***	-2.02***	0.53**
	(0.167)	(0.11)	(0.19)	(0.55)	(0.256)	(0.249)
Observations	654,217			654,217		

Note: Each model includes village and year-fixed effects, and time-trend interacted with population of village, literacy rates of villages and distance to nearest town as per Population Census 2001.

Table-14: Impact on Employment after Including Differential Time-trends

	Female Employment		Male Employment	
	Agricultural Enterprises	Non-agricultural Enterprise	Agricultural Enterprises	Non-agricultural Enterprises
	(1)	(2)	(3)	(4)
Treated*Post-2005	-2.24***	3.12***	-2.94***	3.65**
	(0.303)	(0.83)	(0.366)	(1.49)
Observations	654,217		654,217	

Note: Each model includes village-fixed effects, year-fixed effects, and time-trend interacted with population of village, literacy rates of villages and distance to nearest town as per Population Census 2001.

Table-15: Impact on Credit Uptake after Including Differential Time-trends

	Female Owned		Male Owned	
	Non-Institutional	Institutional	Non-Institutional	Institutional
	(1)	(2)	(3)	(4)
Treated*Post-2005	0.049***	0.003	0.072**	0.022
	(0.018)	(0.008)	(0.03)	(0.04)
Observations	654,217		654,217	

Note: Each model includes village-fixed effects, year-fixed effects, and time-trend interacted with population of village, literacy rates of villages and distance to nearest town as per Population Census 2001.

Table-16: Impact on Uptake of Credit in States with Below-average Share of SHGs Finance

	Female Owned Enterprises		Male Owned Enterprises	
	Non-Institutional Finance	Institutional Finance	Non-Institutional Finance	Institutional Finance
	(1)	(2)	(3)	(4)
Treated*Post-2005	0.071***	-0.011	0.101*	-0.026
	(0.026)	(0.013)	(0.054)	(0.059)
Observations	226,214		226,214	

Note: (i) Each model run for states which have share of SHG finance (as major source) below-average. SHG share is used from EC 2013 data. (iii) Each model includes village and year-fixed effects. (iv) Standard errors are provided in parenthesis. (v) */**/*** denote significance at 10/5/1% levels respectively.