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Developing a financial inclusion index and inclusive growth in India

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Abstract. *Financial inclusion is one of the systems through which Inclusive Growth can be achieved in developing countries like India where large sections are unable or hopeless to contribute in the financial system. An inclusive financial system mobilizes more resources for productive purposes leading to higher economic growth, better opportunities and reduction of poverty. This study, proposed an Index of financial inclusion – a multidimensional measure. The Financial Inclusion Index can be used to compare the range of financial inclusion across different economies and to monitor the progress of the economies with respect to financial inclusion over time. From the computation of Financial Inclusion Index of India, it is evident that during 2010 to 2012 (Demand side dimensions such as: banking penetration, availability of banking services, usage of the banking system), India is categorised under the full financial inclusion or high financial inclusion and during 1987-1988 and 1989-2009 (Supply side dimensions such as: access to saving, access to insurance, bank risk), India is categorised under the low financial inclusion. Here, the major difference between the demand side and supply side indicators of Financial Inclusion Index during the period 2010 to 2012 is that, the India is categorised under the high financial inclusion in case of demand side dimensions but low financial inclusion in case of supply side dimensions.*

Keywords: Financial Inclusion, Inclusive growth, Financial System.

JEL Classification: O43, O430, G21.

1. Introduction

Financial inclusion holds the promise of boosting growth and reducing poverty and inequality, notably by mobilizing savings and providing households and firms with greater access to resources needed to finance consumption and investment and to insure against shocks. In addition, financial inclusion can foster labour and firm formalization, helping, in turn, boost government revenues and strengthen social safety nets.

'Financial Inclusion' is the buzzword of the current era. It has become the most important phrase in the lexicon of economics. It has drawn the attention of a large section of the intelligentsia: scholars, researchers, economists, policymakers, bankers and of course academia. It has generated a keen interest in the development circles too. Policymakers and central bankers from around the world gather in different forums to discuss 'Financial Inclusion' and to build a more financially inclusive economic system. It is widely regarded as a policy priority and need to be taken care of immediately, to achieve an equitable and viable growth. Hence, it has become the focus of intense intellectual debate and economic-policy making all over the world.

Financial Inclusion is one of the yardsticks to measure the growth of an economy as well as human welfare. It is a key enabler of economic and social development. The word "Financial Inclusion" is not the recent development in the policy initiatives taken by the government of India. There has been some effort made in 1904 and later more effectively in 2000, during the beginning of co-operative movement in India. Since then, Indian financial system has gained momentum rapidly but its benefit has been in few pockets. In spite of that the rapid development in expansion of banking infrastructure and financial products, the poorer sections have remained untouched to the financial services.

To make an effective and inclusive financial system is an important plan of action; however it is not an easy task. It is because; measuring financial inclusion by the creation of an index or a set of Indices is a herculean task. The existing literature on measuring financial inclusion has not been too comprehensive and has not captured selective important aspects of financial services. Against this backdrop, the present research makes an effort not only to study the concept of financial inclusion, its important facets but also to suggest the construction of a new Index or a set of Indices (for a more inclusive policy on Financial Inclusion).

2. Literature Review

Different approaches have been proposed in the literature including the use of a variety of financial inclusion dimensions to econometric estimation. One of the first efforts at measure financial sector outreach across countries was done by Beck et al. (2006). The authors designed new indicators of banking sector outreach for three types of banking services-deposits, loan and payments (access, affordability, and eligibility). Combining these elements to evaluate overall progress skilled by countries can be complicated. Sarma, M. and Paise, J. (2008) did a study to find out the co-relation between financial inclusion and human development. Within 49 countries data on banking services, he

found that high financial inclusion can lead human development. So it can be argued that financial inclusion is policy initiatives which can reduce poverty and improve standard of living. Further he stated that high income can lead to a high level of financial inclusion. Mehrotra, et al. (2009), constructed a Financial Inclusion Index (FII) to measure the level of financial inclusion and then try to find out the relation between financial inclusion and economic growth. Their argument is that, when people access to banking services it benefits them to park their money in the formal financial institutions. This results in high growth through multiplier effects which in other words helps to achieve an inclusive growth.

Chakravarty and Pal (2010), have very recently presented a set of matrices for measuring financial inclusion. In what they call as an axiomatic approach, they consider data from Beck et al. (2007) which reported eight indicators of financial inclusion. Their work is two folds. In the first stage they calculated the level of financial inclusion in 21 countries including India for different income groups. They stated that, to achieve the high level of financial inclusion, the factors of banking services have contributed equally to that success. At the state level, most of the states have experienced low financial inclusion during the period of 1991 to 2001. Interestingly, for the period of 2001 to 2007, the level of financial inclusion has increased in Indian states. Laha and Kuri (2011), conducted a study to observe the level of financial inclusion in India, two composite financial inclusion indices; they are constructed separately for demand side and supply side information of financial services. The study concluded by identifying the empirical result, which suggests a large difference between rural and urban regions in the access of financial services on both sides in India. In the existence of a significant association between the demand for and supply of financial services, the study suggest for evolving an integrated approach influencing the demand and supply dimensions so as to promote the strategy of complete financial inclusion in India.

Chattopadhyay (2011) have studied the efficacy of financial inclusion in West Bengal (WB). For that, he has compared the performance of WB among all other Indian states and then a survey has been done in selected districts of WB. In comparing the performances, the WB has scored a very low level of financial inclusion. In the Financial Inclusion Index, Maharashtra has scored the highest level of achievement in financial inclusion. He argued that, after 2005 to 2006, there has not been any measure success in financial inclusion. Considering the district level study, it is confirmed that financial inclusion is not speeded over all the rural areas. Money lender still dominants rural informal credit market (Chattopadhyay, 2011).

Gupte et al. (2012), has used more updated data base to study the impact of financial inclusion India. By showing the major draw backs in the previous studies, a Financial Inclusion Index (FII) was constructed. In the result he found that, the financial inclusion has increased from the period of 2008 to 2009. This improvement has been mainly due to the contribution of some important demand side factors. By comparing the results of Sharma, he concluded that, the level of financial inclusion has declined for the same period. Yorulmaz (2013) used three dimensions of financial inclusion to measure the coverage of financial inclusion Turkey. He used similar kind of methodology as Sharma

used to calculate FII. From the result it is evident that the high income region has performed well in the Index. In other words high income groups have better access to banking services in Turkey. In the Turkey region, Istanbul has scored highest rank in FII, whereas mid-east Anatolia has performed very low level of financial inclusion.

Piñeyro (2013) has studied the level of financial inclusion in 32 states of Mexico and its Municipality. Using principal component analysis, he found that around 36 percent of Municipality are financial inclusive whereas 29 percent of them are still excluded. He also found a direct relationship between education and financial inclusion and to some extent the high correlation between poverty and financial inclusion. Thus he suggested that in order to benefit a large mass of excluded population, Mexican government should encourage equitable growth and equal opportunities.

Thakkar (2014) in his article, identified the level of financial inclusion in India within the BRICS economies and the study also intended to analyse the level of financial inclusion in India vis-à-vis other emerging economies. His study was based on six selected demand side indicators. Through his study, he found out that the financial inclusion in India is very low within the BRICS economies.

The above review of literature on the various Index/Indices of financial inclusion opens up the debate that these Index/Indexes are necessary but not sufficient for an all-inclusive idea called financial inclusion. The various Indices/Indices give an idea about the limitation of the reach of the various programmes of financial inclusion to the different segments of the population. It suggests that for a more inclusive policy on financial inclusion one needs to think about constructing a new Index/Indices apart from the various Index/Indices discussed above.

3. Origin of the Theory

First time a classical economist named as Walter Bagehot (1870)[(1)], who pointed out a new theory under which the financial system of an economy is of most important for economic growth. According to him loanable funds are encouraging economic activity. First loanable funds are allocated among investors and next it will be encourage to adopting new technology. Finally the production process of an economy will be increase. As a result, gradually this process spill over the whole economy. Credit goes to Goldsmith (1975), for pioneering explicitly the index of financial inclusion as Financial Interrelation Ratio. He explained about the penetration of financial system in terms number of branches, customers etc., which has gained lot of significance in today's time. For the first time some geographers propounded the term financial exclusion in 1993, where they explain that the closing of bank branches are the reasons for limited access to bank services (Leyshon and Thrift, 1995).

In India, the term financial inclusion was given preliminary importance during cooperative movement. However, the term "Financial Inclusion" was effectively used for the first time by Y.V. Reddy in 2005. Soon after, C. Rangarajan committee (2008) was formed to study the form of financial exclusion and in order to identify the barriers that

stop the vulnerable groups to access banking services, and recommended the steps to achieve financial inclusion. In 11th five year plan (2007-12), government felt the need of financial inclusion to boost economic growth. Further this growth generates rural employment and can reduce poverty level of the country.

4. Need for Financial Inclusion

Access to affordable financial services would lead to increasing economic activities and employment opportunities for rural households with a possible multiplier effect on the economy. It could enable a higher disposable income in the hands of rural households leading to greater savings and a wider deposit base for banks and other financial institutions.

Financial inclusion will enable the Government to provide social development benefits and subsidies directly to the beneficiary bank accounts, thereby drastically reducing leakages and pilferages in social welfare schemes. It could be an instrument to provide monetary fuel for economic growth and is critical for achieving inclusive growth.

There have been many selective objectives related to the need for financial Inclusion such as:

I. Economic Objectives

By economic objectives, financial inclusion aims at achieving an equitable distribution of income and reducing income saving gap.

II. Mobilisation of Savings

In the process of financial inclusion the weaker sections of the society can be linked to the banking services which will create high level of national savings and later this saving can be used for the investment and economic growth.

III. Larger Market for the Financial System

A larger market for the financial system can be created through the creation of high level of savings and this market will meet the demand of the larger section of the society. This process will create the growth of banking sector.

IV. Social Objectives

Through financial inclusion, social problems like poverty can be eradicated in the form of giving bank loans to create income and livelihood.

V. Sustainable Livelihood

If the bank loans are given to weaker section of the society, than that will create their own business and further, that can lead to sustainable livelihood of those weaker sections

5. Need of the Study

Developing countries like India, it is necessary to include the entire section of the society under a single roof of financial services. Still money lander in India dominants the rural credit markets. The people in rural areas lacks knowledge about the entire range of financial services such as: opening bank accounts and credit etc. Against the above backdrop, the main purpose of this present study is to take in account the different variables or indicators and construct a new Financial Inclusion Index. Through which we can know that the banking services development in a country or a particular state.

6. Objective of the Study

In the light of these above problems an attempt has been made:

- To study the role of financial inclusion in inclusive growth.
- To identify the important indicators to construct a FII in India.
- To develop and propose an Index by which financial inclusion may be measured in terms of direction, degree and intensity in the context of India.

7. Methodology

With the rising interest in financial inclusion across policymakers, a multiplicity of financial inclusion indicators has been developed. As the inclusiveness of a financial system should be evaluated along several dimensions, this study constructing a Financial Inclusion Index (FII) is similar which previously used by United Nation Development Programme (UNDP) for computation of some popular indices such as: Human Development Index, Human Poverty Index and Gender Development Index and so on. To construct an index, this study first calculating a dimension index for every dimension of financial inclusion.

Formula 1:

$$\boldsymbol{d_i = w_i * \frac{A_i - m_i}{M_i - m_i}}$$

Where,
w_i = Weight attached to the dimension i, 0≤ w_i ≤1;
A_i = Actual value of dimension i;
m_i = Minimum value of dimension i;
M_i = Maximum value of dimension i;
d_i = Dimensions of financial inclusion i.

Formula (1) confirms that $0 \leq w_i \leq 1$ and here, n dimensions of financial inclusion represented by a point X = (1, 2, 3…). Point 0 = (0, 0, 0…0) represents the point indicating the worst situation and Point W = (1, 2, 3 …) represents an ideal situation. Here, both the worst point 0 and the ideal point W is the important factor to calculate an index for countries' and sates which indicates the position of financial inclusion. If the distance will be larger between X and 0 then it represents higher financial inclusion and

similarly if the distance will be lower between X and 0 then it represents lower financial inclusion.

Formula 2:

$$X_1 = \frac{\sqrt{d_1^2 + d_2^2 + d_3^2 + \ldots\ldots + d_n^2}}{\sqrt{(w_1^2 + w_2^2 + w_3^2 + \ldots\ldots + w_n^2)}}$$

Formula 3:

$$X_2 = 1 - \frac{\sqrt{(w_1 - d_1)^2 + (w_2 - d_2)^2 + (w_3 - d_3)^2 + \cdots + (w_n - d_n)^2}}{\sqrt{(w_1^2 + w_2^2 + w_3^2 + \ldots\ldots + w_n^2)}}$$

Formula 4:

$$\text{FII} = \frac{1}{2}(X_1 + X_2)$$

The formula (2), for financial inclusion index (FII), X_1 indicates average of the Euclidian distance between X and 0. Higher value of X_1 implies more financial inclusion. Formula (3), for FII, X_2 indicates inverse Euclidian distance between X and W and similarly, higher value of X_2 corresponds to be higher financial inclusion. The formula (4) is the simple average of X_1 and X_2.

Depending on the value of FII, country will be categorised into

1. **$0.6 < \text{FII} \leq 1$** indicates **high financial inclusion**
2. **$0.4 < \text{FII} < 0.6$** indicates **medium financial inclusion**
3. **$0 \leq \text{FII} < 0.4$** indicates **low financial inclusion**

To calculate FII, this study taking into account two groups of indicators such as: demand side indicators and supply side indicators of an inclusive financial system. Demand side indicators such as: Banking Penetration (BP), Availability of Banking Services (BS) and Usage of the Banking System (BU), Banking Linkage (BL). Supply Side indicators are: Access to Savings, Access to Insurance, number of loans given to small entrepreneurs (Banking Risk) and Banking Utilization (BU). Here, this study trying to develop two separate index such as: Financial Inclusion Index with demand side indicators (FII_D) and supply side indicators (FII_S). These indicators are examined elaborately as follows:

Demand side Indicators

(a) Banking Penetration: The number of people having a bank account is called banking penetration. Thus, if every person in an economy has a bank account, then the value of this measure would be 1.

- No. of deposit account with commercial bank per 1000 adults (d_1)

(b) Availability of banking services: The services of an inclusive financial system should be easily to its users. Availability of services can be indicated by the number of

bank outlets (per 100000 populations) and /or by the number of ATM per 100000 people, or the number of bank employees per customer. In the absence of comparable data on the number of ATMs and number of bank staff, we can use the number of bank branches per 100000 populations to measure the availability dimension.

- No. of ATM per 100000 adult (d_2)
- No. of commercial bank branches per 1000 adult (d_3)

(c) Usage of the banking system: Bank account is not enough for an inclusive financial system, it is also imperative that the banking services are adequately utilized. Here, outstanding deposit with commercial banks as percentage of GDP dimension used in this present study.

- Outstanding deposit with commercial banks as percentage of GDP (d_4)

Supply side Indicators

(a) Access to Saving:

- Proportion of households having access to savings (d_1)

(b) Access to Insurance:

- Proportion of households having access to insurance (d_2)

(c) Bank Risk:

- No. of loans given to small entrepreneurs (d_3)

8. Data Sources and Variables

This study is primarily based on secondary data on the various variables such as Bank branches, ATMs, Deposits, Credits, Small borrowable account (RBI), Female literacy, Decadal population growth, Mobile users (Census of India), Insurance office, agents, density and penetration, Micro Insurance (Insurance Regulatory and Development Authority of India (IRDA)), SHGs (NABARD), Life expectancy (Census of India), Number of NGOs (different working paper and websites), above all these are indicators and dimension wise data sources and sourced from MOSPI, Economic Survey of India, CSO, NSSO, IMF and World Bank.

For calculation of (taking demand side indicators), the study used different demand side indicators such as: Banking Penetration, Availability of Banking Services and Usage of the Banking System in India and the study period is spanning from 2004 to 2012. The data on demand side indicators are sourced from Financial Access Survey (IMF) is the data sources. For calculation of (taking supply side indicators), this study used different supply side indicators such as: households having access to savings, households having access to Insurance and number of loans given to small entrepreneurs through Schedule commercial bank in India from 1975 to 2012 and all these supply side indicators variables data are taken from RBI website. It is needless to mention here that the mismatched

between the period of the study of demand and supply side indicators are due to lack of availability of the data especially on demand side indicators.

9. Scope and Limitations of the Study

The study is limited to construct an Index of Financial Inclusion (IFI) in India. The study is trying to explain the role of financial inclusion in inclusive growth. A major limitation of this study is non-availability of data base of some important variables which can help to get a robust result.

10. The Role of Financial Inclusion for Inclusive Growth in India

India needs inclusive growth in order to achieve rapid and well-organized growth. Inclusive growth is necessary for sustainable development and equitable distribution of wealth and prosperity. Achieving inclusive growth is important and also it is one of the major challenges for India. The challenge is to take the levels of growth to all section of the society and to all parts of the country. In order to address the problem of financial and social exclusion in India, the 11th five year plan in India commissioned a strategy of inclusive growth. The approach paper of the plan emphasised that "the 11th plan provides an opportunity to reform policies to achieve a new vision of growth that will be much broader based and inclusive, bringing about a faster reduction in poverty and helping bridge the divides that are currently in focus". More over economic growth to be sustainable, it requires all sections of the society included and participating in the growth process.

Financial inclusion is one of the systems through which Inclusive Growth can be achieved in India where large sections are unable or hopeless to contribute in the Financial System. An inclusive financial system mobilizes more resources for productive purposes leading to higher economic growth, better opportunities and reduction of poverty. Financial inclusion is unavoidable in creating economic opportunities to the poor, supporting it, overcome the risk associated with it and continue to participate so that they become successful economic mediators to the growth process of the country. Keeping this in mind Government, RBI, banks and other financial institutions are making policy interventions to accommodate the vulnerable in to the financial system. If we are thinking about inclusive growth with stability, it is not possible without financial inclusion and inclusive finance is a long run phenomenon which cannot be achieved overnight, especially with regard to developing country like India where the access to financial products is constrained by several factors such as lack of awareness, unaffordability, high transaction costs etc.

11. Empirical Result and Discussion

11.1. Computation of Financial Inclusion Index in India

Table 1. *Index of Financial Inclusion-using data on 4 dimensions (demand side indicators) of financial inclusion in India from 2004 to 2012*

Year	DACBA	d_1	ATMA	d_2	CBBA	d_3	ODCBG	d_4
2004	610.98	0	2.5	0.02154	9.04	0.01739	46.61	0
2005	611	0.00004	2.31	0	9.02	0.00869	47.3	0.04911
2006	622.19	0.02643	2.76	0.05102	9	0	48.69	0.14804
2007	652.85	0.09875	3.41	0.12471	9.11	0.04782	52.08	0.38932
2008	717.35	0.25088	4.33	0.22902	9.43	0.18695	57.72	0.79074
2009	801.47	0.44929	5.36	0.34580	9.73	0.31739	60.54	0.99145
2010	872.91	0.61778	7.34	0.57029	10.18	0.51304	58.51	0.84697
2011	944.97	0.78774	8.95	0.75283	10.65	0.71739	60.05	0.95658
2012	1034.96	1	11.13	1	11.3	1	60.66	1

Source: Authors' computation

Calculation based on Financial Access Survey (IMF), 2004-2012.
Note, DACBA = No. of deposit account with commercial bank per 1,000 adults
ATMA = No. of ATMs per 100000 adults
CBBA = No. of commercial bank branches per 1,000 adults
ODCBG = Outstanding deposit with commercial banks as percentage of GDP
d_i = Dimensions

Table 2. *Index for Financial Inclusion on demand side indicators of Financial Services (FII_D) in India*

Year	Value of X_1	Value of X_2	FII_D
2004	0.013842986	0.009684393	0.011764
2005	0.024937122	0.014253944	0.019596
2006	0.079402132	0.054720582	0.067061
2007	0.211640669	0.154730101	0.183185
2008	0.440349159	0.318017049	0.379183
2009	0.592699541	0.452898517	0.522799
2010	0.649515065	0.615527822	0.632521
2011	0.808858982	0.783266428	0.796063
2012	1	1	1

Source: Authors' Computation

As per the method mentioned above, Financial Inclusion Index (FII) for the year 2004 to 2012 aggregated data (including all states) in India is calculated. The country is grouped into three categories namely, higher, medium and low financial inclusion (Table 3) based on range of Index. If the country's Index score will be varies from 0.6 to 1 then it is called high financial inclusion. If the country's Index score will be varies from 0.4 to 0.6, then it categorised the under the medium financial inclusion. Similarly, 0 to 0.4 categorised under the low financial inclusion.

Table 3. *Classification of India according as the value of FII from Demand side*

Year	FII_D	FII Range	Category
2004	0.011	0≤ FII <0.4	Low FI
2005	0.019		
2006	0.067		
2007	0.183		
2008	0.379		
2009	0.522	0.4 < FII <0.6	Medium FI
2010	0.632	0.6 < FII ≤1	High FI
2011	0.796		
2012	1		

Source: Authors' Computation
***Note*,** FI means Financial Inclusion and FII means Financial Inclusion Index

Above Table 3 depicts that, the classification of India as the value of Financial Inclusion Index from demand side. It is an absolute measure of financial inclusion. From 2004 to 2008, values of Financial Inclusion Index vary from 0 to 0.4. It indicates that, during this period India is categorised under the low financial inclusion. There may be various reasons behind the achievement of low financial inclusion but the major reasons may be the lack of initiatives taken by the GOI and RBI, unawareness about the banking policies and financial crisis (2007-08) etc. In 2009, India is categorised under the medium financial inclusion. During 2010 to 2012, India is categorised under the full financial inclusion or high financial inclusion.

Table 4. *Classification of India according as the value of FII from Supply side*

Year	FII_S	FII Range	Category
1975	0.43	0.04 ≤ FII < 0.06	Medium FI
1976	0.46		
1977	0.42		
1978	0.46		
1979	0.47		
1980	0.44		
1981	0.58		
1982	0.48		
1983	0.45		
1984	0.47		
1985	0.47		
1986	0.46		
2010	0.43		
1011	0.41		
2012	0.51		
1987	0.35		
1988	0.35		
1989	0.32		
1990	0.29		
1991	0.31		
1992	0.33		
1993	0.34		
1994	0.39		

Year	FII_S	FII Range	Category
1995	0.33		
1996	0.34		
1997	0.28	$0 \leq FII < 0.4$	Low FI
1998	0.23		
1999	0.21		
2000	0.16		
2001	0.14		
2002	0.14		
2003	0.22		
2004	0.25		
2005	0.28		
2006	0.32		
2007	0.37		
2008	0.27		
2009	0.3		

Note: FI means Financial Inclusion and FII means Financial Inclusion Index.
Source: Authors' computation.

Table 4 explains that, the classification of India as the value of Financial Inclusion Index from supply side. From 1975 -1980, 1981-86 and 2010-2012 India categorised under the medium financial inclusion (0.4 to 0.6). During 1987-1988 and 1989-2009, India is categorised under the low financial inclusion (0 to 0.4). There are also many reasons behind the low financial inclusion in India, in case of supply side financial services such as narrowing of the branch network in rural areas, fall in credit deposit ratios in rural areas, high transaction cost, staff attitude and complex products etc. Here, the major difference between the demand side indicators of FII and supply side indicators of FII during the period 2010 to 2012 is that India is categorised under the high financial inclusion in case of demand side indicators but low financial inclusion in case of supply side indicators.

Hence, the GOI and RBI should take into account the major challenges to improve the arena of financial inclusion by providing the supply side financial services and also demand side financial services in India. By the achievement of full or high financial inclusion, it will be more help full to reduce the farmers indebtedness, promoting inclusive growth, improves the standard of living and promote grassroots innovations and entrepreneurship etc.

11.2. Association between Demand for and Supply of Financial Inclusion in India

In order to make a comparative analysis between the demand for financial services and the supply of financial services in India, it requires data on demand- supply components at the same point of time. Since study is based on the data from 2004 to 2012.

The movement of both the demand and supply side indices of financial inclusion is shown in the following Table 5 and Figure 1. An association between these two indices is quite evident in the Figure 1.

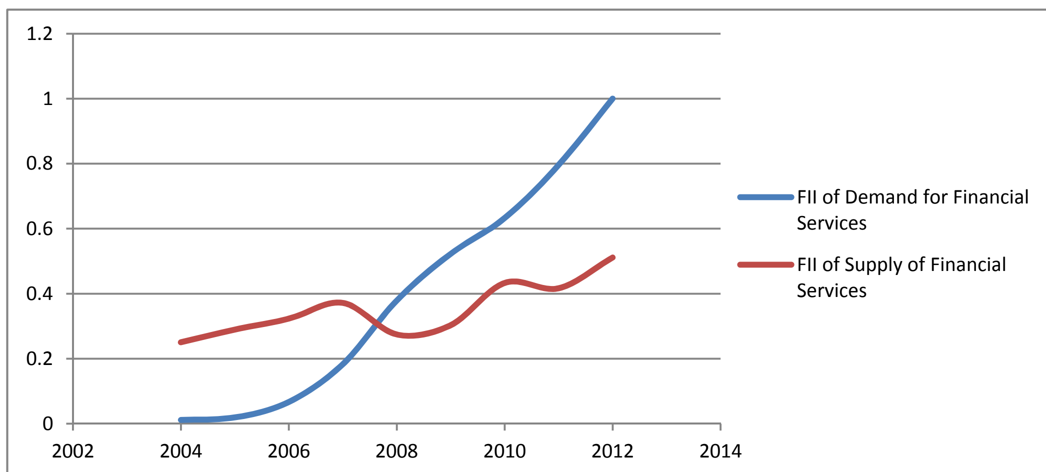
Table 5. *Movement of FII of Demand for and Supply of Financial Services*

Year	FII of Demand for Financial Services	FII of Supply of Financial Services
2004	0.011764	0.250309
2005	0.019596	0.289445
2006	0.067061	0.323024
2007	0.183185	0.371664
2008	0.379183	0.274519
2009	0.522799	0.3032
2010	0.632521	0.433127
2011	0.796063	0.416594
2012	1	0.511182

Source: Authors' computation.

Figure 1 simply plots the relationship between the process of financial inclusion from demand side and supply side perspectives in India. This figure shows that, the trend line of financial inclusion index of demand for banking services is going upward with very minimal fluctuation but at the same period, the trend line of financial inclusion index of supply of banking services is going upward with more fluctuation. From this observation, finally, we can conclude that, both financial inclusion index of demand for banking services and supply of banking services are increasing year by year. It is only possible through different initiatives taken by the GOI and RBI and our policy maker also should alert about recent causes of financial exclusion in India. In spite of that, right now it indicates that the India is walking on the right path and going to achieve full financial inclusion in near future.

Figure 1. *Movement of FII of Demand for and Supply of Financial Services*



Source: Authors' computation.

Table 6. *Index of Financial Inclusion for the States of India*

State	D_1 (Penetration)	D_2 (Availability)	D_3 (Usage)	IFI	IFI Rank	PNSDP at current price
Chandigarh	0.002	0.638	0.455	0.311	2	128634
Delhi	0.136	1.000	0.294	0.356	1	150653
Haryana	0.192	0.094	0.142	0.142	23	94680
Himachal Pradesh	0.118	0.085	0.153	0.118	27	65535
Jammu &Kashmir	0.222	0.137	0.108	0.105	28	37496
Punjab	0.111	0.156	0.201	0.156	28	69737
Rajasthan	0.341	0.080	0.067	0.153	21	42437
Arunachal Pradesh	0.424	0.113	0.050	0.179	13	55789
Assam	0.494	0.042	0.055	0.170	16	30569
Manipur	1.000	0.005	0.002	0.186	12	29684
Meghalaya	0.315	0.074	0.062	0.142	23	50427
Mizoram	0.244	0.056	0.018	0.101	29	48591
Nagaland	0.599	0.017	0.000	0.158	18	52643
Tripura	0.537	0.028	0.069	0.178	14	44965
Andaman & Nicobar	0.230	0.055	0.186	0.154	20	76883
Bihar	0.746	0.092	0.047	0.226	5	20708
Orissa	0.304	0.087	0.054	0.141	25	40412
Sikkim	0.147	0.178	0.076	0.132	26	81159
West Bengal	0.378	0.120	0.94	0.187	11	48536
Madhya Pradesh	0.568	0.095	0.051	0.203	6	32222
Uttar Pradesh	0.503	0.092	0.086	0.203	6	26355
Goa	0.019	0.202	1.001	0.270	4	168572
Gujarat	0.246	0.098	0.098	0.145	22	75115
Maharashtra	0.275	0.485	0.127	0.281	3	83471
Andhra Pradesh	0.257	0.143	0.140	0.178	14	62912
Karnataka	0.172	0.262	0.168	0.200	8	60946
Kerala	0.127	0.154	0.198	0.159	17	71434
Puducherry	0.239	0.112	0.242	0.195	10	98719
Tamil Nadu	0.213	0.214	0.147	0.200	8	72993

Source: Authors Calculation (Data Sources: RBI).

It explains Index of Financial Inclusion for the state of India and this Index indicates how much a state is sound in providing financially services. Here, Delhi has scored 1 rank because its value of Index of Financial Inclusion (IFI) is 0.356 which is the highest value among other states of India. Similarly, Mizoram has scored 29th rank which is the lowest rank among other states of India because its value of Index of Financial Inclusion (IFI) is 0.101. From this rank we can know that, Delhi has better financial services such as penetration, availability and usage and people were more included with banking and financial services comparison to other states of India (Table 6).

12. Cross Country Comparison

Table 7. *Financial Inclusion indicators in SAARC Countries*

Outreach of Financial Services	India	Bangladesh	Pakistan	Nepal	Sri Lanka	Afghanistan
Bank branch per 100000 population	10.11	5.16	8.68	4.19	9.05	2.00
Bank branches per 1000 KMs	26.46	43.14	11.73	5.26	21.38	0.49
Deposits accounts per 1000 adults	467.40	228.75	119.84	229.49	1891.74	83.85
Loans account per 1000 adults	137.0	54.73	21.93	1.81	12.29	3.32
ATM per 100000 population	7.29	-	4.06	1.81	12.29	-
ATM per 1000 Km	19.08	-	5.49	2.27	29.03	0.39
Financial Access Index Rank (WEF 57 Countries)	49	35	55	-	-	-

Sources:
1. Compiled from Financial Access 2010, www.cgap.org
2. W.E.F (World Economic Forum), 2010, www.weforum.org

Table 7 depicts that there is extensive dissimilarity among countries in the South Asian region in terms of deposit account penetration and access to credit. The deposit account per 1000 population varies from 83 bank accounts in Afghanistan to 1891 bank accounts in Sri Lanka. Similarly, in terms of loan account penetration, it differs from only 3 bank loans per 1000 adults in Afghanistan to 137bank loans per 1000 adults in India. The ATMs location per 100000 populations equally varies from Nepal to 12.29 in Sri Lanka. India's rank in Financial Access Index is 49 among all the countries of the World.

13. Conclusion

If we consider financial inclusion as a coin then, both demand side as well as and supply side indicators of banking services are the two side of a same coin. As one side of a coin cannot represent the coin fully similarly in case for the success of financial inclusion, a demand side or a supply side indicator cannot influence individually significantly. Hence, to achieve a high and sustainable financial inclusion in India both demand side as well as supply side indicator are indispensable.

The FII can be used to compare the extent of financial inclusion across different economies and to monitor the progress of the economies with respect to financial inclusion over time. From the computation, it is evident that during 2010 to 2012 (Demand side Indicators), India is categorised under the full financial inclusion or high financial inclusion since the value of FII is ranged from 0.6 to1. During 1987-1988 and 1989-2009(Supply side indicators), India is categorised under the low financial inclusion (0 to 0.4). There are also many reasons behind the low financial inclusion in India, in case of supply side financial services such as narrowing of the branch network in rural areas, fall in credit deposit ratios in rural areas, high transaction cost, staff attitude and complex products etc. Here, the major difference between the demand and supply side indicators of FII during the period 2010 to 2012 is that India is categorised under the high financial inclusion in case of demand side indicators but low financial inclusion in case of supply side indicators. Hence, the GOI and RBI should take into account the major challenges to improve the status of financial inclusion by addressing the adequate policies to improve the supply side financial services and also demand side financial services in India. By the achievement of full or high financial inclusion, it will easy to reduce the farmer's indebtedness, promoting inclusive growth, improves the standard of living and promote grassroots innovations and entrepreneurship etc.

14. Contribution of this Study

In the previous studies, indices were computed using select indicators of banking only (such as Banking penetration, Availability of banking services and Usage of banking system) whereas this study considers other potential banking services such as Baking Risk, Access to savings and Access to Insurance (supply side indicators). This study takes into consideration supply and demand side indicators of financial services and it also developed two separate types of Financial Inclusion Index (FII) such as : Financial Inclusion Index with demand side indicators (FII_D) and Financial Inclusion Index with supply side indicators (FII_S).

15. Scope for Future Research

The construction of FII by considering the demand side and supply side indicators in the context of India at aggregate level is constructed here in this study. However, the study couldn't consider a lot of potential indicators to represent the demand side indicators because of the lack of the availability of the data. Secondly, the lack of the data availability is also limited the study while comparing the FII at both demand side and supply side. However, keeping this in mind, whatever this study attempted over can be seen as the initial investigation in this direction. The further research may be investigated to construct the FII at state and region level by considering disaggregated data. From the policy prospective point of view we can see the impact of FII on poverty, inequality, employment etc.

Note

[(1)] See also, M. Stolbov, 2013, The Finance-Growth Nexus Revisited: From Origins to a Modern Theoretical Landscape. *Economics: The Open-Access, Open-Assessment E-Journal*, Vol. 7, p. 2.

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Appendix

Index of Financial Inclusion-using data on 3 dimensions (supply side indicators) of financial inclusion in India from 1975 to 2012

Year	PHHS	d_1	PHLIF	d_2	SE	d_3
1975	153.8917	0.564285	1197.872	0.721355	11.53	0
1976	156.8981	0.600736	1269.275	0.784405	14.03	0.000364
1977	148.7316	0.50172	1208.446	0.730691	17.04	0.000803
1978	146.2808	0.472005	1388.433	0.889624	22.32	0.001573
1979	153.4337	0.558731	1325.873	0.834382	26.95	0.002248
1980	146.7763	0.478013	1324.372	0.833056	39.53	0.004081
1981	189.828	1	1313.5	0.823457	44.64	0.004826
1982	159.0934	0.627353	1303.401	0.814538	53.89	0.006174
1983	145.5723	0.463414	1365.552	0.869419	65.37	0.007848
1984	139.6085	0.391105	1513.432	1	78.29	0.009731
1985	145.7045	0.465017	1436.875	0.932398	91.27	0.011623
1986	139.3769	0.388297	1475.174	0.966217	106.59	0.013856
1987	109.5136	0.026214	1394.593	0.895062	129.68	0.017222
1988	130.4624	0.280212	1167.339	0.694393	146.35	0.019651
1989	128.6136	0.257796	1092.48	0.628291	159.69	0.021596
1990	123.7609	0.198958	1052.116	0.59265	179.38	0.024466
1991	135.8774	0.345867	971.655	0.521601	189.39	0.025925
1992	128.6675	0.258449	1129.519	0.660998	209.75	0.028893
1993	127.4275	0.243414	1148.073	0.677381	239.78	0.03327
1994	131.8079	0.296526	1279.692	0.793603	291.75	0.040845
1995	145.9571	0.46808	894.8971	0.453822	342.46	0.048237
1996	141.7239	0.416754	983.3075	0.53189	381.96	0.053994
1997	133.6691	0.319092	884.8016	0.444907	457.71	0.065036
1998	118.7567	0.138284	883.9978	0.444197	516.79	0.073647
1999	117.7725	0.126352	824.6509	0.391793	570.35	0.081454
2000	111.1687	0.046283	730.8556	0.30897	601.41	0.085981
2001	107.3515	3.39E-07	693.6344	0.276103	671.07	0.096135
2002	116.3195	0.108733	621.7616	0.212638	647.07	0.092637
2003	125.2724	0.217285	745.5456	0.321942	712.09	0.102114
2004	137.5833	0.36655	657.731	0.2444	834.98	0.120027
2005	142.1367	0.421759	699.6814	0.281443	1012.85	0.145953
2006	149.4283	0.510167	665.7939	0.251519	1273.23	0.183907
2007	164.2006	0.689276	454.7507	0.065164	2135.39	0.309576
2008	135.4464	0.340642	475.5229	0.083506	2561.28	0.371654
2009	133.8202	0.320924	380.9538	9.28E-09	3622.91	0.526398
2010	145.6383	0.464214	513.9727	0.117458	4785.27	0.695825
2011	137.4609	0.365066	470.5357	0.079103	5276.84	0.767476
2012	137.5635	0.36631	578.846	0.174743	6872.08	1

Source: Authors' computation.

Here, PHHS = Proportion of households having access to savings

PHLIF = Proportion of households having life insurance fund

SE = No. of loans given to small entrepreneurs (Banking Risk)

d_i = Dimensions

Index for Financial Inclusion on Supply side indicators of Financial Services (FII_S) in India

Year	Value of X_1	Value of X_2	FII_S
1975	0.528762676	0.350002307	0.439382
1976	0.57043087	0.366184936	0.468308
1977	0.511740132	0.336875041	0.424308
1978	0.581441141	0.344810727	0.463126
1979	0.579764084	0.362908416	0.471336
1980	0.554525418	0.343698525	0.449112
1981	0.747909178	0.416465206	0.582187
1982	0.593600016	0.377919905	0.48576
1983	0.568830398	0.344423391	0.456627
1984	0.619961762	0.32883545	0.474399
1985	0.601593045	0.349957431	0.475775
1986	0.601260414	0.329726012	0.465493
1987	0.51708173	0.198933196	0.358007
1988	0.432468258	0.275989466	0.354229
1989	0.392290401	0.259210184	0.32575
1990	0.361209211	0.234217292	0.297713
1991	0.361645804	0.268431294	0.315039
1992	0.410101006	0.267909369	0.339005
1993	0.41601376	0.267180819	0.341597
1994	0.48969451	0.302993716	0.396344
1995	0.377438482	0.295939514	0.336689
1996	0.391367699	0.303764874	0.347566
1997	0.31832474	0.259297207	0.288811
1998	0.271942323	0.202169636	0.237056
1999	0.242281737	0.188231647	0.215257
2000	0.187080498	0.139277599	0.163179
2001	0.168794549	0.116635608	0.142715
2002	0.147895736	0.136363714	0.14213
2003	0.231866623	0.208670942	0.220269
2004	0.263626513	0.236992106	0.250309
2005	0.304627126	0.274262903	0.289445
2006	0.345134777	0.30091294	0.323024
2007	0.437867811	0.305460989	0.371664
2008	0.295034829	0.254003358	0.274519
2009	0.355943329	0.25045718	0.3032
2010	0.487669003	0.378585205	0.433127
2011	0.492798219	0.340388811	0.416594
2012	0.623088612	0.399274804	0.511182

Source: Authors' computation.