MEASURE OF INDEX ON FINANCIAL INCLUSION IN INDIA

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ABSTRACT

Financial inclusion led by banking institutions, creation of regulatory environment which is conducive and provision of institutional support for banks have improved availability and penetration of banking services as targeted by the Reserve Bank of India. Through financial literacy and financial inclusion initiatives, usage of banking services has significantly improved among adult population in India. Hence considering banking services’ penetration, availability and usage as most significant dimensions of financial inclusion in the country a multidimensional Index to measure financial inclusion is attempted by many researchers across industry and academia. This research paper computes a multidimensional index for financial inclusion by quantifying dimensions of Penetration, Availability, and Usage of banking services in India based on the available literature.

KEYWORDS
Financial Inclusion, Financial Exclusion, Index on Financial Inclusion

JEL CLASSIFICATION
G200

INTRODUCTION

Financial Inclusion - Exclusion

The essence of financial inclusion is to ensure delivery of financial services which include – savings bank accounts, current accounts, low cost credit, financial advisory services, and insurance facilities. “Financial inclusion may be defined as the process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups such as weaker sections and low income groups at an affordable cost” (Rangarajan, 2008). “Financial inclusion can be broadly defined as the 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” (Rajan, 2009). “Financial exclusion can be of two types – involuntary exclusion arising from lack of access to financial services or non-availability of financial services or products satisfying the need or voluntary – self exclusion arising from unaffordability due to monetary or cultural reasons or lack of adequate information on the services available or on the benefits of the services” (Sarma, 2010).

Need for Financial Inclusion

There are many benefits of Financial Inclusion (Rajan, 2009).

1. “Financial inclusion broadens the resource base of the financial system by developing a culture of savings among large segment of rural population and plays its own role in the process of economic development. It facilitates efficient allocation of productive resources”.
2. “Added to that, by bringing low income groups within the perimeter of formal banking sector, financial inclusion protects their financial wealth and other resources in exigent circumstances. It significantly improves the management of finances”.

3. “Financial inclusion also mitigates the exploitation of vulnerable sections by the usurious money lenders by facilitating easy access to formal credit”.

**MEASURING FINANCIAL INCLUSION**

There are several indicators of financial inclusion out of which penetration of banking services, availability of banking services and usage of banking services are most significant. Monitoring different indicators of financial inclusion individually does not offer a comprehensive understanding of the level of financial inclusion in a country or across countries. These individual measures should be available for developing a multidimensional indicator to measure the level of financial inclusion of a country. Multidimensional measurement of financial inclusivity is important in several aspects (Sarma, 2010).

1. “It aggregates several indicators into a single index that aids in summarizing the complex nature of financial inclusion and helps to monitor its evolution over time”.
2. “It allows us to study the relationship between financial inclusion and other macroeconomic variables of interest”.
3. “It helps us to identify the problems of financial inclusion for policy making and policy evaluation”.

RBI has worked out an Index on financial inclusion (IFI) based on three variables: (Chattopadhyay, 2011).

1. penetration (number of adults having bank account)
2. availability of banking services (number of bank branches per 1000 population)
3. usage (measured as outstanding credit and deposit)

**Dimension1 – Banking Penetration:** (Sarma, 2010), (Chattopadhyay, 2011). The primary indicator of financial inclusion is banking penetration. For more financial inclusivity in a country, its financial system should penetrate more to have as many users as possible. The size of the ‘banked’ population, which is the proportion of people having bank account, is a measure of the banking penetration of the financial system. However, in the absence of data on the number of ‘banked’ people, the number of bank account deposits per 1000 adult population is considered to measure this dimension.

**Dimension2 – Availability of Banking Services:** (Sarma, 2010), (Chattopadhyay, 2011), (Sarma, 2012), (N. Câmara, 2014). Banking services should be made available to the users and their availability also indicates financial inclusion. The measures of availability of banking services are number of bank outlets, ATMs, per 1000 population and/or bank outlets, ATMs per 1000 km². Number of PoS Terminals, bankers per customer or other such measures, which have consistent data available, can also be considered to measure availability.

**Dimension3 – Usage of Banking Services:** (Sarma, 2010), (Chattopadhyay, 2011), (Sarma, 2012), (N. Câmara, 2014). Financial inclusion is also indicated by the adequate usage of banking services. The measure for usage dimension is number of people having bank accounts and availing two basic services – deposit and credit. The number of customers availing internet banking services and number of customers availing mobile (G.Flora Jor Priya, S.Ramamoorthy, 2015) banking services are also important to measure usage. The proportion of people having bank accounts and not adequately availing the banking services are ‘under banked’ or ‘marginally banked’ people. These people may not be availing banking
services due to various involuntary reasons such as remoteness of banking outlets, voluntary reasons such as unaffordable conditions, negative experiences with the service provider. The appropriate measure considered for the usage dimension is the volume of credit and deposit to adult individuals.

INDEX ON FINANCIAL INCLUSION (IFI)
Considering a proposed Index on Financial Inclusion (IFI) (Sarma, 2012), the IFI for India can be computed to a higher degree of achievement. This can be computed by computing a dimensional index for each of the penetration, availability and usage dimensions of financial inclusion.

**Figure 1 – Graphical explanation of a 3-Dimensional IFI**

In this paper three dimensions of financial inclusion are considered for computation of IFI i.e. $i = 1, 2, 3$

$d_1, d_2, d_3 =$ index for the dimensions penetration, availability and usage respectively

$w_1, w_2, w_3 =$ weight attached to dimensions penetration, availability and usage respectively

$A_1, A_2, A_3 =$ actual value of the dimensions penetration, availability and usage respectively

$m_1, m_2, m_3 =$ lower limit on value of penetration, availability, usage dimensions respectively

$M_1, M_2, M_3 =$ upper limit on value of penetration, availability, usage dimensions respectively.

DATA COLLECTION AND ANALYSIS
**Table 1:** Number of Households and Penetration, Availability & Usage of Banking Services w.r.t 1000 persons (15 years and above) in India

*# excluding institutional households
*per 1000 people (15 years & above)*

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>No. of Households (w.r.t 1000 persons)</th>
<th>No. of Households Inclusive in Banking System*</th>
<th>No. of Bank outlets*</th>
<th>No. of ATMs*</th>
<th>No. of PoS terminals*</th>
<th>No. of ICT-A/Cs-BC transactions*</th>
<th>Household Bank Deposits* (In Rs. Mn)</th>
<th>Bank Credit to Households (In Rs. Mn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011-12</td>
<td>291.26</td>
<td>170.97</td>
<td>0.10</td>
<td>0.11</td>
<td>0.78</td>
<td>184.03</td>
<td>10.88</td>
<td>3.39</td>
</tr>
<tr>
<td>2012-13</td>
<td>293.85</td>
<td>189.15</td>
<td>0.11</td>
<td>0.13</td>
<td>0.99</td>
<td>289.7</td>
<td>12.07</td>
<td>3.72</td>
</tr>
<tr>
<td>2013-14</td>
<td>297.11</td>
<td>208.09</td>
<td>0.12</td>
<td>0.18</td>
<td>1.21</td>
<td>373.04</td>
<td>13.33</td>
<td>4.04</td>
</tr>
<tr>
<td>2014-15</td>
<td>300.03</td>
<td>227.15</td>
<td>0.12</td>
<td>0.2</td>
<td>1.25</td>
<td>529.86</td>
<td>14.16</td>
<td>3.54</td>
</tr>
<tr>
<td>2015-16</td>
<td>302.19</td>
<td>302.16</td>
<td>0.13</td>
<td>0.22</td>
<td>1.51</td>
<td>896.08</td>
<td>16.23</td>
<td>4.51</td>
</tr>
</tbody>
</table>

where, \(A_1, A_{2,1}, A_{2,2}, A_{2,3}, A_{2,4}, A_{3,1}, A_{3,2}\) = actual value of the dimensions penetration, availability of bank outlets, ATMs, PoS terminals, ICT-A/Cs-BC transactions and usage of deposits, credit respectively.

**CALCULATION OF INDEX ON FINANCIAL INCLUSION (IFI)**

Computation a dimensional indices for each of the penetration, availability and usage dimensions by using the formula (1) is tabulated in Table 2 to Table 5. Then the Index on Financial Inclusion is computed by using formulae (2), (3) and (4) with actual values of the dimensions in 2011-12 as the Base Year (Census, 2011).

**Table 2:** Indices for dimensions.

<table>
<thead>
<tr>
<th>Year</th>
<th>Penetration</th>
<th>Availability</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(d_1)</td>
<td>(d_{2,1})</td>
<td>(d_{2,2})</td>
</tr>
<tr>
<td>2011-12</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>2012-13</td>
<td>0.15</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>2013-14</td>
<td>0.29</td>
<td>0.02</td>
<td>0.05</td>
</tr>
<tr>
<td>2014-15</td>
<td>0.44</td>
<td>0.02</td>
<td>0.05</td>
</tr>
<tr>
<td>2015-16</td>
<td>1.00</td>
<td>0.03</td>
<td>0.06</td>
</tr>
</tbody>
</table>

where, \(d_1, d_{2,1, d_{2,2}}, d_{2,3}, d_{2,4}, d_{3,1}, d_{3,2}\) = indices for the dimensions penetration, availability of bank outlets, ATMs, PoS terminals, ICT-A/Cs-BC transactions and usage of deposits, credit respectively.

Indices for dimensions for the base year 2011-12 are set to 0.00 upon which the increase can be computed with 1.00 being the maximum value of the indices as shown in case of penetration dimension in Table 2.
Table 3: Weights for the dimensions.

<table>
<thead>
<tr>
<th>Period</th>
<th>Penetration</th>
<th>Availability</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>w₁</td>
<td>w₂,₁</td>
<td>w₂,₂</td>
</tr>
<tr>
<td>2011-16</td>
<td>1.00</td>
<td>0.33</td>
<td>0.33</td>
</tr>
</tbody>
</table>

where,  
w₁, w₂,₁, w₂,₂, w₂,₃, w₂,₄, w₃,₁, w₃,₂ = weights attached to dimensions penetration, availability of bank outlets, ATMs, PoS terminals, ICT-A/Cs-BC transactions and usage of deposits, credit respectively. These weights are arrived by considering equal weights of 1.00 and the ratios of average of actual values for each of the dimensions - penetration, availability and usage of banking services as all three dimensions have been found to have a high impact on Financial Inclusion.

Table 4: Lower limits for the dimensional values.

<table>
<thead>
<tr>
<th>Period</th>
<th>Penetration</th>
<th>Availability</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>m₁</td>
<td>m₂,₁</td>
<td>m₂,₂</td>
</tr>
<tr>
<td>2011-16</td>
<td>170.97</td>
<td>0.10</td>
<td>0.11</td>
</tr>
</tbody>
</table>

where,  
m₁, m₂,₁, m₂,₂, m₂,₃, m₂,₄, m₃,₁, m₃,₂ = lower limit on the value of the dimensions penetration, availability of bank outlets, ATMs, PoS terminals, ICT-A/Cs-BC transactions and usage of deposits, credit respectively. The lower limits are set as the actual values of the base year 2011-12 which represent the existing values that need to be retained.

Table 5: Upper limits for the dimensional values.

<table>
<thead>
<tr>
<th>Year</th>
<th>Penetration</th>
<th>Availability</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M₁</td>
<td>M₂,₁</td>
<td>M₂,₂</td>
</tr>
<tr>
<td>2011-12</td>
<td>291.3</td>
<td>0.30</td>
<td>0.40</td>
</tr>
<tr>
<td>2012-13</td>
<td>293.9</td>
<td>0.40</td>
<td>0.40</td>
</tr>
<tr>
<td>2013-14</td>
<td>297.1</td>
<td>0.40</td>
<td>0.60</td>
</tr>
<tr>
<td>2014-15</td>
<td>300.0</td>
<td>0.40</td>
<td>0.70</td>
</tr>
<tr>
<td>2015-16</td>
<td>302.2</td>
<td>0.40</td>
<td>0.70</td>
</tr>
</tbody>
</table>

where,  
M₁, M₂,₁, M₂,₂, M₂,₃, M₂,₄, M₃,₁, M₃,₂ = upper limit on the dimensions penetration, availability of bank outlets, ATMs, PoS terminals, ICT-A/Cs-BC transactions and usage of deposits, credit respectively. The upper limits are calculated as the total values of penetration availability and usage per 1000 people (15 years & above) among the total households in India.
**Table 6:** Measure for Index on Financial Inclusion (IFI) in India

<table>
<thead>
<tr>
<th>Year</th>
<th>IFI</th>
<th>(X_3)</th>
<th>(X_2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011-12</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>2012-13</td>
<td>0.10</td>
<td>0.11</td>
<td>0.09</td>
</tr>
<tr>
<td>2013-14</td>
<td>0.20</td>
<td>0.22</td>
<td>0.18</td>
</tr>
<tr>
<td>2014-15</td>
<td>0.28</td>
<td>0.32</td>
<td>0.25</td>
</tr>
<tr>
<td>2015-16</td>
<td>0.55</td>
<td>0.72</td>
<td>0.39</td>
</tr>
</tbody>
</table>

**RESEARCH FINDINGS**

The computations of the indices for the dimensions penetration, availability of bank outlets, ATMs, PoS terminals, ICT-A/Cs-BC transactions and usage of deposits, credit have resulted in computation of a measure for a multidimensional Index on Financial Inclusion (IFI). The IFI for India across the years of 2011 to 2015 is shown in Table 6. IFI of 0.00 for 2011-12 indicates initial values set to zero upon which the relative multidimensional index has been calculated. The results of the computation show that the Index on Financial Inclusion has significantly increased to 0.55 in 2015-16 with the increase in the dimensions penetration, availability of bank outlets, ATMs, PoS terminals, ICT-A/Cs-BC transactions and usage of deposits, credit in India.

**SUGGESTIONS AND SCOPE FOR STUDY**

It is observed that the ‘household’ financial inclusion in terms of penetration is 99.9%, since year 2015. Improvement in the ‘population’ financial inclusion will result in higher IFI, and more so through the improvement in availability and usage of financial services. With change in the total households’ population and the ‘households’ availing banking services, IFI can be measured year-on-year through measuring the penetration, availability and usage of financial services.

**CONCLUSION**

Research study thus carried out brings out a multidimensional index which is an indicator for the financial inclusion in India. It summarizes the complex nature of the financial inclusion and will help to monitor it over time. It helps to identify the problems of financial inclusion for policy making and policy evaluation to address those problems. It helps to study the relationship between financial inclusion and other macroeconomic variables of interest.

**REFERENCES**


