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Measuring Financial Inclusion and Its Purpose: A Cross-Country Impact Assessment

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Greater access to financial services is very important to increase savings, empower women, and boost productive investment and consumption. This paper measures the extent of financial inclusion and explains the major purpose of the financial inclusion index. The cross-country analysis shows that India is the most financially inclusive country from 2013 to 2017.

I. Introduction

Access to finance has always been considered one of the important parameters of economic growth, and, therefore, the promotion of an inclusive financial system is an area of policy thrust and priority (RBI, 2021). Financial inclusion (hereafter, FI) also has a multiplier effect in boosting overall economic output, reducing poverty, and income inequality, and promoting gender equality and women empowerment. Furthermore, financial exclusion can threaten economic growth due to the lack of financial infrastructure (Greenwood & Jovanovic, 1990). Thus, FI is widely recognized as one of the most important engines of economic development. Its contributions to gross domestic product, individual and social welfare, and business creation and expansion – particularly small and medium enterprises – have been amply documented. The benefits of FI to the poor are extremely significant (World Bank, 2022).

FI is a multidimensional concept that cannot be accurately captured by individual indicators such as bank account ratios, and the number of automatic teller machines (ATMs) (Camara & Tuesta, 2014). Since when used alone, these indicators can only provide partial and incomplete information about the comprehensiveness of the financial system. Even the use of individual indicators can lead to misunderstandings about the level of FI in an economy (Sarma, 2015). In addition, most studies follow a multidimensional approach, with different sets of indicators, such as per capita bank accounts, bank branches, ATMs, credit/debit cards, and number of household depositors/borrowers (Dabla-Norris et al., 2015; Mialou et al., 2017). A single indicator approach may not capture the true extent of FI; for example, just having a bank account may not necessarily imply that the account is well utilised on account of physical or psychological barriers. Also, despite having bank ac-

counts, “marginally banked” people may not be making sufficient use of formal financial infrastructure and may be using informal non-bank services (Kempson et al., 2004).

Many studies attempted to identify an appropriate measurement to comprehensively assess the extent of coverage of a financial system. In recent years, some studies built an FI index based on the principal component analysis (PCA) method (e.g., Ahamed & Mallick, 2019; Anarfo et al., 2019; Elsherif, 2019; Ismail et al., 2018; Lenka & Bairwa, 2016; Nguyen, 2021; Park & Mercado, 2018). Other studies built indices of FI based on the multidimensional approach proposed by Sarma (2015) (e.g., Goel & Sharma, 2017; Gupte et al., 2012; Huang & Zhang, 2020; Park & Mercado, 2015; Prastowo & Putriani, 2019; Sethi & Sethy, 2019; Sethy, 2016; Sethy & Goyari, 2018, 2022a, 2022b). This approach is more favoured because it is similar to the approach used to create the well-known development indicators of the UNDP, such as the human development index, the human poverty index, and the gender development index.

As mentioned above, a single indicator approach may not capture the true extent of financial inclusion. To avoid this issue, a comprehensive measure of FI is needed. The major drawback of previous studies on measuring FI is that they do not provide a measure of FI that changes over time. As a result, a time-varying FI index is also needed. In conclusion, developing a comprehensive index to measure the extent of FI for developing countries is not only necessary but also particularly important for these countries. In this context, the current study attempts to construct a comprehensive multidimensional FI index (FII) for South Asian countries and to explain the purpose of the FII.

The present study differs from many of the previous studies because it constructs a comprehensive multidimensional FII for the period from 2004 to 2018 using ten indi-

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Table 1. List of indicators for constructing Financial Inclusion Index (FII)

Availability Dimensions	Accessibility Dimensions	Usage Dimensions
<i>Demographic Branch Penetration:</i> (1) Number of bank branches per 1 lakh Adults (2) Branches of Commercial Bank <i>Demographic ATM Penetration:</i> (3) ATMs per 1 lakh Adults (4) Number of ATMs	<i>Geographic ATM Penetration:</i> (5) Number of ATMs per 1000 Km^2 <i>Geographic Branch Penetration:</i> (6) Branches of Commercial Bank per 1000 Km^2	<i>Credit Penetration:</i> (7) Outstanding loans with Commercial Banks (8) Outstanding loans with Commercial Banks (% of GDP) <i>Deposit Penetration:</i> (9) Outstanding deposits with Commercial Banks (10) Outstanding deposits with Commercial Banks (% of GDP)

Source: IMF's Financial Access Survey

cators related to availability, accessibility, and usage of formal financial services.

II. The Purpose of an FII

The purpose of a multidimensional FII is to capture the extent of FI across different countries. The index captures information on various aspects of FI in a single value ranging between 0 and 1, where 0 represents complete financial exclusion and 1 indicates full FI. In addition, it provides information on the level of FI and measures financial services for use in internal policy-making. It also facilitates researchers to study the impact of FI and other macroeconomic variables.

III. Methodology

A. Data and variables

All the data are taken from the IMF's Financial Access Survey. For the absolute measure of FI of the selective South Asian countries, the study period spans from 2004 to 2018. This study period ensures the collection of the most complete and consistent representative data on the variables for the selected countries.

B. Calculating the FII

The study constructs a multidimensional FII by following the methodology used by the UNDP and proposed by Sarma (2015). This study considers three dimensions of an inclusive financial system and the calculation of FII is explained below.

Step 1: This study first calculates a dimension index for every dimension of financial inclusion, and dimension index d_i is:

$$d_i = w_i * \frac{A_i - m_i}{M_i - m_i} \quad (1)$$

where A_i is the actual value of dimension i ; m_i represents the minimum value of dimension i ; M_i is the maximum value of dimension i ; and d_i denotes dimensions of FI i , w_i is weight.

First, to calculate the dimension index, the minimum and maximum values (empirically observed) are chosen for each underlying indicator. The worst point (0) and point $W = 1$ represent an ideal situation, w_i is the weight (based on equal-weighting approach). If the distance between X and 0

is larger, it indicates higher FI; likewise, if the distance between X and 0 is smaller, it indicates lower FI.

Step 2: In the second step, the calculation of X_1 based on d_i and W_i as follows:

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

Step 3: In the third step, the calculation of X_2 based on d_i and W_i as follows:

$$X_2 = 1 - \frac{\sqrt{(w_1 - d_1)^2 + (w_2 - d_2)^2 + (w_3 - d_3)^2 + \dots + (w_n - d_n)^2}}{\sqrt{w_1^2 + w_2^2 + w_3^2 + \dots + w_n^2}} \quad (3)$$

Step 4: In the fourth step, the calculation of FII based on X_1 and X_2 as follows:

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

In **Step 2**, when X_1 value is high, it indicates a greater expansion in FI. **Step 4** measures the overall FI, which is the mean of X_1 and X_2 (derived from **Step 2** and **Step 3**).

IV. Results and Discussion

Table 2 indicates that the overall FII in South Asian countries has tremendously increased from 2004 to 2018. Among the seven South Asia countries, Afghanistan, Bangladesh, India, and Sri Lanka are better performers than others. It is interesting to note that, among all South Asia countries, India is the most financially inclusive from 2013 to 2017. This result indicates that there have been important financial inclusion initiatives, such as Pradhan Mantri Jan Dhan Yojana (2014), Pradhan Mantri Mudra Yojana (2015), Credit Enhancement Guarantee Scheme (2015) for Schedule Casts (SCs), Mobile Banking, Financial literacy programs, new SHGs framework, and Post office savings bank, etc. taken by the government of India and the Reserve Bank of India (for details, see **Table 2**).

V. Conclusion

Greater FI is crucial for inclusive and sustainable growth. Therefore, a measure of FI is necessary to effectively monitor the progress of the policy initiatives undertaken to promote FI. Based on the Financial Access Survey data of the IMF, this study constructs a multidimensional FII for seven South Asian countries from 2004 to 2018. Cross-country

Table 2. Ranks and value of FII in South Asian countries from 2004 to 2018

Year	Value of FII in South Asian countries						
	Afghanistan	Bangladesh	Bhutan	India	Maldives	Pakistan	Sri Lanka
2004	0 (7)	0.0061 (4)	0.0793 (3)	0.0025 (6)	0.0033 (5)	0.2391 (1)	0.1335 (2)
2005	0.0797 (4)	0.0468 (6)	0.0510 (5)	0.0466 (7)	0.1672 (3)	0.2949 (1)	0.1805 (2)
2006	0.1921 (4)	0.0897 (6)	0.0739 (7)	0.0950 (5)	0.2202 (3)	0.2561 (2)	0.2679 (1)
2007	0.3114 (3)	0.1028 (6)	0.0619 (7)	0.1688 (5)	0.3973 (1)	0.3259 (2)	0.3038 (4)
2008	0.4421 (1)	0.1583 (6)	0.1551 (7)	0.2651 (5)	0.4403 (2)	0.3436 (3)	0.3063 (4)
2009	0.5828 (1)	0.2350 (7)	0.2728 (6)	0.3205 (4)	0.4695 (2)	0.2879 (5)	0.3611 (3)
2010	0.6473 (1)	0.3528 (6)	0.3775 (4)	0.3547 (5)	0.4732 (2)	0.3019 (7)	0.3832 (3)
2011	0.5579 (1)	0.4747 (3)	0.4516 (5)	0.4369 (6)	0.4688 (4)	0.2979 (7)	0.4967 (2)
2012	0.5567 (1)	0.5357 (3)	0.2928 (7)	0.5147 (4)	0.4503 (5)	0.3702 (6)	0.5397 (2)
2013	0.5998 (2)	0.5899 (3)	0.4856 (5)	0.6017 (1)	0.4599 (6)	0.4467 (7)	0.5849 (4)
2014	0.6196 (4)	0.6797 (2)	0.5386 (5)	0.7508 (1)	0.5154 (6)	0.5089 (7)	0.6275 (3)
2015	0.6555 (4)	0.7685 (2)	0.5659 (6)	0.8380 (1)	0.5425 (7)	0.5787 (5)	0.7237 (3)
2016	0.6772 (5)	0.8397 (2)	0.6572 (7)	0.9010 (1)	0.6637 (6)	0.6851 (4)	0.8162 (3)
2017	0.7082 (7)	0.9056 (2)	0.8035 (4)	0.9344 (1)	0.7659 (5)	0.7247 (6)	0.9016 (3)
2018	0.7914 (6)	0.9394 (3)	0.9549 (2)	0.9249 (4)	0.7820 (7)	0.8639 (5)	1 (1)

Note: Ranks of the countries are given in the parenthesis. Source: Author's calculation

analysis suggests that the level of financial inclusion in these countries increased over the sample period. It is interesting to note that, among the seven South Asian countries, India is the most financially inclusive from 2013 to 2017. The analysis shows that FI has been gaining momentum over time and across countries but varying widely. Although much progress had been achieved, a huge work re-

mains to be done to foster FI for inclusive growth and to disperse the benefits to the masses. This research helps policymakers and communities understand the importance of FI in the economy.

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