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Empirical Analysis of Growth and Distribution of Microfinance in India using Panel-Corrected Standard Error Fixed Effect Method

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Abstract

An attempt was made to analyze the Growth and Distribution of Microfinance in India towards SHG-BLP programme during the period 2008-09 to 2019-20. Study was intended to assess the sustainability of microfinance program in India through its financial lending towards SHG-BLP. Endogeneity model of financial lending towards microfinance was chosen for the study under which bank-loans were taken as dependent variable affected by Independent variables i.e. savings, number of SHGs, loan outstanding and lagged or endogenous variable of bank loans. State-specific effects were measured for the analysis of Growth and distribution of microfinance in India. Model used the PCSE fixed effect methods to highlight the State-specific growth potential of microfinance in India. Study also used post-hoc analysis to assess the performance of commercial, cooperative and regional rural banks in bank linkage program through SHGs and concluded that commercial banks were found highest contributing in SHG-BLP however the growth trends supports the easy accessibility and availability of RRBs in terms of savings, loan disbursement and even in loan outstanding. Period for this assessment was taken from 2009-10 to 2018-19. Empirical finding raised a serious concern about the growth and distribution of Microfinance in India by highlighting the rising trend of loan outstanding in the financial lending towards SHG-BLP. It was found that the financial lending in India towards microfinance is majorly driven by number of SHGs, loan outstanding followed by savings. This also was observed that endogenous factor past

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period of loans also affected the bank-loans towards SHG-BLP in India. The selected states and agencies performing towards microfinance were contributing greater in loan outstanding than loan disbursed towards the program raised the need for sustainable policy implications for the microfinance program in India.

Keywords: *SHGs, Microfinance, Panel Data, PCSE, Post-Hoc, Commercial Banks, RRBs, Cooperative Banks, Endogenous*

JEL Codes: *G21, C23*

INTRODUCTION

Microfinance in India is the program to extend financial help towards rural poor and Self-Help Groups bank linkages. Microfinance program was the initiative to uplift poor by empowering them with employment opportunities. Besides giving such opportunities it provides services such as savings, insurance, training and skill development. "Microfinance refers to small scale financial services for both credit and deposit-that are provided to people who farm or fish or herd; operate small or microenterprises where goods are produced, recycled, repaired or traded; provide services; work for wages or commissions; gain 144 income from renting out small amount of land, vehicle, draft animals, or machinery and tools; and to other individuals and local groups in developing countries in both rural and urban areas" (Robinson, 2001). Present study focuses to investigate the bad loans affecting the Microfinance program of India and the performance of banks and states towards it.

Bank loans to MFIs decreased in year 2016-17 by 7.2 percent and outstanding were also increased by 13.7 percent and 14.3 percent in year 2015-16 and 2016-17 respectively (Sharif Mohd., 2018). This has been found that microfinance institutions are becoming urban centric and share of rural beneficiaries are declined in year 2016 and 2017 except few states of India such as Assam, Arunachal Pradesh, Nagaland, Jammu & Kashmir and Andaman. Asha, Sivakumar and Agarwal (2016) discussed the financial inclusion in India through microfinance and SHGs and pointed out high NPAs and multiple lending. The performance of SBLP with reference to six regions of India and found than loan disbursement, loan outstanding and savings were higher in southern region than other regions of India and further reported north east at least reach out nation in the same (Louis, 2015). The status of microfinance

and its growth in India and the role of MFIs, NGOs and SHGs in credit link program. To enhance the loan productivity special training and skills have to be given priority in lending micro-credit (Mahanta, Panda & Sreekumar, 2012). Chandran and Sandhya (2012) evaluated the economic and social impact of SHGs on members. Study found the economic and social effects of SHGs and how it was beneficial for the members. SHGs provide the credit supplement for poor people, deprived groups of society and women. They make people economically empowered and reduce the dependency of many lenders and non-institution sources

OBJECTIVES

- To examine the Growth and Distribution of Microfinance through SHG-BLP in India.
- To investigate the cross-sectional differences between Indian states with reference to growth of Microfinance in India.
- To Assess the Bank-Wise Growth of Self Help Group-Bank Linkage Program in India.

HYPOTHESES FORMULATION

H_1 Financial Lending towards microfinance program has significant association with the growth of SHG-BLP programme in India.

H_2 Savings and Loan disbursements towards SHG-BLP is significantly influenced by number of SHGs in India.

H_3 There is the significant differences in Bank-Wise growth of SHG-BLP Program in India.

MATERIALS AND METHODS

Endogeneity model of Bank loans towards microfinance have been taken as dependent variable affected by Independent variables such as savings, number of SHGs, outstanding loan, NPAs and lagged variable of bank loans. Data were edited in natural log form to avoid inconsistency. Refer Table 1 for the description of variables used in the model. Loan disbursements considered as the tool of financial lending through banks towards SHG-BLP and the model is intended to assess the growth of this variable. Study used fixed effect model which captures causal effects of

independent and other variables in determination of growth of financial lending in India.

Table 1: Description of Variables Used in the Model

Variables	Description
Loan Disbursement (LD)	It's a dependent and very important variable of the empirical analysis. Considered as microfinance extension and its growth by loan disbursements cause of SHGBLP and its growth. It will help to explain the magnitude of change with respect to other variables in the model.
Loan Outstanding (LO)	Explanatory variable. Failure of repayment, considered as bad loan. Study was intended to assess the impact of bad loans on the loan disbursements by banks in Rajasthan.
Savings (Sav)	Explanatory variable. Savings through SHGs. To assess whether loans are being disbursed based on the saving generation through SHGBLP.
No. of SHGs (NSHG)	Explanatory variable. Number of SHGs linked with banks. To assess whether loans are being disbursed based on increasing number of self-help groups in Rajasthan.
Lag variable of Loan Disbursement (LD_{t-1})	Explanatory variable. This variable is a lag variable of loan disbursement. This was intended to assess whether loans are being disbursed based on past loans extended by banks in Rajasthan.
Non-Performing Assets (NPAs)	Explanatory variable. When increasing number of loan outstanding is converted into non-performing assets. Study has aim to see whether this variable is affecting the loan disbursements of banks.

Model I Growth and Distribution of Microfinance in India through SHG-BLP Using PCSE (panel-corrected standard error) fixed-effects regression Method.

Panel data approach was used to analyze the data for year 2008-09 to 2019-20 for the bank loans disbursed by 29 states of India towards SHG-BLP. State-specific effects were measured through the study.

$$lnLD_{it} = \beta_0 + \beta_1 D_{1it} + \beta_2 D_{2it} + \beta_3 D_{3it} + \beta_4 D_{4it} + \beta_5 D_{5it} + \beta_6 D_{6it} + \beta_7 D_{7it} + \cdots\cdots\cdots\cdots\cdots + \beta_{28} D_{28it} + \gamma_1 lnSav_{it} + \gamma_2 lnNSHG_{it} + \gamma_3 lnLO_{it} + \gamma_4 lnNPAs_{it} + \gamma_5 lnLD_{it-1} + \mu_{it} + \epsilon_{it} \quad \ldots (1)$$ [1]

[1] LD=Loan Disbursement, D=Dummy, Sav=Savings, LO=Loan Outstanding, NSHG=Number of SHGs,=Past Period of Loans.

The model was assessed for 29 states of India for the year 2008-09 to 2019-20. 28 state dummies were opted for the state specific effects. State specific effects were measured with in the model where as is the error term across the states.

Model II Bank-Specific Analysis with Panel Data and Post-Hoc Comparisons:

$$lnSA_{it} = \beta_1 + \beta_2 lnSHG_{it} + \mu_{it} \quad \ldots.(2)$$

$$lnLD_{it} = \beta_1 + \beta_2 lnSHG_{it} + \mu_{it} \quad \ldots.(3)$$

Equation 2 represents the pooled OLS regression model. In this analysis, the natural log has been taken on both sides (dependent and independent) variable. Study period for Bank-wise Analysis has been taken from 2008-09 to 2018-19. Study also used post-hoc multiple comparison model to assess bank-wise growth of Self Help Group-Bank Linkage Programme.

RESULTS

Model I: Growth and Distribution of Microfinance through SHG-BLP in India using PCSE Fixed Effect Model

To execute the Model 1 Endogeneity model of Bank loans towards microfinance have been taken as dependent variable affected by Independent variables such as savings, number of SHGs, outstanding loan and lagged variable of bank loans. Data were edited in natural log form to avoid inconsistency. Model used the PCSE fixed effect methods to highlight the State-wise growth potential of microfinance in India.

Model Specification and Diagnostic Test

Based on model estimation methods data were analyzed on fixed effect, random effect, and OLS regression model. Specification tests for model selection suggested fixed effect model was found appropriate to analyze the data. Results of Hausman and BP (Breusch & Pagan Lagrangian multiplier) tests confirmed the appropriateness of the fixed effect model for the analysis (refer Table 2). Wooldridge test confirmed that there was the presence of autocorrelation in the model. Pesaran abs test confirmed that there was the presence of cross-sectional dependence across the entities and found that model was suffering from heteroskedasticity according to

the Wald test results (refer Table 3). Therefore, PCSE fixed effect method was used to estimate the results which corrects heteroskedasticity, autocorrelation and cross-panel correlations in the model. PCSE method is appropriate to use when T<N and as per the specifications of the present model this method is appropriate and consistent as model uses the variation across 29 entities and 12 years summarized by Beck and Katz (1995).

Table 2: Specification Tests for Model Selection

Tests	Selection between	Results	Final Selection
Hausman	Random and Fixed Effect Model	Chi2=88.47***	Fixed Effect Model
Breusch and Pagan Lagrangian multiplier test	Random effect and OLS	Chi2=0.00	OLS
F test	OLS and Fixed Effect	F=4.58***	Fixed Effect Model

*P<0.05. **P<0.01,***P<0.001.

Source: Author's Own Estimation.

Table 3: Diagnostic Tests for Checking the Model Consistency

Test	Results	Model Consistency
Wooldridge test for Autocorrelation Durbin-Watson	F=23.239*** Pr>F=0.000 1.175	Presence of Autocorrelation in the model
Pesaran abs test of cross-sectional independence	Chi2(1)=8.387*** Pr=0.0000	Cross-sectional dependence found
Wald test for heteroskedasticity	Chi2(2)=688.51*** Pr>chi2=0.0000	Presence of heteroskedasticity in the model

*P<0.05. **P<0.01,***P<0.001.

Source: Author's Own Estimation.

Model Empirics

Table 4 exhibits loan disbursements by various banks in the selected states of India found positive association with loan outstanding (0.271), number of SHGs (0.660), Savings (0.110) and lag variable of loan disbursement (0.0662). This further shows that financial lending towards SHG-BLP was found highly dependent on the number of linked SHGs followed by the loan outstanding, savings and the past period of loans. However, model does not show any significant association with NPAs in India.

Loan outstanding is considered as a bad loan and this affected the loan disbursement greater than saving implies that loan disbursements increases by 0.27% by one percent change in loan outstanding whereas saving increases loan disbursements by 0.11%. This further implies that there is a rising trend of bad loans in India which may further cause rising NPAs in near future. Model gives a strong association with savings indicated that microfinance distribution in India significantly inducing growth. R^2 implies that 98% model is explained by the explanatory variables chosen for the model.

Table 4 : Results of Panel Data and PCSE Analysis

Variables	Dependent Variable lnLD (Loan-Disbursements)			
	Fixed Effect	Random Effect	OLS	PCSE
NPAs (lnNPAs)	-0.00253 (-0.1.18)	-0.00875*** (-4.18)	-0.00875*** (-4.18)	-0.00341 (-1.62)
Savings (lnSavings)	0.144*** (5.22)	0.0848** (3.07)	0.0848** (3.07)	0.110*** (3.81)
Loan-Outstanding (lnLO)	0.290*** (6.94)	0.321*** (7.94)	0.321*** (7.94)	0.271*** (6.65)
No. Of SHGs (lnNSHG)	0.605*** (17.56)	0.522*** (15.15)	0.522*** (15.15)	0.662*** (19.35)
Lag variable of Loan Disbursement (lnlagLO)	0.0950*** (4.09)	0.120*** (5.05)	0.120*** (5.05)	0.0662** (3.02)
_cons	-1.356*** (-5.90)	-0.554*** (-5.30)	-0.554*** (-5.30)	-1.33*** (-4.84)
_obs	348	348	348	348
R-sq	0.9737	0.9749	0.9749	0.9834
F/chi2	532.83***	13267.27***	2653.45***	17437.04***

t statistics in parentheses *P<0.05. **P<0.01,***P<0.001.

Source: Author's Own Estimation.

The cross-section heterogeneity of 13 states out 29 selected states was also found significant. Maharashtra, Goa, Karnataka, Kerala, Andhra Pradesh, New Delhi, Jammu & Kashmir, Himachal Pradesh, Haryana, Nagaland, Mizoram, Andaman & Nicobar were found with positive and significant association with microfinance interventions through banking loans whereas Chhattisgarh reported negative coefficient with the growth and distribution of Microfinance program. However, negative intercept

variation was reported across all the entities. The presence of state-wise effect in the model was confirmed by the testparm test statistics (Chi2 (28)=128.25***) and results further implies the rejection of null hypothesis that there is zero state-wise effect in the growth and distribution of microfinance in India (refer Table 5).

Table 5: State-Specific Effects towards Growth of Microfinance

State	Coefficient	Intercept Estimation
Chhattisgarh (_cons) (Reference State)	-1.33*** (-4.84)	-1.33***
Madhya Pradesh (D1)	-0.124 (-0.97)	-1.454
Uttarakhand (D2)	0.0017 (0.02)	-1.328
Uttar Pradesh (D3)	-0.0032 (-0.02)	-1.3332
Andaman & Nicobar (D4)	0.615*** (3.30)	-0.715***
Bihar (D5)	0.0249 (0.23)	-1.30
Jharkhand (D6)	-0.625 (-0.43)	-1.955
Odisha (D7)	-0.0291 (-0.23)	-1.359
West Bengal (D8)	-0.342 (-1.72)	-1.672
Arunachal Pradesh (D9)	0.0272 (0.19)	-1.303
Assam (D10)	0.245 (1.61)	-1.085
Manipur (D11)	0.2142 (1.24)	-1.1158
Meghalaya (D12)	0.276 (1.83)	-1.054
Mizoram (D13)	0.649*** (4.76)	-0.681***
Nagaland (D14)	0.632*** (4.83)	-0.698***
Sikkim (D15)	0.280 (1.48)	-1.05
Tripura (D16)	0.196 (1.02)	-1.134

State	Coefficient	Intercept Estimation
Haryana (D17)	0.289*** (3.44)	-1.041***
Himachal Pradesh (D18)	0.386*** (4.48)	-0.944***
Jammu and Kashmir (D19)	0.508*** (3.66)	-0.822***
New Delhi (D20)	0.576*** (3.69)	-0.754***
Punjab (D21)	0.099 (0.80)	-1.231
Rajasthan (D22)	0.093 (0.98)	-1.237
Andhra Pradesh (D23)	0.353** (2.29)	-0.977**
Karnataka (D24)	0.287** (2.19)	-1.043**
Kerala (D25)	0.409** (2.22)	-0.921**
Goa (D26)	0.741*** (3.94)	-0.589
Gujarat (D27)	0.0549 (0.36)	-1.275
Maharashtra (D28)	0.0062** (3.02)	-1.323**

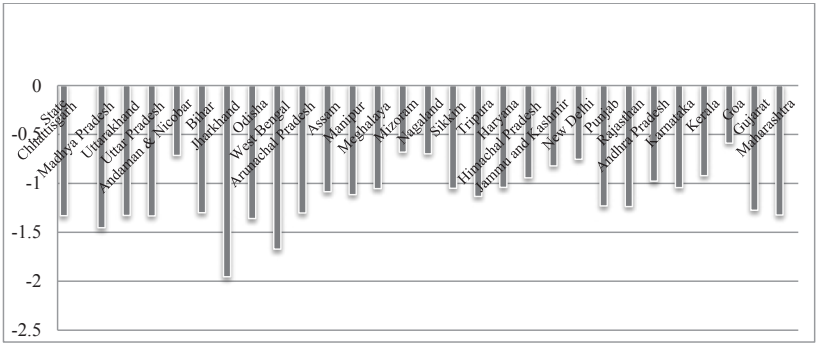
*P<0.05. **P<0.01,***P<0.001.

Source: Author's Own Estimation.

Model found significant state effects with PCSE fixed effect regression. It concluded that the cross-section heterogeneity of 13 states out of 29 selected states (Maharashtra, Goa, Karnataka, Kerala, Andhra Pradesh, New Delhi, Jammu & Kashmir, Himachal Pradesh, Haryana, Nagaland, Mizoram, and Andaman & Nicobar) were found positive and significant association with SHG-BLP program in India. This further implies that these states were largely extended bank loans based on higher loan outstanding and number of increasing self-help groups. However, model generated positive coefficient of saving also but due to rising loan outstanding, its impact seems to be overshadowed. Findings supported by the MF report 2019 revealed that Haryana, Jammu & Kashmir, Himachal Pradesh, Nagaland, Arunachal Pradesh, Maharashtra, Madhya Pradesh were some of the states reported higher growth with respect to rising SHGs whereas southern region reported declined with 3.8% growth.

However; this implies the development process through SHG-BLP is led large number of SHGs by connecting poor to poor to the program but the loan disbursements should not be driven largely by this factor only because most of the SHGs do not run intensively referred to quantitative growth. It was evidently seen that 11.8% growth in SHGs and 24% increase in loan outstanding were observed in the growth of Microfinance in India. A larger contribution of loan outstanding becomes a major concern for this sector in India (MFR, 2019).

Model findings further concluded that Goa, Andaman & Nicobar, Kerala, Karnataka and Andhra Pradesh were found with least negative intercept variation. However, all states of India reported negative intercept variation and Goa amongst all was found least negative whereas Maharashtra found with highest negative intercept variation amongst all significant states. This also implied rising loan outstanding and non-payment of loans. However, these states are contributing majorly in the extension of SHG-BLP in India (Fig. 1).



Source: Author's Own Estimation.

Fig. 1: Intercept Variations: State-Effects

The potential growth model interprets that all significant states were performing in SHG-BLP program more than the predicted growth except the state Nagaland (1.052). Relative growth analysis further interprets that the states found significant and higher growth in comparison to year 2008 are Andaman & Nicobar (0.991), Chhattisgarh (0.971), Himachal Pradesh (0.983), J &K (0.939), Andhra Pradesh (0.976), Karnataka (0.990), Kerala (0.976), Goa (0.958), and Maharashtra (0.983) during the year 2019-20 on the other hand Mizoram (0.989), Haryana (0.989), and New Delhi (0.971) reported increase in the relative score implied declining growth of financial lending towards SHG-BLP.

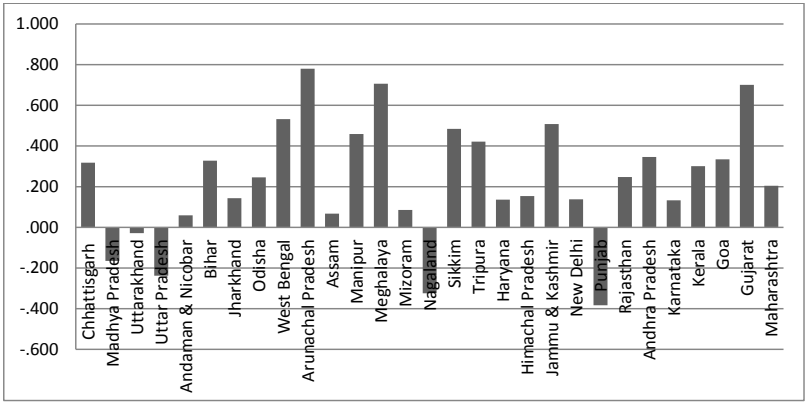
Table 6: Potential Growth of Selected States in Growth and Distribution of Microfinance in India

	Relative Growth		Absolute Growth	
State	**2008**	**2019**	**2008**	**2019**
Chhattisgarh	0.977	0.971	-0.226	-0.318
Madhya Pradesh	1.071	1.016	0.620	0.165
Uttarakhand	0.964	1.003	-0.371	0.028
Uttar Pradesh	0.999	1.024	-0.007	0.238
Andaman & Nicobar	1.116	0.991	0.634	-0.059
Bihar	0.984	0.975	-0.159	-0.3
Jharkhand	0.966	0.987	-0.301	-0.143
Odisha	1.029	0.980	0.312	-0.246
West Bengal	1.037	0.962	0.400	-0.532
Arunachal Pradesh	1.034	0.853	0.185	-0.780
Assam	1.035	0.994	0.342	-0.067
Manipur	0.967	0.937	-0.206	-0.459
Meghalaya	1.039	0.912	0.244	-0.706
Mizoram	0.983	0.989	-0.115	-0.085
Nagaland	0.959	1.052	-0.219	0.324
Sikkim	0.923	0.932	-0.549	-0.484
Tripura	0.928	0.951	-0.619	-0.421
Haryana	0.960	0.985	-0.349	-0.136
Himachal Pradesh	1.019	0.983	0.158	-0.154
Jammu & Kashmir	1.001	0.939	0.004	-0.508
New Delhi	0.841	0.971	-1.234	-0.138
Punjab	0.998	1.051	-0.014	0.383
Rajasthan	1.002	0.977	0.015	-0.248
Andhra Pradesh	1.032	0.976	0.422	-0.346
Karnataka	1.037	0.990	0.431	-0.133
Kerala	1.034	0.976	0.369	-0.301
Goa	1.091	0.958	0.740	-0.335
Gujarat	0.949	0.932	-0.524	-0.701
Maharashtra	1.093	0.983	0.935	-0.204

Source: Author's Own Estimation.

Absolute growth differences reveal that the highest negative score was obtained by J & K (-0.508) followed by Andhra Pradesh (-0.346) and Goa

(-0.335) amongst the states found significant by the model estimates. This further implied that the actual growth of these states was found greater than the predicted growth whereas the highest absolute difference score was reported by Nagaland (0.324) and the lowest negative difference by Mizoram (0.085) implies their poor performance towards SHG-BLP in India (refer Table 6).



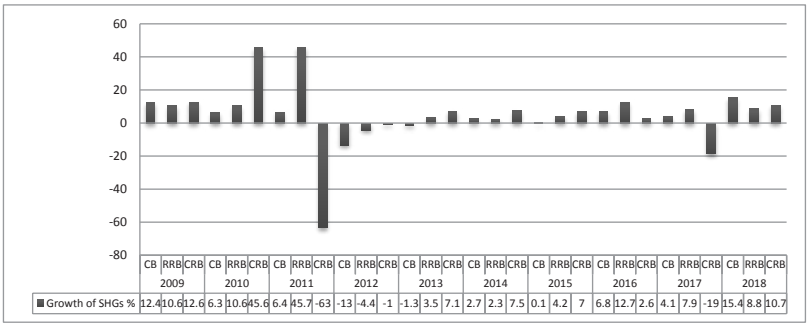
Source: Author's Own Estimation.

Fig. 2: Relative Growth of SHG-BLP based on Residual Statistics during the Year 2019

This situation should be considered a great concern for the country's microfinance program that all of the significant and major contributor states were found on border line of performance. If the issues of loan outstanding and NPAs were not addressed, then the growth of SHG-BLP will report a decline even in the better performing states. However, it is a good news that there has been a decline in NPAs some of the states after the year 2015 (NABARD, 2019). But the rising graph of loan outstanding still remains a cause of concern. Nagaland was significantly found under performing state due to its lowest credit disbursement practices per SHGs; but has enough potential to grow due to larger savings and large number of credit and saving linked SHGs. The same has been corroborated by the report of microfinance 2019 that highest increase in saving was observed by Central (20.3%), southern (18.5%) and north eastern (12%) during year 2019-2020. ₹ 7686 lakh saving was generated by financial lending program by Nagaland during the year 2019-2020 while loan disbursements were recorded at ₹ 1241.46 lakh (Microfinance Report NABARD, 2019). Outcomes of Potential growth model may be confirmed by the residual statistics of the states presented in the Fig. 2. The highest residual growth

was observed in Andhra Pradesh and lowest in Nagaland.

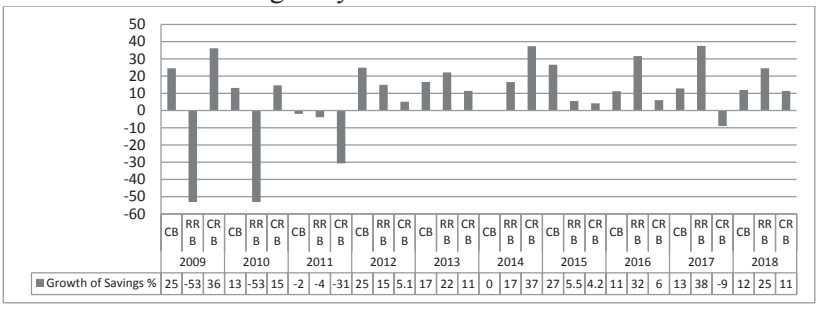
Model II: Bank-Wise Growth of SHGBLP in India



Source: Author's Own Compilation based on MFI reports 2009-2018.

Fig. 3: Bank-Wise Growth of SHGs in India

Fig. 3 shows that the Bank-wise growth of self-help groups. The figure shows that the growth in number of SHGs was observed in commercial, regional rural and cooperative banks during the year 2017 to 2018. It can be noted that growth of number of Self-help groups was observed 15.4% in commercial banks during the year 2018.



Source: Author's Own Compilation based on MF reports 2009-2018.

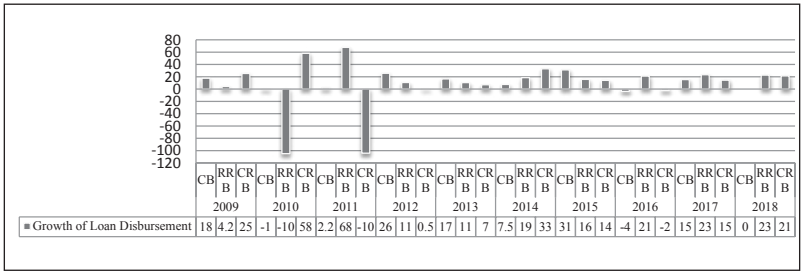
Fig. 4: Bank-Wise Growth of Savings in India

According to Fig. 4, 11.9% savings were generated by commercial banks in year 2018 against the year 2017 but there was a significant rise in beneficiaries and loan activities. For RRBs this growth of Savings was recorded 24.5% during the year 2018. In comparison to commercial banks, RRBs were performing better in SHGBLP programme as SHGs

mainly linked with RRBs due to it's availability in rural areas whereas the contribution of cooperative banks were found least with 11.4% savings during the year 2018.

There was declining growth of Commercial Banks and RRBs in year 2018 due to large number of saving accounts were opened up under *Jan Dhan Yojana*. According to report *PMJDY* (2018)[2], public sector Banks' deposits were of ₹6908371.17 lakh, RRBs' deposits were of ₹1483823.55 and total deposits in accounts were of ₹ 8623079.30. Savings has been declined due to data sanitization, closure of doormat accounts and changes in Bank linkage program. This has been reported a major decline by some states in year 2017-18 (NABARD, 2018).

Therefore this can be concluded that SHGs linkages programme with commercial banks, RRBs and Cooperatives banks resulted in significant growth in saving through microfinance programme in India.



Source: Author's Own Compilation based on MFI reports 2009-2018.

Fig. 5: Growth of Loan Disbursement

The Fig. 5 shows that according to the number of SHGs, Banks provide credit disbursements through SHGs and it has been observed that credit disbursements had increased through SHGs in India. It can be noted that under the Commercial banks, growth of number of Self-help groups disbursing loan was 15.9% and the growth of loan disbursement was 16.8% in 2018. For RRBs, this growth of SHGs was recorded 16.8% whereas loan disbursement by the banks was 22.7% during the year 2018. RRBs growth was found increasing for last few years due to the Joint

[2] https://pmjdy.gov.in/BankwiseLatest

Liability Group scheme of funding of SHG-BLP targeted middle class poor. According to the report of status of Microfinance in India 2017-18, the scheme of NABARD's 100 percent refinance support by banks had registered notable growth in year 2017-18 with 10.19 lakh JLGs over the previous year the growth of 7.02 lakh JLGs. NABARD encouraged RRBs to finance JLGs and accordingly they entered in MOU with State Bank of India during 2017-18. Growth of Cooperative banks was recorded 15.9% whereas 21.4% loans were disbursed by them in year 2018 (Microfinance Report, 2018). This implied rising growth of loan disbursement by SHGs under all the three agencies in year 2018 as compared to year 2017. There was a significant rise in beneficiaries and loan activities during the year 2018 greater in comparison to year 2017. Results of regression analysis for SHGBLP of panel data of three Banks for 11 years are summarized in Table 7 & 8:

$$lnSA_{it=} - 6.5 + 1.3SHG_{it} + \mu_{it} \quad \text{....(4)}$$

$$lnLD_{it} = -5.08 + 1.4lnSHG_{it} + \mu_{it} \quad \text{.....(5)}$$

Table 7 shows the regression results of pooled, fixed-effect model, and random effect model are significant at 1% level. The R^2 values are high, showing the goodness of fit of the model. The R^2 value of about 77 means that 77% of variations in saving amount which are generated by SHGs can be explained by the number of SHGs linked with saving accounts. Model was found significant at 1% level of significance implied the positive relation between numbers of SHGs linked with Banks and saving amount through SHGs in India. Test statistics of Hausman test and Breusch-Pagan concluded that Pooled OLS model was appropriate for the study. The result specifies that with 1% increase in number of SHGs induces growth in saving amount by 1.30% in India. During the year 2017-18 the number of SHGs increased by 1.67 lakh with a corresponding increase in the savings by ₹3477.89 cores (MFI report 2017-18). It has been observed that the saving linked SHGs increased by 79.03 lakh up to the year 2016, with a net addition of 2.06 lakh SHGs during the year (MFI Report 2016-17). During 2018-19, 4026 training programs were conducted under FIF covering 133791 participants from various banks/stakeholders. In addition, 1333 training programs covering 46166 participants were conducted under the WSHG Fund. Such programs train the participants to utilize the loans effectively and encouraged the start-ups and micro-enterprises in country.

Table 7: Growth of Saving Amount Generated through SHGBLP in India: Comparing POLS with FE and RE

Dependent Variable Log of Saving Amount through SHGs							Autocorrelation Correct in Pooled OLS	
Prob> F = 0.000								
Variables	**Pooled OLS**		**Fixed effect**		**Random effect**			
	Coefficient	**t**	**Coefficient**	**t**	**Coefficient**	**t**	**Coefficient**	**t**
Log of SHGs	1.3	9.71*	1.78	4.9*	1.3	9.7*	1.3	13.2***
_cons	-6.5	-3.3*	-13.6	-2.6*	-6.6	-3.3*	-6.56	-4.42
R^2	0.75		R^2 (overall)	0.75	R^2 (overall)	0.75	0.75	
	R^2 (within)		0.45	R^2 (within)	0.45			
	R^2 (between)		0.99	R^2 (between)	0.99			
X^2 for Hausman test	Prob>chi2 = 0.1526, chi2(1)= 2.05						Autocorrelation correct Std. Err. adjusted for 3 clusters in banks	
	Random effect is chosen over fixed effect							
$\overline{X}^2$ for BP test	chibar2(01)= 0.00							
	prob>chibar2=1.000							
	Pooled OLS is appropriate.							

Source: Model Estimation Note: Test statistics are significant at 1% level. Where: *p value 0.10, **0.05 and ***0.01.

NABARD was continuously supporting the training and capacity building of various stakeholders of SHG bank linkage programs such as bankers, NGOs, government, SHG members and trainers.

Table 8: Growth of Loan Disbursment through SHGBLP in India: Comparing POLS with FE & RE

Dependent Variable Log of Loan Disbarment through SHGs						
Prob>F = 0.000						
Variables	**Pooled OLS**		**Fixed Effect**		**Random Effect**	
	Coefficient	**T**	**Coefficient**	**T**	**Coefficient**	**T**
Log of SHGs	1.41	13.7***	1.4	6.2***	1.41	12.9***
_cons	-5.08	-3.8***	-4.9	-1.68***	-5.08	-3.6***
R^2	0.85 R^2 (within) R^2 (between)		R^2 (overall)	0.84	R^2 (overall)	0.84
			0.57	R^2 (within)	0.57	
			0.99	R^2 (between)	0.99	
X^2 for Hausman test	Prob>chi2=0.952, chi2(1)=0.00 Random effect is chosen over fixed effect					
$\overline{X}^2$ for BP test	chibar2(01)= 0.54, prob>chibar2=0.230					
	Pooled OLS is appropriate.					

Source: Model Estimation Note: Test statistics are significant at 1% level. Where: *p value 0.10, **0.05 and ***0.01.

Table 8 shows that Regression results of pooled, fixed-effect model, and random effects models are found highly significant at 1% level. R^2 values were high showed the goodness of fit of the model. 85% of variations in loan disbursement through SHGs are explained by the number of SHGs providing loan amounts. Model was found free from Autocorrelation Prob>F=0.2449 (accept H0: no first-order autocorrelation).

The model was found significant at 1% level. Empirics found a positive relationship between the numbers of SHGs associated with Banks and the disbursement of loans through SHGs. Studies found that the

increase in the number of SHGs is due to increase in loan disbursements through SHGs in India. This is a positive sign for the progress of SHGBLP in India. Hausman test and Breusch-Pagan Test concluded the use of pooled regression model would be appropriate, hence pooled regression model was chosen. The result specified that with 1% increase in number of SHGs, there will be 1.41% growth in loan disbarments in India. During the year 2017-18, there was a logical leap in the number of institutional credits of SHGs and in the amount of institutional credit distributed to SHGs at 19.13% and 21.67%, respectively. The increase in NPAs in loans to SHGs from 2.1 percent in 2008 to 7.4 percent in 2015 was a matter of concern. After this the NPA rate fell from 7.4 percent (in 2015-16) to 6.12 percent in 2017-18, which again came down to 5.19 percent in 2018-19. Absolute NPAs had declined to improve the quality of debt assets in the banking sector. Village level programs were conducted in collaboration with SHG-BLP to promote better understanding of mutual needs among banks, SHGs and SHPIs, to address issues related to credit linkage, repayment at the grassroots level. VLPs were sponsored by NRLM and NABARD resulted in better interaction between bankers and SHGs leading to increased credit flow and appreciation of each other's needs. During 2017-18 NABARD supported more than 30011 village level programs with expenditure ₹464.27 lakh benefitted 855713 SHG members. A record 25.86% increase in credit disbursements by banks during the year 2017-18 were provided with institutional lending which is the highest ever in a year. Banks disbursed ₹4718 crore loans to 22.61 lakh SHGs during the year 2016-17.

Variation in Average Loan Outstanding, Loan Disbursement and Savings Per SHGs

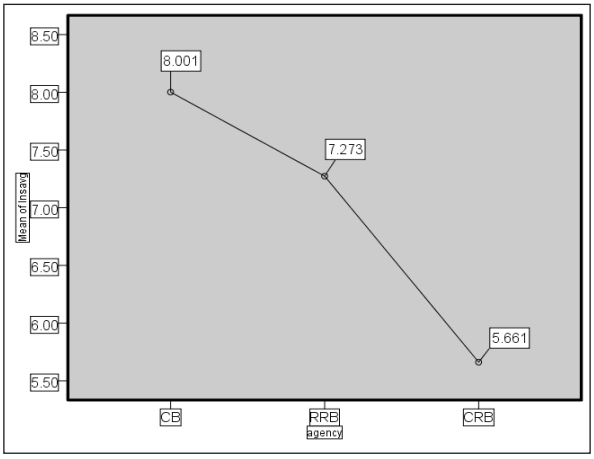
Post-hoc comparisons for average Loan Outstanding, loan disbursement and savings found significant with F statistics 9.475 (.001), 88.874 (.000) and 38.573 (.000) respectively. Table 9 shows the mean differences which interpret that highest mean difference is shown by commercial banks and the lowest by cooperative banks. This further reveals that commercial banks are better in SHGBLP (in all three loan outstanding, loan disbursement and savings) as compare to RRBs and CRBs.

Table 9: Post-Hoc Multiple Comparisons for Average Loan Outstanding, Loan Disbursement and Savings Per SHG (Bank-Wise SHBLP)

Dependent Variable	(I) Agency	(J) Agency	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
lnLO (Loan Outstanding)	CR	RRB	1.94909*	.70315	.025	.2156	3.6825
		CRB	3.01841*	.70315	.000	1.2850	4.7519
	RRB	CR	-1.94909*	.70315	.025	-3.6825	-.2156
		CRB	1.06932	.70315	.296	-.6641	2.8028
	CRB	CR	-3.01841*	.70315	.000	-4.7519	-1.2850
		RRB	-1.06932	.70315	.296	-2.8028	.6641
lnLD (Loan Disbursement)	CR	RRB	.61385	.25918	.062	-.0251	1.2528
		CRB	3.25187*	.25918	.000	2.6129	3.8908
	RRB	CR	-.61385	.25918	.062	-1.2528	.0251
		CRB	2.63802*	.25918	.000	1.9991	3.2770
	CRB	CR	-3.25187*	.25918	.000	-3.8908	-2.6129
		RRB	-2.63802*	.25918	.000	-3.2770	-1.9991
Lnsavg (Savings)	CR	RRB	.72782*	.27290	.032	.0550	1.4006
		CRB	2.33974*	.27290	.000	1.6670	3.0125
	RRB	CB	-.72782*	.27290	.032	-1.4006	-.0550
		CRB	1.61192*	.27290	.000	.9391	2.2847
	CRB	CB	-2.33974*	.27290	.000	-3.0125	-1.6670
		RRBs	-1.61192*	.27290	.000	-2.2847	-.9391

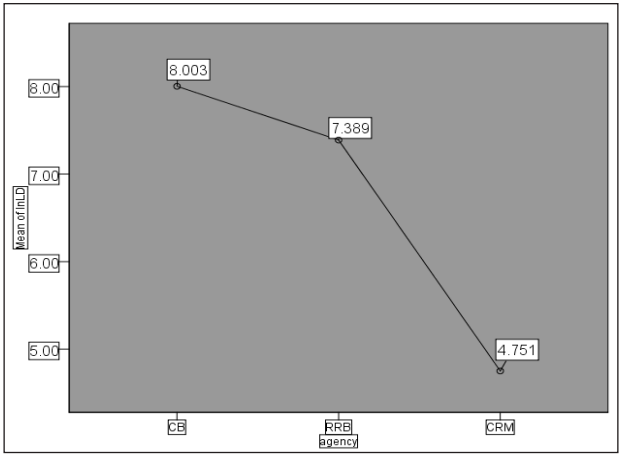
The mean difference is significant at the ***0.01, ** 0.05 level. , *.10.

Source: Model Estimation.



Source: Author's Own Estimation based on Model Empirics.

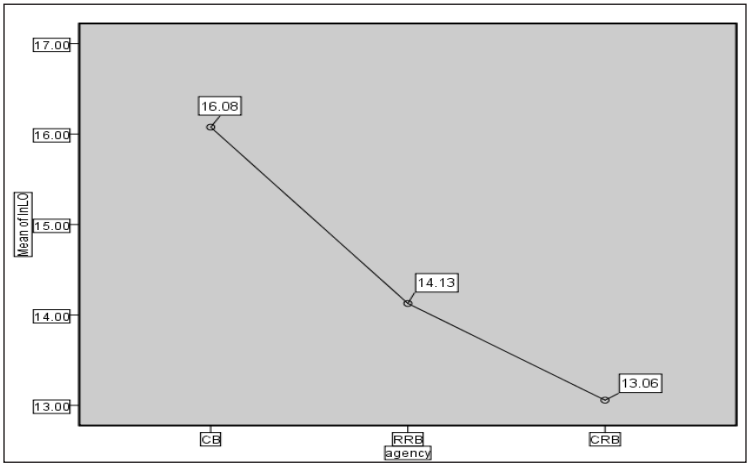
Fig. 6: Mean Plot of Savings



Source: Author's Own Estimation based on Model Empirics.

Fig. 7: Mean Plot of Loan Disbursement

RRBs can also generate more savings than cooperative banks but cooperative banks were better in loan disbursement than RRBs. Fig. 6 shows 8.001 % savings generated by commercial banks during the study period whereas 7.2% and 5.6% were generated by RRBs and CRBs respectively. With regard to loan disbursement; 8.003%, 7.38% and 4.75% of total bank loans towards microfinance disbursed by CBs, RRBs and CRBs respectively (refer Fig. 7).



Source: Author's Own Estimation based on Model Empirics.

Fig. 8: Mean Plot of Loan Outstanding

Looking at the loan outstanding, it was generated by commercial banks which are 16.9% of total outstanding. This is also worrying trend as 16.9% is greater than 8.001% of savings (refer Fig. 8). Policy makers need to pay attention for extending bank loans by commercial banks towards microfinance shouldn't generate inefficiency or outstanding amount, there is a need to focus on repayment schemes and training, capacity programmes by SHGs and new schemes innovations to be adopted by microfinance to promote and generate the employment and uses of loans.

DISCUSSION

There was no doubt that microfinance program was a very powerful means of poverty alleviation which not only opens up employment opportunities with small credit but also gives its identity to rural women. This study emphasized the role of banks in this microfinance programme. This analysis is an attempt to uncover the trend of MFI's faulty loans and rising non-performing assets and showed how this could hamper the objectives of Microfinance in the near future. To improve this, it is necessary that the credit quality of the banks should be taken care of, it should be managed effectively. It is necessary that the repayment should be monitored; effective steps should be taken to increase the loan outstanding. The bad loans should be neutralized in time so that they do not turn into non-performing assets. It is also important to see the size of the loan. Intensive self-help groups should be monitored; records of self-help groups should be maintained through training and banking camps. Empiric of the analysis was also supported by the evidences.

It was observed from the financial lending of banks involved in various states of India towards SHG-BLP found a serious concern of growth of microfinance and its sustainability to enhance micro-enterprises and productivity. Model finding implied that financial lending of India is being driven by loan outstanding by a greater coefficient which overshadows the effects of savings in the system. This further implied that there are the issues in repayment of loan in the banking system. A quantitative approach was seen in the practices of financial lending to SHGs; its rising based on the number of SHGs. The association between loan disbursement and loan outstanding, number of SHGs, and savings and confirmed that it had positive and significant association with the variables (Shivagandhi & Dash, 2017). However, it may reflect that increasing number of poorer household is being linked to the program but

the existence of non-intensive SHGs cannot be denied. Under the SHG-BLP initiative of NABARD loans were lends to poor people who were not bankable were not performing and safe. Model findings observed the positive and significant association of savings towards SHG-BLP in India implies that SHG-BLP has significant contribution in uplifting poor. It was observed that the SHG-BLP driven microfinance had many advantages of high recovery, low transaction cost, availability of micro-credit, and developing quality of clients for the future (Srinivasan, 2008). However, this contribution will be overshadowed if loan over dues is not addressed on time. SHG-BLP program of India leading to a chronic banking collapse, rising trend of loan outstanding greater than loan disbursement and savings may result greater NPAs in the near future. If Economic activities were not being set through SHG loans they might get convert into bad loans and chronic NPAs (Sukanya, 2017). However, the model analysis did not find significant association of NPAs with SHG-BLP. This implied that we have still scope to improve the financial lending program by intervening qualitative measures such as implementing training programs, addressing over dues and over borrowings, control mechanism on borrowers through pressure group of SHGs for utilization of loans in productive means and micro-enterprises (SIDBI, 2019). Microfinance addressed the poverty alleviation through micro-credit over the years. As SHGs ensured financial discipline in lending loans to the group easily because peer pressure in the group ensures repayment (Jayadev & Sundar, 2016).

This was observed from the empirics of endogeneity model that India's financial lending program was found affected by the past period of loans. Although the coefficient was not found much larger but affected the financial lending in the system. It further carried lag period effects in the loan disbursement with greater loan outstanding and rising NPAs. The financial inclusion in India through microfinance and SHGs pointed out high NPAs and multiple lending (Asha, Sivakumar & Agarwal, 2016).

Model findings concluded that states found significant association with financial lending endogeneity model were required to intervene and to implement qualitative measures for bringing effectiveness in the system. The relative growth measures confirmed that performance of Andhra Pradesh was found highest in comparison to other states found significant by the model. The lowest growth was reported by Nagaland in the model estimates. The same has been corroborated by the report of microfinance 2019 that highest increase in saving was observed by Central (20.3%), southern (18.5%) and north eastern (12%) during year 2019-

2020. ₹ 7686 lakh saving was generated by financial lending program by Nagaland during the year 2019-2020 while loan disbursements were recorded at ₹ 1241.46 lakhs (Microfinance Report NABARD, 2019). This has been found that microfinance institutions are becoming urban centric and share of rural beneficiaries were declined in year 2016 and 2017 except few states of India such as Assam, Arunachal Pradesh, Nagaland, Jammu & Kashmir and Andaman & Nicobar (Sharif Mohd, 2018).

The lowest negative intercept variation was reported by Goa in India implies rising contribution towards SHG-BLP in India. This has been observed that loan disbursements of this state were increased for the recent years. In their study Goa occupied the highest rank among all the states of India in the index of women empowerment through microfinance interpreted by (Laha & Kuri, 2014)**.** The study found the different intercept variation or different pattern of growth through fixed effect estimates to highlight the causal effects towards the SHG-BLP growth in India. This implies that every state had its own contributing factors for showing intercept variation and cross-sectional differences such as literacy level, caste, culture, religion etc. Goa, Kerala, Mizoram are good in the literacy whereas the difference of caste i.e. *Tribes* and religion, Naxalites and lack of exposure could be the reason of Chhattisgarh, Rajasthan and Madhya Pradesh.

In comparison to commercial banks and cooperative banks, RRBs performed better in terms of availability and accessibility of RRBs is better in rural areas than the commercial and cooperative banks. This implied that the trend supports the effective future growth towards SHG-BLP will be contributed by RRBs in India in terms of savings and loan disbursements. Pooled OLs model found that both loan disbursements and savings were affected by number of SHGs. However, the coefficient of SHGs was found larger with respect to loan disbursements than savings. Post-hoc comparisons found that the commercial banks were contributed highest in the growth of SHG-BLP in India followed by RRBs. However, commercial banks were also found highest in loan outstanding towards SHG-BLP in India implied non-payment of loans which may get convert into NPAs in future. This was an alarm for policy makers and government to reframe the bank loan policies and repayment of loans. State-Wise analysis showed some of the states are significantly performing better but their growth intercept was also negative which can't be ignored. Therefore, it was required to address the issue arose due to bad loans in Microfinance growth according to the affecting factors of the states. There was a need

to address the institutional growth in South India to improve quality and reduce over dues (Thorat, 2006).

CONCLUSION

Study found the positive coefficient with saving in the empirics of endogeneity model towards SHGBLP but at the same time it's contributing in greater loan-outstanding too. Majority of states of India were found performing at border line in the growth of SHG-BLP implied decline in performance due to high loan disbursements directly proportional to high loan outstanding implies rising bad loans. And the similar findings were found by bank specific analysis that the financial lending through commercial banks contributed in high bad loans with higher number of SHGs and savings. This situation may bring collapse in banking capital and its productivity. There were factors affecting repayment of loan such as literacy, caste, religion, awareness and lack of exposure which can be improved by providing the beneficiaries training, skills and capacity building programs. Empirics of Cross-sectional differences recommended that policy makers to frame the policies keeping in view of different nature and characteristics of the state so that the aim of microfinance to be attained.

Thus it can be concluded that there was a need to address issues of Manual & incomplete bookkeeping by SHGs, inability of banks to monitor the records and functioning, lack of training through SHPIs/NGOs/JLG/ MEDPs, & other intervention of NABARD, lack of transparency, the existence of informal financial channels of borrowing, Over borrowing, rising trend of loan outstanding and NPAs were found the huge hurdles in the growth of SHG-BLP in India. Despite these challenges, study significantly found the association of saving with loan disbursements and the states effects in India does not show any significant association with NPAs implied that financial Lending towards microfinance program has significant association with the growth of SHGBLP programme in India and Rajasthan.

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