BANK-BASED FINANCIAL INCLUSION, ECONOMIC GROWTH AND EMPLOYMENT IN INDIA

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ABSTRACT

This paper investigates the impacts of bank-based financial inclusion on economic growth and employment in India. Time series and cross-sectional data for selected 28 states of India over 2001-2012 are combined to create a heterogeneous panel data set. Credit-to-deposit ratios and number of bank branches are used to proxy for bank-based financial inclusion. The fixed effects models are found appropriate for this study. The estimates reveal significant positive effects of both credit-to-deposit ratios and number of bank branches on economic growth. However, such effects on employment are relatively very weak. **JEL Classification**: G10, G20, O11

INTRODUCTION

Financial inclusion has been increasingly drawing interests from policy makers, academicians and practitioners in recent decades across the globe due largely to its positive contributions to economic growth, job creation and poverty alleviation. Despite such growing interest, there is no commonly accepted precise and comprehensive definition of financial inclusion in the existing strands of theoretical and empirical literatures (Abel *et. al.,* 2018). In a broader term, financial inclusion is defined as a process that confirms the ease of access, availability and use of formal financial systems (Zulkhibri and Ismail, 2017). Chakravarty and Pal (2013) also define financial inclusion as a process that serves to remove barriers and overcome the inabilities of societal groups, including the poor and the socially disadvantaged, to access and use safe, low-cost, and fair formal financial services whenever needed.

Adults around the world in all income groups use variety of financial services ranging from savings account to loan and insurance. However, according to Global Findex Database, approximately 1.7 billion adults reported not having an account at a formal financial institution or through a mobile money provider in 2017. The unbanked adults mostly come from poorer households with low educational attainment. Furthermore, they are more likely to be inactive in labor force. As documented in (World Bank, 2018), nearly half of the unbanked adults live in the developing countries (e.g., China, India, Pakistan, Bangladesh, Indonesia, Mexico, and Nigeria).

Financial inclusion has multiple dimensions since financial services vary from

savings account to credit, pensions and securities market. Several studies reveal that the functioning of financial systems significantly varies across different dimensions, time and regions (Chakravarty and Pal, 2013; Honohan, 2008; Beck et al., 2007). A country's position might be strong in one dimension of financial inclusion but weak in other dimensions. Since there are variations in performances of financial systems across different dimensions, an appropriate synthetic index is required to be created for measuring an overall financial inclusion, but there is none yet in place. The usual variables used to measure financial inclusion are mainly concentrated in three major areas: accessibility, availability, and uses (Kodan and Chhikara, 2013). Penetration of the banking system, indicated by number of bank accounts per 1000 population, is used to measure accessibility. Likewise, number of bank branches and number of ATMs per 1000 population are used to measure availability. Finally, volumes of credit and deposit are standard proxy for uses. The most commonly used proxies to measure financial inclusion is average number of bank branches per 1000 population (Sarma and Pais, 2011). However, a single variable proxy does not operationalize the multidimensional concept of financial inclusion (Lenka and Sharma, 2017).

The reasons for financial exclusions lie in both supply and demand sides. On demand side, adults limit themselves from using financial services due to psychological and cultural reasons. These include people with low income, financial illiteracy, elderly people who prefer cash only for transactions, and so on. Supply side barriers include inefficient regulations, inappropriate products, insufficient reach and access, etc., (Europa, 2008). Some of the general reasons for financial exclusions are poverty, associated costs, distance, lack of documentation, distrust in financial system and religious concerns (World Bank, 2018). These challenges can further be outlined in three key clusters: human barriers (e.g., financial literacy, age and gender issues, etc.), institutional barriers (e.g., lack of coordination between central bank and government, lack of quality services, etc.), and infrastructural barriers (e.g., location, distance, high cost, lack of knowledge about use of technology, etc.,), as noted in (Rahman and Banerjee, 2018; Gupta, 2015).

In brief, hundreds of millions of people live in poverty as they get isolated from fundamental services, they need to improve their livelihoods. Access to financial services, on the other hand, offers people a chance to deliberately get involved in securing a means of subsistence to alleviate abject poverty. In addition, financial exclusion obstructs the private sector businesses from accessing financial services that, in turn, hinders their growth prospects. Since small and medium enterprises (SMEs) play an important role in improving economic growth and job creation, financial exclusion hinders economic growth rate and exacerbates joblessness (Aro-Gordon, 2017; World Bank, 2017). Therefore, researchers have largely focused on financial inclusion and its likely impacts on economic growth and poverty reduction.

Despite India's robust economic growth, a vast majority of the population still remain unbanked. According to Global Findex Database, India has the world's second largest unbanked population hovering around 190 million (World Bank, 2018). Therefore, they have to rely on uses of different quasi-formal and informal channels to meet their financial needs (Rahman and Banerjee, 2018). Commercial banks are important players in the economy, as they contribute to economic growth by mobilizing savings as deposits and extending credit to businesses out of deposits. The Reserve Bank of India (RBI) is engaged in promoting financial literacy by primarily focusing on unbanked regions for greater financial inclusion. However, despite such

effort for greater financial inclusion, approximately one-third of the population still remain unbanked in India.

In light of the aforementioned, this study aims to examine the influence of bank-based financial inclusion on economic growth and employment in India over 2001-2012 across 28 selected states. Selections of the sample period and states are solely conditional on complete data availability for credit-to-deposit ratios and bank branches.

The remainder of the paper is organized in sequence as follows: brief review of literature; empirical methodologies; results; conclusions and policy implications.

BRIEF REVIEW OF LITERATURE

Schumpeter (1911) pioneered the effect of finance on economic growth. In theory, services provided by financial intermediaries are crucial for technological innovation and economic development. After several decades, some other authors contrasted the above arguing that the relationship between financial and economic developments was over-stressed since financial development follows economic development in most cases (e.g., Lucas, 1988; Robinson, 1952). In the recent decades, a host of empirical studies focused on the impacts of financial inclusion on economic growth and poverty alleviation. They have found positive effects on both. As a result, financial inclusion has become an important development agenda for poverty reduction, particularly in many developing countries.

Sharma (2016) empirically investigated the nexus between dimensions of financial inclusion (banking penetration, availability and usage of banking services) and economic development in Indian economy for the period of 2004-2013. Vector Auto-Regression (VAR) models were estimated to perform Granger causality test. The results showed a significant positive relationship between economic growth and each dimension of financial inclusion. In particular, the study revealed a strong association between banking penetration and economic growth. Unidirectional causality was found from number of deposit/loan accounts to economic growth, but bi-directional causality was evidenced between geographic outreach and economic growth. These findings are in line with those in Ghosh (2011).

Implementing ARDL-bounds testing approach and ECM approach, Lenka and Sharma (2017) studied the long-run and short-run relationships between financial inclusion and economic growth in India. They found a significant positive impact of financial inclusion on economic growth both in the long run and the short run. Rahman and Banerjee (2018) applied Pedroni's heterogeneous panel co-integration methodology and random effects model to examine the impact of institutional financial inclusion on per capita real GDP growth of selected six South Asian countries (Bangladesh, Bhutan, India, Maldives, Nepal and Sri Lanka). They unveiled weak long- run and short- run causal effects of institutional financial inclusion on per capita real GDP growth in the above countries.

A host of other studies (e.g., Neaime and Gaysset, 2018; Kim, 2016; Beck *et al.,* 2007; Honohan 2004) observed negative association between income inequality and access to formal financial services. Kim (2016) analyzed the effect of financial inclusion on income inequality. Counterintuitively, the effect of such financial inclusion was initially negative on income inequality despite surging economic growth

particularly in low-income countries. However, this scenario reversed in the long run with stronger economic growth.

Karpowicz (2014) noted that financial inclusion transmits influences on economic growth and income inequality via three different channels: more developed financial markets means more funds to entrepreneurs to increase their output, higher growth results from more efficient contracts that limit waste from frictions, and increase in total factor productivity via efficient allocation of funds. Availability of financial services help smaller businesses to reap the benefits of using credit to expand their businesses. Moreover, the availability of credit via financial inclusion helps people engage in self-employed micro-business activities thereby reducing poverty rates among the self-employed (Beck, 2016; Cull, et al., 2014). However, huge amount of credits may not necessarily resemble the extensive use of financial services due to credit concentration mostly among large wealthy firms (Karpowicz, 2014).

Morgan and Pontines (2014) contended that lending to financially excluded firms may lower the average credit risk and probability of default. However, the impact of financial inclusion on the economy may not be discernible. Mehrotra and Yetman (2015) opine that broad base of depositors and diversified lending activities contribute to financial stability with greater financial risk in the unregulated parts of the financial sector.

Cull, et al., (2014) claimed that financial inclusion is positively correlated to both economic growth and employment. Since financial innovation lowers transaction costs and increases the outreaches across the economy, households can manage cash flows, build working capital and smooth consumption. Moreover, the availability of insurance products is likely to help people manage risk and shocks. Besides, access to banking services helps individuals save more. The resulting higher investment accelerates economic growth via multiplier effect (Ghosh, 2011; Mehrotra, et al., 2009).

Likewise, Yorulmaz (2012) asserted that unemployment has significant negative association with financial inclusion. Typically, unemployed and irregularly employed persons participate less in financial system. Therefore, they face higher unemployment rate due to greater possibility of financial exclusion. Using Pearson's Correlation technique, Hettiarachchi (2014) analyzed the effect of financial inclusion on unemployment rate. Results revealed that financial inclusion reduces the prevailing unemployment rate.

EMPIRICAL METHODOLOGIES

This section outlines the econometric methods and approaches that are applied in this empirical study. 28 Indian states are considered due to complete availability of state-level data for all variables, considered in this current undertaking. The sample period is selected from 2001 to 2012 for the above reason as well. The augmented panel data set combines time series and cross-sectional observations for Time-Series and Cross-Sectional (TSCS) analysis following (Wooldridge, 2009). Obviously, N=28 and T=12. Thus, the panel data set has altogether N*T (28*12=336) observations.

Panel data has several advantages over a time series or a cross-sectional data set (Baltagi, 2005; Klevmarken, 1989). As compared to traditional cross-sectional or time series data, panel data set creates large data points, an increase in degree of freedom

(d_f) and minimizes the problem of multicollinearity among independent variables (Hsiao, 1985). Panel data estimation models incorporate pooled OLS, fixed effects and random effects regression models. For best model selection, F-test, Breusch-Pagan Lagrange Multiplier test and Hausman specification test are employed.

The basic static panel data analysis model is specified as follows:

$$y_{i,t} = \alpha + \beta x_{i,t} + u_{i,t} \qquad i=1,2,\ldots N;\ t=1,2,\ldots T \tag{1}$$

where, $y_{i,t}$ is dependent variable, α is intercept, β is slope- coefficient, $x_{i,t}$ is matrix of explanatory variables and $u_{i,t}$ is the error- term.

Majority of panel data applications segregate $u_{i,t}$ into two parts: u_i and $v_{i,t}$. u_i represents unobservable individual-specific effect and $v_{i,t}$ represents the residual disturbances. Pooled OLS does not consider the effect of u_i. However, fixed effects model assumes u_i to be individual-specific time-constant variable and the remaining stochastic disturbance $v_{i,t}$ *is* independently and identically distributed with (0,). Random effects model considers u_i as random variables that are not correlated with explanatory variables. (Baltagi, 2005; Gujrati, 2004).

To find the suitable model between pooled OLS and fixed effects, F-test is applicable. Likewise, Breusch-Pagan Lagrange Multiplier test is employed to find the appropriate model between pooled OLS and random effects. Finally, Hausman test is used to determine whether fixed effects model should be used instead of random effects model.

The results reveal that the F-test favors the suitability of fixed effects model, while the Breusch-Pagan Lagrange Multiplier test favors the suitability of random effects model (Appendixes A and B *)*. Generally, Hausman (1978) test is preferred to choose between fixed and random effects models. Thus, Hausman test is conducted to select between fixed effects and random effects models. Hausman test supports the application of fixed effects model in lieu of random effects model *(Appendixes C and D)*.

A simple fixed effects model is specified as follows:

$$y_{i,t} = \beta_1 x_{i,t} + \beta_2 z_{i,t} + \alpha_i + u_{i,t} \tag{2}$$

where, α_i(i=1…28) is the unknown intercept for each cross-section, $y_{i,t}$ is the dependent variable, $x_{i,t}$ and $z_{i,t}$ represent independent variables, β_1 and β_2 are the slope- coefficients and $u_{i,t}$ is the error-term.

Thus, the following regressions in natural log are estimated:

$$lnSDPPC_{i,t} = \beta_1 lnCTDR_{i,t} + \beta_2 lnBB_{i,t} + \alpha_i + u_{i,t} \tag{3}$$

$$lnEmployees_{i,t} = \beta_1 lnCTDR_{i,t} + \beta_2 lnBB_{i,t} + \alpha_i + u_{i,t} \tag{4}$$

where, SDPPC is per capita gross state product, Employees represent total number of civilian employees, CTDR is credit-to-deposit ratio of scheduled commercial banks, and BB is the total number of bank branches. α_i is the unknown intercept for each cross-section and $u_{i,t}$ is the error-term.

RESULTS

To find the appropriateness of fixed effects or random effects model, Hausman model specification test is implemented. The results are reported as follows:

The low p-value confirms rejection of the null hypothesis that random effects model is consistent. This lends support in favor of the fixed effects model in equations (3) and (4). In other words, fixed effects models are more appropriate than random effects models for this study.

Consequently, the fixed effects model test results of variables in natural log-level are reported in Table 3. The associated t-values of estimated coefficients are reported within respective parenthesis. As observed, each slope-coefficient has positive sign. This implies that increases in both credit-to-deposit ratio and number of bank branches enhance per capita gross state product. Associated t-values are also statistically significant. The F-value signifies the estimated overall regression. Relatively, an increase in the number of bank branches contributes more to per capita gross state product growth than that in credit-to-deposit ratio. The adjusted- R^2 shows that 84.5 percent of the increase in per capita real gross state product is explained by increases in credit-to-deposit ratio and number of bank branches. The remaining 15.5 percent is attributed to other omitted factors.

The estimates of equation (4) are reported as follows:

$$\underset{}{\ln Employees_{i,t}} = \underset{(23.99)}{12.077} + \underset{(0.19)}{0.012}\ \ln CTDR_{i,t} + \underset{(1.33)}{0.115}\ \ln BB_{i,t}$$

R^2 (overall) = 0.010, F = 1.57

The associated t-value of each estimated coefficient is reported within respective parenthesis.

As observed, each slope-coefficient has positive sign. This implies that increases in credit-to-deposit ratio and number of bank branches contribute to higher employment. Comparatively, an increase in the number of bank branches contributes more to employment than that in credit-to-deposit ratio. However, the associated t-values appear statistically insignificant. The F-value at 1.57 is also insignificant meaning overall statistical insignificance of the estimated regression. The adjusted-R^2 barely explains 1.0 percent rise in employment due to increases in credit-to-deposit ratio and number of bank branches. Remaining 99 percent of increase in employment is accounted for by other factors that are not considered in this study.

CONCLUSIONS AND POLICY IMPLICATIONS

In brief, increases in both credit-to-deposit ratio and number of bank branches strongly improve per capita state product. But an increase in the number of bank branches contributes more than that in credit-to-deposit ratio. Both variables make very marginal contributions to job creation. Again, the number of bank branches seems to contribute more than the other variable in this case too.

Finally, bank-based financial inclusion, as considered in this study, plays a much

greater role in promoting economic growth than in employment growth. However, an expansion in bank branches contributes more to both relative to larger credit-to-deposit ratio. To add further, higher economic growth does not necessarily lead to larger job creation. This observation is in accord with the prevailing macroeconomic scenario in India. Despite robust economic growth in recent years, India remains plagued with intolerably high unemployment rates.

India should broaden all dimensions of financial inclusion for addition of the rural population as well as the economically vulnerable and the excluded segments of the overall population. Urban-centric financial inclusion for pro-capital using activities may help attain higher economic growth, but it may not necessarily translate into higher job creation. So, India should focus more closely on labor-intensive rural economic activities through larger financial inclusion of SMEs, micro-enterprises and agriculture for additional rural job creation.

As one of the shortcomings, this paper limits its scope only to two components of bank-based financial inclusion as causal variables. So, their impacts on per capita gross state product and employment are likely to be relatively less comprehensive. Another shortcoming is that all States of India are not included in this study due to data limitations. Moreover, the sample period considered in this study is only for 2001-2012 for the above reasons. As a result, the findings of this study to draw any general conclusion should be considered with due caution.

Some possible extensions of this study may include data updating and inclusion of other remaining States of India to augment the panel data set even further. The measure of bank-based financial inclusion can be broadened by adding mobile phone banking and agent banking. However, such undertakings would be conditional upon relevant data availability.

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Table 1: Hausman Test (Chi-Sq. Statistic) – Equation 3

Test Summary	Chi-Sq. Statistic	Chi-sq. d.f.	Prob
Hausman test	7781.66	2	0.0000

Table 2: Hausman Test (Chi-Sq. Statistic) – Equation 4

Test Summary	Chi-Sq. Statistic	Chi-sq. d.f.	Prob
Hausman test	57.58	2	0.0000

Table 3
FixedEffects Models Dependent Variables: lnSDPPC; lnEmployees

Method: Panel Least Squares
Sample: 2001-2012
Cross-sections included: 28
Total Panel (balanced) observations: 336

	lnSDPPC	lnEmployees
lnCTDR	0.444***	0.0117
	(7.31)	(0.19)
lnBB	2.436***	0.115
	(28.62)	(1.33)
_cons	-8.236***	12.08***
	(-16.62)	(23.99)
N	336	336
R^2 (within)	0.845 (within)	0.010
F-statistic	835.95	1.57
	(0.0)	(0.2106)

Note: t statistics are reported in parentheses
* p<0.05, ** p<0.01, *** p<0.001

The estimates of equation (3) are reported as follows:

$$\underset{(-16.62)}{lnSDPPC_{i,t}} = \underset{(7.31)}{-8.236 + 0.444\ lnCTDR_{i,t}} + \underset{(28.62)}{2.436\ lnBB_{i,t}}$$

R^2 (within) = 0.845, F = 835.95

Appendix A: Fixed effects regression for model 3

. xtreg lnSDPPC lnCTDR lnBB, fe

Fixed-effects (within) regression — Number of obs = 336
Group variable: States — Number of groups = 28

R-sq:
- within = 0.8453
- between = 0.0463
- overall = 0.0100

Obs per group:
- min = 12
- avg = 12.0
- max = 12

F (2.306) = 835.95
corr(u_i, Xb) = -0.9881 — Prob > F = 0.0000

lnSDPPC	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnCTDR	.4439675	.0607025	7.31	0.000	.3245204	.5634146
lnBB	2.435598	.0851139	28.62	0.000	2.268115	2.60308
_cons	-8.235897	.4955915	-16.62	0.000	-9.211095	-7.260698
Sigma_u	4.2591665					
Sigma_e	.18242935	(fraction of variance due to u_i)				
rho	.99816876					

F test that all u_i=0: F(27, 306) = 109.52 — Prob > F = 0.0000

Appendix B: Fixed effects regression for model 4

. xtreg lnSEmploees lnCTDR lnBB, fe

Fixed-effects (within) regression — Number of obs = 336
Group variable: States — Number of groups = 28

R-sq:
- within = 0.0101
- between = 0.9314
- overall = 0.9107

Obs per group:
- min = 12
- avg = 12.0
- max = 12

F (2.306) = 1.57
corr(u_i, Xb) = 0.9494 — Prob > F = 0.2106

lnEmployees	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnCTDR	.0116653	.061662	0.19	0.850	-.1096698	.1330004
lnBB	.1147416	.0864592	1.33	0.185	-.0553883	.2848714
_cons	12.07749	.503425	23.66	0.000	11.08688	13.0681
Sigma_u	1.2410735					
Sigma_e	.18531289					
rho	.9781908	(fraction of variance due to u_i)				

F test that all u_i=0: F(27, 306) = 52.84 — Prob > F = 0.0000

Appendix C: F-test, Breusch-Pagan Lagrange Multiplier test and Hausman test for Model 3

F-test

Joint significance of differing group means:
F(27, 306) = 109.517 with p-value 3.23973e-140
(A low p-value counts against the null hypothesis that the pooled OLS model is adequate, in favor of the fixed effects alternative.)

Breusch-Pagan Lagrange Multiplier test

Breusch-Pagan test statistic:
LM = 497.214 with p-value = prob (chi-square(1) > 497.214) = 3.83881e-110
(A low p-value counts against the null hypothesis that the pooled OLS model is adequate, in favor of the random effects alternative.)

Hausman test

	Coefficients			
	(b) fixed	(B) random	(b-B) difference	Sqrt (diag(V_b-V_B))
lnCTDR	.4439675	1.10659	-.6626224	.
lnBB	2.435598	.5302541	1.905343	.0194668

b = consistent under Ho and Ha; obtained from xtreg
B – inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

Chi2(**2**) = (b-B) ' [(V_b-V_B) ^ (-1)] (b-B)
= 7781.66
Prob>chi2= 0.0000
(V_b-V_B is not positive definite)

Appendix D: F-test, Breusch-Pagan Lagrange Multiplier test and Hausman test for Model 4

F-test

Joint significance of differing group means:
F(27, 306) = 52.838 with p-value 1.13438e-98
(A low p-value counts against the null hypothesis that the pooled OLS model is adequate, in favor of the fixed effects alternative.)

Breusch-Pagan Lagrange Multiplier test

Breusch-Pagan test statistic:
LM = 968.358 with p-value = prob (chi-square(1) > 968.358) = 1.35606e-212
(A low p-value counts against the null hypothesis that the pooled OLS model is adequate, in favor of the random effects alternative.)

Hausman test

	_____Coefficients _____.			
	(b) fixed	(B) random	(b-B) difference	Sqrt (diag(V_b-V_B))
lnCTDR	.0116653	-.165	.1766653	.020551
lnBB	.1147416	.6867136	-.5719721	.0734615

b = consistent under Ho and Ha; obtained from xtreg
B – inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

Chi2(**2**) = (b-B) ' [(V_b-V_B) ^ (-1)] (b-B)
= 57.58
Prob>chi2= 0.0000
(V_b-V_B is not positive definite)