What Role Does Financial Inclusion Play for Poverty Reduction? Empirical Evidence From The Indian States in the Post-Liberalization Era

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Research

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Posted Date: February 23rd, 2021

DOI: https://doi.org/10.21203/rs.3.rs-217570/v1

What Role Does Financial Inclusion Play for Poverty Reduction? Empirical Evidence from the Indian States in the Post-Liberalization Era

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Abstract

The paper tries to analyzes the effect of financial inclusion on poverty reduction among 28 Indian states and rural-urban as well. Using data from 28 Indian states over the period of 1993 to 2015, this study constructed a single financial inclusion index through Principal Component Analysis (PCA) method, which signifies the state-wise variation in financial inclusion services. Furthermore, this study uses Fixed Effect, Random Effect, Panel Corrected Standard Errors, Feasible General Least Square, and Hausman-Taylor Regression model to know the impact of financial inclusion on state-wise poverty reduction and rural-urban poverty reduction as well. The results of this study suggest that financial inclusion has a negative and significant effect on state-wise and rural-urban poverty reduction respectively. With regards to the control variables, this study finds that variables like social sector expenditure, per capita state GDP and capital receipt are negatively associated with all three categories of poverty (i.e., overall poverty and rural-urban poverty) whereas the rural population is positively associated.

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Paper Type: Research Paper

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1. Introduction

Easy and affordable access to financial products and services through financial inclusion is an imperative policy instrument to improve livelihood, reduce poverty and inequality (Kapoor, 2014; Sinha, 2014), especially for low and middle-income countries. As financial exclusion is termed as 'social exclusion', hence the main objective of financial inclusion policy is to include the poor unbanked people with the mainstream financial system so that they can able to obtain economic benefits. Understanding the significance of financial inclusion on poor people's lives, many developing and developed countries have extended the outreach of formal banking to the lower sections of society.

In this context, 'India' being the second largest populous country in the world, comprises a large number of unbanked people. In a study, conducted by Center for Financial Inclusion (CFI) Sharma and Chatterjee (2017) argue that globally 2 billion people and in India 37 per cent people are excluded from the formal financial system. Hence, to bring these unbanked people into the banking system, both the Government of India (GoI) and the Reserve Bank of India (RBI) have under-taken many financial inclusion initiatives. In India, the process of financial inclusion started a long time ago. The first financial inclusion drive started with the introduction of nationalization of banks where 14 major private banks were nationalized in 1969 and later six more banks were nationalized in 1980.

However, the liberalization in the financial market in 1991 has witnessed a paradigm shift in the basic structure and functioning of the Indian financial market. The Indian financial institutions in general and the banking sector in particular, show a significant change in India's financial markets. There was major economic and financial policy reform happened during that time. Because of the sluggish functioning of the Indian financial markets in the earlier time, the implementation of financial reform pushed the government to immediately form a high-level committee (Narasimham Committee-I) for preparing a road map for the smooth and efficient function of the future financial markets. Similarly, with the opening of the Indian financial markets, many foreign financial institutions were welcomed to operate in India. With the reform in the banking sector and the operation of foreign banks, it was expected that these policy initiatives would help to enhance India's financial inclusion process. Moreover, the post-liberalization India has also perceived several major pro-financial inclusion policies to provide

basic banking services to the earlier unbanked people. Such policies are: the launching of Self-Help Groups (SHGs) in 1992 and linking it with individual's bank account, provision of Kisan Credit Card (KCC), opening of no-frill account, introduction of Know Your Customer (KYC) scheme, Direct Benefit Transfer (DBT) facility, Pradhan Mantri Jan-DhanYojana (Prime Minister's People Money Scheme), Mudra Yojana and the recent introduction of digital India programme. (see Barik and Sharma, 2019). The prime motto of all these financial inclusion policies was to provide easy and affordable financial services to the poor and marginalized communities so that they can overcome their economic hardship. Additionally, the new financial reform also led to the withdrawal of social banking policy in India, which was having a very significant impact on poverty reduction. Earlier researchers (like Burgess *et al.,*2005; Burgess and Pande, 2005) have claimed that the implementation of social banking policy in India between 1977 to 1990 has reduced rural poverty by extending credit to the rural people through the establishment of bank branches in rural areas. However, with the major financial reform in 1991 and the withdrawal of social banking policy during the same time, a debate has erupted about the performance of financial inclusion on poverty reduction in the post-liberalization period.

Hence, based on the above arguments, this study here discusses how the public sector banks have played a major role to improve financial inclusion and poverty reduction in India. Taking data from India's public sector banks, from the period 1993 to 2015, this study tries to analyze the effect of financial inclusion on poverty reduction among 28 Indian states and rural-urban India as well. With the help of the Principal Component Analysis (PCA) method, this study has constructed a single financial inclusion index for all the 28 Indian states. Furthermore, this study has used unbalanced panel data to empirically examine the effect of financial inclusion on state-level poverty reduction in India. Additionally, using the same state-level financial inclusion index the paper also investigates the impact of financial inclusion on rural and urban poverty in India.

The rest of the paper is prepared as follows. Section 2 describes the usual linkages between financial inclusion and poverty reduction in Indian states. Section 3 provides a complete review of the literature. Section 4 describes the model specification, data and variables used for

this study. Section 5 discusses the empirical results. Lastly, section 6 provides the concluding remarks with policy recommendations and limitations of this study.

2. Linkages between Financial Inclusion and Poverty Reduction

Poverty is defined as the deprivation of consumption and other basic economic resources among the people. Provision of microcredit through the formal financial institution will help the poor to smoothen their consumption expenditure and enhance their capability by investing in their non-income generating activities such as health, education, sanitation and other basic entitlements. Sen, (2001) argues that the availability and easy access to finance has a very significant effect on economic entitlement.

At first, financial inclusion enhances the saving habits among poor people. Through financial inclusion, the poor unbanked people will have an opportunity to save a small amount of money in their bank/post office account, which they can use during their adverse economic shocks. Simultaneously, through saving in bank/post office, the poor people will get a rate of interest in return and can accumulate more wealth. Secondly, financial inclusion extends credit to poor people at an affordable cost. Accessing easy and adequate credit from the formal financial institutions can save the poor people from the exploitation of local money lenders because with the absence of a formal financial system to provide credit, local money lenders provide loans with a high rate of interest. In this context, it can be argued that the provision of easy and adequate finance curtails financial risks of the poor and marginalized people which may increase their production capacity. Thirdly, from an individual family perspective financial inclusion not only increases poor people's cash flow and but also encourages them to invest their obtained credit on other dimensions of poverty such as children's education, health, building house, smoothening consumption, etc.; as a consequence, families involved in the formal financial system raise their family income and secure their family from the adverse financial shocks which create instant financial risks for the family. Fourthly, in India, it is known that poor agriculture farmers and small entrepreneurs often face difficulties to access adequate finance from formal financial institutions because of less collateral values to deposit in the bank. Hence, extending micro loans to the poor and marginalized farmers/entrepreneurs can help them to improve their agricultural activities and small business (Kasekende, 2014; Beck and Demirgüç-Kunt, 2008). Lastly, in India many government resources are unable to reach the poorest of the poor due to the

leakages in the government distribution system. As a remedy, the Government of India (GOI) has implemented a Direct Benefit Transfer (DBT) scheme for transferring money to the beneficiary's bank/post office accounts. So opening a bank account is the first step to acquire the benefits of the DBT scheme. Hence, through financial inclusion, the poor and marginalized people can obtain government subsidies which ultimately help them to raise their standard of living.

[Insert Fig. 1 here]

The above figure (fig-1) depicts the effect of different indicators of financial inclusion (used in this study) on poverty reduction. As per the availability of data, six indicators are taken from the three dimensions of financial inclusion (i.e., availability, accessibility and usability), which shows the effect of these indicators on poverty reduction through various channels.

3. Review of Literature

In many developing and emerging economy, it is argued that the mere development of the financial system is not enough for the country to reduce poverty because the financial system does not reach all sections of people equally due to the problem of adverse selection or asymmetry information in the financial market and high fixed cost/risk associated in lending to small borrowers. Sometimes the financial system is more favoured towards the better-off person, elite people, or urban middle-class section leaving the poor and marginalized people out of the reach of the formal financial system (Achugamonu, et al. 2020; Barik and Pradhan, 2021). In this situation, the concept of financial inclusion plays a very crucial role to bring the unbanked/underbanked people under the banking purview with an easy and affordable cost (Lenka and Sharma, 2017). Hence, in this context, it can be said that financial development is an input variable that works as a means to achieve the goal of financial inclusion through the establishment of financial institutions. Through financial inclusion, the poor people will have an opportunity to accumulate their savings, obtain micro-credit to establish a small business that eventually generates more employments and higher income, which ultimately reduces poverty.

Therefore, recently there have been substantial studies from both theoretical and empirical analysis perspectives that have addressed the effect of financial inclusion (or the

accessibility of banking products and services) on poverty reduction and income inequality by taking different indicators of financial inclusion. Such studies (Chibba, 2009; Kablana and Chhikara, 2013; Kim, 2016; Mookerjee and Kalipioni, 2010; Inoue, 2011, 2018; Park CY., Mercado R.V., 2016; Zhang and Posso, 2017) have used few indicators of financial inclusion as per their data availability and suitability and analyzed that financial inclusion has a significant effect on poverty reduction (Williams et al., 2017; Anwar et al., 2016; Hussaini et al., 2018). Oppositely, researchers like Meager, 2019 and Neaime & Gaysset, 2017 have also found no impact of financial inclusion on poverty reduction.

[Insert Table 1 Here]

Except for these secondary data analyses of financial inclusion and poverty reduction, researchers have shown the same linkage by working with primary data. Khaki and Sangmi (2017) surveyed the Kashmir valley and found that access to finance through National Rural Livelihood Mission (NRLM) (formerly known as Swarnajayanti Gram Swarozgar Yojana) scheme has a positive and significant effect on lowering multi-dimensional poverty in the valley.

The literature on financial inclusion and poverty reduction in context to India depicts that Inoue, (2011) had conducted a study to know the effect of financial inclusion on poverty reduction among the Indian states. In that study, the author empirically analyzed the effect of financial inclusion on rural and urban poverty reduction among the 25 Indian states and union territories, without measuring the same effect on the overall state's poverty. Secondly, the author used five indicators (such as no. of bank branches in proportion to 10000 population, no. of the deposit bank account in proportion to 10000 population, no. of credit bank accounts in proportion to 10000 population, amount of deposit as a per percent of state GDP, amount of credit as a per percent of state GDP) of financial inclusion and empirically tested the effect of each particular financial inclusion indicator on state-wise rural and urban poverty. Similarly, in a recent study Inoue, (2018) conducted another research to know the effect of financial inclusion on poverty reduction in India. This time the author used only two indicators (like number of bank branches and bank accounts) to measure financial inclusion and along with financial deepening interaction term, the author empirically analyzes whether and to what extent, the breadth and depth of the banking sector interact with each other to reduce aggregate poverty in India.

From the above literature journey, we did not find any study conducted to measure the effect of financial inclusion on both overall state poverty reduction and rural-urban poverty reduction in India. Hence, to fulfill the literature gap, this study is an extension of previous studies. This study differs from the previous studies in three ways. Firstly, this study includes more indicators of financial inclusion (i.e., six indicators) than the previous studies. Secondly, this study uses a different methodology to construct state-wise financial inclusion indexes (i.e., PCA). Thirdly, this study analyzes the effect of financial inclusion on both overall states' poverty and rural-urban poverty reduction also.

4. Empirical Models

The present study aims to estimate the effect of financial inclusion on state-level poverty reduction in India. Additionally, the study also finds out the rural and urban poverty reduction with context to financial inclusion. Therefore, to empirically examine the above-cited objectives, this study uses three different models. We ran three different regression models for (a) full sample states (which includes both rural and urban poverty), (b) for rural poverty only, and (c) again separately for urban poverty reduction. The main purpose of doing separate regression for rural-urban context is to examine the regional characteristics that affect the outcomes. As there is huge variation in the socio-economic characteristics between rural and urban India, financial inclusion is having non-monotonic nature in these two areas. Simply, it can be said that there are huge socio-economic differences exist between these two regions. These differences can lead to an unequal accessibility of financial services among the peoples. Generally, it is expected that because of high financial literacy, high income, better transportation facilities, and easy accessibility of financial institutions in urban areas, people from urban localities are more likely to be financially included than their rural groups. Hence, to examine the regional differences that are impacting the main consequences, here we have used separate regressions for both rural and urban poverty. Similarly, to capture the different zonal state effects on the process of poverty reduction, this study has taken regional dummies (Reg-Dum) across the three regression models (i.e., full sample, rural only and urban only). As India is a vast country, having different socio-economic lives pattern of people in different states. Hence, all the 28 Indian states are divided into six zones (i.e., Central India, East India, Northern India, North-East India, Southern India, Western India). Hence, to capture six zonal effects, the study has considered five dummies.

Furthermore, various state governments in Southern zonal (i.e., Tamil Nadu, Kerala and Andhra Pradesh) have undertaken numerous pro-financial inclusion policies to eradicate the presence of poverty in their respective states/zones. Therefore, the regional dummies are used in this study to capture the particular zonal effect on poverty. The following three econometric models are specified in-order to materialize our above-cited objectives.

Mode 1

$$Pov_{it} = \alpha + \beta_1 FII_{it} + \delta_i Z_{it} + \beta_2 Reg\_Dum_{it} + \varepsilon_{it} \quad (1)$$

Model 2

$$RPov_{it} = \alpha + \beta_1 FII_{it} + \delta_i Z_{it} + \beta_2 Reg\_Dum_{it} + \varepsilon_{it} \quad (2)$$

Model 3

$$UPov_{it} = \alpha + \beta_1 FII_{it} + \delta_i Z_{it} + \beta_2 Reg\_Dum_{it} + \varepsilon_{it} \quad (3)$$

These three models are established to analyze the effect of financial inclusion on poverty reduction in all 28 Indian states and in rural-urban India as well. Moreover, in these three models, we used Pov_{it} (model 1), $RPov_{it}$ (model 2) and $UPov_{it}$ (model 3) in the dependent variable sides and financial inclusion and other control variables are used in the independent variable sides. In model 1, Pov_{it} is the poverty headcount ratio for i^{th}states at time period t; in model 2, $RPov_{it}$ is the % of people living below the poverty line in rural areas for i^{th}states at time period t and in model 3, $UPov_{it}$ is the % of people living below poverty line in urban areas for i^{th}states at time period t. Similarly, FII_{it} is the financial inclusion index for i^{th}states at time period t; Z_{it} refers to vector of four control variables, namely log of social sector expenditure (sse), per capita SGDP (pcsgdp), rural population (rp); log of capital receipt (cr) for each state at time period t. The term Reg_Dum_{it} refers to the zonal dummies that have been considered to capture the zonal effect on poverty reduction. And finally, the term ε_{it} indicates the error term. All the control variables are well supported with the existing literature.

4.1. Variable Specification and Data Sources

This section briefly describes the definition and sources of data used for this study. To measure the inter-relationship between financial inclusion and poverty reduction in Indian states, this study employs unbalanced panel data of 28 Indian states (except Telangana), covering the period

from 1993 to 2015. For poverty measurement, this study uses headcount ratio as the dependent variable, while on the independent variable side, financial inclusion index and other suitable control variables are used (see table 2).

4.1.1 Poverty

State-wise reduction of poverty *(pov)* is accessed through state-wise headcount ratio i.e., the percentage of people living below the poverty line, determined by the Government of India. Data for headcount ratio is collected from NITI Aayog (GOI). Headcount ratio is also used in other literature (Inoue and Hamori, 2012; Zahonogo, 2016; Ayyagari *et al.*, 2013) of financial development and poverty reduction. In the financial inclusion literature, the percentage of people below the poverty line or headcount ratio is also used in Inoue (2011); Park and Mercado, (2016).

4.1.2 Financial Inclusion

In the financial inclusion literature, different indicators have been used by different researchers as per the data availability and suitability. In the present study, we use six indicators taken from three dimensions of financial inclusion. Such indicators are (i) number of bank branches in proportion to 1000 population, (ii) number of bank employees as the ratio of bank branches, (iii) deposit bank accounts in proportion to 1000 population, (iv) credit bank account in proportion to 1000 population, (v) amount of deposit as the percentage of state GDP, (vi) amount of credit as the percentage of state GDP. All these indicators are used in Lenka and Sharma(2017) in their financial inclusion and economic growth paper. And also the same indicators (except bank employees as the ratio of bank branches) have been used by Inoue (2011) in his state-wise analysis of financial inclusion and poverty reduction paper with different magnitude of variables. All the indicators of financial inclusion are collected from basic statistical returns of schedule commercial of RBI.

4.1.3 Control Variables

For control variables, we use per capita state GDP, social sector expenditure, rural population and capital receipt. The control variable for per capita GDP has been used by Beck and Levine, (2007), Jalilian and Kirkpatrick, (2002), and Donou-Adonsou and Sylwester, (2016). The control

for social sector expenditure or government expenditure has been used by Ayyagari *et al.,* (2013), Jalilian and Kirkpatrick, (2002, 2005). Similarly, the control for the rural population has also been used by (Ayyagari *et al.,* 2013). The first control variable like Per capita state GDP has a significant role to play in reducing poverty. Generally, the rise in per capita income of the individual raises the economic status of the person and equally persuades the individual to spend more money on their consumption. Similarly, with the rise in social sector expenditure, the citizens of the county will have the opportunity to obtain more government benefits in the field of food security, health, education, sanitation employment, etc., which will further help the citizens to move out from the poverty trap. The government spending on social upliftment through providing various welfare measures has a significant impact on the reduction of poverty in the country. Likewise, the increase in the percentage of rural population is expected to hamper the process of poverty reduction in the country. Because of less literacy, low employment skills, and lack of employment opportunity in the rural areas, it is expected that the presence of more rural people can hinder the process of poverty reduction. With regard the last control variable (i.e., capital receipt), it can be argued that the inflow of more capital in the country is expected to reduce the poverty rate. With the inflow of more capital, the government will have more resources to spend on the different welfare measures, that may have negative impact on the poverty condition of the country.

[Insert Table.2 here]

4.2. Measuring the State-Wise Financial Inclusion Index through PCA

Measuring a holistic and unbiased composite financial inclusion index is a challenging assignment for the researchers. Meanwhile, previous studies (Sarma, 2008; Arora, 2010; Gupte *et al*, 2012; Chakravarty and Pal, 2013) have used different methods (like distance-based approach adopted by UNDP to computed HDI, Analytical and Hierarchical Process-AHP and axiomatic approach) to compute the index of financial inclusion. Each method has its own merits and demerits for computation of the index. Most of the studies have used AHP for weights of the variables in the composite index construction. However, the problem with AHP is that there is no prior information available about the weight of a particular variable (Lenka and Barik, 2018). So AHP may not be a good method to find out the weight of factor included in the multidimensional

index. Also, looking at the volatility nature of financial access variables, AHP, and distance-based approach may not solve unbiased index construction.

To overcome these deficiencies, the present study relies on the statistical procedure for the construction of weights of the factors i.e., Principal Component Analysis (PCA) method. The study used six financial access indicators to construct a single holistic financial inclusion index. The six indicators included in the FII are (i) number of bank branches in proportion to 1000 population, (ii) number of bank employees as the ratio of bank branches, (iii) deposit bank accounts in proportion to 1000 population, (iv) credit bank account in proportion to 1000 population, (v) amount of deposit as the percentage of state GDP, (vi) amount of credit as the percentage of state GDP.

In the PCA method, first we calculate the factor scores (weights) through their eigenvalues. Then we calculate the factor score (weights) of each variable and multiplied it with the respective original variable. Finally, we add them together to get the single value of the composite index for i^{th}state for a particular time period t. Hence, for constructing a single index of financial inclusion, the formula is expressed as: -

$$FII_i = \sum_{i=1}^{p} Wji\ Xpi \tag{4}$$

By expanding this equation, it can be expressed as: -

$$FII_i = W_{i1}X_1 + W_{i2}X_2 + W_{i3}X_3 + \ldots\ldots\ldots + W_{ip}X_p \tag{5}$$

Here, FII_i is the financial inclusion index; W_i is the weight of the factor coefficient, X is the respective original value of the component, and p is the number of variables used.

Finally, FII for all Indian states is calculated using these below cited variables: -

$$FII_i = W_{1i}BB_t + W_{2i}BE_t + W_{3i}DBA_t + W_{4i}CBA_t + W_{5i}DEP_t + W_{6i}CRE_t \tag{6}$$

Here, the financial inclusion index for all the Indian states are calculated by adding together the entire factor scores (weights) and their respective original values. FII_i is the financial inclusion index of i^{th}state and W_1, W_2, …….W_6 are the weights of different factor scores. In the matter of state-wise financial inclusion, it can be observed from the below graph (graph no. 2) that there is a high variation in financial inclusion among Indian states. Some states are having high financial inclusion whereas other states are having low financial inclusion. The

states like Maharashtra, Kerala, Goa, are placed on the top of the ranking of financial inclusion whereas states like Utter Pradesh, Uttarakhand, Bihar are placed in the bottom of the ranking. In the aggregate sense southern, western, northern and central regions of India are relatively better placed in financial inclusion whereas eastern and north-eastern regions are less financially included. Here, our result is relatively similar to the result of Rajeev (2015), Poonam and Chaudhry (2016).

[Insert Table. 3 here]

4.3 *Estimating Procedure*

Before going for regression estimation, this study conducted a unit root test to check the stationarity of the data. As the used financial data are non-stationary in nature, hence the study has applied Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) test for stationarity check for the sample period from 1993 to 2015. Furthermore, in the empirical models, the study uses both fixed effect and random effect models to measure the impact of financial inclusion on poverty reduction. Moreover, the fixed effect model is chosen for the final interpretation of the result based on the Hausman test. Through panel data are mainly based on the two dimensions i.e., time and cross-sectional dimensions; so there might be the issue of autocorrelation and heteroscedasticity in the dataset. To take care of these issues, the study employs Panel Corrected Standard Errors (PCSEs) and Feasible General Least Square Method (FGLS) for robustness of the results. At the end, both PCSEs and FGLS are not sufficient to solve the issue of endogeneity or any potential problem of variables omission. To overcome these problems, the study applies Hausman-Taylor Regression (RE_HTR) model and re-estimates the results.

5. Empirical Results and Discussion

The main objective of this study is to empirically examine the impact of financial inclusion on poverty reduction among the 28 Indian states, and rural-urban India as well from the time period of 1993 to 2015. The Table A1 in the appendix section provides a detail descriptive statistic of this study. There are total 620 observation used in this analysis. The correlation results (table A2) show the overall correlation between all the variables. The correlation result depicts that the

financial inclusion index is negatively associated with the overall state poverty, rural poverty and urban poverty respectively. The social sector expenditure (SSE) is negatively associated with the overall state poverty and rural poverty whereas with context to urban poverty SSE is positively associated. Similarly, the per capita SGDP (PCSGDP) is having negative relationship with all three poverty categories (i.e., overall state poverty, rural and urban poverty). However, as expected, the rural population is positively associated with the three poverty groups. Finally, the capital receipt is negatively related with the overall poverty and rural poverty whereas it is positively associated with urban poverty (See Table A2 in Appendix).

Before conducting regression analysis, the study used unit root test (ADF and PP) for checking the stationarity in the data. The result of ADF and PP test indicate that variables used in this study are stationary at their level forms (see table A3 in appendix). After the stationarity check, the study moved for the regression analysis. Here, table 4a, 4b and 4c discuss the regression results for the impact of financial inclusion on poverty reduction for the full sample states and rural-urban areas respectively. Here, in addition to financial inclusion index, the study has also used other control variable indicators that may have a major impact on poverty. The study has used the overall state-wise financial inclusion index for full sample states and rural-urban poverty as well. The estimated results depict that for all the three sample areas (i.e., full sample states and rural-urban) financial inclusion have a negative and significant impact on poverty; that is states with higher financial inclusion are tend to have lower poverty rates. Correspondingly, it can also be argued that the rise in financial inclusion will have a significant impact on reducing the states overall poverty and rural-urban poverty as well. The empirical outcomes found that across the five models' specifications, our negative results for financial inclusion on poverty remain the same (See table 4a,4b and 4c). The negative impact of financial inclusion on poverty could be understood from the pioneering role that public sector banks in India have played historically. One of the probable reasons for this result is that this study has used public sector banks data for its analysis. The primary objectives of public sector banks are to promote banking services to the unserved areas and to include the poor and weaker sections of people into the banking system. While looking at the history of financial inclusion in India, it can be seen that to enhance financial accessibility, both GoI and RBI has undertaken so many initiatives. In the pre-liberalization period, the government has undertaken numerous policy measures (like nationalization of banks, the establishment of RRBs, opening of NABARD, social

banking policy, priority sector lending) to enhance financial accessibility in the country. Similarly, the post-liberalization period has also witnessed major pro-financial policy reforms (such as implementing SHGs and connecting it with the banking system, No Frills account, introduction of Pradhan Mantri Jan-Dhan Yojana and DBT schemes) in India. Additionally, the post-liberalized Indian economy has observed rapid growth of urbanization and income growth of the people. With the rising of urban people in India, over the years the government is continuously extending public sector banks for the easy accessibility of banking services to the urban people. Because of all these aggregate policy initiatives, Indian poor people have able to access easy and affordable financial accessibility from the formal banking sectors. The easy accessibility of banking services nearby the localities has encouraged the Indian poor to enhance their savings and mitigating their future uncertain financial risks. Similarly, the affordable accessibility of formal credit has protected the rural poor from the exploitation of local moneylenders. The corresponding rise in credit to the Micro, Small and Medium Enterprises (MSME) sectors in both rural and urban areas have helped the poor to increase their income through their various investment channels. Consequently, the cumulative effect of all these policy efforts has helped to produce a negative impact of financial inclusion on poverty in the overall full sample states and rural-urban poverty as well.

[Insert Table.4a here]

Furthermore, our empirical results for the impacts control variables on poverty suggest that all the three-control variables like PCSGDP, R-POP, and Capital Receipt (CR) have similar kinds of results across the three poverty categories (i.e., full sample states and rural-urban poverty). However, the findings for SSE differ for different poverty categories (See table 4a, 4b and 4c). The estimated results for SSE depict that social sector expenditure by the government has a negative impact on the overall state poverty and rural poverty (see table 4a and 4b) whereas for urban poverty, the social sector expenditure has a positive impact. In the case of rural poverty, we first observed a positive sign of SSE on poverty, whereas after controlling the autocorrelation and heteroscedasticity, we found a negative impact of SSE on rural poverty. The probable reasons for this result could be due to the inclination of the government to allow more government expenditure on rural poverty eradication. Contrast to this result, while measuring the

impact of SSE on urban poverty, it is observed that for the initial two models (i.e., FE and RE) we found a negative effect whereas after controlling autocorrelation and heteroscedasticity, we found a positive impact of SSE on urban poverty. Similarly, as expected, the per capita state GDP has a negative and significant impact on poverty in all the poverty categories (see table 4a, 4b and 4c). The result of this is very obvious that the rise in people's income would lead to an increase in their standard of living and assist them to spend more on both consumption and non-consumption expenditure. However, the result of the control variable 'R_POP' depicts that the rural population has a positive effect on poverty across the three poverty categories analysis (see table 4a, 4b and 4c). This result is quite expected because with lack of employment skills, less education and unavailability of employment opportunities in rural areas, the increment of the rural population would augment the poverty situation in rural India. Similarly, with the rising trend of urbanization, urban slums and urban poverty are also increasing rapidly. Because of the modernization of the agriculture sector, low employment skills and less employment opportunity in rural areas, a huge number of rural people are migrating to urban areas in search of better livelihood. Consequently, this huge rural-urban migration would help to increase urban poverty. Hence, the rise in rural population would ultimately lead to a rise in urban poverty also. Similarly, the empirical result of another control variable 'CR' shows that capital receipt has a negative effect on the poverty condition in all three poverty categories (see table 4a, 4b and 4c). This result could be possible because with the inflow of more capital, the government will able to spend more on public welfare activities which would help to have a negative impact poverty condition of the respective states.

[Insert Table 4b here]

Our analysis with context to the zonal effect on poverty shows that the results of all the five zonal dummies are varying for different Indian state zones. The empirical result depicts that zones like North, South and West are having a negative impact on overall state poverty. However, the other two zones such as North-East and East zones are having a positive impact on the overall poverty (see table 4a). The negative impact of financial inclusion in North, South and West zones could be possible because of their high financial inclusion and higher economic status. Whereas in the case of North-East and East zones, because of low financial inclusion and lower economic status, the overall zonal dummies are having no impact on poverty reduction.

Likewise, in case of rural poverty all five zonal dummies (such as North, South, West, North-East and East) are having a negative impact on rural poverty (see table 4b). This result could be possible because of extensive pro-financial inclusion policies implemented in North, South, West zones and may be because of the nature of higher economic state status in these zones. However, for North-East and East zones through the overall formal sector financial sector have low financial inclusion but the extensive outreach of microfinance to the rural areas have helped to reduce poverty in these two zones as well. Similarly, in case of urban poverty, our result found that zones such as North, South and West are having negative impact on urban poverty where as other two zones like North-East and East are having positive impact on urban poverty. In urban poverty, our first four models found a negative impact for North-East and East zones whereas after controlling the autocorrelation and heteroscedasticity we observed a positive sign for the same zones.

5. Concluding Remarks

The prime objectives of this paper are to empirically examine the effect of financial inclusion on poverty reduction among the 28 Indian states and in rural-urban India as well. To measure the degree of financial inclusion among Indian states, we have constructed a single index of financial inclusion among the 28 Indian states from 1993 to 2015. The states-wise financial inclusion index signifies the variation of financial accessibility among the Indian states from 1993 to 2015. Our state-wise financial inclusion index shows demonstrate that states like Maharashtra, Kerala, and Goa have captured a higher position in financial inclusion whereas states like Utter Pradesh, Uttarakhand, Bihar are placed in the bottom of the financial inclusion ranking. Hence, it can be stated that there is high degree of variations of financial inclusion among the India states.

Furthermore, this study uses Fixed Effect (FE), Random Effect (RE), Panel Corrected Standard Errors (PCSE), Feasible General Least Square (FGLS) and Hausman-Taylor Regression (HTR_RE) models to empirically verify the impact of financial inclusion on poverty reduction. The empirical analysis of this study depicts that that financial inclusion has a negative and significant effect on state-wise and rural-urban poverty respectively. That means states with a higher level of financial inclusion are tend to have a lower poverty rate. Additionally, the results from control variables suggest that control variables such as social sector expenditure and per capita state GDP and capita receipt are negatively associated with the overall poverty, and rural-

urban poverty as well. However, the percentage of the rural population is positively associated with all three poverty categories (i.e., overall poverty, and rural-urban poverty).

6.1 Policy recommendations

Based on our empirical findings, we take an opportunity to suggest the following thoughts for policy consideration. Firstly, our findings depict that there are variations in financial inclusion among the 28 Indian states. States from eastern and north-eastern regions of India are having low financial inclusion than states from southern, western, northern and central regions. Hence, in order to minimize the financial inclusion gaps between the Indian states, state-specific policy initiatives should be undertaken by the government. Strengthening good governance, promoting financial literacy and enhancing institutional quality in low ranked financial inclusion states will be good policy initiatives to promote financial inclusion among these states.

Secondly, our empirical results illustrate that financial inclusion has a negative and significant effect on the overall state poverty and rural-urban poverty reduction as well. Our findings advise that financial inclusion plays a major role in lowering overall poverty. hence, more financial inclusive policies must be undertaken and more unbanked poorer people should be encompassed within the banking fold.

6.*2 Limitations and future research*

Though this study has provided sufficient empirical evidence to support its primary objectives, but this study also has certain limitations. Firstly, this study has taken six indicators of financial inclusion for constructing the financial inclusion index; a future study could be conducted by capturing more financial access indicators such as microfinance, insurance, post office saving banks etc, which are having significant impact on inclusive finance. Secondly, here we have measured poverty through headcount ratio; a further study could be developed by constructing a multidimensional poverty index and also empirically can test the effect of financial inclusion index on multidimensional poverty index.

Acknowledgements

Not Applicable

Availability of data and materials

Not Applicable

Competing interest

The authors declare that they have no competing interests.

Funding

No funding was received for this study.

Authors' Contributions

Mr. Rajesh Barik has formed the idea, collected the data and prepared the manuscript. Dr. Sanjaya Kumar Lenka has analysed the data and supervised the overall manuscript.

References

Achugamonu, et al. (2020). Financial exclusion of bankable adults: Implication on financial inclusive growth among twenty-seven SSA countries. *Cogent Social Sciences*, 6(1), 1730046.

Anwar, A., Uppun, P., Tri, I., & Reviani, A. (2016). The Role of Financial Inclusion to Poverty Reduction in Indonesia. *IOSR Journal of Business and Management*, *18*(6), 37–39. https://doi.org/10.9790/487X-1806033739

Arora, R.U. (2010), "Measuring financial access", Griffith University, Discussion Paper Economics, No-7.

Ayyagari, M., Beck, T. and Hoseini, M. (2013), "Finance and Poverty: Evidence from India", (SSRN Scholarly Paper No. ID 2275150). Rochester, NY: *Social Science Research Network*. Retrieved from https://papers.ssrn.com/abstract=2275150

Barik, R., & Sharma, P. (2019). Analyzing the progress and prospects of financial inclusion in India. *Journal of Public Affairs*, *19*(4). https://doi.org/10.1002/pa.1948

Barik, R., & Pradhan, A. K. (2021). Does financial inclusion affect financial stability: Evidence from BRICS nations?. *The Journal of Developing Areas*, 55(1).

Beck, T., and Demirgüç-Kunt, A. (2008), "Access to Finance: An Unfinished Agenda", *The World Bank Economic Review*, Vol. 22 No. 3, pp. 383–396.

Beck, T., Demirgüç-Kunt, A., and Levine, R. (2007), "Finance, inequality and the poor", *Journal of Economic Growth*, Vol. 12 No.1, pp. 27–49.

Burgess, R., and Pande, R. (2005a), "Do rural banks matter? Evidence from the Indian social banking experiment", *American Economic Review*, Vol. 95 No.3, pp.780–795.

Burgess, R., Wong, G., and Pande, R. (2005b), "Banking for the Poor: Evidence from India", *Journal of the European Economic Association*, Vol. 3 No.2/3, pp. 268–278.

Cavoli Tony, I. O., & And Patricia SOURDIN. (2020). Financial Inclusion , Active Bank Accounts and Poverty Reduction in India. *ERIA Discussion Paper Series, No. 345*, *345*.

Chakravarty, S.R. and Pal, R. (2013), "Financial inclusion in India: an axiomatic approach", Journal of Policy Modeling, Vol. 35 No. 5, pp. 813-837.

CHEI BUKARI, JAMES ATTA PEPRAH, REBECCA NANA YAA AYIFAH, S. K. A. (2020). Effects of Credit ' Plus ' on Poverty Reduction in Ghana. *The Journal of Development Studies*, *00*(00), 1–18. https://doi.org/10.1080/00220388.2020.1797689

Chibba, M. (2009), "Financial Inclusion, Poverty Reduction and the Millennium Development Goals", *The European Journal of Development Research*, Vol. 21 No.2, pp.213–230.

Churchill, S. A., & Marisetty, V. B. (2020). Financial inclusion and poverty : a tale of forty-five thousand households. *Applied Economics*, *52*(16), 1777–1788. https://doi.org/10.1080/00036846.2019.1678732

Donou-Adonsou, F., and Sylwester, K. (2016), "Financial development and poverty reduction in developing countries: New evidence from banks and microfinance institutions", *Review of Development Finance*, Vol.6 No.1, pp.82–90.

Gupte, R., Venkataramani, B. and Gupta, D. (2012), "Computation of financial inclusion index for India",Procedia-Social and Behavioral Sciences, Vol. 37, pp. 133-149.

Hussaini, U., Chibuzo, I. C., Umaru, W., Polytechnic, F., & Kebbi, B. (2018). The effects of financial inclusion on poverty reduction : The moderating effects of microfinance. *International Journal of Multidisciplinary Research and Development International*, *5*(12), 188–198.

Inoue, T. (2011),"Financial Inclusion and Poverty Alleviation in India: An Empirical Analysis Using State-wise Data", In *Inclusiveness in India* (pp. 88–108). Palgrave Macmillan, London.

Inoue, T. (2018), "Financial inclusion and poverty reduction in India", *Journal of Financial Economic Policy*. https://doi.org/10.1108/JFEP-01-2018-0012

Inoue, T., and Hamori, S. (2012), "How has financial deepening affected poverty reduction in India? Empirical analysis using state-level panel data", *Applied Financial Economics*, Vol. 22 No.5, pp. 395–408.

Jalilian, H., and Kirkpatrick, C. (2002), "Financial development and poverty reduction in developing countries", *International Journal of Finance & Economics*, Vol.7 No.2, pp. 97–108.

Jalilian, H., and Kirkpatrick, C. (2005), "Does Financial Development Contribute to Poverty Reduction?", *Journal of Development Studies*, Vol.41 No.4, pp. 636–656.

Kablana, A. S. K., and Chhikara, K. S. (2013), "A Theoretical and Quantitative Analysis of Financial Inclusion and Economic Growth", *Management and Labour Studies*, Vol.38 No.1-2, pp.103–133.

Kapoor, A. (2014), "Financial inclusion and the future of the Indian economy", *Futures*, Vol. *56* (Supplement C), pp.35–42.

Kasekende, L. (2014), "What Role Does Financial Inclusion Play in the Policy Agenda for Inclusive Growth in Sub-Saharan Africa?", *Development*, Vol.57 No. 3-4, pp. 481–487.

Khaki, A. R., and Sangmi, M.-D. (2017), "Does access to finance alleviate poverty? A case study of SGSY beneficiaries in Kashmir Valley", *International Journal of Social Economics*, Vol.44 No.8, pp. 1032–1045.

Kim, J.-H. (2016), "A Study on the Effect of Financial Inclusion on the Relationship Between Income Inequality and Economic Growth", *Emerging Markets Finance and Trade*, Vol. 52 No.2, pp. 498–512. Kirkpatrick, C., Sirageldin, I., and Aftab, K. (2000). Financial Development, Economic Growth, and Poverty Reduction [with Comments]. *The Pakistan Development Review*, 363–388.

Koomson, I., Villano, R. A., & Hadley, D. (2020). Effect of Financial Inclusion on Poverty and Vulnerability to Poverty : Evidence Using a Multidimensional Measure of Financial Inclusion. *Social Indicators Research*, *149*(2), 613–639. https://doi.org/10.1007/s11205-019-02263-0

Lal, T. (2018), "Impact of financial inclusion on poverty alleviation through cooperative banks", *International Journal of Social Economics*, Vol.45 No.5, pp. 808–828.

Lenka, S. K., and Sharma, R. (2017), "Does Financial Inclusion Spur Economic Growth in India?", *The Journal of Developing Areas*, Vol.51 No.3, pp. 215–228.

Lenka, S.K. and Barik, R., (2018). A discourse analysis of financial inclusion: post-liberalization mapping in rural and urban India. *Journal of Financial Economic Policy*, Vol. 10 No.3, pp.406-425.

Md. Kabir Ahmeda, M. Niaz Asadullah, U. K. (2016). The Effect of Formal Banks on Household Income and Poverty in. *Malaysian Journal of Economic Studies*, *53*(2), 173–193.

Meager, R. (2019). Understanding the average impact of microcredit expansions: A bayesian hierarchical analysis of seven randomized experiments. *American Economic Journal: Applied Economics*, *11*(1), 57–91. https://doi.org/10.1257/app.20170299

Mookerjee, R., and Kalipioni, P. (2010)," Availability of financial services and income inequality: The evidence from many countries", *Emerging Markets Review*, Vol.11No.4, pp. 404–408.

Neaime, S., & Gaysset, I. (2017). Financial Inclusion and Stability in MENA: Evidence from Poverty and Inequality. *Finance Research Letters*, *24*, 230–237. https://doi.org/10.1016/j.frl.2017.09.007

Park, C.-Y., & Mercado, R. (2017), "Financial inclusion, poverty, and income inequality", *The Singapore Economic Review*, Vol.63 No.1, pp. 185–206.

Rajeev, M. (2015), "Financial inclusion and disparity: a case of India", *Global Labour University Working Paper no.37*, pp.1-31.

Sarma,M. (2008), “Index of financial inclusion”, ICRIER Working paper no. 215.
Sharma, M., and Charrerijee, S. (2017). Agents of Change: How the Human Touch is Bringing Digital Financial Services to New Customers in India. Center for Financial Inclusion, ACCION.

Lenka, S. K., and Sharma, R. (2017). Does financial inclusion spur economic growth in India?. T*he Journal of Developing Areas*, 51(3), 215-228.

Sen, A. (2001)," Development as Freedom", Oxford: OUP Oxford.

Sinha, R. P. (2014), "Index of Financial Inclusion: Some Empirical Results", In *Analytical Issues in Trade, Development and Finance* (pp. 467–478). Springer, New Delhi.
Sriram, M. S. (2010). Commercialisation of microfinance in India: A discussion of the Emperor’s apparel. *Economic and Political Weekly*, *45*(24), 65–73.

Williams, H. T., State, E. O., Adegoke, A. J., State, E. O., Dare, A., & State, E. O. (2017). Role of financial inclusion in economic growth and poverty reduction in a developing economy. *Internal Journal of Research in Economics and Social Sciences*, *7*(5), 265–271.

Zahonogo, P. (2016)," Financial Development and Poverty in Developing Countries: Evidence from Sub-Saharan Africa", *International Journal of Economics and Finance*, VOl.9 No.1, pp.211-220.

Zhang, Q., and Posso, A. (2017), "Thinking inside the Box: A Closer Look at Financial Inclusion and Household Income", *The Journal of Development Studies*, pp. 1–16.

Appendix

[Insert Table A1 here]

[Insert Table A2 here]

[Insert Table A3 here]

[Insert Table A4 here]

Figures

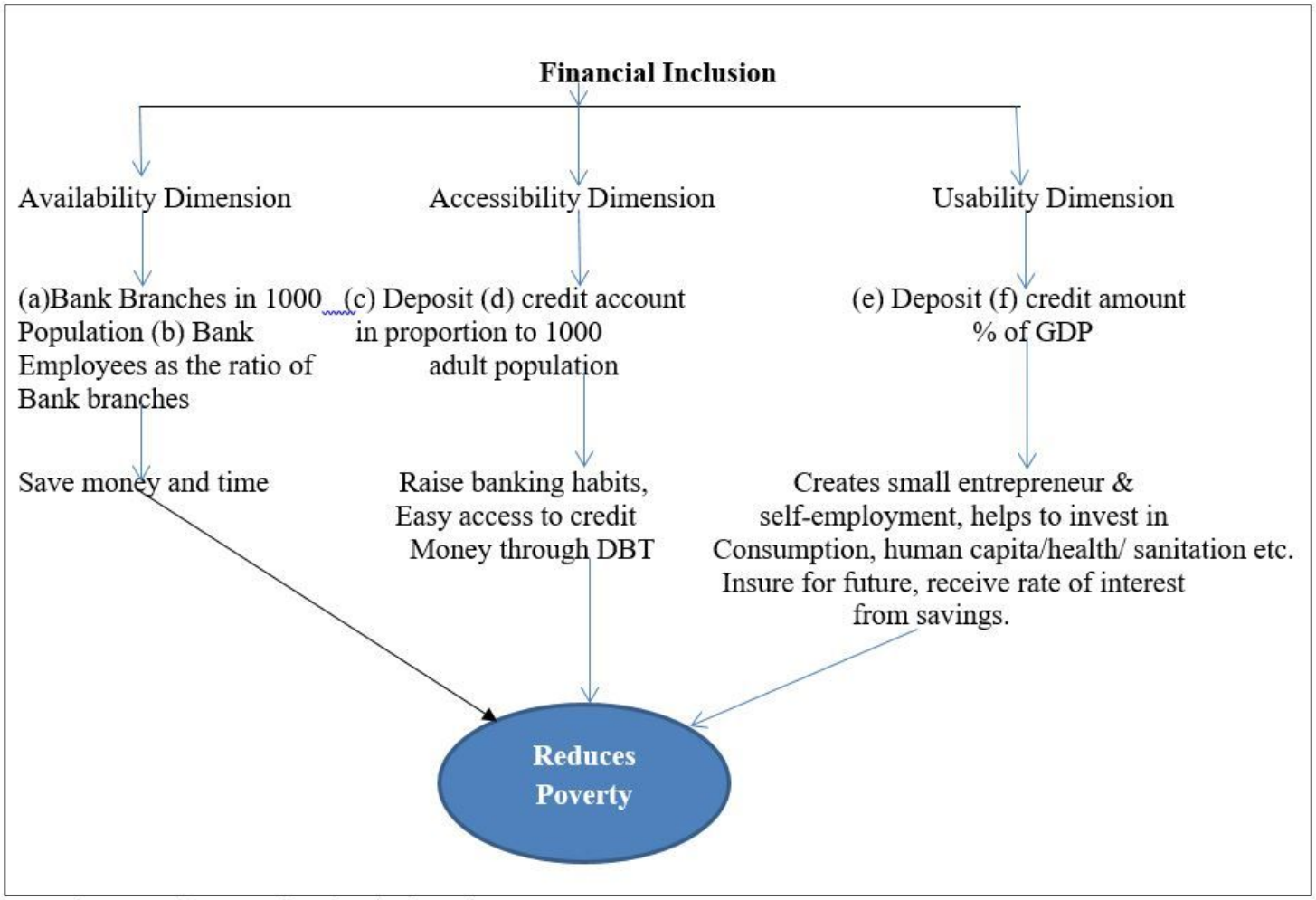

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Figure 1

Relationship between the different dimensions of financial inclusion and poverty reduction

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