Does microfinance contribute to economic development? Evidence from reinforcing regulation on microfinance institutions in India

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Abstract

In this seminar paper, we try to study the effect of microfinance on economic development using the regulation on Indian microfinance institutions taken in 2011 as an exogenous shock. Microfinance is given to the financially excluded groups, especially the poor, mainly for productive activities. This helps in employment generation and poverty alleviation. Using difference-in-difference, we first would like to establish the effect of regulation on microfinance institutions. We find that following the regulation, the size of institutions, the business outreach and the profitability of the institutions have been affected negatively with statistical significance. We then further analyze the effect of regulation on the state-level economic development. Due to the insignificant results, we cannot conclude on the causal effect of microfinance on economic development. However, with better data and identification strategy, there is scope to explore this area.

Section 1, 2, 4.1 and 5.1 were written by Satwika Vysetty.
Section 3, 4.2, 5.2 and 6 were written by Sanxing Song.

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1. Introduction

Microfinance is used as a strategy for financial inclusion. Its main objective is to assist the poor in working their way out of poverty. Through their various services, MFIs have helped in efficient resource allocation and increase productivity, thus displaying a positive relationship with the GDP. The relationship between GLP and GSDP of India can be seen in graph 1.

-Graph 1-

Recent empirical work suggests that microfinance and economic development have positive correlation. Adonsou and Sylwester (2015) show that microfinance helps developing nations. They find a positive and significant effect of microfinance on economic growth and total factor productivity. Buera, Kaboski and Shin (2012) conclude that microfinance has a positive impact on most of the population. They find that output, wages, total factor productivity have been significantly affected by microfinance. Ahlin and Jiang (2005) infer that microfinance helps in lowering the inequality and poverty in long run.

Though there exists a positive correlation between microfinance and economic development, the direction of effect remains arguable. Muhammad Yunus, a well-known proponent of microfinance from Bangladesh, believes that access to credit is a fundamental right of humans.[1] He claims that microfinance builds confidence in people and helps them break their poverty cycle. On the other hand, Ahlin, Lin and Maio (2010) argue that stronger economies have better performing MFIs. We try to answer the central question of causality using an exogenous shock in the context of India.

The poor, especially in India, have been excluded from the formal financial system. 19% of Indian population is financially excluded.[2] The poor largely is financially excluded because of their financial illiteracy, costs involved in travelling to bank and opening an account and are generally denied credit because of their ability to provide collateral and time consuming bureaucratic processes involved. They have always relied on informal and community-based financial networks. Moreover, 21.9% of its population is below

[1] Article from Forbes
[2] Article from Business Standard

the national poverty line.[3] In such a scenario, provision and access to microfinance becomes necessary for the people to be able to fight against the poverty.

The microfinance sector in India operates in two channels. One is through Self-Help Group- Bank Linkage Program, a government initiative, driven by the concept of group lending directly from the banks and the other is through MFIs run by the private sector which includes Non-Banking Finance Companies,[4] Non-Governmental Organizations, credit unions and rural banks. In 2010, the SBLP and the NBFC accounted for 58% and 34% of the outstanding loan portfolio respectively in the MFI sector in India.[5]

During 2001-2010, India's MFI industry has seen a rapid growth in terms of its breadth.[6] This can be seen in graph 2 and graph 3. As of 2010, the client outreach of MFIs stands at 31.8 million and their loan portfolio stands at 207564.7 million INR.[7] In 2010, India had the largest MFI industry in the world.[8]

-Graph 2-

-Graph 3-

Understanding that countries like India need microfinance and knowing that India has a huge microfinance industry, we want to study this relationship in the context of India. This paper is organized into six sections. In section 2, we explain the details of the shock. In section 3 and 4, we describe the data and the empirical methods used for this paper respectively. In section 5, we present our results and in Section 6, we conclude the paper.

2. Regulation of MFIs in India

Though poverty alleviation is the intent with which MFIs have sprouted, majority of them are not financially sustainable to be able to provide uninterrupted services to the poor. In various works, it is also pointed out that by charging high interest rates, MFIs may not help the very poor and hence may not help in poverty alleviation. Copestake and Williams (2011) discussed that microfinance may not be an effective tool to deal with poverty alleviation and indeed may cause harm to the vulnerable borrowers.

[3] Published by the RBI
[4] These are non-deposit taking and for-profit institutions
[5] Published in the Malegam Report
[6] Breadth refers to serving large number of clients if they are marginally poor or non-poor
[7] Published in the BMR 2011
[8] Article from M-CRIL

This turned out to be true in the case of Andhra Pradesh, a southern state in India, which had a huge presence of MFIs. The MFIs in this state started charging exorbitant interest rates and were using abusive practices for loan recovery. The growing pressure and inability to pay debts lead to a whopping 80 borrowers committing suicide in 2010.[9]
Following these incidents, the Reserve Bank of India has formed the Malegam Committee to study the issues concerning the microfinance sector in India. Following the committee's recommendations, the RBI in 2011 has adopted certain regulatory measures targeting the NBFCs. Some of the important regulations include a 12% margin cap, a 26% interest-rate cap, longer repayment period, most loans to be given for income-generating activities, guidelines on fair practices in lending, screening of clients to avoid over-borrowing such as- restriction on number of SHG/JLG[10] a client can be part of, restriction on the amount and the number of loans a person can take. The regulation adopted was in the view of consumer protection. Thus, we may conclude that it was not taken with an expectation of better growth prospects.

3. Data

For the institution-level (first step) analysis, we use the MFI dataset given by Mr. Rehbein, which is originally published by MIX Market. This dataset contains balance sheet information of roughly 15,000 MFI observations from more than 100 countries in the time period 1995-2014. We keep the observations from India for our analysis. Furthermore, we keep only the annual data and drop observations in other formats, by which the observations in 2013 and 2014 are completely dropped.[11] To have balanced pre- and post-shock periods, we drop the observations before 2009. Besides, we drop several MFIs which are outliers in some variables and MFIs that appear only before the regulation (2009-2010) or only after the regulation (2011-2012). After these steps of cleaning, our final institution-level dataset contains 409 MFI observations with 83 variables in the time period 2009-2012. We use the 311 observations in the time period 2010-2012 to run the institution-level regression on 8 variables and use the 212

[9] Article by BBC
[10] Self-help group and Joint Liability Group are two different kinds of groups formed by people with homogenous background. The main difference is that SHG are saving oriented while JLG are credit oriented.
[11] All the observations in 2013 and 2014 are remarked as quarterly data, which means these observations might not reflect the status at the end of a financial year. Therefore, these observations are not trustable and it is better to drop all of them.

observations in the time period 2009-2010 to do the placebo test. The variables used are summarized in table 1.

-Table 1-

For the state-level (second step) analysis, we build the dataset by ourselves. We choose 32 out of 39 states and union territories in India as our observations.[12] For each state/UT, we create an ID based on their names in the alphabetic order. To have balanced pre- and post-shock periods, we set a total time period from 2009 to 2013.[13] We collect state-level data of production, education, employment and poverty from the online publication of RBI. The state-level data of MFI model are collected from the Bharat Microfinance Annual Report, which is published by Sa-Dhan. The state-level data on SBLP are collected from the Status of Micro Finance in India annual reports, which is published by National Bank for Agriculture and Rural Development. Finally, our state-level panel data includes 160 state observations[14] and 20 variables with missing values in some variables.[15] We use 96 observations in the time period 2010-2012 to run the state-level regression on 7 variables and use 64 observations in the time period 2009-2010 to do placebo test. The variables used are summarized in table 3.

-Table 3-

4. Methodology

We investigate the causal effect of microfinance on the economic development in two steps. Given that the regulation we choose is targeting the NBFCs in the MFI model, we first want to see the effect of the regulation at the institutional level. If MFIs are not significantly affected by the regulation, it suggests the regulation is not strong enough and thus not valid. After seeing the significant effect on the MFIs, we want to see whether the regulation can affect state-level economic development. If we can observe that the economic outcome variables are also significantly affected by the regulation, we can make an argument that microfinance is the cause of this effect, since the regulation only

[12] The rest 7 states and union territories are either border areas or islands, where not many people live, so the economic data e.g. gross state domestic product of these areas are not available.
[13] As the data of gross state domestic product before and after 2013 are based on different prices, 2009-2013 is the only choice for balanced pre- and post-shock periods.
[14] 32 states/UT in 5 years
[15] Missing values come from two sources: 1) the employment and poverty data are only available for the year of 2009 and 2011 in the time period 2009-2013; 2) the MFI and SHG data in the original report are not complete, i.e. data of some states are missing.

affects the microfinance sector in a state. In this way, we may find some evidence to answer the question whether or not microfinance contributes to economic development.

4.1. Institutional-level identification

We first want to understand if the regulation has had any significant effect on the MFIs. We use D-i-D method to estimate this. As described previously, the regulation concerns the NBFCs and is adopted by all the states in India. However not all the MFIs in India are NBFCs. Consequently, all the NBFCs in India should be in the treatment group and all the non-NBFC should be in the control group. The institutional level effect of the regulation is estimated by the following model:

$$y_{it} = \alpha_0 + \alpha_i + \alpha_t + \alpha_1(Post_t * Dir\_affected_i) + \in_{it} \qquad (1)$$

y_{it} is institutional-level outcome variable from institution i in year t. Dummy variable Post indicates the year after the regulation i.e., $Post_t$ = 1 for t=2011, 2012 and 0 for t=2010. Dummy variable Dir_affected indicates the institutions that are affected by the regulation. We use $Dir\_affected_i$ = 1 for all the NBFC and 0 for non-NBFC. α_i controls institutional-level fixed effects, while α_t controls time fixed effects.

Based on the availability of data, we chose to analyze different aspects of the institutions such as the size of the business, profitability and portfolio quality. To understand the effect of regulation on the size of business we analyze the following variables: gross loan portfolio, number of loans, number of borrowers, number of branches and number of staff. The portfolio quality and profitability are measured by variables such as ratio of loan portfolio at risk for 30 days, ratio of loan portfolio at risk for 90 days and return on assets.

4.2. State-level identification

After seeing the effect of regulation on the MFIs, we want to explore the effect of the regulation on the state-level economic development. To achieve this with a standard binary D-i-D approach, the first task is to identify the affected/unaffected states. The affected states with a full exposure to the regulation should be in the treatment group and the unaffected states with zero exposure should be in the control group. However, the regulation in our case is pushed and implemented in the whole country, i.e. all the states are affected and there will be no states in the control group, if we simply classify them with affected and unaffected states. To solve this problem, we try to find an indicator to show each state's exposure level to the regulation, so that the states could be categorized

into different groups. We observe that, while the MFIs are directly affected by the regulation, the states are indirectly affected through their microfinance sector, which consists of MFI model run by private sector (NBFCs + non NBFCs) and SBLP model run by government. Due to data constraints, we simplify the case and treat the whole MFI model as affected and SHG model as unaffected for the state-level analysis.[16] Then the most obvious indicator of the state's treatment exposure level is the market share of MFI model in the microfinance sector when the regulation happens. Since we have limited data access, we use the share of MFI gross loan portfolio in the microfinance sector in 2010[17] to reflect the market share of MFI model in each state. In this way, as showed in the equation 2, we construct a continuous variable and name it as "indirectly affected", indicating the state j's exposure level to the regulation. That is, the higher the exposure level, more indirectly affected the state is. A heat map for India using equation 2 has been generated. The comparison in this D-i-D estimation is between more indirectly affected states and less indirectly affected states.

$$Indir\_affected_j = Exposure_j = \frac{MFI\ GLP\ 2010_j}{MFI\ GLP\ 2010_j + SHG\ GLP\ 2010_j} \qquad (2)$$

-Heat map-

Since we have a continuous exposure variable, it is reasonable to run a continuous D-i-D estimation. Equation 3 shows the regression model. y_{jt} is state-level outcome variable from state j in year t. Dummy variable $Post_t$ indicates the periods after the regulation, i.e. $Post_t = 1$ for 2011, 2012 and $Post_t = 0$ for 2010. $Indir\_affected_j$ is the continuous variable showing the exposure level of state j. β_j controls state-specific fixed effects, while β_t controls time fixed effects.

$$y_{jt} = \beta_0 + \beta_j + \beta_t + \beta_1\left(Post_t * Indir\_affected_j\right) + \in_{jt} \qquad (3)$$

To see the effect of regulation on the state-level microfinance sector, we pick MFI GLP (in logs), total GLP (in logs) and number of MFI clients as dependent variables (y_{jt}). We expect that the state-level analysis here can show a similar effect of the regulation on

[16] Though only NBFCs are actually affected by the regulation, the state-level aggregate data of NBFCs before the regulation are not available. Thus, to treat the whole MFI model as affected in the state-level analysis is the only choice for us. After the regulation, a new organization called Microfinance Institutions Network (MFIN) is established specifically for NBFCs. Since then the state-level aggregate performance of NBFCs are reported each quarter/year.

[17] Latest data before the regulation happens

microfinance as showed in the previous institution-level analysis. Only by seeing that, we can trust our identification and explore the effect on economic development. To investigate the effect of the regulation on the economic development, we choose four outcome variables in regard to production, education, employment and poverty. They are the gross state domestic product (in logs), the dropout rate of primary school,[18] the unemployment rate in the rural areas and the poverty rate.

5. Results

5.1. The effect of regulation on the MFI

We expect the important aspects of the regulation like the cap on margin as well as conducting detailed background check of the clients before lending to have crippling effects on the MFIs. Moreover, the main aim of the regulation is to restrict the MFIs from exploiting the poor. Thus, we expect the profitability of the NBFCs after the regulation to drop. Using D-i-D method, equation 1 has been estimated with standard errors clustered at the institutional level. The results have been reported in table 2.

-Table 2-

In the first part, from row 1 to 5, we look at the effect of regulation on the NBFC's size of the business outreach. As expected, various aspects have been negatively affected. Following the regulation, the GLP of NBFCs has fallen by 19 million USD relative to the non-NBFC. The number of loans, after the regulation relative to the non-NBFC, have fallen significantly too. We also see that following the regulation, the NBFCs have been downsized by reducing the number of branches and staff. The number of branches following the regulation have fallen by 45 with statistical significance. Relative to the mean, it's a 27% decline. Similarly, the number of staff following the regulation have fallen by 500 with statistical significance. That is relatively, a 48% drop. The number of borrowers has significantly reduced following the regulation, relatively a 31% fall. This could possibly be due to the new bureaucratic procedures involved or requirement of bigger loans by the clients. It is also mentioned in the regulation that a client cannot be part of more than one SHG/JLG, which could possibly have led to the reduction in borrowers.

[18] Average value for 1-5 grades

From rows 6 and 7, we infer the effect of regulation on the NBFC's portfolio quality. The ratios used here signify the risk of credit not being repaid. After the regulation, the portfolio quality of the NBFCs relative to the non-NBFCs, has improved. Since the values are not statistically significant, we cannot conclude on this.

In the last row, we estimate the effect of regulation on the NBFC's profitability. The return on assets of NBFCs, following the regulation and relative to the non-NBFCs, has fallen by 4 percentage points with 5% statistical significance. NBFC are the for-profit MFIs and have been accused of exploiting the vulnerable poor. This result reflects the main aim of the regulation.

Overall, immediately after the regulation (2011 and 2012), the NBFCs have been negatively affected. Not only their profitability and business size has reduced but also their outreach to the clients has fallen. This reduction in the outreach, could have some negative effects on the economic development as well.

5.2 The effect of regulation on the state-level economic development

We do the state-level analysis by estimating equation 3 using OLS with standard errors clustered at state level. In this D-i-D regression, states are identified by their exposure level to the regulation.[19] To begin with, we want to see the effect of regulation on the state-level microfinance sector. If we can observe similar effects at state level as at institution level, we can make an argument that our state-level identification is valid. As we see in the section 5.1 that institution-level GLP is reduced by the regulation, we expect that state-level MFI GLP drops as well. In table 4, we can see this expected negative effect on the MFI GLP, though the coefficient is not statistically significant. Then, given that SBLP model is not affected by the regulation, state-level total GLP is expected to be influenced negatively. Again, the result in the table 4 shows a negative coefficient, although it is not statistically significant. But the negative coefficient of the number of MFI clients is 10% significant and it is consistent with the decrease in institution-level number of borrowers. The interpretation of this coefficient is: if a state's exposure level to the regulation increases by 0.01[20], the number of MFI clients in this state decreases by 0.058 lakh. Given that the average number of MFI clients before the regulation is 9.82 lakhs, this decrease by 0.058 lakh means a 0.6% decrease.

[19] See equation 2.

[20] 0.01increase in the state's exposure level to the regulation means 1 percentage point increase in the share of MFI GLP in the microfinance sector in 2010.

-Table 4-

The previous results show that the effect of the regulation on microfinance can be seen at the state level with our identification. Now we can investigate the effect of the regulation on the economic development. Firstly, we study the GSDP. Since state-level total GLP is reduced by the regulation, we expect a negative effect on GSDP because total GLP and GDP show a positive correlation.[21] Interestingly, the coefficient is positive which means that the regulation raises state GDP. However, the p-value of this coefficient is 0.42 so we cannot fully trust this result.

Then we investigate the dropout rate of primary school. We think the effect on the dropout rate is difficult to predict. On one hand, due to the drop in the number of borrowers and the number of loans after the regulation, we expect lesser families to have credit. This means, they can no longer keep their kids in the school and dropout rate may increase. On the other hand, families who manage to get loans have a longer repayment period after the regulation, so they can keep the children in the school and dropout rate may decrease. Similar to the result for GSDP, a statistically insignificant result is showed for dropout rate too in the table 4. But the negative coefficient may show some evidence that the regulation helps reduce the dropout rate by giving borrowers more time to repay the loans.

Next, we explore the unemployment rate in the rural areas, where microfinance plays a bigger role in the economic development than in the urban areas. The effect of the regulation on the unemployment rate is complicated too. Since the regulation requires that more loans should be invested in income generating projects, the unemployment rate is expected to decrease. However, if less loans are given after the regulation, then some small business projects will be stopped, which could raise the unemployment rate. The coefficient indicates that the unemployment rate in the rural area is insignificantly raised by the regulation.

At last, we investigate the poverty rate. Result shows that the poverty rate is significantly reduced by the regulation. If a state's exposure level to the regulation increases by 0.01,[22] the poverty rate in this state decreases by about 0.1 percentage point. Although the coefficient of poverty rate is 5% significant, we cannot fully believe this result and argue that the regulation really helps reduce poverty rate. The reason is, if microfinance can

[21] See graph 1

[22] 0.01increase in the state's exposure level to the regulation means 1 percentage point increase in the share of MFI GLP in the microfinance sector in 2010.

help reduce poverty, the mechanism is that the poor get credit from microfinance and use the money to generate more income. Therefore, the effect of regulation should take more time to show up and should not be seen immediately after the regulation. However, we use poverty rate data of 2009 and 2011(shock year) to do the analysis,[23] so the effect in reducing poverty we observe might not come from the regulation in microfinance and may be driven by other reasons.

To sum up, by investigating the above four outcome variables, we cannot find strong evidence that the regulation on microfinance has an effect on the economic development.

6. Conclusion

This paper attempts to explore whether or not microfinance contributes to economic development. We investigate this causal effect by doing D-i-D analysis in two steps, using the microfinance regulation in 2011 in India as an exogenous shock.

In the first step analysis, we run institution-level binary D-i-D regression, by identifying directly affected institutions with the type NBFC, to study the effect of the regulation on MFIs. We find that the regulation has a negative effect on NBFCs with respect to the size of institutions, the business outreach and the profitability. In particular, the NBFCs reduce their number of branches (-27%) and personnel (-48%) significantly due to the regulation. At the same time, the number of loans decreases by 37% and the number of borrowers decreases by 31% due to the regulation. Besides, the return on assets decreases by 4 percentage points.

In the second step analysis, we run state-level continuous D-i-D regression, by identifying indirectly more affected states with higher exposure to the regulation, to investigate the effect of the regulation on economic development. As the regulation does not influence economic development directly, if we can find significant effects on the state-level economic development, these effects should be attributed to the microfinance sector, which provides evidence that microfinance contributes to economic development. However, we don't see significant results on the chosen economic outcome variables and thereby cannot answer our research question with sufficient evidence.

[23] In RBI's database, no poverty rate data after 2011 are available. Thus, we can only use 2011 as post-shock period.

We reconsider our research design and find several possible reasons why we cannot see significant results in the second step analysis. Firstly, our identification strategy might be not precise enough. We don't have a better strategy due to data constraints on state-level microfinance data. Secondly, it is possible that the effect of the microfinance regulation on the economic development can only be seen in the long run. We observe the economic development variables in the short term because some variables are based on different prices in the long run e.g. state-level GDP and data for some variables are very limited e.g. unemployment rate. Thirdly, our regression model without any control variables is not accurate. In the future research, we could improve our research design in these three points if we have better data access.

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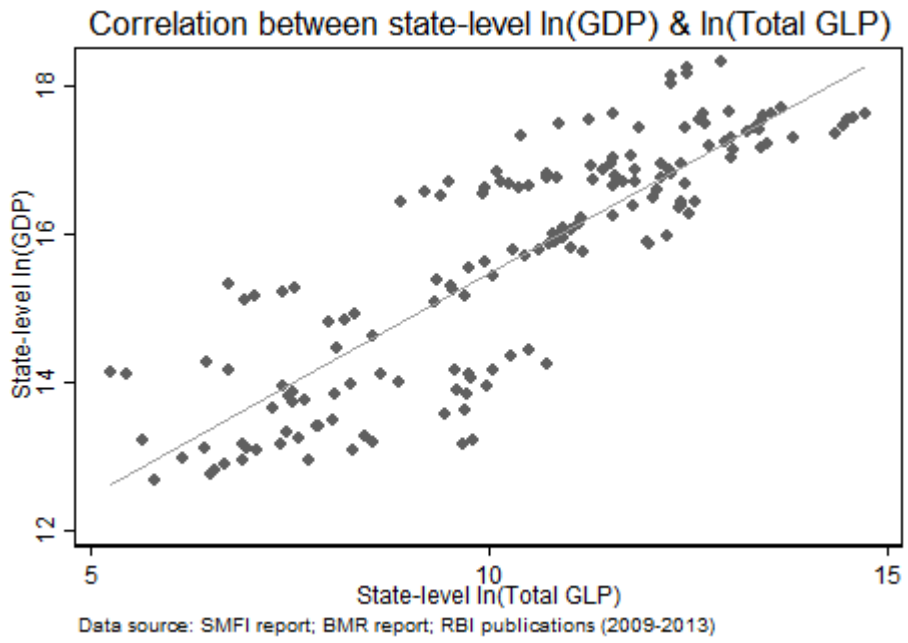
APPENDIX

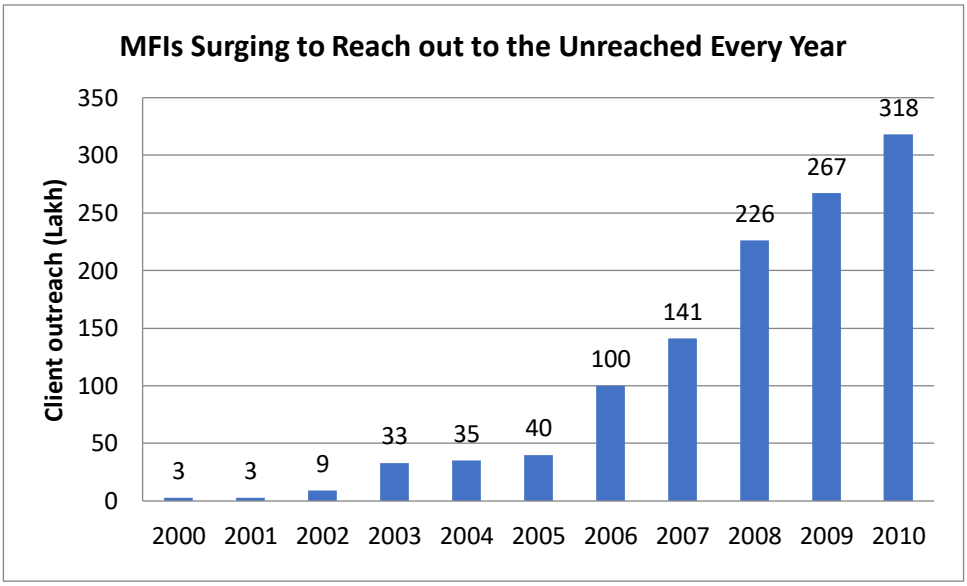
Abbreviations

AP	Andhra Pradesh
D-i-D	Difference-in-Difference
GDP	Gross Domestic Product
GLP	Gross Loan Portfolio
GSDP	Gross State Domestic Product
INR	Indian Rupee
MFI	Micro Finance Institution
NBFC	Non-Banking Finance Company
NGO	Non-Governmental Organization
OLS	Ordinary Least Square
PAR 30	Portfolio at Risk over due by 30 days
PAR 90	Portfolio at Risk over due by 90 days
RBI	Reserve Bank of India
ROA	Return on Assets
SBLP	Self-Help Group- Bank Linkage Program
SHG	Self-Help Group
USD	United States Dollar
UT	Union territory

Graph 1

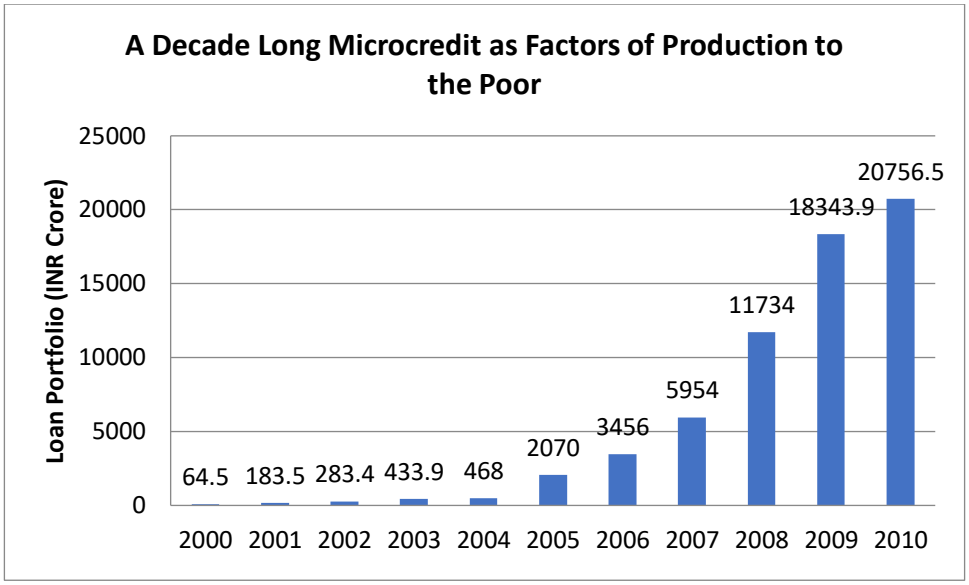


Graph 2



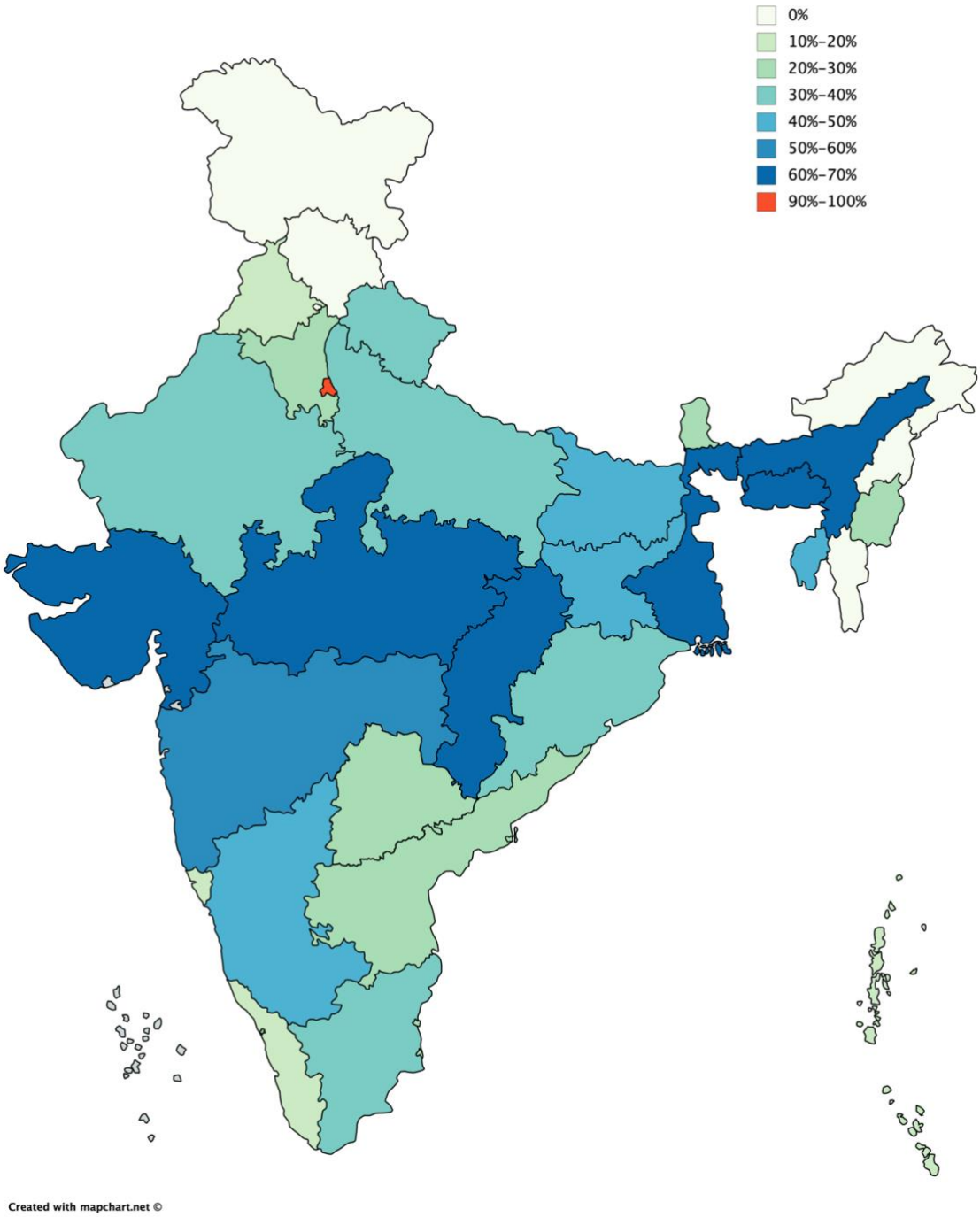
Data Source: BMR 2011

Graph 3



Data Source: BMR 2011

Heat map: Treatment Exposure of the states in India[24]



[24] Calculated using equation 2

Table 1: Descriptive statistics: Institutional-level

Variable	Description	N	Mean	SD	Min	Max
Identification						
Dir_affected	Dummy variable with 1 for treatment group and 0 for control group	409	0.54	0.50	0	1
Dependent Variables						
GLP (Million USD)	The outstanding loans of all clients. It doesn't include the interest receivable and the loans that have been written-off	407	45.7	126	0.06	961
No. of loans	The number of outstanding loans that MFI has lent	391	310763.4	834777.8	519	6242266
No. of borrowers	The number of individuals who owe money to the MFI	399	284024.3	768836.1	519	6242266
No. of branches	The number of offices a MFI has in India	333	135.08	320.77	1	2380
No. of staff	The number of individuals employed at a MFI	400	939.86	2406.87	9	22733
PAR 30	The ratio between installment of the outstanding principal balance overdue by 30 days and the GLP	321	0.07	0.19	0	0.99
PAR 90	The ratio between installment of the outstanding principal balance overdue by 90 days and the GLP	321	0.06	0.18	0	0.99
ROA	The ratio between net income and the total assets	349	-0.004	0.099	-0.73	0.15

Table 2: Results with Placebo test: Institutional-level

Outcome Variable	$Post_t$*$Dir\_affected_i$	p-value	N	Placebo test[25]
GLP (Million USD)	-18.9	0.140	311	10.2*
No. of loans	-124138.6**	0.034	297	81629.9***
No. of borrowers	-93999.37*	0.063	299	95686.28***
No. of branches	-44.95*	0.073	246	63.58***
No. of staff	-499.92**	0.02	301	321.88***
PAR 30	-0.066	0.637	236	0.006
PAR 90	-0.018	0.863	236	-0.006
ROA	-0.039**	0.035	271	0.014

Table 3: Descriptive statistics: State-level

Variable	Description	N	Mean	SD	Min	Max
Identification						
Indir_affected	Continuous variable for treatment exposure	160	0.35	0.25	0	0.95
Dependent Variables						
MFI GLP (Lakh INR)	Gross loan portfolio of MFI model	160	72185.88	116983	0	593400
Total GLP (Lakh INR)	Gross loan portfolio of the total microfinance secto	160	183374.6	382952.1	0	2450904
No. of MFI clients (Lakh)	number of clients in the MFI model	160	9.14	14.10	0	62.50
GSDP (Lakh INR)	State-level gross domestic production	160	1.55e+07	1.78e+07	320792	8.97e+07
Dropout rate (%)	Percentage of students who left the primary school without completing	133	6.60	4.80	0.10	24.11
Unemployment Rate in rural areas (per 1000)	Number of the unemployed per 1000 person in the rural areas	63	32.46	40.23	3	247
Poverty Rate (%)	Percentage of persons who live below the poverty line	64	20.74	12.36	0.40	53.50

Note:

1 Lakh = 100000

[25] use fake shock in 2010 (2009 as before shock period and 2010 as aftershock period)

Table 4: Results with Placebo test: State-level

Outcome Variable	$Post_t$* $Indir\_affected_j$	p-value	N	Placebo test[26]
In(MFI GLP)	-0.57	0.53	80	0.79
In(Total GLP)	-0.49	0.391	96	0.27
No. of MFI clients (Lakh)	-5.78*	0.083	96	8.48**
In(GSDP)	0.02	0.42	96	0.014
Dropout rate (%)	-2.69	0.301	72	-0.87
Unemployment Rate in rural areas (per 1000)	14.10	0.481	62	/
Poverty Rate (%)	-9.89**	0.013	64	/

Note:

1 Lakh = 100000

[26] Use fake shock in 2010 (2009 as before shock and 2010 as aftershock). Unemployment and poverty rate have data only for 2009 and 2011 so placebo test is impossible

Statement of Authorship

"I hereby confirm that the work presented has been performed and interpreted solely by myself except for where I explicitly identified the contrary. I assure that this work has not been presented in any other form for the fulfillment of any other degree or qualification. Ideas taken from other works in letter and in spirit are identified in every single case."

Bonn, 13.01.2020 V. Satürka

Place, Date **Signatures**