Measuring the Financial Index of India: A Multidimensional Approach

Sakshi Goyal, A.K. Vashisht** Ravi Kumar Gupta****

Economic growth is facilitated by the participation of all sections of society ensuring a higher level of financial inclusion. It is necessary to provide some index to measure this important factor in both developed as well as developing economies. It requires to study of various dimensions that can be used to indicate financial inclusion through various parameters. The present study contributes to the field by developing a robust and comprehensive measure for measuring financial inclusion in a country. The Financial Inclusion Index (FII) is computed using the three elementary dimensions - Availability, Accessibility and Usage of banking services by all sections of the society. These dimensions are assigned fixed weights to create a robust index for analysis of financial inclusion. The index value is categorized into varying ranges – Low, Medium and High, indicating the degree of financial inclusion from 1996 to 2022. The study finds the rise in the financial inclusion level of India in the later half of the study period mainly due to radical upliftment in financial policy transformations for underprivileged sections of the society.

Keywords: Financial Inclusion, Financial System, Economic growth, Banking

JEL Classification: O43, O430, G21.

Introduction

FINANCIAL Inclusion is a crucial factor in the contribution of sustainable development goals at the global level. The economic, political and social empowerment of financially backward people can be improved through resource

* Research Scholar, PCJ School of Management Maharaja Agrasen University, Baddi, Himachal Pradesh.

** Dean Research & Director, PCJ School of Management, Maharaja Agrasen University, Baddi, Himachal Pradesh.

***Department of Management Studies, Maharaja Agrasen Institute of Technology, Delhi.

Goyal, S, Vashisht, A.K., and Gupta, R.K. *(2024)*, Measuring the Financial Index of India: A Multidimensional Approach, *FOCUS WTO*, Vol. 26 No. 1, January-March, pp. 11-19. http://publication.iift.ac.in/focuswto_archive.asp

mobilization which makes them save, invest and earn. In developing countries like India, the vast majority of the population lives below the poverty line and is deprived of most of the financial benefits and schemes of the government mainly due to lack of awareness. To increase the economic growth rate along with better economic opportunities and reduction in the poverty rate, there is a need to provide an inclusive financial system. The current study studies the multidimensional approach to measuring financial inclusion called as Index of Financial Inclusion. It includes the weighted indexation of three demand side parameters, namely availability, accessibility and usability to determine the final value of the coefficient. The measurement is quite useful in comprehending the intensity of financial inclusion in countries over some time. Hence, the paper computes the Financial Inclusion Index of India from 1996 to 2022 to get an idea about the evolution of the index of financial inclusion in the country. As per the analysis, the position of India lies under the low level of financial inclusion from 1996 to 2013 and medium financial inclusion during 2014-2022. Therefore, it is evident that the overall efficiency of the financial system in the economy is raised through better accessibility to formal financial services during the above-mentioned period.

Financial Inclusion

Financial Inclusion is a process that confirms the accessibility, availability and usability of various formal financial services with much ease by all sections of society (Sarma, 2008). Together, all these dimensions from the perspective of the demand side form the inclusive financial system. To analyze the financial inclusion in a country, the measurement can be done through financial facilities available through bank gateways as banks are considered the most basic form of financial gateways and that is why, are considered analogous to financial inclusion. The paper discusses banking inclusion as similar to financial inclusion in the economy.

Rational of the Study

India, being the most populous country in the world, has around 6,00,000 villages and around 640 districts. However, only around 40 per cent of the total households have bank accounts which is quite low. Around 38 per cent of the total commercial bank branches are situated in rural areas of the country revealing that a great majority of the population is excluded from the accessibility to financial facilities of banks (*World Bank Report*, 2023). Hence, financial Inclusion has become a priority of the Government of India which stresses the imperative need to develop an index for it. Different aspects of financial services explaining financial inclusion are used by the researcher to construct the Index of Financial Inclusion. The progress of Financial Inclusion is measured through current status and the progress can be outlined to plug in adequate measures to fulfill the deficiencies in the system. For this, the methodology of measuring the extent of financial inclusion as proposed by Sarma (2008) is used, as discussed in detail.

Review of Literature

The literature on using the various dimensions of financial inclusion for statistical estimation is limited. Beck *et al.* (2006) were the first ones to demonstrate the measurement of financial sector inclusion across countries. New indicators were designed by the author for the banking sector to measure accessibility, affordability and eligibility. Another study by Sarma, M. and Paise, J. (2008) worked to find the association between financial inclusion and human development which is a major study to contribute towards policy measures for poverty reduction and improvement in standard of living. Also, he proved that the high income of a country may lead to higher financial inclusiveness in the country by analyzing various data. By attaching equal weights to all the dimensions, FII was calculated and countries were categorized as having Low, Medium and High levels of Financial Inclusion based on FII value.

A Financial Inclusion Index (FII) was constructed by Mehrotra, *et al.* (2009) to find the relationship between economic growth and financial inclusion through measurement of level of financial inclusion. Another important study by Chakravarty and Pal (2010) discussed the axiomatic approach considering the data from the study of Beck *et al.* (2007) recording eight indicators of financial inclusion and calculating the FII for 21 countries based on differences in the income level. In India, a low level of financial inclusion was experienced between 1991 to 2001 by most of the states whereas, the level increased from the period 2001 to 2007 mainly due to improvements in demand side factors of Banking services. Interestingly, the study of Chattopadhyay (2011) found that the dominance of money lenders still exists majorly in the rural informal credit and loan market. In 2012, Gupte *et al.* found the impact of Financial Inclusion in India based on FII by using updated data and information. He found a major improvement in the index value because of demand-side factors. Further, another study by Yorulmaz (2013) used the same methodology as described by Sarma (2008) for measuring financial inclusion in Turkey where it was found that there is a positive association between high-income groups and level of FII. T.P. (2018) assessed the economic and social consequences of financial inclusion for vulnerable people within society. The study indicated that the level of awareness of financial inclusion programmes is low, and that crucial elements accelerating financial inclusion are financial awareness, financial literacy, and the availability of financial products and services. Kochar *et al.* (2022) provide that to improve the decision-making ability of married women in India, it is necessary to raise the accessibility to financial resources. Goel, S. and Sharma, R. computed

FII by analyzing 62 indicators under nine dimensions from 2012 to 2019 for India. It was evident in the study that India is gradually attaining a higher financial inclusion level as 0.62 was its value in the final year of the study.

Objectives of Study

The prime objective of the paper is to quantify the degree of financial inclusion of India from the year 1996 to 2022 through demand-side the indicators of banking system. These factors measure the degree, direction and intensity of Financial Inclusion in India.

Methodology

Research Design

The nature of the present study is empirical. The data for all the dimensions for the period from 1995 to 2002 was extracted from secondary sources like varying scheduled commercial banks' websites, the Central Bank of India - RBI website, World Bank, International Monetary Fund, etc. The period of study was from 1995 to 2022 as the major financial and economic reforms of Liberalization, Privatization and Globalization in India were introduced due to the financial crisis. The entire period of study will be divided based on the level of financial inclusion computed from the given parameters as discussed above. The tool used to analyze the data is Microsoft Excel as the calculations will be done using the given formula for Index of Financial Inclusion by Sarma (2008).

Calculation of Index of Financial Inclusion

The computation part of the Financial Inclusion Index (FII) is similar to other popular indices as the methodology involves giving weightage to certain factors directly affecting the inclusiveness of the financial system. Examples of such United Nations Development Programme (UNDP) developed indices are the Human Development Index, Human Poverty Index and Gender Development Index, etc. FII is evaluated using several dimensions for the inclusiveness of the financial system.

To measure the degree of financial inclusion, numerous indicators including the number of bank accounts per 1,000 adult persons, number of bank branches per 100,000 population, amount of credit deposits in lakhs and amount of deposit amount in lakhs are used. The minimum and maximum value of the Financial Inclusion Index lies between 0 and 1, 0 being the lowest rate of financial inclusion and 1 indicating complete financial inclusion.

$$d_j = w_i^* \frac{A_i - m_i}{M_i - m_i} \quad \text{... (1)}$$

The value of each dimension di lies between 0 and wi. The achievement of a country in dimension 'i' is directly dependent on the value of di.

where wi = weightage of dimension 'i'

Ai= actual value of dimension i

mi = lowermost limit given to the value of dimension i

Mi = uppermost limit given to the value of dimension i

$$X_1 = \frac{\sqrt{d_1^2 + d_2^2 + \cdots + d_n^2}}{\sqrt{(w_1^2 + w_2^2 + \cdots + w_n^2)}} \quad \text{... (2)}$$

$$X_2 = \frac{\sqrt{(w_1 - d_1)^2 + (w_2 - d_2)^2 + \cdots + (w_n - d_n)^2}}{\sqrt{(w_1^2 + w_2^2 + \cdots + w_n^2)}} \quad \text{... (3)}$$

$$\text{FII} = \frac{1}{2}\,(\mathbf{X_1 + X_2}) \quad \text{... (4)}$$

The values assigned to 'Mi' and 'mi' are based on some prespecified rule. Achievement in dimension 'i' is directly related to the value of di. A country's achievements in n number of dimensions will be characterized by a particular point on n-dimensional space, X= (d1, d2, d3,….dn) when 'n' dimensions are used for financial inclusion. For the final value of FII, the simple mean value of Euclidian distance and that of inverse Euclidian distance will be used when these distances are normalized when its value lies between 0 and 1. Therefore, X1 represents the distance between X and O. Similarly, the inverse distance of X and W is represented by the value of X2. Then, the average value of X1 and X2 will be taken to ultimately get the FII by incorporating the worst point and the perfect point distance. By giving equal importance to all the dimensions to measure the comprehensiveness of a financial system, wi = 1 for all 'i'. Hence, the point W = (1, 1, 1….1) in n-dimensional space is taken embracing equal weightage to all the three dimensions for computation of FII.

The formula for FII will be -

$$\text{FII} = \frac{1}{2}\left[\frac{\sqrt{d_1^2 + d_2^2 + \cdots + d_n^2}}{\sqrt{n}} + (1 - \frac{\sqrt{(1 - d_1)^2 + (1 - d_2)^2 + \cdots + (1 - d_n)^2}}{\sqrt{n}})\right] \quad \text{... (5)}$$

For calculating IFI, three dimensions are used, namely, Accessibility, Availability and Usage of the Financial Services.

(i) *Availability (Dimension 1):* The total number of banking outlets in the form of bank branches, number of ATMs, offices, etc. represents the availability of

banking services. Using the number of bank outlets per 100,000 of the adult population is useful to have an average number of bank branches according to population.

(ii) Accessibility (Dimension 2): Deposit account numbers of credit outstanding bank accounts per 1000 of the adult population represent the measure of banking accessibility/ penetration of the system.

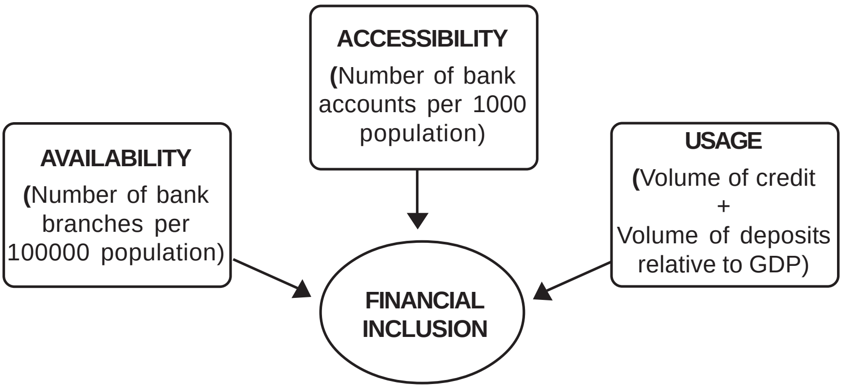
(iii) Usage (Dimension 3): The volume of bank credits and deposits of the adult population as a proportion of GDP represents the usability of the banking system.

For each dimension, Mi and mi need to be fixed to normalize the values between 0 and wi. Also, these values should remain the same throughout the study to maintain the same benchmark for different dimensions. For the lower bound, mi, it is safe to choose 0 but for the maximum value or upper limit, the empirically observed highest value of the dimension can be considered.

The data of each of these dimensions and calculated values of these dimensions using the formula (1) are given in the appendix. Also, the values of X1 and X2 are calculated using the above formula (2) and (3). Finally, the value of FII was done using these two values and formula (4) to reach formula (5).

FIGURE 1

DIMENSIONS OF FINANCIAL INCLUSION INDEX



Source: Author's own design.

Results and Discussion

Index of Financial Inclusion of India

The Index value was found by first obtaining the value of various indicators for the given period of study using equation (1). These dimension values will indicate the contribution of each of the dimensions toward the final value of FII. During the initial phase of the study, the dimension values are quite low, either 0.00 or below 0.10. These low values will result in low values of X1 and X2 signaling lower FII as well. The same values have improved during the later years of study signifying improvement in FII as well.

TABLE 1

FINANCIAL INCLUSION INDEX COMPUTED VALUES ALONG WITH CATEGORY OF FI DURING 1996-2022 IN INDIA

Year	Computed Value of FII	Nature of Financial Inclusion
1996	0.152	Low FI
1997	0.152	Low FI
1998	0.153	Low FI
1999	0.155	Low FI
2000	0.160	Low FI
2001	0.167	Low FI
2002	0.174	Low FI
2003	0.177	Low FI
2004	0.180	Low FI
2005	0.150	Low FI
2006	0.197	Low FI
2007	0.210	Low FI
2008	0.228	Low FI
2009	0.241	Low FI
2010	0.247	Low FI
2011	0.263	Low FI
2012	0.275	Low FI
2013	0.294	Low FI
2014	0.320	Medium FI
2015	0.342	Medium FI
2016	0.367	Medium FI
2017	0.386	Medium FI
2018	0.392	Medium FI
2019	0.404	Medium FI
2020	0.411	Medium FI
2021	0.492	Medium FI
2022	0.510	Medium FI

Source: Author’s own compilation using given formulas.

According to Sarma (2008), regions with 'Low' Financial Inclusion are having a value of FII as 0.0 < FII < 0.3. Regions with 'Medium' Financial Inclusion have a range of 0.4 < FII < 0.5 and finally, the regions having 'High' Financial Inclusion have a range between 0.6 < FII < 1.0.

It is quite evident from the above results that the level of Financial Inclusion in India was extremely low after the introduction of major financial reforms in 1991 in India. The calculated value of FII was less than 0.3 till the year 2013. However, there has been improvement in the value of FII which lies in the 'Medium' level of FII as the value raised from less than 0.3 to more than that and reached 0.40 during the year 2019. It highlights the rise in efficacy level and the aggressive efforts put in by the Government of India through various policy initiatives in the financial and banking sector. For instance, the introduction of Pradhan Mantri Jan Dhan Yojana in 2014 which is open to all Indian citizens so that accessibility to banking and other financial services can be expanded through easy access. Additionally, other strategies of RBI in the form of new products and services launched, and supportive steps in the form of relaxation of guidelines have proved to be useful in enhancing the Financial Inclusion Index. It started with the nationalization of scheduled commercial banks and after that series of policy initiatives like the introduction of priority lending schemes, leading banking, self-help groups, linkage programmes of banks, and Regional Rural Banks, which have brought a big turnaround in the efficacy of the financial inclusion approach. It was further enhanced through other measures like General Credit Cards (GCC), Business correspondents and No-Frills accounts.

Conclusions and Recommendations

The paper introduces a multidimensional approach to provide an exact valuation of the financial inclusion intensity in the country as per the update available regarding reaching out to financial services, usage and the availability of these financial services. Also, the paper provides a comprehensive review of measuring the financial inclusion index and other existing frameworks contributing towards the latest condition in the country. The proposed FII would be useful for further studies as a tool to understand the progress of financial inclusion by researchers, practitioners and policy-makers. Further financial and economic policy pronouncements can be developed by utilizing this data and the computed value of FII. The paper also confirmed the methodological development of the systematic approach for future calculations of the index, thereby contributing to the best practices in the field. Hence, it is recommended that policy-makers prioritize awareness programmes over financial schemes and facilities available. The provision of some kind of benefits on usage of digital services can prove to be a game changer in financial inclusion over some time. The role of technology upliftment is quite important in delivering a varying range of available monetary products and facilities to all segments of society.

Conflict of Interest

The author declare that they have no conflict of interest.

REFERENCES

1. Beck, T., Demirgüç-Kunt, A., and Levine, R. (2006), Bank Concentration, Competition, and Crises: First Results, *Journal of Banking & Finance, 30*(5), pp. 1581-1603.
2. Beck, T., and De La Torre, A. (2007), The Basic Analytics of Access to Financial Services, *Financial Markets, Institutions & Instruments, 16*(2), pp. 79-117.
3. Charkravarty, S.R. and Pal, R. (2010), Measuring Financial Inclusion: An Axiomatic Approach, *IGIDR, WP 2010(3)*.
4. Chattopadhyay, S.K. (2011), Financial Inclusion in India: A Case Study of West Bengal. [Online] Available from: https://mpra.ub.unimuenchen.de/34269/1/MPRA_paper_34269.pdf [Accessed 21/05/2023].
5. Goel, S., and Sharma, R. (2023), Financial Inclusion Index of India, *Journal of Southwest Jiaotong University, 58*(3), pp. 699-713.
6. Gupte, R., Venkataramani, B., and Gupta, D. (2012), Computation of Financial Inclusion Index for India, *Procedia-Social and Behavioral Sciences, 37*, pp. 133-149.
7. Mehrotra, N., Puhazhendhi, V., Nair G. and Sahoo, B.B. (2009), Financial Inclusion - An Overview, Department of Economic Analysis and Research, National Bank for Agriculture and Rural Development (NABARD), *Occasional Paper 48, Mumbai*.
8. Sarma, M. (2008), Index of Financial Inclusion, *Working Paper 215*, Indian Council for Research on International Economic Relations.
9. Sarma, M. and Pais, J. (2008), Financial Inclusion and Development: A Cross Country Analysis, Annual Conference of the Human Development and Capability Association, New Delhi.
10. T.P., S. (2018), An Evaluation of Banking Services and Financial Inclusion of District Co-Operative Banks in Kerala. *Retrieved from https://sg.inflibnet.ac.in/handle/10603/22157*
11. World Bank Group (2023), *Global Financial Development Report 2022: Financial Inclusion* (Vol. 2), World Bank Publications.
12. Yorulmaz, R. (2013), Construction of a Regional Financial Inclusion Index in Turkey. *BDDK Bankacýlýk ve Finansal Piyasalar Dergisi, 7(1)*, pp. 79-101.
13. Data retrieved from https://dbie.rbi.org.in/DBIE/dbie.rbi?site=Bsr Publications Data retrieved from https://databank.worldbank.org/
14. Data retrieved from https://data.imf.org/?sk=e5dcab7e-a5ca-4892-a6ea-598b5463a34c