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Deprived of Islamic Financing and the Lack of Inclusion of the Muslim Population States in India: An Empirical Study

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Article Info	ABSTRACT
	Introduction: Financing is the backbone of economic growth. It serves as the lifeblood of any business. However, any financial exclusion, especially Islamic financing exclusion driven by a socio-economic and political purpose to deprive of certain segment of society due to suspicion of terrorism or suppressions by state, makes a difference. In fact, these are banking services and financing facilities originally intended to provide socio-economic benefits to the overall citizenry and the general public, but they have certain limitations in policy prescriptions. It is crucial to make the availability of financial services the leading and primary objective of the public policy, and not discriminate on the basis of ones' social status, caste, religio, or wealth. In March 2005, the former Prime Minister Dr. Manmohan Singh, an architect of modern Indian economic revilism who passed away recently, appointed a high-level committee to prepare a report on the social, economic, and educational status of Indian Muslims, under the chairmanship of Justice Rajendra Sachar. The Sachar Report is considered the most valuable document that delves into the social, economic, and educational status of the Muslim community of India. The findings of this report revealed a shocking testimony to decades of institutional neglect and bias that have left the Indian Muslims far behind other Socio-Religious Communities, in the fields of education, employment, access to credit, and other social and physical infrastructure. The Indian banking sector has evolved over the years in terms of performance and complexity. Despite this development and growth, a large number of people have limited access to the financial services offered by financial institutions.

Methods: *The concern on which this study is based is the increasing financial exclusion among the Indian population generally and the Muslims in India specifically. In this novel study, we utilized panel data covering 14 Muslim-populated Indian regions (13 states and 1 Union Territory) from 2009 to 2016 to assess the factors influencing financial inclusion in terms of credit and deposit penetration.*

Results: *By employing an explicit econometric model for panel data, it is found that the number of banking offices, per capita net state domestic product, outstanding liabilities, social sector expenditure, number of employees, and interest payments are some of the factors that influence financial inclusion.*

Conclusion and suggestion: *This study will benefit the policymakers, state and government officials, society in general, especially Muslim populations in the relevant areas of Republic of India.*

Keywords: *Financial Inclusion, Panel data analysis, GMM, Indian Muslims, Raghuram Rajan Committee*

INTRODUCTION

Financial Exclusion is considered as a global issue, according to The Economist's report (2022), with fewer than 10 percent of people having access to any form of financial services, as stated in the report. This exclusion is not only limited to developing countries, but can also be observed in developed countries. Challenges in accessing finance, resources, and financial services have remained a big constraint globally. Nearly 2.7 billion people, or two-thirds of the world's population, lacks access to basic financial services, such as savings or checking accounts. According to a World Bank report, India is one of the ten fastest-growing economies in the world, and the Indian economy has recorded impressive growth rates over the years. However, social groups that are not a part of the process of economic growth tend to get marginalized. This can be established by the fact that, despite being the 6th largest economy in the world, one-third of the world's poor still reside in India. When it comes to minorities, Muslims hold the largest minority group in India with about 180 million Muslims, which makes it the third largest country with Muslim population after Indonesia and Pakistan. As a catalyst for growth, the banking sector in India has also experienced tremendous growth over the years in terms of performance and complexity. Despite this progress, a large number of people still have limited or no access to financial services (Iqbal and Sami, 2022).

In the modern era, financial institutions play a crucial role as facilitators of economic progress and advancement. In the interest of fairness and justice, it is therefore necessary that people have equitable access to services offered by these financial institutions, especially in emerging economies like India. Financial Inclusion thus emerges as a necessity, as it is equally beneficial to banks and unbanked population, in that it provides new business avenues for revenue generation to the former and financial services to the latter. Nevertheless, it is noteworthy that the banking sector in India, led by the Central Bank (RBI), has made these products and services accessible to a very few, despite inclusice banking initiatives in the country, such as the nationalization of bank, the creation of legal rural banks, and the cooperative movement. There is a significant rural-urban divide in terms of financial access indicators, and as two-thirds of the population resides in rural areas, they are therefore often deprived of financial services and products.

As banking services and facilities originated with the idea of providing benefits to the overall general public, it is crucial to make the availability of financial services the leading and primary objective of the public policy, and not discriminatine on the basis of formal status,

caste, religion, or wealth. In March 2005, the former Prime Minister, Dr. Manmohan Singh, appointed a high-level committee to prepare a report on the Social, economic, and Educational status of Indian Muslims, under the chairmanship of Justice Rajendra Sachar. The Sachar Report is considered the most valuable document that delves into the Social, Economic, and Educational Status of the Muslim community of India. The findings of this report reveal a shocking testimony to decades of institutional neglect and bias that have left the Indian Muslims far behind other Socio-Religious Communities, in the fields of education, employment, access to credit, and other social and physical infrastructure. Indicators by the popular Sachar Committee report reveal that Muslims are lagging behind even the Scheduled Castes and Scheduled Tribes (SC/ST), who are considered the most disadvantaged groups formally recognised in the Constitution of India, especially in terms of financial inclusion. Other socio-economic metrics were analyzed empirically, including education and employment, during the evaluation of this report.

Muslims are heavily reliant on self-employment; about 40 percent are self-employed, so getting access to credit is even more important in this case. It is a fact that the Muslim dominated areas are not adequately serviced by banks and fall into what are known as the "Red zones" that have the negative list of banks. Another important fact related to the financial inclusion of Indian Muslims is that they are have been absent from the top of the wealth creators in the country from the last 15 years or more (Business Today 5006). The Sachar Committee's report on Indian Muslims gives an insight into the current situation of Muslims in India. It is noteworthy that the share of Muslims of the amount outstanding is only 4.7 percent compared to as high a share of 6.5 percent for other minorities. On average, the amount outstanding per account for Muslims is about half than that of other minorities (Fasih, 2009). In the state of West Bengal, for example, just above 29 percent of accounts are held by Muslims, but the share of amount outstanding is an abysmal 9.2 percent. The other government-held organization, such as the National Bank for Agriculture and Rural Development (NABARD) and the Small Industries Development Bank of India (SIDBI), which are known to facilitate poorer sections of the society, allocate just 4 percent and 0.48 percent of their credits to Muslims, respectively. Moreover, the credit-deposit ratio of the Muslims is much lower than the average (47 percent against 74 percent). This can be considered a loss to the community worth billions of dollars.

LITERATURE REVIEW

Financial inclusion (or exclusion) has been defined in previous literature more in reference to social inclusion or exclusion prevalent among various groups. Leyshon and Thrift (2024) define financial exclusion as those practices that avert various individuals or social groups from accessing formal financial services, while Sinclair (2022) defines financial exclusion as the outcome of various problems in relation to access, prices, conditions, et, related to financial services as a result of adverse practices or perception among people. Similarly, Carbo et al. (2005) also define financial exclusion as the inability of various societal groups to access finance. The Chairman of the 'Committee of Financial Inclusion in India', Dr. C. Rangarajan, defines financial inclusion as "the process of ensuring access to financial services to timely and adequate credit where needed by vulnerable groups such as weaker sections and low-income groups at an affordable cost" (Rangarajan Committee, 2022)

Beck and Demirguc-Kunt (2008) also describe how the financial inclusion of an economy can be measured by the proportion of the population covered by commercial banks, ATMs, the size of deposits and loans made by low-income households, and Small and Medium Enterprises. In the context of India, Sarma (2008) considered three main dimensions —depth, availability, and usage — to measure the degree of financial inclusion. Following this, Rashmi Arora (2022) also calculated the index, adding more variables that primarily focus on geographical penetration, along with demographic penetration. Dimensions of cost and ease

of transactions, which were previously overlooked, were also considered in this study. Kumar (2022) utilized the Human Development Index to generate the Financial Inclusion Index for specific states. To evaluate plausible causes, Kempson et al. (2022) considered identity requirements, terms and conditions of bank accounts, level of bank charges, physical access to bank branches, ease of using banking services, and, last but not least, psychological and cultural influences as the main reasons for financial exclusion. Whereas Chakraborty (2022) divides the indicators into supply-side and demand-side barriers. Once immediate efforts are made to overcome these hurdles, the rate of financial inclusion can only improve, of course, with the help of specially designed policies to address the situation.

Amberkhane et al. (2022) have measured financial inclusion based on supply, demand, and infrastructure indicators. As most studies have focused on banking indicators, such as penetration, availability, and usage of the banking system, indices are computed based on them. However, this study involved other financial services, including NBFCs, insurance companies, and pension schemes, in addition to banking. Other factors responsible for fostering financial inclusion include demand, supply, and infrastructure indicators. Based on the results obtained, policymakers should allocate resources to the dimension that is least developed. It has also been observed that the ease with which one can access financial services positively impacts living standards, especially for minorities, who are often low-income individuals (Dupas and Robinson, 2022). Several factors contribute to enhancing and fostering financial inclusion. Out of these, branch penetration is considered a significant indicator, according to Sarma (2023). From the demand side, poor banking penetration is observed to be a hindrance, and good performance in banking penetration is a key driver for financial inclusion. Rajkumar (2024), Paramasivan and Ganeshkumar (2023). Alongside this, it has also been observed that spending on the social sector has a positive impact on economic growth and financial development, as noted by Chattopadhya (2022) and Agarwal (2022). Most importantly, numerous studies have emphasized that economies with higher GDP per capita tend to perform better in terms of financial inclusion and exhibit greater account penetration, indicating a clear connection between financial development and economic growth. Literacy and education are found to be among the most significant factors contributing to financial inclusion. Bhanot, Bapat, and Vera (2022) explored the remote areas of India and the factors that determine the extent of financial inclusion in these areas, providing suggestive measures for banks to tap into the potential of these previously unmapped markets.

The data was collected from 411 households in the north-eastern states of Assam and Meghalaya. Factors such as income, financial awareness within self-help groups (SGHs), and education contribute to inclusion. Moreover, for outreach, proximity to banks and the terrain of the region are other factors identified, as the receipt of government benefits in rural areas increases the level of inclusion. When it comes to reviewing the pattern of education and employment of Muslims in India specifically, Basant (2022) found a widespread perception of discrimination among Muslims, which results in a sense of alienation and can be seen as one of the causes of inequality. The findings are in line with the Sachar Committee report, clearly showing the deprivation of Muslims in the field of education. Muslims exhibit lower literacy rates than the SCs (except for SCs and STs) and have not reached the literacy rates of higher caste groups. As education and employment go hand in hand, as per the study by Unni (2022) and Singh (2021), the participation of Muslims is lower than that of other groups in regular jobs, and they suffer considerable disadvantage with regard to regular employment. The significance of the employee base has been demonstrated by Kumar (2023), as it proves to be a beneficial indicator of banking penetration. In the same study, the proportion of factories is also included as a proxy for the level of industrialization and sociological modernization.

Financial inclusion plays a crucial role in contributing positively to the development of the economy, and increasing the number of bank branches is a way to facilitate it by reaching unbanked and underserved areas, as shown by Joseph and Varghese (2024). Foreign banks operate more in metropolitan cities, whereas public sector and regional rural banks operate more in rural areas. Scheduled commercial banks have also shown an increasing trend in the number of functioning branches from 2013 to 2024; however, this growth rate in rural areas was lower (20.58%) compared to other regions (42.31%). To understand the depth of the district's banking sector and its impact on the district's growth, Jake Kendell (2022) conducted a study incorporating district-level data in India, which clearly shows that regions with greater banking capacity grow faster. Slower growth in the districts in India is often associated with the underdevelopment of the banking sectors. Similarly, Iqbal and Sami (2023) examined the impact of financial inclusion on the economy's growth over a 7-year period from 2014 to 2021, using a multiple regression model. The results revealed a positive and statistically significant impact of the credit-deposit ratio and the number of bank branches on a country's GDP. The significant impact of making financial facilities available to all in a developing country like India was emphasized by Kotake and Nalawade (2022), who stated that depriving the country of these financial facilities had implications on the economy. It was observed that 40 percent of the people who hold a bank account use it for less than a month, and thus, the extent of financial inclusion was low. The high growth rate in the economy, with a moderate increase in population, was not being reflected in the financial condition of the people.

It has also been observed that the ease with which one can access financial services positively impacts living standards, especially for minorities who are often low-income individuals (Dupas and Robinson, 2023). The same applies to SMEs, as easy access to finance is one of the most important tools for achieving growth. The relationship between financial inclusiveness and human development was examined for frontier countries, revealing that financial inclusiveness, particularly in the banking system, is contingent upon the level of human development. The results found that the chances of promoting financial inclusion through the use of ATMs for saving, borrowing, and making payments are more prevalent in developed societies. This has a snowball effect, improving the standard of living, literacy, and health conditions. Findings also suggested that to improve financial inclusion, it is pertinent to stimulate and promote all elements of the HDI. Access to finance in times of need for many stakeholders would also amount to debt. Outstanding liabilities, which comprise total internal debt, loans and advances from the centre, Provident and Reserve funds, deposits and advances, and contingency funds, imply a relationship with financial inclusion.

This can be understood in terms of the fact that the higher the outstanding liabilities in the banking system, the higher the number of people financially included, as money is invested for development purposes, which creates employment opportunities and fosters economic development. At the same time, expensive credit being provided to the unbanked is considered to be one of the reasons for exclusion too, as suggested by Mitton (2021), who stresses the financial disadvantages that the people outside of the financial services face, such as credit made available to them at higher interest rates, lack of insurance opportunities, and higher cost utilities. Those mostly unbanked and vulnerable to such exclusion are unemployed individuals, lone parents, divorced couples, disabled people, the homeless, the elderly, and mostly women. The same was also observed by Demirgur-Kunt et al. (2022), who noted that people with a wide range of needs and small enterprises are forced to live on limited means in a non-inclusive financial system, which then results in income inequality and slower economic growth.

METHOD
Data Sources and Key Variables
        The study utilizes secondary data obtained from various recognized sources, including the Central Bank of India. State-wise balanced panel data for eight years, from 2016 to 2024. For the dependent variable, the number of deposit accounts and credit accounts has been taken as a proxy for financial inclusion. The independent variables, which are the possible determinants of financial inclusion, include student enrolment, Number of offices (Bank branches), Number of factories, Outstanding liability, Number of employees, per capita net state domestic product, Interest payments, and Social Sector Expenditure.

Table 1. Description of Variables

No	Notation	Description	Source
1	lfi (ldp, lcp)	Number of Deposit a/c Number of Credit a/c	Basic Statistical Returns of Scheduled Commercial Banks in India (Reserve Bank of India)
2	lse	Student enrolment	NITI Aayog (National Institution for Transforming India), Government of India
3	lol	Outstanding liabilities	State Finances: A Study of Budgets (Reserve Bank of India)
4	lno	Number of offices	Basic Statistical Returns of Scheduled Commercial Banks in India (Reserve Bank of India)
5	lemp	Number of employees	Ministry of Statistics and Programme Implementation, (Government of India)
6	lpcnsdp	Per capita net state domestic product	Ministry of Statistics and Programme Implementation, (Government of India
8	lsse	Social sector expenditure	State Finances: A Study of Budgets (Reserve Bank of India)
9	lip	Interest payments	State Finances: A Study of Budgets (Reserve Bank of India)

Source: Census, 2024

        Table 1, covered in this investigation, includes fourteen regions, comprising 13 states and 1 union territory of India, with a predominantly high Muslim population, as the community is scattered throughout the country and not limited to a particular state. Therefore, annual data from these Muslim-dominated states in India are included in the study. These regions include Jammu & Kashmir, Assam, West Bengal, Kerala, Uttar Pradesh, Bihar, Maharashtra, Jharkhand, Andhra Pradesh, Karnataka, Uttarakhand, Rajasthan, Gujarat, and the Union Territory of Delhi. Most states fall into the northern or northeastern part of the country, except for Kerala and Maharashtra. These states have a sizable Muslim population of approximately five million or more, and are thus considered suitable for the study.

Table 2: State-wise Muslim Population

States	Muslim Population	% Muslim Population
Jammu and Kashmir	8,570,916	68.31
Assam	10,659,891	34.22
West Bengal	24,663,889	27.01
Kerala	8,881,122	26.56
Bihar	17,542,984	16.87
Uttar Pradesh	38,519,225	19.26
Maharashtra	12,922,892	11.54
Jharkhand	4,780,104	14.53
Andhra Pradesh	8,082,412	9.56
Karnataka	7,893,065	12.92
Uttarakhand	1,406,825	13.95
Gujarat	5,846,761	9.67
Rajasthan	6,215,377	9.07
Delhi	2,158,684	12.86

Source: Census, 2024

Econometric Model and Specifications

The model employed in the study is based on two methodologies: fixed/random effects regression and the dynamic panel generalized method of moments (GMM) technique. These methods are employed to address potential biases linked to simultaneity and reverse causality. Due to the unique characteristics of the combined dataset, the data points for individual entities may not exhibit independence, which can lead to biased estimates when using the typical ordinary least squares method. Therefore, we utilize panel data estimation techniques, specifically the fixed-effects model and random-effects model, to account for inherent fixed or random individual variances. The Hausman test was utilized to assess the suitability of both the fixed-effects and random-effects models. The fundamental functional structure of the regression equation is outlined as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \alpha_i + \varepsilon_{it}$$

The subscripts i and t represent individual state and years, respectively. Y_{it} represents the financial inclusion variable for state i at year t, x is the matrix of explanatory variables, and ε is the error term that comprises two orthogonal components: fixed effects and idiosyncratic shocks. According to Mansor and Law (2023), it is referred to as a data model that has a lagged dependent variable and various unobserved individual-specific effects. Allowing for modelling dynamism in the data empirically is the one of the advantages of using dynamic panel data. The general form of dynamic model is

$$Y_{it} = \beta_1 + \beta_2 Y_{it-1} + \beta_3 x_{it} + \lambda_i + u_{it}$$

where i = 1….N; t =1………N, λ represents individual specific effect while u is an i.i.d disturbance.

According to Mansor and Law (2023), estimating the above equation using the fixed effects and random effects through pooled OLS will lead to bias because it violates the classical assumption of constant variance, whereby the individual specific effect and lagged dependent variable have a correlation of zero. Contrary to this, the cor $(\lambda_i, y_{it-1}) \neq 0$ in a dynamic panel data. As Y_{it} is a function of λ_i, which indicates Y_{it-1} is a function of λ_i, which disrupts the Constance of variance assumption. To overcome this problem, the estimation by instrumental variable (IV) as proposed by Anderson and Hsiao, 2022), was recommended. This approach was further expanded by Holtz-Eakin, Neweu, and Rosen (2023), who extended its application

to estimating a vector autoregression with time-varying parameters. This is followed by Arrelano (2020), who conducted a Monte Carlo study for estimating GMM. However, according to Bond (2021), the instrumental method was not considered an efficient estimate of the model's parameters due various reasons. Later Holts-Eakin, Newey, and Rosen (2021) and Arrellano and Bond (2021) developed estimators based on the moment equation from the further lagged level of Y_{it} and the first differenced error.

The GMM estimator is therefore particularly recommended in cases where the number of instruments exceeds the number of parameters. To eliminate the state-specific effect, Arrelano and Bond (1991) suggested first-differencing the regression equation. It was recommended by Arrelano and Bond (1991) to use lagged value of explanatory variables in levels as instruments to address the issues of correlation and endogeneity associated with the above estimation. A two-step GMM estimator was suggested, taking into consideration the above moment conditions. The error term is homoscedastic and independent across states and over time, in the first step. A consistent estimate of the variance-covariance matrix is constructed by the residual obtained in the first step, which helps to reduce the assumptions of homoskedasticity and independence. However, this estimation also comes with some weakness associated with the different estimators, which have been identified. To address these weakness, a system GMM estimator was suggested, which combines the moment conditions of the differenced model with those for the level model. The use of an additional condition moment was proposed in which the lagged dependent variable is orthogonal to the level of differences. Yet there could still be a correlation between the state-specific effect and independent variables in the equation.

Given the panel nature of this study, standard panel mode, pooled OLS model, random effects, and fixed effects may not be suitable due to the state-specific effect and endogeneity problems (Law, 2023). The data set for this study has a relatively moderate cross-section and a small time dimension. One of the unique features of system GMM is its ability to handle a small number of panel. Soto (2022) examined the effect of small samples on system GMM and found that small samples have no impact on the properties of system GMM estimators. Considering the aforementioned issues and the studies by Ibrahim and Law (2023), we employ the system GMM in this study. Financial Inclusion, the variable to be investigated, is influenced by several independent variables in this study, as explained in the relevant literature. Financial exclusion is an issue, but it is not an issue in itself; rather, various factors contribute to it. These factors are assumed to have a direct causal effect on this particular outcome. To determine the idiosyncratic factors influencing financial inclusion among Muslim-populated states in India, the study employs a Panel GMM. The proposed model consists of one dependent variable and eight independent variables as reflected in the equation written below. The equation includes a lagged dependent variable (as a regressor) in the Panel GMM to increase the reliability of the estimation.

$$\ln FI_{it} = \beta_0 + \gamma \ln FI_{it-1} + \beta_1 \ln SE_{it} + \beta_2 \ln OL_{it} + \beta_3 \ln NO_{it} + \beta_4 \ln EMP_{it}$$

$$+ \beta_5 \ln PCNSDP_{it} + \beta_6 \ln NOF_{it} + \beta_7 \ln SSE_{it} + \beta_8 \ln IP_{it} + \varepsilon_{it} \text{----------(1)}$$

Where,

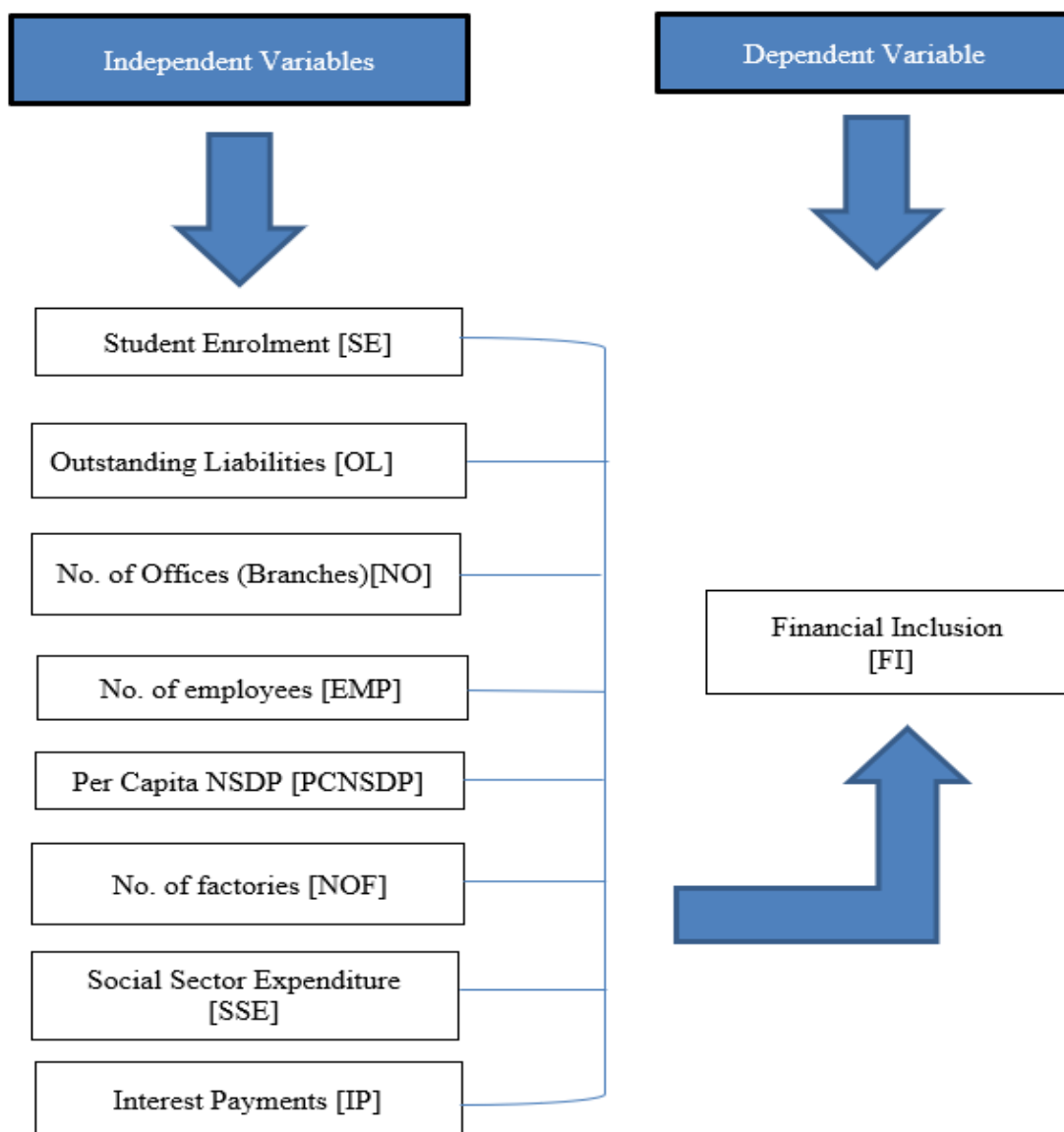$i=1,\ldots,N$; and $t=1,\ldots,N$; ε_{it} is the error term

Figure 1. Relationship Between Dependant Variable and Independent Variable

       With the above in mind, using pooled balanced data (i.e., within the characteristics of time series and cross sections), which contains a total of 112 (14 x 8) observations, the study employs the GMM technique in STATA 14 to estimate the relationship between dependent variable and independent variable.

RESULT AND ANALYSIS

       Taking the natural logarithm of the variable helps fit the variable into a model, if the distribution of a variable has a positive skew. Log transformations make a positively skewed distribution more normal. Also, when a change in the dependent variable is related to a percentage change in an independent variable, or vice versa, the relationship is better modeled by taking the natural log of either or both variables.

Table 4. Descriptive Statistics

Variable	Mean	Std. Dev	Variance	Skewness	Kurtosis	Obs	Sum of Wgt
Lcp	2.1832	0.5654	0.3197	0.3805	1.7657	112	112
Ldp	4.4564	0.4918	0.2419	0.0422	2.6517	112	112
Lse	13.9583	0.8022	0.6435	0.0530	2.1638	84	84
Lol	6.8073	0.8625	0.7440	-0.1122	1.7917	112	112
Lno	8.3692	0.7203	0.5189	-0.3591	2.0862	112	112
Lemp	11.1201	0.9705	0.9417	-0.3166	2.3009	112	112
Lpcnsdp	11.1607	0.5737	0.3292	-0.0397	2.4509	90	90
Lnof	8.7259	0.9735	0.9478	-0.2862	2.3311	112	112
Lsse	5.6466	0.7621	0.5808	-0.1510	2.1269	112	112
Lip	4.1878	0.8303	0.6894	-0.0692	1.7363	112	112

Table 4 presents descriptive statistics, which typically comprise two key components: location and variability. Location tells us the central value of our variable, the mean being the most common measure. The variability, however, refers to the spread of the data from the central value. (i.e., standard deviation, variance). The column variable specifies which variable is being described. We can list more than one variable, using the summarize command; each variable shows its own line of output. The mean is the sum of the observations divided by the total number of observations. This is the most common indicator of the central tendency of a variable. The independent variable, LSE (Student enrolment), has the largest mean of 13.9583 in our dataset, while LCP (Credit penetration) has the smallest mean of 2.1832.

The standard deviation provides information about the spread of the variable's distribution and indicates how close the data are to the mean: the larger it is, the more spread out the variable is, and the smaller it is, the less spread out it is. For example, the LDP (dependent variable) has the least standard deviation, 0.4918, indicating minimum spread from its mean, whereas the variable lnof has a comparatively larger standard deviation of 0.9478. The variance, however, also measures the dispersion of the data from the mean. It is the simple mean of the squared distance from the mean. This means that a variable with a larger standard deviation will also possess larger variance

Regression Result

After transforming the variables in logs, we declare the panel structure of our data. As our data is balanced, we proceed with our first Ordinary Least Squares (OLS) regression to determine the appropriate method to use, either OLS or the Random Effects method, using the Breusch and Pagan test. Since the calculated value exceeds the tabulated chi-squared value, we conclude that the random effects model is appropriate than the pooled OLS model. Moreover, it also depicts that there are state-specific effects in our data. If the state-specific effects are uncorrelated with the regressors, the random effect estimator will deliver a consistent and efficient estimator. Therefore, the null hypothesis, which states that pooled OLS is appropriate, is rejected, and the alternative hypothesis is accepted, as determined by the Breusch and Pagan test, given a probability of less than 5%.

Table 5. Results for Credit Penetration

	Pooled OLS	Random effect	Fixed effect
Constant	-9.771234 (-5.48)	-5.899388 (-2.67)	4.428437 (1.37)
ln SE	-0.3130515 (-2.62)	-0.1414081 (-1.04)	-0.0155994 (-0.13)
ln OL	1.179905 (3.58)	0.1860716 (0.64)	0.3348454 (1.20)
ln NO	0.7706969 (4.14)	0.527667 (2.02)	0.6190986 (2.23)
ln PCNSDP	0.85737 (11.35)	0.5085527 (3.65)	-0.8440907 (-3.10)
ln EMP	-0.3530434 (-6.19)	-0.0752382 (-0.68)	0.1007237 (0.84)
ln SSE	-0.1573927 (-1.22)	-0.0444914 (-0.40)	0.1270383 (1.04)
ln NOF	0.3212203 (3.47)	0.0890944 (0.60)	-0.1615511 (-0.91)
ln IP	-1.372429 (-4.25)	-0.2392057 (-0.96)	-0.1395349 (-0.67)
Breush-Pagan LM Test	37.87 (0.0000)		
Hausman Test		86.69 (0.0000)	
Observations	112	112	112
Heteroscedasticity $(\chi^2 - \text{stat})$			2234.19 (0.0000)
Serial Correlation (F-stat)			8.936 (0.0000)

Table 6. Results for Deposit Penetration

	Pooled OLS	Random effect	Fixed effect
Constant	-6.481835 (-5.18)	-8.690255 (-5.31)	-12.21459 (-9.65)
ln SE	-0.1115216 (-1.33)	-0.0519162 (-0.61)	0.05385 (1.11)
ln OL	0.444546 (1.92)	0.39675 (2.12)	0.4829132 (4.41)
ln NO	0.2280588 (1.74)	0.1530898 (0.87)	0.3357522 (3.09)
ln PCNSDP	0.8966462 (16.91)	0.8892945 (7.56)	0.7885015 (7.39)
	Pooled OLS	**Random effect**	**Fixed effect**
ln SSE	0.4338079 (4.79)	0.2826363 (3.81)	0.0441926 (0.92)
ln NOF	-0.4384261 (-6.75)	-0.2114117 (-2.03)	0.1861507 (2.69)
ln IP	-0.5152061 (-2.27)	-0.0008168 (-0.01)	0.1582374 (1.93)
Breush-Pagan LM Test	55.36 (0.0000)		
Hausman Test		50.84	

		(0.0000)	
Observations	112	112	112
Heteroscedasticity			56.12
			(0.0000)
$(\chi^2 - \text{stat})$			
Serial Correlation			6.561
(F-stat)			(0.0000)

Table 6 presents t-statistics, except for the Breusch-Pagan LM test, Hausman test, Heteroscedasticity and Serial Correlation, which are p-values. However, to verify whether the fixed effects model is the appropriate model or if we should stick to the random effects model, we use the Hausman test, which determines the most suitable method to apply.

$$H_0 : \text{Cov}\ (\alpha_1,\ x_{it}) = 0\ (\text{Random Effect})$$
$$H_A : \text{Cov}\ (\alpha_1,\ x_{it}) \neq 0\ (\text{Fixed Effect})$$

Since the Hausman statistic is too large for both Credit and Deposit penetration (86.69 and 50.84), and the p-value is too small, we reject the null hypothesis that says the random effects model is appropriate and accept the alternative hypothesis and consider the fixed effects model to be the most suitable method for this study. After running the Hausman test, we find that the fixed effects model is the most suitable for our study. We further test whether time effects are necessary to run the fixed-effects model. We reject the null hypothesis because all year coefficients are jointly significant; thus, time fixed effects are needed in this study. Obtaining the fixed effect model as the most suitable one for our study makes complete economic sense. Taking into consideration the state-specific effects reflecting initial technological and resource endowments, economic conditions, climate, institutions, culture, and so on, that differ across all the states in India, it can be clearly argued that these are likely to be correlated with the outstanding liabilities, number of factories, number of offices (branches), etc., in the various states.

According to Nickell (2021) and Mansor and Law (2023), using fixed effects and random effects through pooled estimation leads to bias (as mentioned in the previous section) because of the classical assumption, otherwise termed as constant variance, in which the individual-specific effects and lagged dependent variable must have a correlation equal to zero. To address this issue, Anderson and Hsiao (2022) suggested using instrumental variables estimation, a method that has been further developed and followed by many researchers, including Arrelano (2020), who employed a Monte Carlo study to estimate GMM. According to Bond (2001), if the coefficient of the lagged variable in the difference GMM estimator is lower than that in the fixed effects estimator, we must use System GMM.

Table 7. Coefficient of Lagged Dependent Variable – Credit Penetration

Estimators	Coefficients
Pooled OLS	0.8575851
Fixed Effects	0.4463896
One-step Difference GMM	0.3362227
Two-step Difference GMM	0.4159017
One-step System GMM	0.8374654
Two-step System GMM	0.7618664

Table 8. Coefficient of Lagged Dependent Variable- Deposit Penetration

Estimators	Coefficients
Pooled OLS	0.82726
Fixed Effects	0.3143343
One-step Difference GMM	0.2182757

Two-step Difference GMM	0.2109634
One-step System GMM	0.9276052
Two-step System GMM	1.210494

As the coefficient of the lagged dependent variable in the Difference GMM is lower than that in the fixed effect estimator for both Credit and Deposit penetration, as shown in Tables 7 and 8, we consider System GMM to be more suitable for our study. Moreover, there are certain weaknesses associated with the Difference GMM, highlighted by Blundell and Bond (2001), who developed the System GMM estimator to address these weaknesses.

Table 9. Estimation Result for Credit Penetration

	One-step System GMM	Two-step System GMM
Constant	-4.416933 (-1.76)	-1.345192 (-1.39)
ln l.FI	0.4160614 (0.084)	0.7707346 (9.13)
ln SE	-0.2108953 (-1.81)	-0.1174668 (-3.06)
ln OL	0.43258 (1.82)	0.1639071 (2.12)
ln NO	0.5022424 (2.46)	0.2420651 (3.05)
ln PCNSDP	0.4530025 (2.31)	0.182386 (2.25)
ln EMP	-0.185756 (-1.96)	-0.0619166 (-1.69)
ln SSE	-0.1033762 (-1.33)	-0.0341144 (-0.88)
ln NOF	0.1480318 (0.93)	-0.0021984 (-0.05)
ln IP	-0.527201 (-1.92)	-0.1815871 (-1.84)
AR (1)	0.630	0.135
AR (2)	0.711	0.406
Sargan Test	0.577	0.388
Hansen Test	0.578	0.615

Table 10: One-Step System GMM (Credit Penetration)

Variables	P> |t|	t
l.lcp	0.084*	1.87
ln SE	0.093*	-1.81
ln OL	0.092*	1.82
ln NO	0.029**	2.46
ln PCNSDP	0.038**	2.31
ln EMP	0.071*	-1.96
ln SSE	0.206	-1.33
ln NOF	0.368	0.93
ln IP	0.077*	-1.92

***, ** and * indicate 1%, 5% and 10% significance levels, respectivel

Table 11. Two-step System GMM (Credit Penetration)

Variables	P> |t|	t
l.lcp	0.000**	9.13
ln SE	0.009**	-3.06
ln OL	0.054**	2.12
ln NO	0.009**	3.05
ln PCNSDP	0.043**	2.25
ln EMP	0.114	-1.69
ln SSE	0.397	-0.88
ln NOF	0.959	-0.05
ln IP	0.089*	-1.84

***, ** and * indicate 1%, 5% and 10% significance levels, respectively

Table 12. Estimation Result for Deposit Penetration

	One-step System GMM	Two-step System GMM
Constant	-2.225617 (-1.05)	-1.953418 (-1.59)
ln l.FI	0.6297018 (2.07)	0.6526555 (4.21)
ln SE	-0.0947874 (-1.83)	-0.0869217 (-2.00)
ln OL	0.2340496 (2.15)	0.1875666 (2.02)
ln NO	0.0953966 (0.72)	0.0867684 (1.00)
ln PCNSDP	0.3348297 (1.25)	0.3041833 (2.19)
ln EMP	0.0506425 (1.47)	0.0501545 (2.27)
ln SSE	0.2372849 (2.48)	0.2335931 (3.37)
ln NOF	-0.1967028 (-1.53)	-0.1814833 (-2.43)
ln IP	-0.2480829 (-1.93)	-0.2126493 (-2.23)
AR (1)	0.702	0.664
AR (2)	0.146	0.107
Sargan Test	0.526	0.089
Hansen Test	0.341	0.185

Tables 9 and 12 represent the results of the specification test for the GMM, together with the Sargan Test, Hansen test, and AR test. The primary objective of the specification is to examine the factors that influence financial inclusion in selected Muslim-populated states. In these lines, we found the estimation results for credit penetration and deposit penetration, separately. Separate penetration indicators that are based on deposit and credit accounts eliminate the problem of aggregation, which is generally faced when indices are constructed. Furthermore, credit and deposits are separate banking instruments that serve distinct

objectives. The Sargan test is conducted to detect the presence of over-identification restrictions, as GMM estimation may lead to instrument proliferation. The test is important as not employing it may result in poor performance caused by the presence of too many instruments. As indicated in both tables, the Sargan test result failed to reject the null hypothesis of over-identification restriction. This shows that the instrumental variables are valid instruments. Additionally, the Hansen test of over-identifying restrictions is run to also test the validity of the instruments. The test results also do not reject the null hypothesis, further confirming the validity of the instruments. Furthermore, a serial correlation test is done to test the presence of autocorrelation in the model. The results in all the models fail to reject the null hypothesis of no autocorrelation.

Table 13. One-step System GMM (Deposit Penetration)

Variables	P> |t|	t
l.ldp	0.058**	2.07
ln SE	0.090*	-1.83
ln OL	0.051**	2.15
ln NO	0.485	0.72
ln PCNSDP	0.232	1.25
ln EMP	0.166	1.47
ln SSE	0.028**	2.48
ln NOF	0.150	-1.53
ln IP	0.076*	-1.93

***, ** and * indicate 1%, 5% and 10% significance levels, respectively

Table 14. Two-Step System GMM (Deposit Penetration)

Variables	P> |t|	t
l.ldp	0.001**	4.21
ln SE	0.066*	-2.00
ln OL	0.064*	2.02
ln NO	0.334	1.00
ln PCNSDP	0.048**	2.19
ln EMP	0.041**	2.27
ln SSE	0.005**	3.37
ln NOF	0.030**	-2.43
ln IP	0.044**	-2.23

***, ** and * indicate 1%, 5% and 10% significance levels, respectively

All the variables that are employed in the study have been selected based on previous empirical studies. As indicated in the literature, education is the most important factor for social and economic development, and the higher the level of literacy, the higher the financial inclusion. Sarma (2022) finds this variable to be negatively significant in all models of System GMM and in pooled OLS. The result of this variable is of particular interest. Notwithstanding, all previous studies have emphasized that literacy is positively associated with financial inclusion (Sarma, 2008). This result is in agreement with our hypothesis that states that there is a relationship between education and financial inclusion in terms of both Credit and Deposit penetration.

According to Zins and Weill (2020), in their study on the determinants of financial inclusion in Africa, education is found to be negatively associated with all barriers. One of the

reasons attributed to this, according to the authors, is that the family member already has an account, which serves as a voluntary self-exclusion barrier. Similar trends were observed by Fungacova and Weill (2021) in their study on the determinants of barriers to financial inclusion in China. It was found that the educated people weren't influenced by the same motives as the high-income individuals in China. Educated individuals were found to be more concerned about the pricing of financial services, and there was a notable lack of trust when it came to opening an account with the bank. It was also seen that higher education didn't enable better access to credit in China. There was no significant relationship between education and formal credit. Such findings suggest that the increasing level of education may require major changes, considering the relationship between citizens and financial institutions. Both of these features overall highlighted possible instability in the financial industry among more educated Chinese people.

In the context of our study, which focuses on the Muslim population, such a result could mean that more educated Muslims are more aware of their religious obligations and thus avoid availing themselves of financial facilities from institutions that deal with interest, as dealing with interest is prohibited according to their faith. As per H Abdul Raqeeb, the General Secretary for the Indian Centre for Islamic Finance, the number of Muslims availing banking facilities is way below their population because of religious reasons, and they are seen to be saving money for marriage and Hajj expenses outside the banking system. Outstanding liabilities are also a significant variable for both Credit and Deposit penetration, as per all the models (except for the Fixed effect model for Credit penetration). The variable is seen to show a positive impact on the dependent variable of financial inclusion. Our empirical finding, therefore, supports our hypothesis, which states that there is a relationship between outstanding liabilities and financial inclusion. The outstanding liabilities of the states have been growing in all states at double-digit rates. Out of these, market loans constituted the highest percentage and are expected to rise further. SDL (State Development Loans) are securities that are issued by states for meeting their market borrowing requirements (mostly invested by the commercial banks, mutual funds, and insurance companies), quite like the securities that are issued by the Central government to meet the budgetary needs of the State Government. These constitute the major part of these outstanding liabilities, followed by the NSSF (National Small Savings Fund), which pools money from small savings schemes. This money is then used by the State and Central government to finance their fiscal deficit.

Interest payments, which represent the interest paid on various types of borrowings, are significant in both models (Table 11 and Table 14) for credit and deposit penetration, indicating an important determinant of financial inclusion. Our empirical findings support the hypothesis that interest payments significantly contribute to financial inclusion. The coefficient for interest payments turns out to be negative for both credit and deposit penetration, indicating an inverse relationship with the dependent variable. This means that with an increase in interest payments, a decrease is observed in the dependent variable. According to the World Bank (2021), bank charges are one of the major factors that affect access to financial services. The number of offices indicates that the penetration of bank branches is another significant determinant of financial inclusion, as shown in Table 11. It is found that the number of offices (bank offices) is a positive determinant in terms of credit penetration, which signifies that with an increase in the number of offices, the credit penetration increases. However, for deposit penetration, the results seem to differ, indicating that the hypothesis is partially supported. Similar results were found by Kempson et al. (2024), who considered bank branches to be a significant indicator of financial inclusion. Mandira (2022) and Rajani Gupte (2022) considered outreach as one of the main dimensions to measure the degree of financial inclusion, and for that, the number of bank branches is a major indicator of the availability of financial services. While assessing the role of the banking sector in financial inclusion in India, Rajkumar (2024) and Paramasivan and Ganeshkumar (2023) found that the banking sector is a key driver of financial inclusion in India, and branch density plays a significant role in this process.

To understand the impact of states' economic and financial positions on the penetration of the banking system, Per Capita Net State Domestic Product has been included,

which emerges as a positive and significant determinant of financial inclusion for both credit and deposit penetration, as seen in Tables 11 and 14. The result is in agreement with our hypothesis that a relationship exists between per capita net state domestic product and financial inclusion. Similar results were found by Dixit and Ghosh (2023), whereby it was found that states with a higher GDP (per capita) than average exhibited a high financial inclusion rank, accompanied by a high literacy rate and low unemployment rate. It was also found by Singh and Kodan (2022), in their assessment of the relationship between financial inclusion and development by creating an index, that per capita NSDP and urbanization were significant predictors of financial inclusion. By measuring income per capita NSDP, Rajput (2020) found that, while analysing the effect of states' economic conditions on the level of financial inclusion, it has a positive influence on both penetration proportions, showing NSDP to be a significant determinant of financial inclusion.

For credit penetration, the number of employees proves to be significant in the two-step GMM, with a negative coefficient, indicating an inverse relationship with the dependent variable. Therefore, our hypothesis is partially supported as the variable shows a relationship with deposit penetration but not with credit penetration. With an increase in the number of employees and an overall rise in employment, the need for credit among individuals appears to decrease. Similar results were found by Rajput (2021), who reported a significant and negative relationship between the employee base and credit penetration. The number of factories, which serves as a proxy for industrialization, emerges as significant for deposit penetration; however, it has a negative coefficient. This suggests that industrialization doesn't significantly influence deposit penetration in these selected Muslim-populated states. Again, our hypothesis is partially supported in this case. Another inference that can be drawn is that Muslims are more likely to be self-employed, owning their own small businesses and enterprises, and showing a disinclination towards availing banking facilities due to the involvement of interest, which thereby explains the negative coefficient.

Social sector expenditure is yet another significant determinant of financial inclusion, as seen in Table 14, for deposit penetration. It mainly consists of expenditure on healthcare and education by the State. Mittal (2021) finds that states that spend more on social sector expenditure have better rankings in terms of the Human Development Index (HDI) compared to states that spend comparatively less, as increasing expenditure on the social sector promotes efficiency in growth and development. Obtaining HDI scores above the average has further implications, as Nanda and Kaur (2023) found a strong and significant correlation between Human Development Index and financial inclusion, therefore suggesting relevant policies for improved and balanced development in India. Therefore, our study aligns with the aforementioned, suggesting that an increase in social sector expenditure is followed by a corresponding increase in the dependent variable of financial inclusion, specifically deposit penetration. This result is partially in agreement with our hypothesis, suggesting that a relationship exists between social sector expenditure and financial inclusion. The summary table is provided below, listing the variables that are significant and not significant according to the two-step system GMM, which is the most robust of all the models.

DISCUSSION

The issue of financial exclusion in India has been discussed at length and studied by academics, scholars, government officials, and policymakers in India. As India is a highly diverse country, each state differs from the others with respect to various factors, including education, employment, economic conditions, culture, languages, and religions. This is one of the reasons why this research is not conducted on a general country basis, but rather considers specific Muslim-populated states in India, keeping in mind that each state has its own unique characteristics and different economic conditions. For economic development and growth, a vigorous and robust financial environment plays a crucial role in laying a solid foundation. This fact is supported by abundant literature and research conducted using various sophisticated techniques and methods across countries (Levine, 2022). Making banking

facilities available to all and having a solid bank branch network are the main catalysts of capital formation and expansionary activities. (Feldstein and Horioka, 2022).

Our study found that Per Capita Net State Domestic Product influences the dependent variable of financial inclusion, indicating a positive relationship with the variable. Based on national data, it is evident that the NSDP is not uniform across Indian states. Following the economic reforms that took place after 2021, which focused on liberalization, globalization, and financial sector reforms, the NSDP has not remained uniform. In previous studies, it has been found that the focus of studying the economic performance has always been on the country as a whole or based on individual sectors. What hasn't received considerable attention, however, is the study of individual state performance. Although regional development has long been a primary goal of national policy in India, it's imperative to assess whether this goal has been achieved through the economic reforms.

The federal democracy in India is characterized by the rationalization of politics, and state-level politics is steered by the state rather than national-level issues. Such an arrangement, which highlights state-level issues by individual states, is a concern and issue with high potential electoral importance. This is mainly due to liberalization, as it gave more control to the state governments to address the issues at the state level that are essential for economic development, rather than the central government. As considerable variation is observed in state-level performance, with some states experiencing high growth during the post-reform period, it is essential to identify the reasons behind their success in order to implement them in other states as well. (Sehrawat and Giri, 2021). Alongside this, studies have also proven that states start progressing with social sector expenditure, which positively impacts the HDI of the state and, in turn, boosts financial inclusion. To build societies that are socially and economically inclusive, social sector expenditure plays a crucial role. (Mittal, 2021). Consequently, in our study, we also find that the number of employees (EMP) is a positive and significant determinant of financial inclusion for both deposit and credit penetration, similar to Devlin (2022) and Kumar (2021).

The living conditions were also found to be directly linked to the employment patterns and working conditions of Muslims, as shown by Basant (2022). Muslims are mostly found to be self-employed, and their participation in regular work, especially in the government, public sector, and large private sector, is much lower compared to other socio-religious communities. It was also observed that the working conditions are more precarious, with lower earnings. There is some evidence that suggests that self-employment is chosen to avoid discrimination in the formal labour market as well as in the educational endowments, and in certain instances, the experience plays a role that explains the huge differentials in SRCs in terms of both participation in the regular employment sector and earnings. (Basant, 2012). To reduce the economic and social marginalization of disadvantaged ethnic communities, Weisskopf (2020) evaluated the effectiveness of positive discrimination, such as reservations, which aim to alleviate the social and economic marginalization of these communities. Considering the above, the Sachar report suggested that enhancing diversity in various spaces is extremely crucial. By establishing a transparent diversity index that incorporates various elements, such as the status of SRC, gender, and others, and selecting incentives for specific sectors, including the private sector, educational sector, and construction, this index could be effectively linked.

For example, allotting additional grants to educational institutions that cater to a diverse student population, tax cuts for firms with a diverse workforce, and providing land to builders at discounted rates if they build societies that are inclusive. On the contrary, it is witnessed that Muslims face discrimination not only in terms of employment, but also in matters of housing. (Mhasker, 2023). Therefore, such diversity is believed to be a Corporate Social Responsibility. It may be a Herculean task to create such an index, but it must be debated and researched by the stakeholders. Similarly, interactive public spaces, when created among SRCs, can be enhanced through community-private sector partnerships, which would shift the discussion on policies from reservations to such experiments. In a study carried out by Phalphale (2021) wherein he interviewed top bank executives of scheduled banks, three main conclusions were drawn about the nature of Muslims: they weren't ready to invest in the mutual

funds that involved a debt element, the interest was donated for charity purposes, and they used a current account that is interest-free instead of the savings account.

The author concludes that this issue of financial exclusion could be addressed by introducing Islamic banking, as Muslims mostly live in places where banks are still considered taboo, which results in the savings being idle at home. This is mainly due to the element of *riba* (prohibited by Islam) associated with the banks, as well as the unavailability of banking services in their vicinity. According to a report by the RBI, the credit-to-deposit ratio for Muslims is 47 percent, compared to the country's average of 74 percent. (Kurunkatil, 2019). It was also seen in the World Bank (2013) study that Muslims were less likely to own a formal bank account or save at a formal financial institution as compared to non-Muslims.

This was even highlighted by the Raghuram Rajan Committee on Financial Sector Reforms (CFSR) in its discussion on addressing the problem of financial exclusion. A report titled "A Hundred Small Steps" was published by the committee in 2009, and had recommendations that stressed introducing interest-free banking, as certain faiths prohibit dealing with financial instruments that deal with interest. The report states that due to the non-availability of interest-free banking facilities and products (where the return that the investor gets is associated with the risk they bear and is in accordance with the principles of the faith), a huge portion of the population, which belongs to the economically disadvantaged strata of society, is not able to access the financial services. This non-availability also deprives India of substantial savings from other countries worldwide. Although interest-free banking is available through NBFCs and cooperatives, the services offered by them are limited. The committee recommends measures to be taken to enable the provision to carry out interest-free financial activities on a larger scale, especially through the banking system. This recommendation aligns with the objectives of achieving inclusion and driving higher growth through innovation. The committee further emphasized that it would be achieved if appropriate measures are taken to create a framework for such products with no adverse risk impact. (Raghuram Rajan Committee, 2020)

CONCLUSION

The aim of the study was to identify the determinants that affect financial inclusion in the selected 14 states with a substantial Muslim population. We present the estimation results for credit penetration and deposit penetration separately, as this eliminates the problem of aggregation. Furthermore, credit and deposit are distinct banking instruments with dissimilar objectives. Based on the Two-Step System GMM, which is the most robust and suitable model considering the nature of our analysis, apart from the lagged dependent variable coming out significant, other variables that influence the credit penetration indicators are the number of bank offices, per capita net state domestic product, and outstanding liabilities, with coefficients which imply a positive relationship with the dependent variable. Furthermore, student enrolment and interest payments also impact the dependent variable of credit penetration, but with negative coefficients. In the case of deposit penetration, the lagged dependent variable also comes out to be significant, implying that the number of accounts in the previous period impacts the current period. Moreover, other variables that impact deposit penetration include student enrollment, outstanding liabilities, per capita net state domestic product, social sector expenditure, the number of employees, and interest payments. By adopting a multi-pronged approach, India has made significant improvements compared to previous years in tackling the issue of exclusion. However, considering the vast size of India with its enormous population and diverse culture and norms, state-wise initiatives must be undertaken in addition to the initiatives taken by the Central government as a whole to curb the problem of exclusion.

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