Working Paper No. 215

Index of Financial Inclusion

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June 2008

INDIAN COUNCIL FOR RESEARCH ON INTERNATIONAL ECONOMIC RELATIONS

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Foreword

Financial inclusion, as defined in this paper, is the ease of access, availability and usage of the formal financial system by all members of the economy. The growing literature on financial inclusion has provided plenty of evidences of the merits of an inclusive financial system. However, the literature lacks a comprehensive measure that can be used to measure the extent of financial inclusion in an economy. This paper is an attempt to fill this gap, and thus, an original contribution to the literature. This paper proposes an index of financial inclusion (IFI), following a multidimensional approach. The IFI developed here can be used to compare levels of financial inclusion across economies at a particular time point. It can also be used to monitor the progress of policy initiatives for financial inclusion over a period of time. And, most important, such an index can be of interest to the research community in order to investigate empirical questions on relationship between development and financial inclusion. The IFI developed here incorporates information on various dimensions of an inclusive financial system and it is easy to compute.

This study is part of a major research project on "Financial Inclusion" under the auspices of the Financial Sector Research Programme (FSRP) at ICRIER. Work is now going on to develop a similar index specifically for India that is expected to provide insightful information on the features of financial inclusion in India.

FSRP, launched in September 2006, is focused on issues pertaining to India's financial sector. Several interesting researches carried out under FSRP have been well-received and are published as refereed journal articles. Many interesting studies are in progress under FSRP. As part of FSRP, ICRIER is also organizing a monthly Financial Sector Seminar Series since October 2006. Apart from this, an annual international conference on financial sector is being organised since November 2007.

(Rajiv Kumar)
Director & Chief Executive

June 26, 2008

Abstract

The promotion of an inclusive financial system is considered a policy priority in many countries. While the importance of financial inclusion is widely recognized, the literature lacks a comprehensive measure that can be used to measure the extent of financial inclusion across economies. This paper attempts to fill this gap by proposing an index of financial inclusion (IFI). The IFI is a multi-dimensional index that captures information on various dimensions of financial inclusion in one single digit lying between 0 and 1, where 0 denotes complete financial exclusion and 1 indicates complete financial inclusion in an economy. The proposed index is easy to compute and is comparable across countries.

Key Words: Financial inclusion, IFI, multi-dimensional index, normalized inverse Euclidean distance

JEL Classification: G00, G21, O16

Index of Financial Inclusion

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1. Introduction

The academic literature has adequately discussed the close relation between financial development and economic growth.[2] However, there has not been much discussion on whether financial development implies financial inclusion. It has been observed that even 'well-developed' financial systems have not succeeded to be 'all-inclusive' and certain segments of the population remain outside the formal financial systems. The importance of an inclusive financial system is widely recognized in the policy circle in recent years and financial inclusion is seen as a policy priority in many countries.[3] An inclusive financial system facilitates efficient allocation of productive resources and thus can potentially reduce the cost of capital. In addition, access to appropriate financial services can significantly improve the day-to-day management of finances. An inclusive financial system can help reducing the growth of informal sources of credit (such as moneylenders) which are often found to be exploitative. Thus, an all-inclusive financial system enhances efficiency and welfare by providing avenues for secure and safe saving practices and by facilitating a whole range of efficient financial services.

[1] I thank the participants of the "Conference on Financial Globalisation and Financial Sector Development in South and Central Asia", November 22-23, Delhi and the "10th Money and Finance Conference", January 18-19, 2008, IGIDR-Mumbai, for insightful comments and suggestions on earlier drafts of this paper. I acknowledge valuable comments from Elaine Kempson, Amaresh Samantaraya and my fellow colleagues at ICRIER. All errors are mine.
[2] See, for example, Levine (1997) for a survey of this debate.
[3] For a review of policy level responses to financial exclusion in developed economies, see Kempson et. al. (2004).

While the importance of financial inclusion is widely recognised, the literature on financial inclusion lacks a comprehensive measure that can be used to measure the extent of financial inclusion across economies. In this paper, we attempt to fill this gap by proposing an index of financial inclusion. A robust and comprehensive measure of financial inclusion is important in order to take stock of the current state of affairs with respect to financial inclusion in an economy and to monitor the progress of the policy initiatives undertaken to promote financial inclusion. A robust and comprehensive measure of financial inclusion will also be of importance to the research community to investigate interesting hypothesis relating to financial inclusion that have been raised in the academic literature. In this paper, we propose an index of financial inclusion that captures information on several dimensions of an inclusive financial system.

Section 2 of this paper defines financial inclusion; Section 3 presents an index of financial inclusion; Section 4 illustrates the computation of the index of financial inclusion using available data. Section 5 concludes this paper.

2. Defining Financial Inclusion (Exclusion)

Financial inclusion (or, alternatively, financial exclusion) has been defined in the literature in the context of a larger issue of social inclusion (or exclusion) in a society. One of the early definitions by Leyshon and Thrift (1995) define financial exclusion as referring to those processes that serve to prevent certain social groups and individuals from gaining access to the formal financial system. According to Sinclair (2001), financial exclusion means the inability to access necessary financial services in an appropriate form. Exclusion can come about as a result of problems with access,

conditions, prices, marketing or self-exclusion in response to negative experiences or perceptions. Carbo et al. (2005) have defined financial exclusion as broadly the inability (however occasioned) of some societal groups to access the financial system. The Government of India's 'Committee on Financial Inclusion in India' begins its report by defining 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).

Thus, most of the definitions emphasize financial exclusion to be a manifestation of a much broader issue of social exclusion of certain societal groups such as the poor and the disadvantaged. For the purpose of this paper, we define financial inclusion *as a process that ensures the ease of access, availability and usage of the formal financial system for all members of an economy*. This definition emphasizes several dimensions of financial inclusion, viz., accessibility, availability and usage of the financial system. These dimensions together build an inclusive financial system. As banks are the gateway to the most basic forms of financial services, banking inclusion/exclusion is often used as analogous to financial inclusion/exclusion.[4] In this paper also, we will use banking inclusion as analogous to financial inclusion.

3. Developing an Index of Financial Inclusion (IFI)

3.1. Motivation

Several indicators have been used to assess the extent of financial inclusion. The most commonly used indicator has been the number of bank accounts (per 1000 adult

[4] In fact, according to Leeladhar (2005), "*Financial inclusion is the delivery of banking services at an affordable cost…*".

persons). Some other indicators are number of bank branches (per million people), number of ATMs (per million people), amount of bank credit and amount of bank deposit. Such indicators, while used individually, provide only partial information on the inclusiveness of the financial system of an economy. Using individual indicators can lead to misleading understanding of the extent of financial inclusion in an economy as seen from the example below. Table 1 presents some such indicators for a select group of countries.

Table 1: Indicators of Financial Inclusion for select countries (2004)

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)
Argentina	503.3	13.7	10.3	23.2
Colombia	892.5	12.7	19.1	24.2
India	627.1	9.4	36.9	54.9
Lebanon	539.4	25.4	75.4	206.6
Malaysia	1858.8	14.6	117.9	123.9
Russia	2244.8	2.7	24.1	27.4
Thailand	1875.8	9.5	94.4	102.2

Sources: WDI (2006), World Bank; IFS (2006), IMF.

As shown in Table 1, the number of bank accounts per 1000 adults is highest in Russia, followed by Thailand, Malaysia and Colombia. However, if we look at the number of bank branches per 100,000 adult people, Russia ranks the lowest. Looking at another dimension of an inclusive banking system, that is, usage of the banking system in terms of the volume of credit and deposit, Argentina seems to be having very low credit to GDP ratio in spite of moderate density of bank accounts and bank branches. In India, in spite of low density of bank branches, the usage of the banking system in terms of volume of credit and deposit seems to be moderately high. As

evident from this example, any one single indicator fails to adequately capture the extent of financial inclusion.

Thus, a comprehensive measure, such as the index proposed in this paper, is required. A comprehensive measure of financial inclusion should be able to incorporate information on several aspects (dimensions) of financial inclusion, preferably in one single number. Such a measure can be used to compare the levels of financial inclusion across economies and across states/provinces within countries at a particular time point. It can be used to monitor the progress of policy initiatives for financial inclusion in a country over a period of time. Fuether, such a measure can be of useful to address questions of academic interest that have been put forward in the growing literature on financial inclusion. Some of the questions raised by the academic community are whether high economic development leads to an all-inclusive financial system and whether low financial inclusion is associated with high income inequality (Kempson et al, 2004). In order to investigate such questions empirically, a robust and comprehensive measure of financial inclusion is required. A good measure of financial inclusion, that serves these purposes, should be constructed based on the following criteria:

1. It should incorporate information on as many aspects (dimensions) of financial inclusion as possible.
2. It should be easy and simple to compute.
3. It should be comparable across countries.

In this paper, we propose an index of financial inclusion (IFI), which satisfies all the above criteria. The proposed IFI takes values between 0 and 1, zero indicating lowest financial inclusion (complete financial exclusion) and 1 indicating complete financial inclusion. Such an index, in our view, will be most useful for policy makers and academic researchers.

3.2 Methodology

As an inclusive financial system should be judged from several dimensions, we follow a multidimensional approach while constructing our index of financial inclusion (IFI). Our approach is similar to that used by UNDP for computation of some well known development indexes such as the HDI, the HPI, the GDI and so on[5] As in the case of these indexes, our proposed IFI is computed by first calculating a dimension index for each dimension of financial inclusion. The dimension index for the i^{th} dimension, d_i, is computed by the following formula.

$$d_i = \frac{A_i - m_i}{M_i - m_i} \qquad \textbf{(1)}$$

where

A_i = Actual value of dimension i

m_i = minimum value of dimension i

M_i = maximum value of dimension i

Formula **(1)** ensures that $0 \leq d_i \leq 1$. Higher the value of d_i, higher the country's achievement in dimension i. If n dimensions of financial inclusion are considered,

[5] For details see Technical Note in UNDP's Human Development Reports available at <www.undp.org>.

then, a country i will be represented by a point $D_i = (d_1, d_2, d_3, \ldots d_n)$ on the n-dimensional Cartesian space.

In the n-dimensional space, the point O = (0,0,0,…0) represents the point indicating the worst situation while the point I = (1,1,1,…,1) represents the highest achievement in all dimensions. The index of financial inclusion, IFI_i for the i^{th} country, then, is measured by the normalized inverse Euclidean distance of the point D_i from the ideal point I= (1,1,1,….1). The exact formula is

$$IFI_i = 1 - \frac{\sqrt{(1-d_1)^2 + (1-d_2)^2 + .. + (1-d_n)^2}}{\sqrt{n}} \qquad \textbf{(2)}$$

In formula **(2)**, the numerator of the second component is the Euclidean distance of D_i from the ideal point I, normalizing it by $\sqrt{n}$ and subtracting by 1 gives the inverse normalized distance. The normalization is done in order to make the value lie between 0 and 1 and the inverse distance is considered so that higher value of the IFI corresponds to higher financial inclusion.

3.3 The present index

In the index of financial inclusion presented here, we consider three basic dimensions of an inclusive financial system: banking penetration (BP), availability of the banking services (BS) and usage of the banking system (BU). These dimensions are largely motivated by two factors -- data availability for a large number of countries and recent development in the literature.[6]

[6] Apart from these three dimensions, one can think of many other dimensions of an inclusive financial system. For example, "Affordability" and "Timeliness" can be very important aspects of an inclusive financial system, as pointed out by the recent Rangarajan Committee Report on Financial Inclusion in India (Rangarajan Committee, 2008). However, data for measuring such dimensions, such as "transaction cost" and "time taken" for a bank transaction, are not readily available for a large number of countries. Therefore these dimensions have not been incorporated in the present

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, i.e. number 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. In the absence of the data on "banked" population, we use number of bank accounts as a proportion of the total population as an indicator of this dimension. [7]

Availability of banking services (dimension 2): The services of an inclusive financial system should be easily available to its users. Availability of services can be indicated by the number of bank outlets (per 1000 population) and/or by the number of ATM per 1000 people, or the number of bank employees per customer. In the absence of comparable data on the number of ATMs and number of bank staff for a large number of countries, we use the number of bank branches per 1000 population to measure the availability dimension.

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…"*. These people are termed "under-banked" or "marginally banked". Thus, merely having a bank account is not enough for an inclusive financial system; it is also

index. In countries where such data are available, one can construct more detailed country specific index using our proposed methodology.

[7] There 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.

imperative that the banking services are adequately utilized. In incorporating the usage dimension in our index, we consider two basic services of the banking system – credit and deposit. Accordingly, the volume of credit and deposit as proportion of the country's GDP has been used to measure this dimension.

Thus, considering the above three dimensions – penetration, availability and usage – we can represent a country i by a point (p_i, a_i, u_i) in the three dimensional Cartesian space, such that $0 \leq p_i, a_i, u_i \leq 1$, where p_i, a_i and u_i denote the dimension indexes for country i computed using formula **(1)**. In the three dimensional Cartesian space, the point (0,0,0) will indicate the worst situation (complete financial exclusion) and the point (1,1,1) will indicate the best or ideal situation (complete financial inclusion).

The IFI for the country i is measured by the normalized inverse Euclidean distance of the point (p_i, a_i, u_i) from the ideal point (1,1,1). Algebraically,

$$IFI = 1 - \sqrt{\frac{(1-p_i)^2 + (1-a_i)^2 + (1-u_i)^2}{3}} \qquad \textbf{(3)}$$

3.4 Points of difference with UNDP methodology:

Although the IFI proposed here follows a multidimensional approach of index construction similar to the UNDP approach, there are methodological differences between the two approaches. We explain the differences below highlighting the justification and merits of our methodology.

The first point of methodological difference with the UNDP methodology is the manner in which dimension indexes are combined to compute the final index. Unlike

the UNDP's methodology of using an average (a simple arithmetic average in case of HDI, GDI and GEM and a geometric average for HPI), our index is based on a measure of the distance from the ideal.[8] Nathan et al (2008) have shown that this distance-based approach satisfies several interesting and intuitive properties of a development index, viz. normalization, symmetry (or anonymity), monotonicity, proximity, uniformity and signaling (collectively termed NAMPUS). They have compared how an index based on the distance-based approach and an index based on UNDP's HDI methodology fare with respect to all of these properties. They show that UNDP's HDI methodology satisfy only three of these properties while the distance based methodology satisfy all. The failure of the HDI methodology to satisfy all the properties is due to the so-called 'perfect substitutability' across dimensions under this methodology. Perfect substitutability implies that an increase in one dimension can be compensated for by a decrease of equal 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). The distance based approach does not suffer from this shortcoming.

The second difference is with respect to the choice of minimum and maximum values for the dimensions. While the UNDP methodology uses pre-fixed values for the minimum and maximum for each dimension to compute the dimensional index, we use empirically observed minimum and maximum for each dimension. There are two reasons for using the empirically observed max and min:

[8] I thank Srijit Mishra for introducing me to this methodology that dates back to Zeleny (1974).

i. It is difficult to fix what should be the minimum/maximum for any dimension of financial inclusion. For several dimensions used in UNDP's HDI, such as the literacy rate and life expectancy, it may be easy to fix limits for the dimensions (e.g. 0 and 100 for literacy rate and 25 and 85 years for life expectancy)[9] but for the dimensions of financial inclusion, it is not straight forward to determine what should be the lowest (highest) value for a particular dimension. Therefore an empirical scheme has been adopted.

ii. By using the empirical scheme, we are attempting to measure financial inclusion with respect to a prevailing situation. Thus, the min and max values for any dimension of the index may change for different points of time and also if the number of countries in our set of countries change. By computing IFI in this manner, we are incorporating certain element of relativity in the IFI, i.e., it measures the extent of financial inclusion in an economy relative to the prevailing situation in all economies. This way, the index is a dynamic one.

4. Computation of IFI – an illustration

4.1 Data

While computing an index such as the one proposed here, availability of data is an important challenge. We found that the latest year for which some data are available for a reasonable number of countries is 2004. When we consider all the 3 dimensions of financial inclusion, then data are available for only 55 countries. If we drop one of the dimensions, viz., banking penetration, then we have data for a bigger set of 100 countries. Accordingly, two sets of IFI values are computed – using data for all the 3

[9] UNDP's fixation of minimum and maximum per capita income for the "standard of living" dimension is not without criticism; see, for example, Desai (1991), Trabold-Nubler (1991), Luchters and Menkhoff (1996) and Sagar and Najam (1998), among others.

dimensions for 55 countries and using only 2 dimensions (availability and usage) for 100 countries. All data pertain to the year 2004.

For financial (banking) penetration dimension, we have used the data on "Bank Deposit Accounts" from World Development Indicators (2006) of World Bank. These are deposit accounts, including checking (or current), savings, and time deposit accounts for business, individuals and others. For the availability dimension, we have taken the data on deposit money bank branches from the same source. Deposit money banks comprise commercial banks and other financial institutions that accept transferable deposits, such as demand deposits.[10] For the usage dimension, we have used the data on "domestic claims on the private and resident sector" and the data on "total deposits" from International Financial Statistics (IFS, 2006) of the IMF.[11]

4.2 Results

Using data on all three dimensions (*penetration*, *availability* and *usage*) for 55 countries and data for *availability* and *usage* dimensions for 100 countries for the year 2004, IFI values have been computed. The IFI values computed for various countries are presented in Table 2 (3-dimensional IFI) and Table 3 (2-dimensional IFI).

Depending on the value of IFI, countries are categorized into three categories, viz.:

1. $0.5 < IFI \leq 1$ – high financial inclusion
2. $0.3 \leq IFI < 0.5$ – medium financial inclusion
3. $0 \leq IFI < 0.3$ – low financial inclusion

[10] Thus, the data includes commercial banks, post offices and other such financial institutions accepting deposits.

[11] Thus, for credit data we use line 32d and for deposit data we use line 24 plus line 25 of IFS. Deposit data comprises of demand, time, and foreign currency deposits of resident sectors.

In the group of 55 countries for which a 3-dimensional IFI has been estimated by using data on 3 dimensions of financial inclusion, Spain leads with the highest value of IFI followed by Austria, Belgium, Denmark, Switzerland and Malta (Table 2). Only these five countries belong to the high IFI group with IFI values of 0.5 or more. Another nine countries, viz., France, Greece, Italy, Malaysia, Mauritius, Singapore, Norway, Thailand and Lebanon form the group of medium IFI countries with IFI values between 0.3 and 0.5. All other countries have a low IFI values, lying between 0.01 and 0.3. It is interesting to note that most of the countries with high and medium IFI values are OECD countries. Among the Asian countries, Malaysia, Singapore and Thailand are better performers than others. In fact Malaysia and Singapore both have IFI values higher than Norway, an OECD country. Among the 55 countries, India ranks 31st with an IFI value of 0.155. Madagascar ranks the lowest, 55th, with IFI value 0.011.

In the group of 100 countries (Table 3) for which a 2-dimensional IFI has been computed, nine OECD countries - Spain, Canada, Portugal, Germany, Austria, Switzerland, Belgium, Netherlands and Denmark - form the group of high IFI countries while 22 countries including United Kingdom (17th rank), Sweden (19th), United States (21st), Japan (22nd), Mauritius (25th), Norway (26th) and Korea (31st) have IFI values in the medium range. All the other countries have a low IFI value. These include, amongst others, China (32nd), Finland (33rd), Hungary (34th), Egypt (41st), South Africa (43rd), Czech Republic (46th), India (50th), Poland (66th), Pakistan (67th), Bangladesh (69th), Mexico (75th) and Nepal (76th). At the lowest rank of IFI values is Cambodia (100th rank) with an IFI value of 0.015.

4.3 Limitations of the present index:

The index presented here has certain limitations, mainly owing to lack of adequate and appropriate data. Like any other macro index, our index of financial inclusion also suffers from loss of country specific information owing to the aggregative nature of the data. For example, geographical aspects of financial inclusion (such as rural/urban divide) and the gender related aspects are not covered in the present index. Further, the present index does not distinguish between resident bank accounts from non-resident accounts. Therefore in the present index, tax havens such as Mauritius and financial hubs such as Singapore and Switzerland may show high level of financial inclusion due to high number of non-resident banking activities.

Table 2: Index of Financial Inclusion - using data on 3 dimensions of financial inclusion (2004)

Country	D1(index for Pen. dim)	D2 (index for Avail. dim)	D3 (index for Usage dim)	IFI	IFI Rank
Spain	0.651	1.000	0.706	0.737	1
Austria	1.000	0.568	0.619	0.667	2
Belgium	1.000	0.567	0.543	0.637	3
Denmark	0.902	0.410	0.700	0.614	4
Switzerland	0.629	0.394	1.000	0.590	5
Malta	0.819	0.321	0.757	0.571	6
France	0.590	0.466	0.507	0.518	7
Greece	0.764	0.317	0.461	0.480	8
Italy	0.301	0.536	0.432	0.415	9
Malaysia	0.499	0.122	0.806	0.406	10
Mauritius	0.566	0.133	0.640	0.403	11
Singapore	0.566	0.094	0.688	0.393	12
Norway	0.540	0.249	0.410	0.388	13
Thailand	0.503	0.076	0.644	0.360	14
Lebanon	0.140	0.220	0.950	0.329	15
Czech Republic	0.610	0.109	0.276	0.300	16
Jordan	0.204	0.141	0.670	0.298	17
Iran	0.884	0.101	0.164	0.288	18

Country	D1(index for Pen. dim)	D2 (index for Avail. dim)	D3 (index for Usage dim)	IFI	IFI Rank
Chile	0.374	0.104	0.353	0.267	19
Bulgaria	0.421	0.136	0.210	0.246	20
Turkey	0.426	0.100	0.168	0.219	21
Brazil	0.232	0.174	0.237	0.214	22
Trinidad and Tobago	0.367	0.097	0.187	0.209	23
Russia	0.604	0.014	0.124	0.205	24
Guyana	0.214	0.030	0.391	0.198	25
West Bank and Gaza	0.123	0.046	0.413	0.179	26
Namibia	0.192	0.060	0.281	0.173	27
Romania	0.386	0.139	0.019	0.167	28
India	0.164	0.075	0.269	0.166	29
Lithuania	0.378	0.027	0.127	0.164	30
Guatemala	0.187	0.152	0.135	0.158	31
El Salvador	0.182	0.054	0.234	0.153	32
Kenya	0.026	0.012	0.493	0.147	33
Philippines	0.121	0.100	0.223	0.146	34
Fiji	0.171	0.064	0.202	0.143	35
Colombia	0.236	0.105	0.095	0.143	36
Dominican Republic	0.274	0.068	0.094	0.140	37
Bosnia & Herzegovina	0.134	0.032	0.230	0.128	38
Saudi Arabia	0.092	0.073	0.222	0.127	39
Ecuador	0.163	0.115	0.103	0.127	40
Honduras	0.123	0.001	0.238	0.115	41
Pakistan	0.080	0.062	0.174	0.104	42
Bangladesh	0.090	0.042	0.181	0.103	43
Argentina	0.130	0.114	0.060	0.101	44
Mexico	0.120	0.095	0.077	0.097	45
Venezuela	0.188	0.049	0.043	0.091	46
Peru	0.121	0.046	0.081	0.082	47
Zimbabwe	0.072	0.040	0.129	0.080	48
Bolivia	0.011	0.013	0.231	0.079	49
Nicaragua	0.038	0.035	0.167	0.078	50
Albania	0.054	0.017	0.148	0.071	51
Papua New Guinea	0.048	0.015	0.075	0.046	52
Armenia	0.032	0.078	0.000	0.036	53
Uganda	0.019	0.000	0.025	0.015	54
Madagascar	0.000	0.001	0.037	0.013	55

Table 3: Index of Financial Inclusion - using data on 2 dimensions of financial inclusion (2004)

Country	D2 (index for Avail. dim)	D3 (index for Usage dim)	IFI	IFI Rank
Spain	1.000	0.706	0.792	1
Canada	0.494	0.886	0.633	2
Portugal	0.543	0.754	0.633	3
Germany	0.516	0.694	0.595	4
Austria	0.570	0.620	0.594	5
Switzerland	0.397	1.000	0.574	6
Belgium	0.569	0.544	0.557	7
Netherlands	0.371	0.873	0.546	8
Denmark	0.413	0.701	0.534	9
Malta	0.324	0.758	0.492	10
France	0.468	0.509	0.488	11
Italy	0.539	0.434	0.484	12
Ireland	0.260	0.943	0.475	13
New Zealand	0.311	0.685	0.465	14
Lebanon	0.223	0.950	0.450	15
Australia	0.328	0.594	0.445	16
United Kingdom	0.195	0.912	0.428	17
Greece	0.320	0.514	0.409	18
Sweden	0.234	0.630	0.398	19
Malaysia	0.126	0.807	0.367	20
United States	0.348	0.384	0.366	21
Japan	0.100	0.986	0.363	22
Jordan	0.145	0.671	0.352	23
Israel	0.173	0.573	0.342	24
Mauritius	0.137	0.641	0.339	25
Norway	0.252	0.412	0.327	26
Singapore	0.099	0.689	0.326	27
Panama	0.162	0.509	0.313	28
Croatia	0.250	0.362	0.304	29
Thailand	0.080	0.645	0.303	30
Korea	0.143	0.507	0.301	31
China	0.010	0.911	0.297	32
Finland	0.203	0.357	0.276	33
Hungary	0.298	0.251	0.274	34
Bahrain	0.163	0.360	0.255	35
Belize	0.189	0.326	0.254	36
Morocco	0.085	0.415	0.232	37
Kuwait	0.100	0.373	0.224	38

Country	D2 (index for Avail. dim)	D3 (index for Usage dim)	IFI	IFI Rank
Chile	0.108	0.355	0.222	39
Kenya	0.017	0.495	0.218	40
Egypt	0.044	0.438	0.216	41
West Bank and Gaza	0.050	0.415	0.211	42
South Africa	0.077	0.368	0.209	43
Brazil	0.178	0.240	0.208	44
Guyana	0.035	0.393	0.194	45
Czech Republic	0.113	0.278	0.191	46
Estonia	0.156	0.212	0.183	47
Bulgaria	0.140	0.213	0.176	48
Slovak Republic	0.107	0.242	0.172	49
India	0.080	0.271	0.170	50
Namibia	0.064	0.283	0.167	51
Costa Rica	0.116	0.215	0.164	52
Philippines	0.104	0.225	0.163	53
Slovenia	0.018	0.317	0.154	54
Saudi Arabia	0.077	0.224	0.148	55
Uruguay	0.071	0.230	0.147	56
Guatemala	0.156	0.137	0.147	57
Trinidad and Tobago	0.101	0.189	0.144	58
El Salvador	0.058	0.237	0.143	59
Indonesia	0.103	0.181	0.141	60
Turkey	0.104	0.171	0.137	61
Iran	0.105	0.167	0.135	62
Sri Lanka	0.081	0.190	0.134	63
Fiji	0.068	0.205	0.134	64
Bosnia & Herzegovina	0.037	0.233	0.129	65
Poland	0.084	0.157	0.120	66
Pakistan	0.066	0.177	0.120	67
Bolivia	0.017	0.233	0.119	68
Bangladesh	0.058	0.183	0.118	69
Honduras	0.006	0.240	0.115	70
Ecuador	0.120	0.106	0.113	71
Colombia	0.110	0.098	0.104	72
Nicaragua	0.039	0.170	0.102	73
Argentina	0.118	0.063	0.090	74
Mexico	0.099	0.080	0.089	75
Nepal	0.021	0.164	0.089	76
Zimbabwe	0.045	0.131	0.087	77
Botswana	0.050	0.122	0.085	78

Country	D2 (index for Avail. dim)	D3 (index for Usage dim)	IFI	IFI Rank
Dominican Republic	0.072	0.097	0.084	79
Albania	0.021	0.151	0.084	80
Romania	0.143	0.022	0.080	81
Lithuania	0.032	0.130	0.079	82
Russia	0.019	0.127	0.071	83
Ethiopia	0.002	0.137	0.067	84
Peru	0.051	0.084	0.067	85
Kazakhstan	0.024	0.107	0.064	86
Venezuela	0.053	0.046	0.050	87
Papua New Guinea	0.020	0.078	0.048	88
Nigeria	0.021	0.075	0.048	89
Belarus	0.046	0.046	0.046	90
Ghana	0.019	0.070	0.044	91
Armenia	0.082	0.003	0.042	92
Azerbaijan	0.047	0.018	0.032	93
Zambia	0.020	0.042	0.031	94
Madagascar	0.006	0.040	0.023	95
Tanzania	0.004	0.037	0.020	96
Georgia	0.030	0.010	0.020	97
Kyrgyz Republic	0.037	0.000	0.018	98
Uganda	0.005	0.028	0.016	99
Cambodia	0.000	0.030	0.015	100

5. Conclusion

In this paper, we have proposed an Index of Financial Inclusion (IFI) – a multidimensional measure developed in line with well known development indexes such as HDI, HPI, GDI and GEM. IFI can be used to compare the extent of financial inclusion across different economies and to monitor the progress of the economies with respect to financial inclusion over time. Such an index can also be of use to researchers to address empirical questions on the relationship between development and financial inclusion.

IFI calculations based on the latest available data are presented in this paper by way of illustration. The results show that a large number of economies, including several industrial economies have low levels of financial inclusion.

Adequate, appropriate and comparable data for a large number of years and for a large number of countries is the essence of a robust IFI. Owing to lack of appropriate data, we are unable to incorporate many aspects of an inclusive financial system in our present index, such as affordability, timeliness and quality of the financial services. International organizations such as the UNDP, the IMF and the World Bank, with their experience and reach, should make efforts to collect and disseminate data on different dimensions of financial inclusion that are presented in this paper.

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