

1

Measuring Financial Inclusion for Asian Economies

Mandira Sarma

Introduction

Asian economies are at different levels of economic and financial sector development. While Japan, Singapore, and the Republic of Korea belong to the high-income Organisation for Economic Co-operation and Development (OECD) group of countries, on the other end of the wide spectrum are low-income countries that include Cambodia, Nepal, and Bangladesh. Within the middle-income countries of Asia, there are countries such as Malaysia and the Maldives that are far better off than Pakistan and India. The various stages of economic development are also reflected in the diverse stages of financial sector development in these economies. While the literature on economic development has adequately discussed the link between financial sector development and

M. Sarma (✉)
Jawaharlal Nehru University, Delhi, India
e-mail: msarma.ms@gmail.com

economic development,¹ there has not been much discussion of whether financial development implies financial inclusion. Financial inclusion can be defined as a process that ensures the ease of access, availability, and usage of the formal financial system for all members of an economy. It has been observed that even ‘well-developed’ financial systems have not succeeded in being ‘all-inclusive’, and certain segments of the population remain outside the formal financial systems.²

An understanding of the issues surrounding inter-linkages between financial inclusion, financial development, and economic growth requires an appropriate measure of financial inclusion. In other words, measuring is the first step towards understanding financial inclusion. In this chapter, we use an index of financial inclusion (IFI), discussed in detail in Sarma (2012, 2015), to measure the level of financial inclusion for several Asian economies. We use the United Nations Development Programme (UNDP) definition of Asia here.³ We compute IFI for as many Asian countries as possible for the years 2004–2013, subject to the availability of relevant data. Our results show that countries of the Asian region are at different levels of financial inclusion. While Japan, the Republic of Korea, Malaysia, Turkey, and Brunei Darussalam have achieved a high level of financial inclusion, countries such as Afghanistan, Myanmar, Syria, and Yemen display abysmal levels of financial inclusion, as indicated by their extremely low IFI values. On average, Asian countries as a whole displayed a medium level of financial inclusion for 2013, the latest year for which data are available. If we group these Asian countries into eastern, western, central, and southern regions, we find that eastern Asia is more financially inclusive than other regions, while financial inclusion is the least in South Asia vis-à-vis others. These measures not only provide us with a snapshot of the status of financial inclusion in the countries of these regions, they also serve as important quantitative tools to compare the status across economies and over time. These measures of financial inclusion can further be used for empirical research on interesting issues on financial inclusion.

¹ See, for example, Levine (1997) for a survey of this debate.

² See, for example, Kempson et al. (2004).

³ The UNDP classification of countries is available at <http://www.unep.org/tunza/tunzachildren/downloads/country-Classification.pdf>, last accessed in May 2015.

In this chapter, our focus is mainly to quantify the level of financial inclusion in the countries under consideration. In doing so, we discuss some conceptual issues involved in measuring financial inclusion and defining the IFI. While we do not delve in a rigorous empirical analysis of what makes some countries more financially inclusive than others, we provide a brief statistical analysis of the levels of financial inclusion and some variables related to the banking structures in these countries.

The chapter is organised as follows. In ‘Defining and Measuring Financial Inclusion: A Brief Review’, we review the literature on what defines financial inclusion and the various attempts at measuring financial inclusion. In ‘Index of Financial Inclusion’, we discuss the IFI. Section ‘Index of Financial Inclusion for Asian Economies’ presents some technical details on various dimensions of financial inclusion and data used for this chapter. In ‘IFI for Asian Countries, 2004–2013’, we present the IFI values computed for Asian economies for which necessary data were available, and also provide some analysis on these measures. Section ‘Conclusion’ concludes the chapter.

Defining and Measuring Financial Inclusion: A Brief Review

Financial inclusion (or, alternatively, financial exclusion) has been defined in the context of a larger issue of social inclusion (or exclusion) in a society. It is generally observed that financially excluded people also suffer from some form of social exclusion, at different levels. One of the early attempts to define financial exclusion was by Leyshon and Thrift (1995) who defined it as referring to those processes that prevent certain social groups and individuals from gaining access to the formal financial system. Sinclair (2001) defined financial exclusion as the inability to access necessary financial services in an appropriate form, owing to a variety of reasons such as difficulties associated with access, conditions, prices, marketing, or self-exclusion in response to negative experiences or perceptions. The Government of India’s ‘Committee on Financial Inclusion in India’ defines financial inclusion ‘as the process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups, such as the

weaker sections and low-income groups at an affordable cost' (Rangarajan Committee 2008, p. 1). All these definitions, conceptual as well as functional, indicate that financial exclusion is a manifestation of social exclusion, mainly among people who are at the margins of the society.

Scholars have attempted to measure financial inclusion in a various ways. Some studies sought to measure financial inclusion by simply measuring the proportion of adult population or households of an economy having access to formal financial services (e.g., having a bank account). The disadvantages with this approach to measuring financial inclusion are many. First, such a measure can be obtained only through countrywide primary surveys, as banks normally do not provide information on their number of clients; in general banks and banking regulators disclose the number of bank accounts held in the banks. Therefore, in order to obtain a measure of the proportion of people with a formal bank account, one has to resort to data from specifically designed primary surveys. Such surveys on access to financial services have been conducted only in a limited number of countries, thus making it difficult to obtain such a measure of financial inclusion for countries where such surveys are not conducted.⁴ Even with the limited number of countries where such primary surveys are conducted, there are bound to be differences in survey methodologies, survey units (individual vis-à-vis households), and dates of surveys—making the measure inconsistent and incomparable across countries. The recent Global Findex⁵ data from the World Bank may eventually reduce many such inconsistencies relating to survey-based data, however, at present, researchers are handicapped by the shortcomings of survey data. Honohan (2008) has made an attempt to combine survey-based information and secondary data on the number of bank accounts, and econometrically estimated the proportion of households/adults having access to financial services for as many as 160 countries. Despite several limitations, these estimates provide interesting information; however, they

⁴ Some of the countrywide surveys of access to financial systems are the Finscope surveys for African and some Latin American countries and the Eurobarometer surveys for the European countries. Honohan (2008) gives a list of the countries for which such surveys are conducted.

⁵ While its worldwide coverage of Global Findex database is impressive, the sample for individual countries is small; for example, the samples for India and China are only about 0.0004% of their respective adult populations. For more on this database, see Demirguc-Kunt and Klapper (2012).

provide only a one-time measure of financial inclusion, and are not useful for understanding the changes over time and across countries.⁶

Financial inclusion is a multidimensional process. Financial exclusion can come about in several forms, *vis-à-vis*, *access exclusion* (e.g., exclusion due to remoteness of financial services or due to the process of risk management of the financial system), *condition exclusion* (e.g., exclusion due to conditions that are inappropriate for some people), *price exclusion* (e.g., exclusion due to unaffordable prices of financial products), *marketing exclusion* (e.g., exclusion due to targeted marketing of financial products), and *self-exclusion* (e.g., when some people exclude themselves from the formal financial system owing to fear of refusal or due to other psychological barriers) (Kempson and Whyley 1999a, b). Even if a person may have a bank account, he or she may suffer from any of the above forms of financial exclusion. Therefore, a measure of financial inclusion that is based on the proportion of adults/households with a bank account ignores some important aspects of an inclusive financial system, and these relate to quality and usage of the financial services. Kempson et al. (2004) pointed out that merely having a bank account may not imply that the account is used adequately. In many countries, people having a bank account do not use them enough due to remoteness of bank branches, or other physical or psychological barriers. An interesting case study by Diniz et al. (2012) illustrated how the ‘banked people’ (e.g., people having a checking or sav-

⁶Honohan (2008) uses a regression-based method to estimate these measures for countries where survey-based information is not available; in countries where survey-based information on percentage of adults/households with access to financial services is available, that information is taken directly. These estimates suffer from several limitations some of which are mentioned by the author himself. The first limitation regards the inconsistencies of the survey dates and survey units. The country surveys used in the estimation pertain to different points of time, so there is an inconsistency regarding the date. Further, some of these surveys have adult individuals as the unit (such as the Eurobarometer surveys) while others have households as their unit (like the Finscope surveys). Honohan (2008) uses both interchangeably, simply by stating that “*the difference may not be all that great*”, although there are reasons to believe otherwise. While estimating the proportion of adults/households with access to financial services, the author uses a log-linear relationship between proportion of financially included adults/households and the number of bank accounts (including number of microfinance accounts). This log-linear relationship is justified by a good fit of this relationship for only 13 countries for which both survey-based proportion of financially included adults/households and number of accounts (bank and microfinance institutions) data are available. However, as in any econometric exercise, such a relationship may not hold true if the data set changes due to a change in the period and/or a change in the number of countries. Thus, these estimates are not easily amenable to computing on a periodic basis to compare financial inclusion over time and across countries.

ings account) of Autazes (an Amazon county) found it extremely expensive and time consuming to use their bank facilities before 2002 when banking facilities were not locally available, and how as a consequence of this remoteness, the people of Autazes were financially excluded, in spite of having bank accounts. A measure of financial inclusion that only counts the number of people having a bank account will not reflect the lack of adequate financial services as in the case of Autazes before 2002. Further, adequate use of financial services is also an important aspect of financial inclusion. Kempson et al. (2004) defined the notion of “underbanked” or “marginally banked” people as those who do not make adequate use of their bank accounts, despite having bank accounts. In a large household level survey of low-income households in Washington, DC, Los Angeles, and Chicago in the United States of America, Seidman et al. (2005) reported that two-thirds of the ‘banked population’ were using informal non-bank services, ranging from “*buying money orders and sending remittances from other than a bank to using payday lenders, pawn shops and auto title lenders as primary sources of credit*” (Seidman et al. 2005, p. 4). Thus, in spite of having a bank account, these households were not using the banking facilities and were in fact using informal financial services. These households form a part of the so-called ‘underbanked’ or ‘marginally banked’ households, which has been discussed in the literature as equivalent to being financially excluded households. This emphasises “usage” as another dimension of financial inclusion.

Thus, any attempt at measuring financial inclusion must take into account the various dimensions of financial inclusion. A measure of financial inclusion based on the proportion of “banked” adults, thus measures only one aspect of financial inclusion, vis-à-vis, access to financial system, and ignores other important aspects, such as availability and usage of the financial system. While access to financial institutions is the primary dimension of financial inclusion, an inclusive financial system is also the one in which financial services are adequately available and used.

An alternate approach, as used by financial regulators of many countries, is to use a variety of indicators of financial sector outreach to take stock of the state of financial inclusion. The most commonly used indicators are number of bank accounts (per 1000 adults), number of bank branches (per million people), number of automated teller machines (ATMs) (per

million people), amount of bank credit, and amount of bank deposits. In Beck et al. (2007), other indicators of banking sector outreach have been used—geographic branch penetration, loan and deposit accounts per capita, loan-income and deposit-income ratios, and so on.⁷

These indicators do provide interesting and useful information on the nature of inclusiveness of a financial system, covering a wide range of dimensions of financial inclusion. However, when used individually, they may provide partial and incomplete information on the inclusiveness of the financial system. Using individual indicators may also lead to a misinterpretation of the extent of financial inclusion in an economy as seen from the example in Table 1.1.

In Table 1.1, bank level indicators of financial inclusion are provided for a select group of countries. Among the countries shown, Malaysia has a higher number of bank accounts per 1000 adults than Thailand and Lebanon but a lower number of bank branches per 100,000 adults compared to Thailand, and a smaller volume of bank deposits as a pro-

Table 1.1 Indicators of financial inclusion for select countries

Commercial bank data, 2013				
Country	No. of bank A/C (per 1000 adults)	No. of bank branches (per 100,000 adults)	Domestic credit (as % of GDP)	Domestic deposit (as % of GDP)
Japan	7260.0	33.8	31.3	141.1
India	1197.6	12.1	55.1	69.9
Lebanon	1408.8	30.0	96.6	250.8
Malaysia	2528.1	11.3	121.6	119.5
S. Korea	5225.1	18.3	90.7	79.4
Nepal	478.9	8.5	49.3	82.5
Thailand	1509.8	12.1	82.1	84.1

Source: Financial Access Survey, IMF

⁷The Reserve Bank of India reports population per bank branch, population per ATM, percentage of population having bank deposit accounts, credit to GDP ratio etc. to report on the progress of financial inclusion in India. In 2010, the Superintendence of Banking, Insurance Companies and Private Pension Funds of Peru began to develop a set of financial inclusion indicators, with an objective of providing information on access and use of financial products and services. These indicators include number of branches, ATMs and agents per 100,000 adults and per 1000 sq. km., number of depositors and borrowers per 100,000 adults, average size of deposit and credit as a ratio of GDP per capita etc.

portion of GDP compared to Lebanon. As seen in these examples, any one indicator fails to adequately capture the extent of financial inclusion. Thus, a comprehensive measure, such as the index of financial inclusion (IFI) used in this chapter, is required. The IFI (Sarma 2012, 2015) is a comprehensive measure of financial inclusion that incorporates information on several aspects (dimensions) of financial inclusion in one single number.⁸ We discuss this measure in the following section.

Index of Financial Inclusion (IFI)⁹

As we pointed out earlier (Sarma 2008, 2010, 2012, 2015), an appropriate measure of financial inclusion should incorporate information on as many aspects (dimensions) of financial inclusion as possible, should be easy and simple to compute, and therefore be comparable across countries over time. From a theoretical point of view, such a measure should also satisfy some important mathematical properties, *vis-à-vis*, boundedness, unit-free property, homogeneity, and monotonicity. The IFI satisfies these criteria (Sarma 2012). The IFI is elaborated below.

Methodology

A multidimensional approach is followed while constructing the IFI. This multidimensional approach is similar in spirit to UNDP's approach of computation Human Development Index (HDI), the Human Poverty Index (HPI), the Gender Development Index (GDI) and so on. As in the case of these UNDP indexes, the IFI is computed by first computing a dimension index for each dimension of financial inclusion. The dimension index d_i , as computed by the formula (1.1), measures the country's achievement in the i th dimension of financial inclusion. A weight

⁸The IFI was first proposed in Sarma (2008). Sarma (2010) modified the methodology. In Sarma and Pais (2011) the modified IFI was used to identify country specific factors associated with financial inclusion. Subsequently, the methodology was further improved in Sarma (2012), replacing all previous versions of the IFI. For a discussion on the improved IFI, see Sarma (2015).

⁹This section is largely drawn from Sarma (2012).

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.

$$d_i = w_i \frac{A_i - m_i}{M_i - m_i} \quad (1.1)$$

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.

The choice of m_i and M_i used in this chapter is discussed in section 'Choice of M_i and m_i for Dimension Indexes'.

Formula (1.1) ensures that $0 \leq d_i \leq w_i$. The higher the value of d_i , the higher the country's achievement in dimension i . If n dimensions of financial inclusion are considered, then, a country's achievements in these dimensions will be represented by a point $X = (d_1, d_2, d_3, \dots, d_n)$ on the n -dimensional space. In the n -dimensional space, the point $O = (0, 0, 0, \dots, 0)$ represents the point indicating the worst situation while the point $W = (w_1, w_2, \dots, w_n)$ represents an ideal situation indicating the highest achievement in all dimensions. The location of the achievement point X vis-à-vis the worst point O , and the ideal point W is the crucial factor in assessing a country's level of financial inclusion. The larger distance between X and O would indicate higher financial inclusion, and the smaller distance between X and W would indicate higher financial inclusion. In the n -dimensional space, it is possible to have two points having the same distance from W but different distances from O , and vice versa. Thus, two countries can have their achievement points at the same distance from one of these points but have different distances from the other point. If two countries have their achievement points at same distance from W but different distances from O , then

the country with higher distance from O should be considered more financially inclusive; while if they have the same distance from O but different distances from W , then the country with less distance from W should be considered more financially inclusive. While developing a measure of financial inclusion, both these distances should be taken into account. In IFI, we use a simple average of the Euclidian distance between X and O , and the inverse Euclidian distance between X and W . Both of these distances are normalized by the distance between O and W to make them lie between 0 and 1. In computing the simple average between the distances, the inverse distance between D and W is considered. This ensures that the IFI is a number that lies between 0 and 1 (e.g., the index has well defined bounds), and is monotonically increasing, for example, the higher level of financial inclusion indicates higher value of the index. Thus, to compute IFI, first we compute X_1 (distance between X and O) and X_2 (inverse distance between X and W), and then take a simple average of X_1 and X_2 to compute IFI, the final index. The exact formulae are given below

$$X_1 = \frac{\sqrt{d_1^2 + d_2^2 + \dots + d_n^2}}{\sqrt{(w_1^2 + w_2^2 + \dots + w_n^2)}} \quad (1.2)$$

$$X_2 = 1 - \frac{\sqrt{(w_1 - d_1)^2 + (w_2 - d_2)^2 + \dots + (w_n - d_n)^2}}{\sqrt{(w_1^2 + w_2^2 + \dots + w_n^2)}} \quad (1.3)$$

$$\text{IFI} = \frac{1}{2} [X_1 + X_2] \quad (1.4)$$

The formula (1.2) for X_1 gives the normalised Euclidean distance of X from the worst point O , normalised by the distance between the worst point O and the ideal point W . The normalisation is done to make the value of X_1 lie between 0 and 1, and the higher value of X_1 implies more financial inclusion.

The formula (1.3) for X_2 gives the inverse normalised Euclidean distance of X from the ideal point W . In this, the numerator of the second component is the Euclidean distance of X from the ideal point W ,

normalising it by the denominator and subtracting by 1 gives the inverse normalised distance. The normalisation is done to make the value of X_2 lie between 0 and 1, and the inverse distance is considered so that a higher value of X_2 corresponds to higher financial inclusion.

The IFI formula (1.4) is a simple average of X_1 and X_2 , thus incorporating distances from both the worst point and the ideal point.

For simplification, if we consider all dimensions to be equally important in measuring the inclusiveness of a financial system, then $w_i = 1$ for all i . In this case, the ideal situation will be represented by the point $W = (1, 1, 1, \dots, 1)$ in the n -dimensional space and the formula for IFI will be

$$\text{IFI} = \frac{1}{2} \left[\frac{\sqrt{d_1^2 + d_2^2 + \dots + d_n^2}}{\sqrt{n}} + \left(1 - \frac{\sqrt{(1-d_1)^2 + (1-d_2)^2 + \dots + (1-d_n)^2}}{\sqrt{n}} \right) \right] \quad (1.5)$$

In Fig. 1.1, a graphical explanation of the IFI is provided with the help of the three dimensions used to construct the index in this chapter. As discussed in the next section, we consider three dimensions of financial inclusion in this chapter—accessibility (or financial sector penetration), availability, and usage of the financial system. In Fig. 1.1, each of these dimensions is represented by an axis in the three-dimensional space. The point $W = (w_1, w_2, w_3)$ 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 inclusive. 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 . In the IFI formula, the normalised distance between X and O is given by the X_1 in formula (1.2), and that between X and W is given by the second component in formula (1.3). The normalised distance between X and W

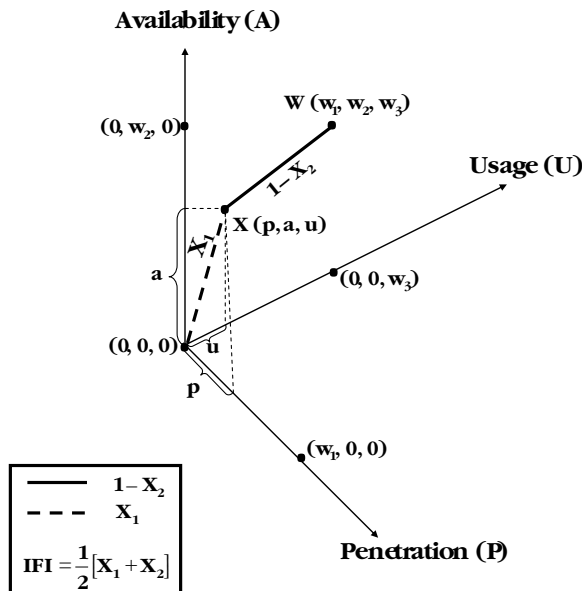


Fig. 1.1 Graphical explanation of a 3-dimensional IFI.
 Source: Author’s own

is a number that lies between 0 and 1, and if X has a highly financially inclusive system, then this normalised distance will be close to 0. While computing the IFI, the inverse normalised distance between X and W , computed as 1 minus the normalised distance is considered. This is given by X_2 in formula (1.3), and this ensures that less distance between X and W implies high financial inclusion. The final index is computed by taking an average of X_1 and X_2 .

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,¹⁰ our index is based on a notion of

¹⁰Until 2011, UNDP used a simple arithmetic average to compute Human Development Index (HDI), Gender-related Development Index (GDI), and Gender Empowerment Measure (GEM) and a geometric average for computing Human Poverty Index (HPI). In 2011, it revised the methodology for HDI by using geometric mean instead of an arithmetic mean. The Human Development

distance from worst and ideal situations.¹¹ UNDP's methodology of using an average of dimension indexes suffers from the criticism that such averaging implies 'perfect substitutability' across dimensions; for example, 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.

The IFI so defined, can be used to measure financial inclusion at different time points, and at different levels of economic aggregation (village, province, state, nation, and so on). It can be constructed at a macro level as well as at a micro level, depending on the availability of data, and the purpose of the research.

Index of Financial Inclusion for Asian Economies

With the above discussion on the general methodology of IFI, we now discuss computing IFI for those Asian economies for which data are available. For quantifying various dimensions for computing the IFI, we use data on various indicators from deposit banks and mobile money service providers. Deposit banks include commercial banks and other deposit-takers. These are defined as *'all resident financial corporations and quasi-*

Report 2011 (UNDP 2011) also computes other indices like Inequality-adjusted HDI (IHDI), Gender Inequality Index (GII) and Multidimensional Poverty Index (MPI) that adopt combinations of arithmetic and geometric averages (see e.g. UNDP 2011).

¹¹This is similar to the "method of displaced ideal" of Zeleny (1974) in the context of multi-objective optimization programming. In the method of displaced ideal, only the displacement from the ideal point is considered. However, we consider displacement from both the ideal and worst points to compute our IFI, and this makes it somewhat different from the "method of displaced ideal". The IFI presented in Sarma (2008, 2010) and Sarma and Pais (2011) was based on the distance from the ideal only. This version, presented in Sarma (2012, 2015) incorporates the distance from both the ideal and worst points; thus the present IFI is an improvement over the earlier one and replaces the earlier versions.

*corporations (except the central bank) that are mainly engaged in financial intermediation and that issue liabilities included in the national definition of broad money. These institutions have varying names in different countries, such as savings and loan associations, building societies, credit unions and credit cooperatives, post office giro institutions, post office savings banks, savings banks, microfinance institutions, etc.’ [International Monetary Fund (IMF) 2015, p. 5]. MMSP are defined as *telecommunication companies or any other entity that partners with mobile phone operators to offer financial services to clients through agents independent of the traditional banking network* (IMF 2015, p. 10).*

The main source of the data used here is the Financial Access Survey (FAS) database from the International Monetary Fund (IMF). This database disseminates annual data on indicators of geographic and demographic outreach of financial services for 160 respondent countries for the period 2004–2013. The FAS database released its first set of data in 2010, and since then data have been regularly updated and revised.¹²

We follow Sarma (2012, 2015), and consider three basic dimensions of an inclusive financial system in the construction of IFI. These three dimensions are banking penetration (BP), availability of the banking services (BS), and use of the banking system (BU). These dimensions are largely motivated by availability of relevant and consistent data for a large number of countries to compute comparable IFI. The following discussion on the dimensions of financial inclusion and the technical aspects of determination of benchmarks (upper bounds for the dimensions) as well as fixation of dimension weights is mainly drawn from Sarma (2012).

¹²The FAS database is an outcome of the initiatives of ‘United Nations (UN) Advisors Group on Inclusive Financial Sectors’, established by the UN in 2006, which decided, in 2008, to involve the IMF and the World Bank in collecting data on access to finance in order to support policy formulation and research. The initial funding for collection of the data was provided by the Government of the Netherlands. In June 2010, the IMF came out with annual data on several indicators of access to finance for the years 2004–2009 on its website. The data used in this chapter was extracted from the website http://data.imf.org/?sk=E5DCAB7E_A5CA_4892_A6EA_598B5463A34C, last accessed in April 2015.

Banking Penetration (Dimension 1)

An inclusive financial system should have as many users as possible, that is, an inclusive financial system should penetrate widely amongst its users. The size of the ‘banked’ population, for example, the proportion of people having a bank account is a measure of the banking penetration of the system. Thus, if every person in an economy has a bank account, then the value of this measure would be 1. However, data on the number of ‘banked’ people is not readily available, and in the absence of such data, we use the number of deposit bank accounts per 1000 adult population as an indicator of this dimension.¹³ The number of deposit bank accounts per adult, and the proportion of banked adults can be expected to be positively correlated, and that can justify using the number of deposit accounts per 1000 adults as a proxy for the number of banked adults.¹⁴ For the penetration dimension, we use data on deposit accounts per 1000 adults from the following deposit takers: commercial banks, credit unions/cooperative banks, and deposit taking microfinance institutions (MFIs). In addition to these, we also use the data on number of registered “mobile money accounts” per 1000 adults in our measure of banking penetration.

Availability of Banking Services (Dimension 2)

In an inclusive financial system, banking services should be easily available to the users. Indicators of availability are banking outlets (offices, branches, ATMs, and so on), therefore, the availability of services can be indicated by the number of bank outlets (per 1000 population) and/or by the number of ATMs per 1000 people. In the present day banking system in many countries, ATMs play an important role. Besides giving customers their bank account details, and allowing the deposit

¹³There may be persons having more than one bank account co-existing with others who may have none. Therefore, number of accounts per capita, is likely to actually provide an overestimation of the proportion of the “banked” population. For example, in 2010, number of bank accounts per 1000 adult people is 2276 in Malaysia, 1324 in Romania, and 1066 in India; this is despite the fact that a significant proportion of population is without bank accounts in these countries.

¹⁴In 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.

and withdrawal of cash and cheques (traditional teller services), ATMs in some instances also perform other functions such as providing bill payment services, and credit card related services. Thus the importance of ATMs in providing improved access to banking services is undeniable. However, the spread of the ATM network varies from bank to bank, and from country to country, and the role of a bank branch remains. In many countries, mobile money service providers (MMSP) have come up in a big way to bridge the gap in outreach for the financially excluded people who can use MMSP for the purpose of payments and remittances. An MMSP agent is a person, quasi-corporation, corporation, or machine that facilitates mobile money transactions, and customer support. It can thus be regarded on par with a bank branch as far as provision of financial services is concerned. In the present index, we use data on the number of bank branches, number of registered MMSP agents, and number of ATMs per 100,000 adults to measure the availability dimension. Two separate indexes are calculated: one for branches (comprised of bank branches and mobile money agent), and the second one for ATMs. Then, a weighted average of these two indexes, using two-thirds weight for bank branch index, and one-third weight for ATM index is considered as the index for the availability dimension.¹⁵

Keeping in view the move towards electronic banking in many countries, data on availability of electronic/internet based banking services should also be incorporated in this dimension. However, due to lack of consistent data on volume/number of electronic banks for all countries, we cannot incorporate electronic/internet based financial services from the availability dimension.

¹⁵ The choice of these weights is motivated by an empirical observation of our data set. In our data set covering 2004–2010, the average ratio of ATM-to-branch per 100,000 adults is found to be 2.13. Thus, on average, there are two ATMs per bank branch, implying that a bank branch, on an average, is equivalent to two ATMs. Thus, the branch index gets a weight of two-thirds and the ATM index gets a weight of one-third in the availability index.

Usage (Dimension 3)

This dimension is motivated by the notion of ‘underbanked’ or ‘marginally banked’ people, as observed by Kempson et al. (2004). They have observed that *‘in some apparently very highly-banked countries, a number of people with bank account are nonetheless making very little use of the services on offer...’* (Kempson et al. 2004, p. 13). These people are termed ‘underbanked’ or ‘marginally banked’. These underbanked people, despite having access to the formal financial services, are unable to use the financial services, due to various reasons such as remoteness of banking outlets, unaffordable conditions attached to financial services, or simply due to negative experiences with the service provider. These factors reflect negatively on the inclusiveness of a financial system. Thus, merely having a bank account is not enough for an inclusive financial system; it is also imperative that the banking services are adequately used. The utilisation can be in many forms—for credit, deposit, payments, remittances, transfers etc. So, the usage dimension should include measures on all these different forms. In the usage dimension of IFI, we use the following indicators: total volumes of credit, deposit, and mobile money transactions as percentage of GDP. The appropriate indicators for credit and deposit would be the volume of credit and deposit to adult individuals as a proportion of GDP. Such data are, however, currently not available. Data on credit and deposit to the household sector are available for a few countries. Relying on them would greatly reduce the coverage of the present study. Hence we use the data on volume of credit to the private sector, and deposits mobilized from the private sector as a proportion of the country’s GDP to measure this dimension.¹⁶

¹⁶In the literature on the role of finance in economic development, the credit to GDP and deposit to GDP ratios indicate what is known as “financial depth”. In this literature, indicators of financial depth provide a measure of the contribution of the financial system in economic activities. Here, however, we are using these ratios to indicate the volume of credit and deposit generated by the banking system as a measure of the extent of the usage of the banking system due to lack of data on more appropriate measure on this.

Choice of M_i and m_i for Dimension Indexes

Computation of the IFI requires a-priori fixing the value of M_i (upper limit) and m_i (lower limit) for each dimension, so that the dimension indexes are normalised to have values between 0 and w_i . Further, it is necessary to keep the values of M_i and m_i fixed for different years so that IFI computed for different years and countries are compared with respect to the same benchmarks on various dimensions. While one can safely choose 0 as the lower bound for all the dimensions discussed above, it is not so easy to fix the upper bound of a dimension, since theoretically it is not possible to arrive at a ‘maximum’ or even an ‘optimum’ level of achievement for a dimension of financial inclusion. Analytically, and using an objective and straightforward methodology, the empirically observed highest value of a dimension can be considered as the upper limit for it.¹⁷ However, this may cause two problems. First, if the empirically observed highest value happens to be ‘an outlier’, then it will distort the scale of the index, driving the IFI values of all other countries down, even though their performance may be reasonable. This is because all countries will be compared vis-à-vis the outlier country. The second problem caused by using the empirically observed highest value as the upper bound is that this value may be different for different years, and hence comparing the index across time will be difficult. In view of these observations, we consider the following upper bounds to be reasonable for different dimensions:

M_p = upper limit for computing dimension index for penetration dimension = 2500 (indicating on an average of at least two deposit accounts per adult).¹⁸

M_{a1} = upper limit for computing first index of availability dimension = 60 (indicating about 1667 clients per bank branch).¹⁹

¹⁷For example, the UNDP uses the empirically observed highest observed value as the maximum while computing dimension indexes for the Human Development Index (HDI) (UNDP 2011).

¹⁸Ardic et al. (2011) estimated that on average, an individual has three deposit accounts in the world. Our choice of M_p is informed both by our data set and the estimates from Ardic et al. (2011). In our dataset, this represents the 90th percentile on the distribution for this dimension.

¹⁹In our data set this again represents about the 90th percentile on the distribution for this dimension.

M_{a2} = upper limit for computing second index of availability dimension = 120 (indicating one ATM per 833 adults).²⁰

M_p = upper limit for computing dimension index for usage dimension = 300 (indicating a credit + deposit to GDP ratio of 3).²¹

If a country has a dimension value higher than these upper bounds, then it is set equal to the upper bound. By setting the upper limits as above, we avoid comparing countries against excessively high benchmarks, and thus remove outliers and smooth the value of the index at the upper level.

Weights Assigned to the Dimensions

Assigning appropriate weights to the dimension indexes is difficult. While all the three dimensions considered here are equally important for an inclusive financial system, the lack of adequate data on important indicators that completely characterise the availability and usage dimensions renders relatively less weight to these dimensions in the present index. As far as availability of banking services is concerned, it may be noted that many countries have moved towards internet banking, thus reducing the importance of physical bank outlets. Some countries also offer banking services through telephones. Thus, using data only on physical outlets (such as bank branches, mobile agent outlets, and ATMs) can give an incomplete picture of the availability of banking services. Similarly, data on credit, deposit, and mobile transactions can only partially depict the usage of the financial system as other services of the banking system, such as payments, transfers, and remittances are not included. In the absence of such data, a complete characterisation of these dimensions is not possible. Therefore, until the time data on all indicators of availability and usage are available, we give relatively less weight to these two dimensions. In the present IFI, we have provided the following weights: 1 for

²⁰In our dataset for 2004 to 2010, we find that the average number of ATMs per bank branch is about 2.13. Our choice of a maximum for ATM (120) being twice the maximum for bank branches (60) is motivated by the above empirical observation. This is about the 92nd percentile observed in the distribution for the ATM dimension.

²¹This represents about 90th percentile observed in the distribution for the usage dimension.

the index of banking penetration, 0.5 for the index of availability, and 0.5 for the index of usage.²²

Given these weights, we can represent a country K by a point (p_k, a_k, u_k) in the three dimensional space, such that $0 \leq p_k \leq 1, 0 \leq a_k \leq 0.5, 0 \leq u_k \leq 0.5$, where p_k, a_k and u_k are the dimension indexes for country k computed using formula (1.1). In the three dimensional space, the point $(0,0,0)$ will indicate the worst situation (complete financial exclusion), and the point $(1,0.5,0.5)$ will indicate the best or ideal situation (complete financial inclusion) in the present context.

The IFI_k for the country k is measured by the simple average of normalised Euclidean distance of the point (p_k, a_k, u_k) from the point $(0,0,0)$, and its normalised inverse Euclidian distance the ideal point $(1,0.5,0.5)$. Algebraically,

$$IFI_k = \frac{1}{2} \left[\frac{\sqrt{p_k^2 + a_k^2 + u_k^2}}{\sqrt{1.5}} + \left(1 - \frac{\sqrt{(1-p_k)^2 + (0.5-a_k)^2 + (0.5-u_k)^2}}{\sqrt{1.5}} \right) \right] \quad (1.6)$$

IFI for Asian Countries, 2004–2013

We now present, in Table 1.2, the computed values of the IFI elaborated in the preceding sections for 31 Asian economies for the years 2004–2013, subject to availability of data. The number of countries for which IFI values are computed varies across years depending on the availability of required data. As evident from Table 1.2, different economies of Asia are at different levels of financial inclusion. For the most recent year, 2013, the IFI varied from a low of 0.061 for Yemen to a high of 0.916 for Japan. The weighted average of IFI, weighted by the proportion of adults for this set of economies for 2013 is 0.385.

²² These weights, though they seem a bit arbitrary, are decided based on extensive discussion with banking sector experts and academicians. When appropriate data on all dimensions are available, the weights can be revised accordingly.

Table 1.2 Index of financial inclusion: Asian economies, 2004–2013

S. No.	Country name	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1	Afghanistan							0.056	0.047	0.096	0.089
2	Armenia	0.089	0.133	0.140	0.176	0.188	0.215	0.238	0.289	0.343	0.378
3	Azerbaijan						0.137	0.171	0.206	0.276	0.383
4	Bangladesh	0.318	0.333	0.347	0.343	0.356	0.362	0.389	0.406	0.424	0.437
5	Bhutan		0.173	0.182	0.187	0.205	0.229	0.276	0.344	0.196	0.350
6	Brunei Darussalam					0.588	0.599	0.604	0.606	0.687	0.694
7	Cambodia					0.060	0.072	0.080	0.170	0.189	0.173
8	China (Mainland)								0.258	0.205	
9	Georgia	0.093	0.136	0.178	0.216	0.270	0.281	0.301	0.338	0.407	0.399
10	India		0.294	0.297	0.301	0.323	0.347	0.365	0.388	0.418	0.440
11	Indonesia	0.185	0.188	0.174	0.177	0.180	0.188	0.216	0.248	0.282	0.331
12	Japan	0.922	0.921	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.916
13	Jordan				0.410	0.399	0.401	0.356	0.360	0.361	0.311
14	Republic of Korea	0.860	0.863	0.870	0.872	0.883	0.887	0.885	0.885	0.889	
15	Kuwait	0.386	0.411	0.439	0.461	0.453	0.453	0.439	0.452	0.425	
16	Laos								0.057	0.034	0.126
17	Lebanon		0.515	0.527	0.539	0.561	0.583	0.605	0.604	0.624	0.588
18	Malaysia	0.609	0.660	0.673	0.677	0.690	0.711	0.721	0.737	0.762	0.728
19	Maldives								0.552	0.469	0.544
20	Mongolia					0.337	0.345	0.387	0.434	0.481	0.491
21	Myanmar								0.056	0.066	
22	Nepal								0.204	0.195	
23	Pakistan	0.096	0.100	0.107	0.115	0.115	0.108	0.113	0.163	0.212	0.251
24	Philippines	0.145	0.149	0.153	0.151	0.163	0.170	0.251	0.281	0.291	0.311
25	Saudi Arabia						0.319	0.319	0.317	0.322	0.363
26	Syrian Arab Republic					0.120	0.132	0.137	0.094	0.070	

(continued)

Table 1.2 (continued)

S. No.	Country name	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
27	Thailand	0.417	0.450	0.479	0.502	0.522	0.527	0.541	0.540	0.574	0.540
28	Turkey		0.525	0.540	0.563	0.550	0.556	0.726	0.733	0.746	0.720
29	United Arab Emirates						0.417	0.415	0.392	0.394	0.324
30	Uzbekistan	0.134	0.135	0.140	0.146	0.150	0.154	0.155			
31	Yemen							0.055	0.050	0.058	0.061

Source: Author's computation using data from the IMF's FAS database

Countries by IFI Categories

We can categorise these countries into three groups—High IFI countries (countries with IFI values between 0.6 and 1), Medium IFI countries (countries with IFI values between 0.3 and 0.6), and Low IFI countries (countries with IFI less than 0.3).

High IFI countries: Countries having high IFI values consistently for at least four years are: Brunei, Japan, Republic of Korea, Malaysia, and Turkey, with Japan having an extremely high level of financial inclusion, indicated by an IFI value of more than 0.9. Clearly, these are the high income and relatively better off economies (upper middle income) in the Asian region.

Medium IFI countries: Countries that have been in the medium IFI categories for at least four years are: Bangladesh, Georgia, India, Jordan, Kuwait, Maldives, Mongolia, Saudi Arabia, Thailand, and United Arab Emirates. Lebanon, which belonged to the high IFI group during 2010–2012, slipped down to the medium IFI category in 2013. Armenia, Azerbaijan, Bhutan, Indonesia, and the Philippines are countries that belonged to low IFI categories earlier but moved up to the medium level of IFI subsequently. As evident, majority of these 16 economies with a medium level of financial inclusion are middle-income economies (Jordan, Maldives, Thailand, Azerbaijan, and Lebanon are upper middle income countries, and Armenia, Bhutan, Georgia, India, Indonesia, Mongolia, and the Philippines belong to the lower middle-income category). Apart from these, three high-income countries, vis-à-vis, Kuwait, Saudi Arabia, and United Arab Emirates also have a medium level of financial inclusion. Bangladesh is the only low-income country having a medium level of financial inclusion.

Low IFI countries: Out of the 31 Asian countries considered in this analysis, ten countries have low financial inclusion as depicted by their IFI values—Afghanistan, Cambodia, China, Laos, Myanmar, Nepal, Pakistan, Syria, Uzbekistan, and Yemen. These economies are all low-income or lower middle-income, except for China, which is an upper middle-income country. The countries having abysmally low levels of financial inclusion are those that have IFI values less than 0.1 and these are Afghanistan, Syria, and Yemen. It may be noted that in Syria, there

is a gradual decline in the level of financial inclusion over the years from low to an extremely low level.

Categorisation of economies into these categories based on their level of financial inclusion indicates that in general, the level of financial inclusion and level of income move in the same direction, although there are some exceptions. We now present some descriptive statistics of the IFI values, organised by income categories and regional grouping of countries.

IFI by Income Categories

Table 1.3 presents some descriptive statistics of the IFI values computed for the Asian economies during 2004–2013. In the interest of brevity, we will discuss the results for the most recent year, 2013. The IFI values for all countries range from a low of 0.06 (extremely low) to 0.92 (extremely high) in 2013, indicating that the level of financial inclusion in these countries varies quite substantially. The average IFI (weighted by proportion of adults) for these countries taken together is 0.39, which corresponds to a medium level of financial inclusion. Over the years, this weighted mean IFI for the Asian economies has improved from 0.32 in 2004 to 0.39 in 2013. The coefficient of variation (CV), a measure of stability of a variable, stands at 0.56—a considerably lower level if we compare the CV over the years. The declining trend in the CV indicates some tendency, however mild, towards convergence in IFI values in these economies. Out of the 27 Asian countries for which data are available for the year 2013, about 30 % had low IFI while about 55 % had medium level of IFI.

When we consider only the relatively richer countries of Asia (comprising of high and upper middle-income countries), we see that the IFI values in these relatively better off countries ranged between a minimum of 0.25 and a maximum of 0.92 in 2013. The average IFI (weighted by proportion of adults) for this club is 0.49 in 2013. It is interesting to see that the average IFI for the club of better off Asian economies has been declining, and the CV has been rising over the years. For 2013, majority (about 58 %) of these countries had medium level of financial inclusion, while for 8 % of these richer economies the level of financial inclusion was low.

Considering the group of relatively poor (low and lower middle-income) economies in the region, we find that the IFI values for this

Table 1.3 Descriptive statistics of FI values of Asian economies grouped by income category: 2004–2013

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<i>All countries</i>										
Min	0.089	0.100	0.107	0.115	0.060	0.072	0.055	0.047	0.034	0.061
Max	0.922	0.921	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.916
Mean (weighted)	0.320	0.388	0.400	0.411	0.397	0.392	0.392	0.411	0.399	0.385
S. D.	0.298	0.265	0.264	0.254	0.249	0.237	0.247	0.243	0.244	0.217
C. V.	0.84	0.71	0.69	0.64	0.65	0.62	0.66	0.62	0.64	0.56
Total no. of countries	12	16	16	17	21	24	26	27	30	27
No. of High IFI countries	3	3	3	3	3	3	6	6	6	4
No. of Medium IFI countries	3	5	5	7	9	11	9	11	11	15
No. of Low IFI countries	6	8	8	7	9	10	11	10	13	8
Proportion of Low IFI countries	50	50	50	41.2	42.9	41.7	42.3	37.0	43.3	29.6
<i>Rich countries (high + upper middle income group)</i>										
Min	0.386	0.411	0.439	0.410	0.399	0.137	0.171	0.206	0.258	0.205
Max	0.922	0.921	0.920	0.920	0.920	0.920	0.920	0.920	0.920	0.916
Mean (weighted)	0.548	0.630	0.644	0.630	0.630	0.505	0.520	0.525	0.556	0.489
S. D.	0.247	0.202	0.192	0.189	0.180	0.224	0.230	0.217	0.224	0.213
C. V.	0.39	0.33	0.30	0.31	0.29	0.41	0.41	0.39	0.41	0.41
Total no. of countries	5	7	7	8	9	12	12	13	14	12
No. of High IFI countries	3	3	3	3	3	3	6	6	6	4
No. of Medium IFI countries	2	4	4	5	6	8	5	6	6	7
No. of Low IFI countries	0	0	0	0	0	1	1	1	2	1
Proportion of Low IFI countries	0.0	0.0	0.0	0.0	0.0	8.3	8.3	7.7	14.3	8.3

(continued)

Table 1.3 (continued)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<i>Poor countries (lower middle+low income group)</i>										
Min	0.089	0.100	0.107	0.115	0.060	0.072	0.056	0.047	0.034	0.066
Max	0.318	0.333	0.347	0.343	0.356	0.362	0.389	0.434	0.481	0.491
Mean (weighted)	0.131	0.181	0.191	0.202	0.208	0.220	0.224	0.247	0.244	0.265
S. D.	0.081	0.079	0.079	0.075	0.096	0.098	0.114	0.133	0.146	0.139
C. V.	0.54	0.43	0.41	0.37	0.47	0.45	0.50	0.53	0.59	0.48
Total no. of countries	7	9	9	9	12	12	13	13	15	14
No. of High IFI countries	0	0	0	0	0	0	0	0	0	0
No. of Medium IFI countries	1	1	1	2	3	3	4	5	5	8
No. of Low IFI countries	6	8	8	7	9	9	9	8	10	6
Proportion of Low IFI countries	86	89	89	78	75	75	69	62	67	43

Source: Author's computation using data from the IMF's FAS database

group varied between 0.07 and 0.49, with a weighted average of 0.27. The average IFI for this set of countries has shown some improvement over the years. Similarly, the declining trend of the CV of IFI values for these countries indicates a tendency towards convergence. Even in this group of relatively poorer Asian economies, a majority, 57 %, has a medium level of IFI, and 43 % has low IFI (2013).

Thus, the main observations from Tables 1.2 and 1.3 are: Asian economies are at varying levels of financial inclusion, ranging from extremely low (Afghanistan, Myanmar, Syria, Yemen) to extremely high (Japan). In 2013, a majority of the Asian countries have a medium level of financial inclusion, with an average IFI value of 0.39. On an average, there is an overall improvement in the level of financial inclusion during 2004–2013.

IFI by Regional Grouping

In Table 1.4, we present IFI values only for the latest year (2013/2012) for the Asian economies, by regional grouping. As indicated by this table, the eastern Asian countries lead the region in the race towards greater financial inclusion. The leaders of the Asian economies in financial inclusion—Japan, Korea (South), Malaysia, Brunei, and Thailand—all belong to this region. Except for China and Cambodia that have low levels of financial inclusion, all countries in this group have at least a medium level of financial inclusion.

In terms of regional averages, Western Asia follows Eastern Asia, with an average IFI value of 0.372. Turkey and Lebanon are the leaders in this region, while Syria and Yemen are the worst performers. In terms of average IFI value, Central Asia stands third with average IFI 0.334, followed by South Asia with an average IFI of 0.303. Except for Bangladesh, Bhutan, India, and Maldives, which have medium levels of financial inclusion, the rest of South Asia has low levels of financial inclusion.

IFI Level and Features of Banking Sector

In this section, we attempt to analyse, with the help of correlation a coefficient, whether there is any significant pattern in the level of IFI and some banking sector variables. The first variable is the share of foreign banks in total banking sector assets in a country, and it indicates whether

Table 1.4 Index of financial inclusion, by regional grouping (2013/2012)

Country	IFI value	Country rank	Country	IFI value	Country rank
<i>Eastern + South Eastern Asia</i>			<i>Western Asia</i>		
Brunei Darussalam	0.694	5	Jordan	0.311	21
Cambodia	0.173	25	Kuwait	0.425	12
China	0.205	23	Lebanon	0.588	6
Indonesia	0.331	18	Saudi Arabia	0.363	16
Japan	0.916	1	Syrian Arab Republic	0.070	29
Laos	0.126	27	Turkey	0.720	4
Malaysia	0.728	3	United Arab Emirates	0.324	19
Mongolia	0.491	9	Yemen	0.061	31
Philippines	0.311	20	<i>Regional average (weighted)</i>	<i>0.372</i>	
Republic of Korea	0.889	2	<i>South Asia</i>		
Thailand	0.540	8	Afghanistan	0.089	28
<i>Regional average (weighted)</i>	<i>0.509</i>		Bangladesh	0.437	11
<i>Central Asia</i>			Bhutan	0.350	17
Armenia	0.378	15	India	0.440	10
Azerbaijan	0.383	14	Maldives	0.544	7
Georgia	0.399	13	Myanmar	0.066	30
Uzbekistan	0.155	26	Nepal	0.195	24
			Pakistan	0.251	22
<i>Regional average (weighted)</i>	<i>0.334</i>		<i>Regional average (weighted)</i>	<i>0.303</i>	

Note: Regional averages are weighted averages, weighted by the proportion of adults in the countries of the region.

Source: Author's own

the banking sector in a country is outward looking or domestically oriented. The other two variables that we consider here relate to stability and health of the banking sector, namely, capital-asset ratio (CAR) and ratio of non-performing assets (NPA) to total assets.

In Table 1.5, we present some data on the share of foreign banks, CAR, and NPA, along with the IFI value and corresponding country ranks for different Asian countries.

As indicated by Table 1.5, the majority of the countries in Asia have a domestically oriented banking structure. There are only four countries (Georgia, Armenia, Pakistan, Cambodia) in our sample that can be

Table 1.5 Financial inclusion and banking sector characteristics of Asian countries

Country	IFI, 2013	Country rank-IFI	% of foreign bank assets in total bank assets	Capital asset ratio (%)	NPA to total assets (%)
(I)	(II)	(III)	(IV)	(V)	(VI)
Japan	0.916	1	0	5.5	1.9
Republic of Korea	0.889	2	19	8.3	0.6
Malaysia	0.728	3	18	9.6	1.8
Turkey	0.72	4	14	11.2	2.7
Brunei Darussalam	0.694	5	NA	9.3	5.4
Lebanon	0.588	6	36	7.6	4
Maldives	0.544	7	NA	NA	NA
Thailand	0.54	8	6	10.9	2.3
Mongolia	0.491	9	NA	NA	NA
India	0.44	10	5	6.9	4
Bangladesh	0.437	11	3	6	8.6
Kuwait	0.425	12	8	12.5	3.8
Georgia	0.399	13	64	16.8	3.5
Azerbaijan	0.383	14	3	NA	4.5
Armenia	0.378	15	79	15.6	6.1
Saudi Arabia	0.363	16	0	13.6	1.4
Bhutan	0.35	17	NA	17	12.1
Indonesia	0.331	18	32	12.5	2.1
United Arab Emirates	0.324	19	2	15.2	7.1
Philippines	0.311	20	2	10.8	2.4
Jordan	0.311	21	23	12.9	7
Pakistan	0.251	22	53	9.3	12.8
China (Mainland)	0.205	23	1	6.3	1.1
Nepal	0.195	24	13	NA	NA
Cambodia	0.173	25	54	NA	NA
Uzbekistan	0.155	26	NA	11.2	0.4
Laos	0.126	27	NA	NA	NA
Afghanistan	0.089	28	NA	7.8	6.1
Syrian Arab Republic	0.07	29	NA	NA	NA
Myanmar	0.066	30	NA	NA	NA
Republic of Yemen	0.061	31	0		21.7

Note: Data for column (IV) are from Claessens and van Horen (2012), pertain to 2009; for columns (V) and (VI) from World Development Indicators, World Bank, pertain to 2013.

NA not available

considered as having a foreign bank dominated banking sector, with more than 50 % of its assets owned by foreign banks. In most other countries, the share of foreign banks in total banking sector assets is found to be quite low. The four countries with the high share foreign banks are seen to have low level of financial inclusion. On the other hand, Japan, with an extremely high level of financial inclusion, has a completely domestic banking sector. The Republic of Korea, Malaysia, and Turkey—other high performers in financial inclusion—have less than 20 % of foreign assets in their banking sector. The simple correlation coefficient between IFI value and share of foreign banks in banking sector assets for this set of countries is -0.12 , which is found to be statistically insignificant.

CAR is an indication of how well capitalised a banking sector is—the higher the CAR, the better prepared the banking sector to face default risks. For the set of Asian countries considered here, we see a negative but statistically insignificant correlation (-0.29) coefficient between IFI values and CAR values. The NPA is another indicator of the health of a country's banking sector. For our set of countries, the correlation coefficient between IFI and NPA is found to be -0.45 , which is highly significant. Thus, IFI and NPA seem to move in opposite directions. This could mean that countries having low NPAs in their banks may be able to have low NPA by restricting poor borrowers, thus leading to less financial inclusion. This is only a tentative finding that needs to be probed further and is beyond the scope of this chapter.

Conclusion

In this chapter, we attempted to quantify levels of financial inclusion in various Asian economies. We use IFI to measure financial inclusion in a set of Asian economies, for the period 2004–2013. We find that these countries are at various levels of financial inclusion, ranging from extremely low IFI (less than 0.1) to extremely high IFI (more than 0.9). On average, Asian economies display a medium level of financial inclusion. However, countries like Japan, Republic of Korea, Malaysia, and Brunei Darussalam have achieved high levels of financial inclusion, indicated by their IFI values. The temporal trend indicates that on an average, there is an improvement in financial inclusion over the years. In terms of regional grouping,

Eastern Asia seems to be ahead of other regions in the race for better financial inclusion, followed by Western Asia, Central Asia, and South Asia. A correlation analysis of financial inclusion and some financial sector variables indicate that NPA levels and IFI levels move in opposite direction in a statistically significant sense. The correlation coefficient between IFI and other variables, such as share of foreign banks in total banking assets and CAR, was not found to be statistically significant.

The IFI measures computed for these Asian economies provide us with useful information on the status of financial inclusion in these economies. These measures can also be used to investigate interesting issues of interlinkages among financial inclusion, financial development, and economic development pertaining to these economies.

References

- Ardic, O. P., Heimann, M., & Mylenko, N. (2011). *Access to financial services and the financial inclusion agenda around the world* (Policy Research Working Paper No. 5537). Washington, DC: World Bank.
- Beck, T., Demirguc-Kunt, A., & Martinez Peria, M. S. (2007). Reaching out: Access to and use of banking services across countries. *Journal of Financial Economics*, 85, 234–266.
- Carbo, S., Gardener, E. P., & Molyneux, P. (2005). *Financial exclusion*. Palgrave MacMillan, Hampshire, England.
- Claessens, S., & van Horen, N. (2012). Foreign Banks: Trends, Impact and Financial Stability (IMF Working Paper WP/12/10) International Monetary Fund
- Demirguc-Kunt, A., & Klapper, L. (2012). *Measuring financial inclusion: The Global Findex Database* (Policy Research Working Paper No. 6025). Washington, DC: World Bank.
- Desai, M. (1991). Human development: Concepts and measurement. *European Economic Review*, 35, 350–357.
- Diniz, E., Birochi, R., & Pozzebbon, M. (2012). Triggers and barriers to financial inclusion: The use of ICT-based branchless banking in an Amazon county. *Electronic Commerce Research and Applications*, 11, 484–494.
- Honohan, P. (2008). Cross-country variation in household access to financial services. *Journal of Banking and Finance*, 32, 2493–2500.
- International Monetary Fund. (2015). *Definitions and instructions for completing the IMF's Financial Access Survey—2015*. <https://data.imf.org/?sk=E5DCAB7E-A5CA-4892-A6EA-598B5463A34C&ss=1390288795525>

- Kempson, E., Atkinson, A., & Pilley, O. (2004). *Policy level response to financial exclusion in developed economies: Lessons for developing countries*. Bristol: Report of Personal Finance Research Centre, University of Bristol.
- Kempson, E., & Whyley, C. (1999a). *Kept out or opted out? Understanding and combating financial exclusion*. Bristol: Policy Press.
- Kempson, E., & Whyley, C. (1999b). Understanding and combating financial exclusion. *Insurance Trends*, 21, 18–22.
- Levine, R. (1997). Financial development and economic growth: Views and agenda. *Journal of Economic Literature*, 35(2), 688–726.
- Leyshon, A., & Thrift, N. (1995). Geographies of financial exclusion: Financial abandonment in Britain and the United States. *Transactions of the Institute of British Geographers, New Series*, 20(3), 312–341.
- Luchters, G., & Menkhoff, L. (1996). Human development as a statistical abstract. *World Development*, 24(8), 1385–1392.
- Rangarajan Committee. (2008). *Report of the Committee on Financial Inclusion*. Government of India, Delhi, India.
- Sagar, A. D., & Najam, A. (1998). The human development index: A critical review. *Ecological Economics*, 25, 249–264.
- Sarma, M. (2008). *Index of financial inclusion* (ICRIER Working Paper No. 215). New Delhi: ICRIER.
- Sarma, M. (2010). *Index of financial inclusion* (CITD Discussion Paper No. 10-05). New Delhi: CITD, JNU.
- Sarma, M. (2012). *Index of financial inclusion: A measure of financial sector inclusiveness* (Working Paper No. 07/2012). Berlin: Berlin Working Papers on Money, Finance, Trade and Development.
- Sarma, M. (2015). Measuring financial inclusion. *Economics Bulletin*, 35(1), 604–611.
- Sarma, M., & Pais, J. (2011). Financial inclusion and development. *Journal of International Development*, 23, 613–628.
- Seidman, E., Hababou, M., & Kramer, J. (2005). *Getting to know underbanked consumers: A financial services analysis*. Chicago, IL: Center for Financial Services Innovation.
- Sinclair, S. P. (2001). *Financial exclusion: An introductory survey*. Edinburgh: Centre for Research in Socially Inclusive Services, Heriot-Watt University.
- Trabold-Nubler, H. (1991). The human development index – A new development indicator? *Intereconomics*, 26(5), 236–243.
- United Nations Development Programme. (2011). *Human development report 2011*. New York: United Nations Development Programme.
- Zeleny, M. (1974). A concept of compromise solutions and the method of the displaced ideal. *Computers and Operations Research*, 1, 479–496.