Developing an Index of Financial Inclusion: An Average Ratio Approach

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Abstract

As financial inclusion gains popularity in developed and developing economies, there is a need for a single index, (simple in computation with little or no assumptions) that pools together the financial inclusion indicators adopted by the IMF financial access survey. The various variants of financial inclusion indicators need to be pooled together in an easy manner into a value that depicts an index. This paper is faced with the challenge of filling the lacuna. To hold the bull by the horn, the author used average of ratio index method to come up with an index called chi-wins financial inclusion index (CFII).

Keyword: Financial inclusion, average of ratio index, chi-wins FII, financial proportional performance.

Introduction

The major aim of financial inclusion is to make financial services reach the unreached people for the improvement of their living standard which culminates in the general development and growth of the economy. The unreached people are majorly found in the rural areas. The rural dwellers fall most, victim of exclusion from payment system and victim of exclusion from formal credit markets which consequently make them to resort to exploitative informal financial markets. These dwellers holding the highest proportion of the population of the country especially in developing economies are made up of marginal farmers, self employed workers, semi-traders, landless labourers and unorganised small scale enterprises who are denied accessibility to basic financial services due to their geographical, social and economic position or level of literacy or inconveniencies of travelling to where such services could be obtained.

Thus, in the calculation of financial inclusion index, rural proportional performance of any inclusion indicator must form a weight instead of assigning weights arbitrarily. In other words, the proportion of the rural branches that are reached in terms of a particular activity to the total activities of the bank or

banks should serve as the weight of the financial inclusion indicator. Where the rural branches, rural deposits, rural borrowers, rural users of ATM, rural loans and/or other rural data on the variant of financial inclusion indicator are not available for the determination of proportional performance for weight(s), the measure of these variables on small scale enterprises could be used as a close substitute for the calculation of the proportional performance (weight). This method can practically be illustrated in the methodological demonstration in section 2 that follows.

2.0 Developing Chi-wins FI Index

Banks are gateway to the most essential forms of financial services and as such financial inclusion lean much on the banking sector activities. The IMF Financial Access Survey (FAS) adopted the following indicators of financial access and usage.

Table1.Access to & Use of Financial Services

Commercial bank branches per 1,000 km^2	0.54	Commercial bank branches per 100,000 adults	1.90
ATMs per 1,000 km^2	0.15	ATMs per 100,000 adults	0.53
Outstanding deposits with commercial banks (% of GDP)	22.71	Outstanding loans from commercial banks (% of GDP)	5.27
Deposit accounts with commercial banks per 1,000 adults	87.89	Loan accounts with commercial banks per 1,000 adults	3.06
Household deposit accounts with commercial banks per 1,000 adults	...	Household loan accounts with commercial banks per 1,000 adults	

Source: IMF Financial Access Survey(2004)

The use of these indicators individually as they are may provide partial information that cannot be good for comparing the level of inclusion across countries. Sarma (2010) found that one indicator (call it I) may show high financial inclusion in one country (say country A) while showing poor inclusion in another country (say B). Another variant of financial inclusion (call it 2) will then be high in country B while being very poor in country A which was earlier proved to have high financial inclusion using variant 1 and so on. This creates confusion when comparison is made across countries. The author agrees with Sarma's argument in this direction but he is not at home

with his method of calculating financial inclusion index – his dimension index, arbitrary assigning of weights and Euclidian distance as this looks complex to a common man and deviates a little from common calculation of index. There is therefore need for a common index (that is simple in nature and appealing to logic) in order to make a rightful decision on the value or magnitude of financial inclusion.

For determination of a common index, proportional performance of the included target area/number will be first of all determined. For instance for the

1. Commercial bank branches per $1000km^2$; the proportional performance or weight of the inclusion indicator is given as:

$$\frac{\text{Rural bank branches}/1000km^2}{\text{Total bank branches}/1000km^2} = \frac{\text{Rural bank branches}}{\text{Total bank branches}} = w_{Rk}$$

2. For commercial bank branches per 100,000 adults we can get

$$\frac{\text{Rural bank branches}/100{,}000}{\text{Total bank branches}/100{,}000} = \frac{\text{Rural bank branches}}{\text{Total bank branches}} = B_{RA}$$

3. $$\frac{\text{ATMs Per } 1000km^2 \text{ for rural banks}}{\text{ATM Per} 1000km^2 \text{ for the entire branches}} = W_{ATM}$$

4. $$\frac{\text{Outstanding deposits for rural banks}}{\text{Outstanding deposits for the banking system}} = W_{Rd}$$

5. $$\frac{\text{Outstanding loans for rural banks}}{\text{Outstanding loans for banks}} = W_{RL}$$

6. $$\frac{\text{Loan account for rural banks}}{\text{Loan account for all banks}} = W_{RAC}$$

In summary the rural data will be divided by the entire banks' data and the result becomes the weight for any of the indicators under consideration. If the rural data cannot be laid hands on, data on small scale enterprises may be used as a substitute in the numerator to determine the weights. Average of ratio index method is used in calculating Chi-wins financial inclusion index (CFII). Generally, the Chi-wins financial inclusion index can be calculated as follows:

Calculation of Chi-wins FI Index

FIV	Weight	FIV x Weight
(BBK) 100	W_{RK}	$(BBP_{KX})\ (W_{RK})$
(BBP) 100	W_{RA}	(BBPP) (W_{RA})
(ATMK) 100	W_{ATM}	(ATMK) (W_{ATM})
(ATMA) 100	W_{RD}	(ATMA) (W_{RD})
(DD) 100	W_{RL}	(DD) (W_{RL})
(BL) 100	W_{RAC}	(BL) (W_{RAC})
	$\sum W_t$	$\sum FIV_t W_t$

$$CFII_t = \frac{\sum_{t=1}^{n} FIV_t W_t}{\sum_{t=1}^{n} W_t}$$

Where

$FIV_t W_t$ = the product of financial inclusion variants and the weights

W_t = weight of each FI variant

$\sum$ = the usual summation notation

The weight of each of the financial inclusion variables is computed as the proportion of the rural or less reached group in terms of that variable to the total measure of the variable. This we believe is simple in computation, depictive and reflective of the weight. The method involves simple calculations of division, multiplication and addition.

The calculated weights are justified, as the essence of financial inclusion is to incorporate the un-reached who are majorly found in the rural areas; thus the reason for rural banking and microfinance banking. Where data on rural dwellers are not available, data on small scale enterprises may be used as a proxy substitute. Once the weights are determined, each weight multiplies the value of its indicator. The products are then summed up and the sum is divided by the sum of the weights to obtain the financial inclusion index

To illustrate this method, the author used available data on some of these variants obtained from Central Bank of Nigeria statistical bulletin. The variables are namely, the

1. Number of commercial banks branches per a hundred thousand adults
2. Outstanding loans from commercial banks per GDP
3. Outstanding deposits with banks per GDP

Using data on these variables, the author carried out computation of financial inclusion index for three different periods in Nigeria, the period prior to structural adjustment programme – 1985, the period within the structural adjustment, programme – 1988 and the period before banking system reform of recapitalisation exercise 2003. Data for these years are provided as follows.

GDP, outstanding loans, deposit and bank branches

Year	GDP	Tloans	TDepos	Rloans	Rdepos	Tbranch	Rbranch
1985	*67908.55*	*12170.2*	*10550.9*	*114.9*	*311.4*	*1290*	*451*
1988	*139085.30*	*19561.2*	*18397.2*	*659.9*	*1378.4*	*1659*	*602*
2003	*8487031.55*	*1210033.1*	*759632.5*	*11251.9*	*20551.8*	*3242*	*722*

Source: CBN statistical bulletin of Nigeria

Where

GDP = Gross domestic product

Tloan = Total outstanding loans

Tdepos = Total deposit

Rloans = Rural loans

Rdepos = Rural deposit

Tbranch = Total domestic bank branches

Rbranch = Rural bank branches

The calculation of Chi-wins financial inclusion index can now be done using a method similar to average of ratios method. The weights are the proportional performance/inclusion values. For the year 1985, the index is calculated thus.

Calculation of Chi-win financial inclusion index for 1985

Item	FIV	Weight	FIV x Weight
Bank branches / 100,000	$\left(\frac{1290}{100000}\right)$ x 100 = 1.3	$\frac{451}{1290}$ = 0.35	0.455
Loans / GDP	$\left(\frac{12170.2}{67908.55}\right)$ x 100 = 18	$\frac{114.9}{12170.2}$ = 0.009	0.162
Deposits / GDP	$\left(\frac{10550.9}{67908.55}\right)$ x 100 = 16	$\frac{311.4}{10550.9}$ = 0.03	0.480
		Total 0.389	1.097

$$CPI = \frac{\sum PIV_i W_i}{\sum W_i} = \frac{1.097}{0.389} = 2.8$$

Calculation of Chi-win financial inclusion index for 1988

Item	FIV	Weight	FIV x Weight
Bank branches / 100,000	$\left(\frac{1659}{100000}\right)$ x 100 = 1.7	$\frac{602}{1659}$ = 0.363	0.617
Loans / GDP	$\left(\frac{1195612}{139085.30}\right)$ x 100 = 14.1	$\frac{659.9}{19561.2}$ = 0.034	4.794
Deposits / GDP	$\left(\frac{18397.2}{139085.3}\right)$ x 100 = 13	$\frac{1378.4}{18397.2}$ = 0.075	0.975
		Total 0.472	6.386

$$CPI = \frac{\sum PIV_i W_i}{\sum W_i} = \frac{6.386}{0.472} = 13.5$$

Calculation of Chi-win financial inclusion index for 2003

Item	FIV	Weight	FIV x Weight
Bank branches / 100,000	$\left(\frac{3242}{100000}\right)$ x 100 = 3.2	$\frac{722}{3242}$ = 0.223	0.71
Loans / GDP	$\left(\frac{1210033.1}{8487031.57}\right)$ x 100 = 14.3	$\frac{11251.9}{1210033.1}$ = 0.009	0.13
Deposits / GDP	$\left(\frac{759632.5}{8487031.57}\right)$ x 100 = 9	$\frac{20551.8}{759632.5}$ = 0.027	0.24
		Total 0.259	1.08

$$CPI = \frac{\sum PIV_i W_i}{\sum W_i} = \frac{1.08}{0.259} = 4.17$$

Index summary for the years considered

1985 2.8

1988 13.5

2003 4.17

With this method, one will be able to calculate the value of financial inclusion at any point in time and make comparison either for countries or for different periods in a particular country. Note that other indicators of financial inclusion can be used or incorporated by the use of this method.

The implication of this illustration for instance is that financial inclusion is higher in the year 1988 – a year after financial liberalization that results from structural adjustment programme.

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