Measuring Financial Inclusion Among Asian Countries

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Abstract

The study focuses on measuring the level of financial inclusion among Asian countries. The key
component of financial and societal growth is thought to be easy access to financial products and
services. A strong and ideal financial system is essential for a nation to advance, and financial inclusion
is a key factor in fostering this structure. Those who are excluded from the formal financial system face
a variety of hazards, such as diminished business prospects and social marginalisation. In general,
having access to finance is typically empowering, especially for women, as it encourages significant
financial and social inclusion. Financial inclusion reduces poverty and stimulates the economy. For the
years 2010 to 2019, 30 Asian nations make up the sample for this study. The index of financial inclusion
(IFI) calculated using the UNDP methodology. The results revealed that Japan, Singapore, Korea,
China, Mongolia and Israel are at a high level of financial inclusion, whereas Bangladesh, Azerbaijan,
the Rep. of, Kyrgyz Rep., Tajikistan, Pakistan, and Timor-Leste are at a low level of financial inclusion.
Most Asian countries remain in the middle or low categories of financial inclusion.

Keywords - Financial inclusion, Bank penetration, Access, Usage, Financial service, UNDP
methodology

1. Introduction

One of the main factors influencing a nation's
economic growth has traditionally been thought
to be its financial system. An efficient financial
system facilitates the most effective movement
of resources, which speeds up an economy's
expansion. "Financial inclusion" refers to
having an official financial company account.
You can keep and borrow money from these
accounts, buy insurance, and use payment
services. Financial stability improves one's
access to economic benefits. It enables low-
income and disadvantaged individuals to
increase their income and likelihood of
employment (Bruhn and Love, 2014). Ajide
(2020) also noted that financial inclusion has a

favourable and significant impact on
entrepreneurship in Africa. Real financial
inclusion is realised when basic financial
services are made available to the public at a
reasonable cost and are continually provided by
service providers. Financial inclusion is less
than ideal and ineffective for both service
providers and customers if these requirements
are not met (Ozili, 2020). The effective
allocation of funds through inclusive finance is
essential for promoting social progress and
economic expansion (Fareed et al., 2017).
Young people all over the world have a poor
degree of financial literacy, which has raised
concerns. Furthermore, it is discovered that
teenage financial literacy is influenced by

gender, age, incomes, educational achievement, and marital status (Garg and Singh, 2018). According to Bongomin et al. (2018), in rural Uganda, the relationship between financial literacy and financial inclusion is strongly moderated by the poor's cognitive abilities. The level of financial inclusion raises numerous poverty indicators. Instead, having access to modern communication tools like the Internet greatly aids in expressing poverty in Peru (Schmied and Ana, 2016). The elimination of poverty is directly impacted by financial inclusion through cooperative banks. (Lal, 2018).

The remaining of this study is planned as follows: Section 2 presents the review of literature related to this study. Section 3 describes the dimensions of financial indicators along with respective indicators. Section 4 highlights the materials and methods used in this study. Section 5 presents the empirical results and discussion, and Section 5 concludes.

2. Related literature

Researchers from all over the world have contributed significantly to the literature on financial inclusion. In this regard, numerous investigations have been carried out. Below, we review some pertinent papers that relate to this subject.

Financial inclusion (FI) is crucial for the sustainability of global development. Economic prospects are influenced by access to financial services, which has an impact on the poor since it enables them to save, invest, and take advantage of loans (Subbarao, 2009). Financial inclusion makes a substantial contribution to encourage a sound and efficient financial structure, which directs a nation along a path of prosperity. Economic growth is accelerated by an efficient flow of resources that are mobilised by an effective financial system. Financial inclusion (FI) offers supplementary and progressive ways to combat poverty, advance inclusive development, and take into account the Millenium Development Goals (MDGs) (Chibba, 2009). Due to the significant savings that the vast majority of people at the base of

the social pyramid enjoy, FI as a whole has a multiplier effect on the economy (Koku, 2015). Access to financial services, particularly savings, credit, and payments, can significantly and favourably impact the living conditions of the poor (Dupas and Robinson, 2013). Better savings rates are thus made possible by the increase of financial inclusion, which may be essential for eradicating poverty, promoting capital accumulation, advancing economic development, and reviving the financial sector (Park and Mercado, 2018). The ability of smallholder farmers to reduce their poverty is significantly impacted by financial inclusion. However, it is crucial for farmers to participate in the economy through savings, credit standing, and insurance coverage (Mhlanga et al., 2020). Population health is improved by financial inclusion. To improve population health in Africa, financial inclusion should be increased. In general, it is believed that some forms of social exclusion are worse for people who are financially excluded. Financial exclusion, according to Leyshon and Thrift (1995), is a practise that hinders people from using the system of public finance. Accessibility encourages people to use economic resources to meet their basic requirements, such as education, housing, and health, as well as to purchase luxuries and seek out investment and ongoing organisation (Bruhn and Love, 2014). The use and adoption of mobile money have both direct and indirect effects on financial inclusion, according to Bongomin and Ntayi (2020). Additionally, the use and acceptance of mobile money and digital buyer safety promote financial inclusion. By ensuring sustainable economic growth and stability inside banks, particularly Islamic banks, digital financial inclusion (DFI) may help to accomplish the Sustainable Development Goals (SDGs) (Banna et al., 2020). The combined use of these two technologies was found to be significant for financial inclusion in WAEMU countries, beyond the adoption of mobile phones and the Internet (Senou et al., 2019). Digital financial services foster coordination between separate

reform initiatives while enabling informal businesses to register and conduct business as usual. Governments' ability to enforce rules and regulations, including tax collection, is ensured by digital financial transactions (Klapper et al., 2019). The majority of banks in Nigeria are currently using chatbots to improve their commitment to their customers and economic inclusion. The nation's economy benefits greatly from the work of commercial banks. However, a sizable portion of the populace, particularly the vulnerable groups, such as the weaker segments and low-income groups, continue to be excluded from even the most basic opportunities and services offered by the economic region. Each man and woman should have access to a range of financial facilities to address the issue of such financial exclusion (Pavithran and Raihanath, 2014). Even though access to financial institution accounts has been expanded in India, those who simply had access to a bank account did not have access to banking services, thus they preferred to work with businesses that offer more flexible services than financial institutions. To achieve inclusion, only opening bank accounts is inadequate. In order to offer clients a full range of services, banks must take timeliness and flexibility into account (Ranjani and Bapat, 2015). Aysan et al. (2013) noted that Turkish participation banks (PBs) broaden the possibility of financial inclusion for people who avoid traditional banking because of non-secular sensitivity. The PBS is crucial in directing idling funds toward more profitable parts. Iqbal and Sami (2017) found that while ATMs have a negligible impact on Indian GDP, the credit deposit ratio and the variety of financial institution branches have a wonderful and considerable impact on GDP.

3. Dimensions of financial inclusion and respective indicators

Several studies have been undertaken to understand the concept of financial inclusion, and their respective indicators have been identified by researchers. Goel and Sharma (2017) studied financial inclusion as availability, banking penetration, and access to insurance, along with bank accounts, ATMs, bank branches, and insurance offices. Sharma (2012) and Sethy (2016) used bank penetration, availability, and usage as demand-side dimensions and access to savings and insurance as supply-side dimensions of financial inclusion. The present study studied three dimensions of financial inclusion, i.e., bank penetration, access, and usage, along with their respective indicators such as deposit accounts (number of deposit accounts with commercial banks per 1,000 adults), bank branches (number of commercial bank branches per 1,000 km^2 and no. of commercial bank branches per 100,000 adults), ATMs (no. of ATMs/1,000 km^2 and no. of ATMs/100,000 adults), insurance (no. of insurance corporations per 100,000 adults), outstanding loans (outstanding loans from commercial banks (% of GDP)), and outstanding deposits (outstanding deposits with commercial banks (% of GDP). As noted, financial inclusion is a multi-dimensional procedure that cannot be fully measured using a single variable. Moreover, many indicators are analysed individually; they do not present a true picture of reality. Thus, it is crucial to construct a composite index of financial inclusion based on the finest arrangements of the different indicators of financial inclusion. In this study, indicators similar to those of all countries were considered to measure the level of financial inclusion.

Table 1: Dimensions of financial inclusion and respective indicators

Author	Dimensions	Indicators	Measurement	Formula

Sarma (2008)	Banking Penetration	Bank Account	The volume of bank accounts as a proportion of the total population	No. of bank accounts*1000/ Total population
	Availability of the banking services	Bank Branches	The number of bank branches per 1000 of persons	No. of bank branches*1000/Total population
	Usage of the banking system	Credits and Deposits	The volume of credits and deposits as the proportion GDP	(Credit)*100/GDP and (Deposit)*100/GDP
Sarma (2012)	Banking penetration	Bank Account	No. of Bank Accounts per 1000 adults	No. of Bank Accounts*1000 / Total adult population
	Availability of banking services	Bank Branches	No. of Bank branches per 100,000 adults	No. of Bank branches*100,000/ Total adult population
		ATMs	No. of ATMs per 100,000 adult	No. of ATMs* 100,000/ Total adult population
	Usage	Deposit and Credit	Loans +Deposits as percent of GDP	(Credit)*100/GDP and (Deposits)*100/GDP
Goel and Sharma (2017)	Banking Penetration	Bank Account	The volume of bank accounts per 1000 populations	No. of bank accounts*1000/ Total population
	Availability	Bank Branches ATMs	The number of bank branches per 1000 of persons The number of ATMs per 100000 of persons	No. of bank branches*1000/Total population No. of ATMs*100000/Total population
		Bank Branches ATMs	The number of bank branches per 1000 k.m^2 The number of ATMs per 1000 k.m^2	No. of bank branches*1000/Total area No. of ATMs *1000/Total area
	Access	life insurance	No. of life insurance offices	

Source : Complied by author through review of literature

4. Materials and methods

To achieve the objective of this study, UNDP's methodology was employed to formulate an index of financial inclusion. The index of financial inclusion was calculated from UNDP methodology over the period 2010–2019. Data for the present study were taken from IMF Financial Access Survey. The data covers 30 countries from Asia over the period 2010 to 2019.

4.1 UNDP's methodology

UNDP's methodology was used to construct an index of HDI, HPI, and GDI. Sarma (2008), Arora (2010), and Ngo (2019) designed an index of financial inclusion with values between 0 and 1, where 0 indicates no inclusion, and 1 indicates overall financial inclusion. As each dimension, along with its respective indicators, is of equal importance, this study does not assign weights to dimensions as well as indicators. Equation 1 explains the computation of the sub-index of the respective indicators. Each dimension contains n number of indicators:

$$D_i = X_1, X_2, X_3, \ldots \ldots X_n,$$

For every variable, di is computed as:

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

(1)

Where

d_i = the achievement level of indicator i of a country

A_i = the actual value of indicator i of a country

M_i = Maximum value of indicator i of the countries in the study

m_i = Minimum value of indicator i of the countries in the study

This confirms that di l falls in the range of 0 to 1, and if the value of di is higher, means the country's progress in the respective dimension is higher. Every dimension (Dj) is the average of the overall di (Gupte et al, 2012).

$$D_j = \sum \frac{d_i}{n}$$

(2)

The progress of a country in a particular indicator is explained by the di value. The present study used eight indicators to measure IFI. Thus, a country's IFI is demonstrated by a point $X = \left(d_1, d_2, d_3, d_4, d_5, d_6, d_7, d_8 \right)$ in the eight-dimensional space. The basis of this eight-dimensional coordinate structure is the point O = (0,0,0,0,0,0,0,0) that describes the poorest place, whereas point I = (1,1,1,1,1,1,1,1) characterizes, supreme state if country accomplishes the greatest in all

dimensions. The value of IFI is assessed by computing not only the space between X and O but also between X and I. An X demonstrating high IFI is meant to be placed in a small space from I but large from O. If the two points have similar remoteness from O, the factor with the lowest space from I has a greater IFI. However, if factors have an equal distance from I, the point with a greater distance from O shows a higher IFI. Therefore, including both distances to measure the level of IFI, this study uses a simple average of the Euclidean distance between X and O and the inverse Euclidean distance between X and I.

First, to measure the distance between X and O (denoted X_1), the normalized Euclidean distance method was applied (Equation 3). Normalization was performed to sort the value of X_1 ranges from 0 to 1. A greater value of X_1 indicates that X is far from O which signifies a higher status of financial inclusion.

$$X_1 = \sqrt{\frac{d_1^2 + d_2^2 + \cdots + d_n^2}{\sqrt{n}}}$$

(3)

Second, the inverse space between X and 1 (denoted X_2) is measured using the inverse normalized Euclidean distance method. Equation 4 shows the normalized Euclidean distance from X to 1, which should be low to be associated with a high level of IFI. The normalized Euclidean distance between X and 1 is subtracted from 1, that called "inverse distance". A higher IFI is represented by a larger X_2.

$$X_2 = 1 - \frac{\sqrt{(1-d_1)^2 + (1-d_2)^2 + \cdots + (1-d_n)^2}}{\sqrt{n}}$$

(4)

Finally, IFI is computed using the simple mean of X_1 and X_2 which is indicated in Equation 5. This computation indicates that both X-O and X-1 distances are considered to measure the degree of financial inclusion.

$$IFI = \frac{(X_1 + X_2)}{2}$$

(5)

5. Results and discussion

5.1 UNDP's methodology

Division of all countries is done according to their IFI values into three categories: those whose IFI values range from 0.60 to 1 are regarded as high IFI economies; those having IFI values between 0.30 and 0.60 are denoted as medium IFI countries; and those having IFI values smaller than 0.30 are denoted as low IFI countries (Sharma, 2012; 2016).

Table 2. Comparative Analysis of Index of Financial Inclusion for the year 2010 and 2019 UNDP Methodology

2010				2019			
Country	IFI	Rank	Stage	Country	IFI	Rank	Stage
Armenia	0.125	21	3rd	Armenia	0.184	20	3rd
Azerbaijan	0.079	25	3rd	Azerbaijan	0.109	26	3rd
Bangladesh	0.115	22	3rd	Bangladesh	0.110	25	3rd
Bhutan	0.164	17	3rd	Bhutan	0.227	13	3rd
Brunei Darussalam	0.330	5	2nd	Brunei Darussalam	0.290	7	3rd
Cambodia	0.061	26	3rd	Cambodia	0.190	19	3rd
China, P.R.: Mainland	0.247	11	3rd	China, P.R.: Mainland	0.378	4	2nd
Georgia	0.150	18	3rd	Georgia	0.242	12	3rd
India	0.139	19	3rd	India	0.154	22	3rd
Indonesia	0.079	24	3rd	Indonesia	0.128	24	3rd
Israel	0.323	6	2nd	Israel	0.261	10	3rd
Japan	0.474	2	2nd	Japan	0.452	2	2nd
Jordan	0.257	10	3rd	Jordan	0.210	17	3rd
Korea, Rep. of	0.432	3	2nd	Korea, Rep. of	0.434	3	2nd
Kyrgyz Rep.	0.045	28	3rd	Kyrgyz Rep.	0.076	28	3rd
Lebanon	0.399	4	2nd	Lebanon	0.350	5	2nd
Malaysia	0.310	7	2nd	Malaysia	0.257	11	3rd
Maldives	0.207	13	3rd	Maldives	0.191	18	3rd
Mongolia	0.267	9	3rd	Mongolia	0.298	6	2nd
Nepal	0.109	23	3rd	Nepal	0.170	21	3rd
Oman	0.200	15	3rd	Oman	0.213	16	3rd
Pakistan	0.061	27	3rd	Pakistan	0.053	30	3rd
Qatar	0.202	14	3rd	Qatar	0.289	8	3rd
Saudi Arabia	0.138	20	3rd	Saudi Arabia	0.141	23	3rd
Singapore	0.602	1	1st	Singapore	0.604	1	1st
Tajikistan, Rep. of	0.040	29	3rd	Tajikistan, Rep. of	0.093	27	3rd
Thailand	0.214	12	3rd	Thailand	0.219	15	3rd
Timor-Leste, Dem. Rep. of	0.032	30	3rd	Timor-Leste, Dem. Rep. of	0.057	29	3rd
Turkey	0.190	16	3rd	Turkey	0.219	14	3rd
United Arab Emirates	0.305	8	2nd	United Arab Emirates	0.278	9	3rd

Source: Calculated by the author

5.2. Countries according to IFI categories

We divided all the countries into three categories: high, medium, and low. Table 2 presents the different levels of financial inclusion in terms of the Index of Financial Inclusion (IFI) for the years 2010 to 2019.All IFI value over the period 2010-2019 are shown in Appendix A. Singapore ranked first in both 2010 and 2019 but gained an IFI value of 0.604 in 2019 from 0.602 in 2010. The IFI value of Singapore increased which indicates the progress of financial inclusion. Japan was at the 2nd rank in both, i.e., 2010 and 2019, with IFI values of 0.474 and 0.452, respectively. But the IFI value decreased i.e. financial inclusion declined in Japan during the study period. China ranked 11th in 2010, progressed to 4th rank in 2019, and gained an IFI value of 0.378 in 2019 compared to 0.247 in 2010. Cambodia and Geogria has also made significant progress in financial inclusion, rising to 19th place in 2019 from 26th place in 2010 and 12th from 18th respectively. The IFI value increased to 0.190 from 0.061 in 2010 and 0.242 from 0.150 in 2010 for both countries respectively. Timor-Leste was the least financially inclusive country with an IFI value of 0.032 and ranked 30th, but progressed withs an IFI value of 0.057 and ranked 29th in 2019. Pakistan has an IFI value of 0.061 and 0.053 in 2010 and 2019 respectively and it ranked 30th in 2019, down from 27th in 2010. Therefore, financial inclusion has declined in Pakistan. Tajikistan was ranked 29th with an IFI value of 0.040 in 2010, but it gained an IFI up to 0.093 in 2019, with the 27th rank. Most Asian countries are in the third stage of financial inclusion (Appendix B). Brunei Darussalam, Israel, Malaysia, and the United Arab Emirates were in the second stage in 2010 but declined to the third stage in 2019. China, and Mongolia were in the third stage but progressed to the second stage in 2019.

6. Conclusion

Financial support has become an engine of growth and can bring benefits and opportunities to society. Therefore, it is imperative to measure financial inclusion and observe its progress. The results revealed that Japan, Singapore, Korea, China, Mongolia and Israel are at a high level of financial inclusion, whereas Bangladesh, Azerbaijan, the Rep. of, Kyrgyz Rep., Tajikistan, Pakistan, and Timor-Leste are at a low level of financial inclusion. Most Asian countries remain in the middle or low categories of financial inclusion.

The level of financial inclusion must be raised throughout the nation, and immediate action must be taken. Access to an account, which enables people to transact and hold money, is the first step toward financial inclusion. A transaction account functions as a sort of pool for various kinds of money. Financial inclusion does not necessarily entail having a bank account, but using banking services is just as crucial. The accessibility of credit makes it easier for the less fortunate and weaker segments of society to become financially included. Therefore, we urge responsible authorities to give credit to the poor at a fair price, as well as to help them become more financially literate and tech-savvy.

In order to guarantee easy access and availability of financial products and services at a fair price, the government should strengthen the financial and banking industry at the rural level.

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Appendix A: IFI Value (UNDP Methodology)

Year / Economy	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Armenia, Rep. of	0.125	0.128	0.064	0.096	0.141	0.146	0.144	0.147	0.171	0.184
Azerbaijan, Rep. of	0.079	0.072	0.036	0.054	0.103	0.125	0.114	0.082	0.100	0.109
Bangladesh	0.115	0.112	0.056	0.084	0.094	0.098	0.096	0.112	0.110	0.110
Bhutan	0.164	0.160	0.080	0.120	0.139	0.144	0.142	0.160	0.193	0.227
Brunei Darussalam	0.330	0.310	0.155	0.233	0.300	0.311	0.306	0.273	0.285	0.290
Cambodia	0.061	0.067	0.034	0.050	0.093	0.114	0.103	0.151	0.173	0.190
China, P.R.: Mainland	0.247	0.216	0.108	0.162	0.213	0.249	0.231	0.233	0.364	0.378
Georgia	0.150	0.146	0.073	0.109	0.179	0.187	0.183	0.198	0.224	0.242
India	0.139	0.133	0.067	0.100	0.130	0.138	0.134	0.148	0.148	0.154
Indonesia	0.079	0.095	0.048	0.071	0.110	0.114	0.112	0.117	0.128	0.128
Israel	0.323	0.295	0.147	0.221	0.248	0.241	0.245	0.211	0.260	0.261
Japan	0.474	0.447	0.224	0.335	0.425	0.431	0.428	0.401	0.449	0.452
Jordan	0.257	0.232	0.116	0.174	0.192	0.201	0.196	0.208	0.213	0.210
Korea, Rep. of	0.432	0.420	0.210	0.315	0.408	0.408	0.408	0.308	0.421	0.434

Kyrgyz Rep.	0.045	0.040	0.020	0.030	0.048	0.058	0.053	0.062	0.071	0.076
Lebanon	0.399	0.380	0.190	0.285	0.351	0.357	0.354	0.362	0.363	0.350
Malaysia	0.310	0.288	0.144	0.216	0.260	0.265	0.263	0.244	0.262	0.257
Maldives	0.207	0.183	0.092	0.137	0.133	0.135	0.134	0.180	0.182	0.191
Mongolia	0.267	0.277	0.139	0.208	0.291	0.292	0.292	0.279	0.324	0.298
Nepal	0.109	0.087	0.044	0.065	0.086	0.101	0.094	0.139	0.156	0.170
Oman	0.200	0.172	0.086	0.129	0.155	0.189	0.172	0.205	0.204	0.213
Pakistan	0.061	0.050	0.025	0.037	0.036	0.036	0.036	0.054	0.051	0.053
Qatar	0.202	0.164	0.082	0.123	0.172	0.235	0.203	0.276	0.264	0.289
Saudi Arabia	0.138	0.115	0.058	0.086	0.123	0.149	0.136	0.127	0.141	0.141
Singapore	0.602	0.603	0.302	0.453	0.600	0.599	0.600	0.588	0.602	0.604
Tajikistan, Rep. of	0.040	0.071	0.036	0.053	0.078	0.087	0.082	0.088	0.072	0.093
Thailand	0.214	0.205	0.102	0.154	0.210	0.219	0.215	0.177	0.223	0.219
Timor-Leste, Dem. Rep. of	0.032	0.039	0.019	0.029	0.041	0.046	0.044	0.073	0.068	0.057
Turkey	0.190	0.185	0.092	0.139	0.189	0.198	0.193	0.190	0.215	0.219
United Arab Emirates	0.305	0.246	0.123	0.184	0.227	0.271	0.249	0.262	0.273	0.278

Appendix B: List of countries (UNDP Methodology)

Categories	Countries 2010	Countries 2019
High IFI countries	Singapore	Singapore
Medium IFI countries	Japan, Korea, Rep. of, Lebanon, Brunei Darussalam, Israel, Malaysia, United Arab Emirates	Japan, Korea, Rep. of, China, Lebanon and Mongolia
Low IFI countries	Mongolia, Jordan, China, P.R.: Mainland, Thailand, Maldives, Qatar, Oman, Turkey, Bhutan, Georgia, India, Saudi Arabia, Armenia, Bangladesh, Nepal, Indonesia, Azerbaijan, Rep. of Cambodia, Pakistan, Kyrgyz Rep., Tajikistan, Rep. of, Timor-Leste, Dem. Rep. of	Israel, Brunei Darussalam,United Arab Emirates, Malaysia, Cambodia, Georgia, Jordan, Thailand, Turkey, Maldives, Oman, Nepal, Bhutan, Armenia, Rep. of, India, Saudi Arabia, Indonesia, Bangladesh, Azerbaijan, Rep. of Tajikistan, Rep. of, Timor-Leste, Dem. Rep. of, Kyrgyz Rep., Pakistan