

# Financial Inclusion Index Approach Unifying E-Wallets

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**Abstract:** In FY 2015 and 2017 India's economy has become the fastest growing major economy in the world. It is the world's sixth-largest economy by nominal GDP and the third-largest by purchasing power parity. However its distribution has largely remained uneven. The lack of access to financial services by a large population of India has been a key impediment in its growth. The importance of financial inclusion to economic growth has been well realised by the policy makers. This paper examines the status of financial inclusion in India in the recent years. The paper focuses on the role of government of India in the development of financial inclusion through regulatory policies and digital means. It highlights the impact of the introduction of Pradhan Mantri Jan Dhan Yojna in 2014 and demonetization in 2016 on financial inclusion of India. It further presents a quantitative approach to calculate financial inclusion index which takes into account mobile money, e-wallets and payment banks. The increased access to mobile phones by the unbanked population is the most effective method of providing financial services and thereby reaching an even and inclusive growth.

**Keywords:** Index of Financial Inclusion, Mobile Money, Regulatory Policies

## 1. Introduction

Poverty in India is an important issue, despite being the fastest growing economies of the world. Poverty is not simply lack of money. It involves a lack of access to the instruments and means through which they can improve their lives. Exclusion from the opportunities and services provided by the financial sector is considered as one of the main barrier for India to exit poverty. Financial constraints on the poor can slow economic growth and increase inequality in the country. On a microeconomic level, this exclusion does not mean that the poor lack active financial lives. However, the dependency on informal system means that the poor are limited in availing facilities for savings and transactional purposes, low cost credit for productive, personal and other purposes, financial advisory services, insurance facilities and managing risk responsibly. An inclusive financial system is desirable for empowering the underprivileged and making them self-sufficient and well informed to take better financial decisions.

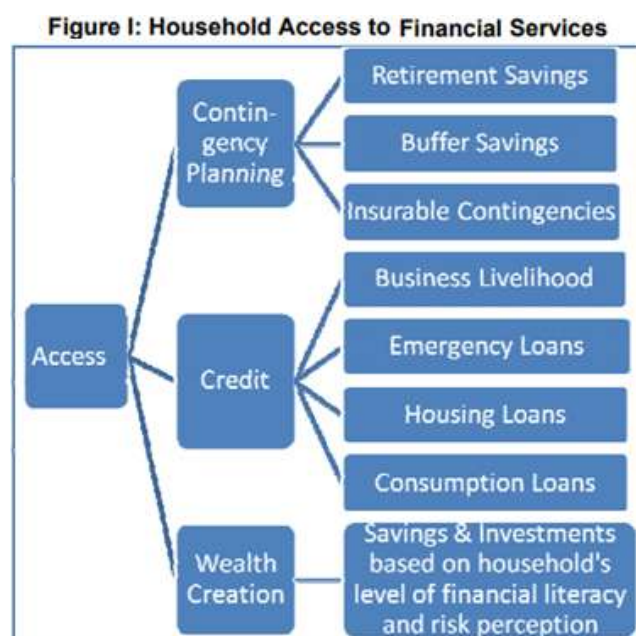
In the Indian context, the term 'financial inclusion' was used for the first time in April 2005 in the Annual Policy Statement presented by Y.Venugopal Reddy, the then Governor, Reserve Bank of India, who had expressed deep concern on the exclusion of vast sections of the population from the formal financial system. It is quite clear that we very much understand the term 'Financial Inclusion' properly before we further proceed with our paper.

### What is Financial Inclusion?

One of the early attempts to define financial exclusion was by Leyshon and Thrift (1995) who defined it as referring to those processes that serve to prevent certain social groups and individuals from gaining access to the formal financial system. Financial inclusion means that individuals and businesses have access to useful and affordable financial products and services that meet their needs – transactions, payments, savings, credit and insurance – delivered in a responsible and sustainable way, as defined by the World

Bank. The World Bank's declared objective of achieving universal financial access by 2020 is another example of financial inclusion being recognised as fundamental for economic growth and poverty alleviation. Financial Inclusion, as defined by RBI, is the process of ensuring access to appropriate financial products and services needed by vulnerable groups such as weaker sections and low income groups at an affordable cost in a fair and transparent manner by mainstream Institutional players.

The Committee on Financial Sector Reforms, Chairman: Dr. Raghuram G. Rajan defines Financial Inclusion as universal access to a wide range of financial services at a reasonable cost. These include not only banking products but also other financial services such as insurance and equity products. Household access to financial services is depicted in Figure I



Source: A Hundred Small Steps - Report of the Committee on Financial Sector Reforms (Chairman: Dr. Raghuram Rajan).

### Why Financial Inclusion?

Financial inclusion is widely recognized as one of the most important parameters for economic development. The benefits of financial inclusion for the poor are extremely significant. Access to finance has been seen as a critical factor in enabling people to transform their production and employment activities and to exit poverty. It also helps to reduce the dependence on informal instruments for money and mitigates the exploitation of vulnerable sections by the money lenders by facilitating easy access to formal credit. It helps in creating a culture of savings among the rural population. Financial inclusion allows maximum investment in business opportunities, education, save for retirement, insurance against risks, etc. by the rural individuals and firms. Financial inclusion is also important to avoid financial collapses within families.

Thus, promotion of inclusive growth has always been a key motive for any international institutions, policymakers, central banks, financial institutions and governments. Finding innovative models to extend financial services to the poor has now become an urgent challenge. This requires a need to define an index to measure financial inclusion. However, the concept of financial inclusion goes beyond single indicators, such as percentage of bank accounts and loans and number of automated teller machines (ATMs) and branches. There have been multiple attempts in the past to measure financial inclusion.

## 2. Financial Inclusion Index

### 2.1 Literature Review

The literature on measuring financial inclusion index is new but growing. The earlier measures included simply the measure of proportion of households in an economy having access to formal financial services. However such measure ignores some important aspects of an inclusive financial system. It includes the usage of the financial services as well and not just merely having a bank account. Mandira Sarma (2008) has attempted to combine banking penetration, availability of banking services and usage of banking services. The index used the Euclidian method of distances for the calculations as deviation from the 94th percentile of the data. The calculations included the allocation of weightage of each factor that corresponds to the impact of that factor on financial inclusion. Sadhan Kumar Chattopadhyaya (2011) also took into account the same factors but allocated equal weightage to all the three corresponding factors. The most recent index to measure India's progress on financial inclusion is CRISIL Inclusix. It is a relative index that has a scale of 0 to 100, and combines three very critical parameters of basic financial services - branch penetration, deposit penetration, and credit penetration into one single metric. In its third edition, the contribution of microfinance institution in the index of financial inclusion was added for the first time. However, in this digital era the contribution of mobile money to the financial inclusion cannot be overlooked. Mobile financial services are among the most promising mobile applications in the developing world. A similar international analogy to Indian current condition could be taken with Kenya where substantial

amount of research has been done to include the mobile money as a measure of financial inclusion.

### 2.2 Mobile Money for Financial Inclusion

Mobile Money is an electronic wallet service that lets users store, send and receive money using their mobile phone. It can be used on both smartphones and basic feature phones. Due to easy electronic payments, mobile money is seen as an effective way to provide access to financial services to millions of people around the globe. The most well-known system, M-PESA, started in Kenya and is now operational in six countries; it has 20 million users who transferred \$500 million a month during 2011. In India, the 2016 banknote demonetisation was a major turning point for the Indian economy. Mobile money users sprung up due to the boom in the e-wallets industry after the demonetization and the support from the government towards a cashless economy. People have been forced to realize that what used to be unnecessary complexity has become the need of the hour and is in the demand owing to its ergonomics in the market.

The increasing mobile penetration among the masses also triggers the importance of the mobile money in the financial inclusion. The ever decreasing costs of the mobile networks and service delivery has added to the ease of the masses to get financially included in this form. There is no distance barrier and with no transaction costs, transactions can be made across the globe in an extremely ergonomic fashion. There is a growing support for the digital economy from the unorganized sector of the society too. Thus, there is a need to include mobile money in the calculation of index of financial inclusion to get a better understanding of financial inclusion in any economy.

### 2.3 Methodology for designing a comprehensive indicator

We will follow a multidimensional approach similar to that of Sarma while constructing our index. The index is computed by first computing a dimension index for each dimension of financial inclusion. The dimension index  $d_i$ , as computed by the formula, measures the country's achievement in the  $i$ th dimension of financial inclusion. A weight  $w_i$  such that  $0 \leq w_i \leq 1$  is attached to the dimension  $i$ , indicating the relative importance of the dimension  $i$  in quantifying the inclusiveness of a financial system.

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

where

$w_i$  = weight attached to the dimension  $i$ ,  $0 \leq w_i \leq 1$

$A_i$  = actual value of dimension  $i$

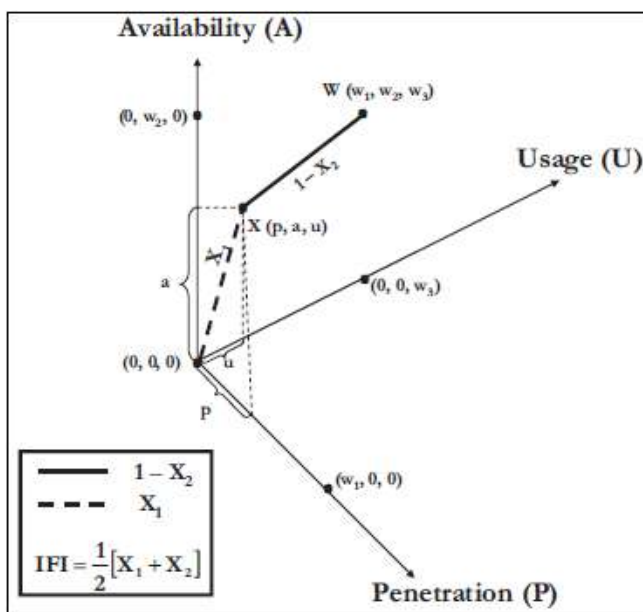
$m_i$  = lower limit on the value of dimension  $i$ , fixed by some pre-specified rule.

$M_i$  = upper limit on the value of dimension  $i$ , fixed by some pre-specified rule.

Now, the Index of financial inclusion  $X$  is calculated by the formula,

$$X = 1 - \frac{\sqrt{(w_1 - d_1)^2 + (w_2 - d_2)^2 + \dots + (w_n - d_n)^2}}{\sqrt{(w_1^2 + w_2^2 + \dots + w_n^2)}}$$

In Figure 2, a graphical explanation of the IFI is provided with the help of the three dimensions used to construct the index in this paper each of these dimensions is represented by an axis in the three-dimensional space. The point W=(w1,w2,w3) represents the ideal point and a particular country's achievements in these dimensions is depicted by the point X=(p,a,u). A country that has an inclusive financial system should be closer to the ideal point W than a country that is less financially included. Similarly, a country with a more financially inclusive system should be farther away from the point O than a less inclusive country. In other words, less distance between the points X and W and more distance between X and O will together indicate high financial inclusion in country X.



**Figure 2:** Graphical Explanation of a 3-dimensional IFI  
 Source: Working Paper No. 07/2012, Index of Financial Inclusion – A measure of financial sector inclusiveness, Mandira Sarma

Although the IFI proposed here follows a multidimensional approach of index construction similar to the UNDP approach, there is a major difference in the manner in which dimension indexes are combined to compute the final index. Unlike the UNDP's methodology of using an average of the dimension indexes, our index is based on a notion of distance from a worst and an ideal situations.<sup>11</sup> UNDP's methodology of using an average of dimension indexes suffers from the criticism that such averaging implies 'perfect substitutability' across dimensions; i.e., an increase in one dimension can be compensated for by a decrease of equal (in case of arithmetic average) or proportional (in case of geometric average) magnitude in another dimension. As all dimensions are assumed to be equally important for the overall index value, the perfect substitutability can hardly be appropriate (Desai, 1991; Trabold-Nubler, 1991; Luchters and Menkhoff, 1996; Sagar and Najam, 1998). The distance based approach does not suffer from this shortcoming.

In the index presented in this paper, we consider three basic dimensions of an inclusive financial system similar to Sarma : banking penetration (BP), availability of the banking services (BS) and usage of the banking system (BU). However, in this paper we have defined these dimensions in a different way than Sarma so as to incorporate mobile money in financial inclusion index.

**Banking penetration (dimension 1):**

The banking penetration should refer to the number of people with an existing bank account but since there would be multiple bank accounts to the same individual, it is not possible to state the total number of individuals with bank accounts due to the absence of data on number of individuals. But the developed index would incur the values in a relative perspective, we can state that the proportion of people having a bank account or a mobile wallet account is proportional to the number of bank accounts or mobile wallet accounts in that year. However, in the absence of such data we use number of deposit bank accounts and number of mobile wallet accounts population as an indicator of this dimension. In this context, it may be noted that Honohan (2008) found a positive and significant association between proportion of banked adults/households and number of bank accounts per 100 adults.

**Availability of banking services (dimension 2):**

In an inclusive financial system, banking services should be easily available to the users. The availability of services is indicated by the number of branches of Basic Savings Bank Deposit Account (per 1000 population). Similar analogy is used in the Government Affiliated Crisil Inclusix too. The dimension is also referred by the term "Branch Penetration". Although there must be a major impact of the mobile penetration that is around 99% in the current scenario but due to the non-feasibility of determining whether a mobile wallet account is being operated by particular mobile phones, we would choose to ignore the factor in these calculations.

**Banking Usage (dimension 3):**

The third key factor that is used for financial inclusion indications is the usage of the available of banking services. Since there is no defined parameter that would determine the extent of usage of banking services. The outstanding credit in banks is usually taken as a valid indicator for this dimension and the state of relative calculations further validates our consideration. In order to include the mobile wallets factors, we would simply include the value of transactions in the domain for the duration 2014-2017. If we had considered the number of transactions instead of value of transactions, that would have modified our calculations and results a lot but that is not possible due to unavailability of data. The value of transactions by mobile money wallets is not much comparable to the other factors and hence we would provide equal weights as it won't alter much of our calculations but still would make a small dent in the index of that particular year.



### 3. Financial Development in India

#### 3.1 Measures by the government

Promotion of inclusive growth has always been a key motive of the government of India. RBI has taken various measures to increase the banked population of the country. The nationalisation of banks in India in 1969 led to an expansion of financial reach by commercial banks, regional rural banks and cooperative credit institutions. The next important measures were the introduction of mandated priority sector lending targets, lead bank scheme, formation of self-help groups, permitting BCs/BFs to be appointed by banks to provide doorstep delivery of banking services, zero balance *Basic Saving Bank Deposit* (BSBD) accounts. Further, for achieving the targeted goals, RBI has created conducive regulatory environment and provided institutional support for banks in accelerating their financial inclusion efforts. The implementation of Pradhan Mantri Jan -Dhan Yojana(2014) and produced significant impact on the financial inclusion for the country. Within an year of the launch of Pradhan Mantri Jan Dhan Yojana in 2014, over 35 crore bank accounts were open due to constant backing of the government on the subject. It definitely lead to a boom in the banking penetration numbers. The next stepping stone in the journey of financial inclusion came with the introduction of the demonetization of 2016 by the Prime Minister and the magnified focus on making the transition from a cash-dependent economy to a completely cashless one. According to the report of National Payments Corporation of India, the share of digital transactions has increased nearly twice from 32% in 2013-14 to 62% in 2017-18. According to the data given by RBI, there was a 408% increase in the use of mobile wallets just after demonetization. With the introduction of payment banks, KYC, Aadhar Pay, BHIM App, UPI, the authenticity and reliability of the sector is also going to increase exponentially. It would be analogous to the nationalization of the banks of 1965.

The recent changes in the regulatory policies by the government of India had an interesting impact on the financial inclusion index. A new relative financial inclusion index has been developed over the four years(2014-2017) that capture the before and after scenarios of landmark steps.

#### 3.2 Index of Financial Inclusion of India

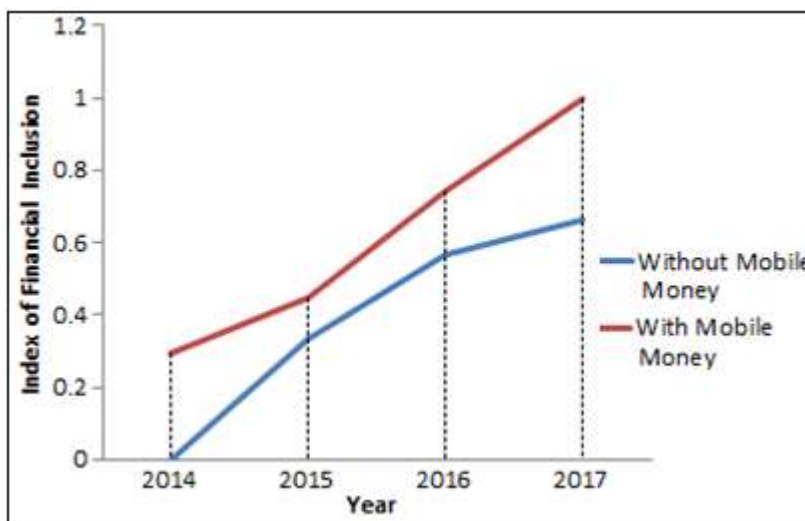
| Year Here, MM represents factors after including mobile money | Mobile Wallet Account Penetration | Banking usage (value of transactions) |
|---|-----------------------------------|---------------------------------------|
| 2014(MM)  | 85                                | 4.59                                  |
| 2015(MM)  | 238                               | 11.96                                 |
| 2016(MM)  | 265                               | 22.93                                 |
| 2017(MM)  | 411                               | 74.42                                 |

The number of the mobile wallet account penetration corresponds to the sum of the top 5 companies in the E-wallets market, namely Paytm, Itz Cash, Mobikwik, Citrus Pay, Oxigen Wallets and Freecharge. The data has been collected for the mentioned financial year starting in month of march. The data for the private mobile wallets has been collected through informal sources owing to the unavailability of public user base data but could be definitely used in our calculations as only the visualisation of the impact of the mobile money wallets in financial inclusion needs to be addressed with no specific focus on the individual share of userbase among the companies.

| Year Here, MM represents factors after including mobile money | Account Penetration | Branch Penetration (Availability of banking services) | Banking usage (Outstanding credit, value of transactions) | Index of Financial Inclusion (X) |
|---|---------------------|---|---|----------------------------------|
| 2014  | 243                 | 0.0907  | 62821   | 0                                |
| 2014(MM)  | 243+85=328          | 0.0907  | 62821+4.59  | 0.29                             |
| 2015  | 398                 | 0.0974  | 68784   | 0.33                             |
| 2015(MM)  | 398+238=636         | 0.0974  | 68784+11.96   | 0.45                             |
| 2016  | 469                 | 0.1026  | 75300   | 0.57                             |
| 2016(MM)  | 469+265=734         | 0.1026  | 75300+22.93   | 0.74                             |
| 2017  | 541                 | 0.1062  | 78820   | 0.67                             |
| 2017(MM)  | 541+411=952         | 0.1062  | 78820+74.42   | 1                                |

Source: RBI  
 Account Penetration (in millions)  
 Branch Penetration (branches per 1000 of population)  
 Banking usage (in billions)

#### 3.3 Graphical Analysis



In India, there is an increasing access to financial services by a large population over the years as depicted by the above graph. We can observe that the actual financial inclusion of India is high. One can't neglect the effect of mobile money on Index of Financial Inclusion. In 2017, the year after demonetisation, the increase in index is as close to 50% after inclusion of mobile money. If we observe the financial inclusion of India without considering mobile money, the curve seems to get saturated. However, there is a lot of scope in increasing the index by focusing on the system that rely on mobile financial services.

#### 4. Conclusion

Policy makers in India have been reforming the institutional infrastructure to allow financial service providers to extend access to financial services and better serve the poor. In 2014, India witnessed a surge in the banking penetration after the introduction of Pradhan Mantri Jan Dhan Yojna. 2015 was the year of first in-principle approval of licenses for 11 payment banks, whose main aim is to enhance the digital provision of payment services. 2016, the year of banknote demonetisation and 2017, the year after witnessed a boom in the mobile wallet users. The economy of India began to shift towards a cashless one. This paper is a step in the direction of appropriately measuring the financial inclusion unifying mobile wallets. The improvement of the model is always possible, however the biggest constraint is the availability of the data.

Regulatory policies have impacted positively in increasing the financial inclusion of India. Determining the best regulatory approach for finance in general is challenging. This challenge is even greater for digital finance, given the many new forms of provision and providers. With growing mobile phone penetration in India, which is expected to rise to 85-90% by 2020, the next step in financial inclusion would be to shift the focus towards the mobile money industry. There is need of enhancement of supportive regulatory frameworks and also extending the financial literacy about overcoming of perceived barriers to financial inclusion such as distance, fees, documents required, security and trust through digital means.

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