



Index of Financial Inclusion

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Defining financial inclusion/exclusion

- Financial inclusion (exclusion) has been defined in the context of a larger issue of social inclusion (exclusion) in a society.
- **Leyshon and Thrift (1995)** - *Financial exclusion refers to those processes that serve to prevent certain social groups and individuals from gaining access to the financial system.*
- **Sinclair (2001)** - *Financial exclusion means the inability to access necessary financial services in an appropriate form.*
- **Santiago, Gardener and Molyneux (2005)** - *...inability (however occasioned) of some societal groups to access the financial system.*
- **Rakesh Mohan (2006)** - *... signifies the lack of access by certain segments of the society to appropriate, low-cost, fair and safe financial products and services from mainstream providers.*
- **Usha Thorat (2007)** - *by financial inclusion we mean the provision of affordable financial services, (viz., access to payments and remittance facilities, savings, loans and insurance services) by the formal financial system to those who tend to be excluded.*

Defining financial inclusion/exclusion

- Thus, these definitions define financial exclusion in the context of social exclusion.
- As banks provide the gateway to the most basic forms of financial services, financial inclusion/exclusion is sometimes used as analogous to banking inclusion/exclusion.
- **Leeladhar (2005)** – *Financial inclusion is the delivery of banking services at an affordable cost to the vast sections of disadvantaged and low income groups.*
- Associated notions are that of “unbanked” and “marginally banked” (or “under banked”).
- **My definition:** *Financial inclusion ensures ease of availability, accessibility and usage of the formal financial system to all members of the economy.*
- Most recent definition (official Indian definition?) is by the Rangarajan Committee (Jan 2008) – *process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups....at an affordable cost.*

Inclusive Financial System

- An inclusive financial system facilitates efficient allocation of productive resources and thus can potentially reduce the cost of capital.
- Access to appropriate financial services can significantly improve the day-to-day management of finances (bill payment, money transfer...)
- Unbanked people are exposed to informal sources of credit, are charged higher (often exorbitant) interest rates and they often face unethical/harsh recovery practices.
- Access to a bank account provides avenues for secure and safe saving practices.
- A bank account can also provide a passport to wide ranging financial services such as overdraft facilities, debit card and credit cards.
- A number of financial services, such as insurance and pension, necessarily require access to a bank account.
- Thus, an inclusive financial system enhances efficiency and welfare of a society.

Financial Inclusion – Policy Initiatives

- Financial inclusion is seen as a policy priority in many countries in recent periods.
 - * The Govt. of India’s initiatives – Vaidyanathan Committee, Thorat Committee, Rangarajan Committee, Raghuram Rajan Committee....
 - * In Sweden and France, banks are legally bound by to open an account for anybody who approach them
 - * Financial Inclusion Task Force (2005) in UK
 - * Community Reinvestment Act (1997) in US
 - * “No frills” accounts in India (2006) and SHG led bank linkage programme
 - * “Everyman” account in Germany (1996)
 - * “Mzansi” account in South Africa (2004)
 - * Emphasis on right to have a bank account by Law on exclusion (1998) in France

Need for an Index of Financial Inclusion

- The literature on financial inclusion lacks a simple comprehensive measure of financial inclusion that is comparable across economies and across time.
- Individual indicators (such as no. of bank A/C, No. of bank branches etc.) can provide only partial information about financial inclusion – hence the need for an index.

An example

Country	A/C (per 1000 adult pop.)	Branch (per 100,000 adult pop.)	Credit/GDP (%)	Deposit/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

We propose an Index of Financial Inclusion (IFI) such that it

- incorporates information on several aspects (dimensions) of financial inclusion (such as penetration of the financial system, availability of financial services, usage of the financial system and so on)
- is easy and simple to compute
- is comparable across economies
- is free from any unit
- has values between 0 and 1, 0 indicating complete financial exclusion and 1 indicating complete financial inclusion.

Index of Financial Inclusion (IFI)– Methodology

- We follow a multidimensional approach, similar to that used by UNDP for computing HDI, HPI and GDI etc.
- First, a dimension index is computed for each dimension of financial inclusion, by assigning an appropriate weight that indicates the relative importance of a dimension in the IFI.
- The dimension indexes can be viewed as a point in the n-dimensional Cartesian space.
- The IFI is measured by the distance of this point from an **ideal** point in the n-dimensional space.

Index of Financial Inclusion (IFI)– Methodology

- The dimension index d_i for the i^{th} dimension is computed by using the following formula

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

where

w_i = weight attached to dimension i , $0 \leq w_i \leq 1$

A_i = Actual value of dimension i

m_i = lower limit of dimension i (determined by empirically observed minimum value)

M_i = upper limit of dimension i (determined by the empirically observed 94th quantile)

- Formula (1) ensures that $0 \leq d_i \leq w_i$. Higher the value of d_i , higher is a country's achievement in dimension i .

Index of Financial Inclusion (IFI)– Methodology

- If n-dimensions of financial inclusion are considered, then, a country k will be represented by the point $D_k = (d_1, d_2, \dots, d_n)$ on the n-dimensional Cartesian space.
- In the n-d space, $O = (0, 0, \dots, 0)$ represents the worst and $I = (w_1, w_2, \dots, w_n)$ represents the highest achievement in financial inclusion.
- The IFI for the country k is given by the **normalised inverse Euclidean** distance of D_k from I

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

Simple Case

- If all dimensions can be considered equally important, then $w_i = 1$ for all i .
- In this case, $I = (1, 1, \dots, 1)$; and formula for IFI will be

$$IFI = 1 - \frac{\sqrt{(1 - d_1)^2 + (1 - d_2)^2 + \dots + (1 - d_n)^2}}{\sqrt{n}} \quad (3)$$

Points of difference with the UNDP methodology

1. 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), we use a measure of the distance from the ideal.
 - Thus, our index does not suffer from the various shortcomings of average-based methodologies of UNDP that are discussed in the literature of development index (Nathan et al (2008), Desai (1991), Trabold-Nubler (1991), Luchters and Menkhoff (1996), Sagar and Najor (1998)...
2. Unlike the fixed minimum and maximum of UNDP methodology, we use empirically observed minimum and maximum for each dimension.
 - Difficult to fix minima and maxima for the dimensions of financial inclusion.
 - By adopting an empirical scheme, we are attempting to measure financial inclusion relative to the prevailing situation in all economies. Thus, our IFI is a dynamic index.

The present index

Dimension 1 → Banking penetration

- size of the “banked” population
- proxied by number of bank A/C per 1000 adult population.
- $w_1 = 1$

Dimension 2 → Availability of banking system

- indicates the extent of the banking system’s availability (spread)
- proxied by number of bank branches and no. of ATM per 100000 adult population
- $w_2 = 0.5$

Dimension 3 → Usage of the financial system

- indicates how much the banking system has been used by its users
- proxied by the size of bank credit and bank deposits, relative to the GDP.
- $w_3 = 0.5$

Dimensions such as “Affordability” and “Timeliness” could not be incorporated due to lack of appropriate data.

Computation of the present IFI

- Availability of latest data for a large number of countries is a big problem.
- The latest available data is for 2004.
- Sources: IMF's IFS and World Bank's WDI – Data on all the three dimensions are available for 54 countries (2004) and on only two dimensions – availability and usage – are available for 99 countries (2004).
- Accordingly, two sets of IFI have been calculated.
- Fiji, Malta, Mauritius, Panama, Singapore and Switzerland are dropped for having “OFC” type banking system (dominance of non-resident banking activities). SO, 49 countries for first set and 93 countries for the second set of IFIs
- Based on the value of IFI, countries are categorised as High, Medium and Low IFI countries depending on whether IFI is > 0.5 , $\in (0.3 - 0.5)$ or < 0.3 .

IFI values (all dimensions)

Country	D_1 (Pen.)	D_2 (Avail)	D_3 (Size)	IFI	IFI Rank
High Financial Inclusion (0.5 – 1)					
Austria	1.000	1.000	1.000	0.953	1
Denmark	1.000	0.770	1.000	0.909	2
Belgium	1.000	0.996	1.000	0.908	3
Spain	0.735	1.000	0.747	0.784	4
Greece	0.863	0.619	0.877	0.767	5
France	0.665	0.909	0.676	0.703	6
Norway	0.609	0.551	0.619	0.603	7
Malaysia	0.563	0.250	0.571	0.533	8
Czech Republic	0.688	0.229	0.699	0.529	9
Thailand	0.568	0.185	0.577	0.520	10
Iran	0.998	0.131	1.000	0.519	11
Medium Financial Inclusion (0.3 – 0.5)					
Italy	0.340	0.981	0.344	0.439	12
Russia	0.681	0.048	0.692	0.427	13
Bulgaria	0.475	0.310	0.482	0.418	14
Chile	0.422	0.260	0.428	0.411	15
Turkey	0.480	0.228	0.487	0.392	16
Trinidad and Tobago	0.414	0.227	0.420	0.358	17
Lithuania	0.426	0.176	0.432	0.346	18
Romania	0.435	0.232	0.441	0.313	19

IFI values (all dimensions)–contd.

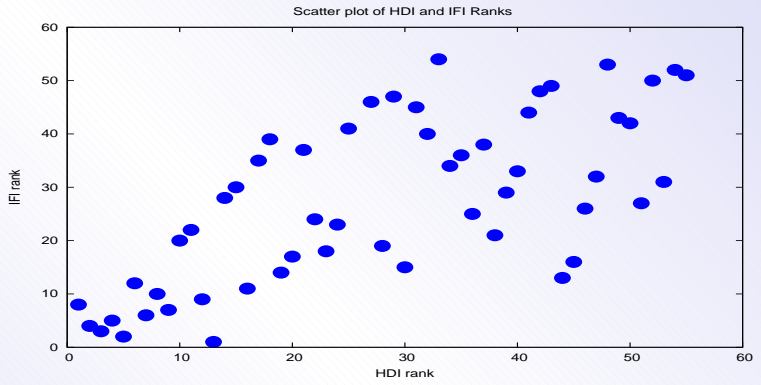
Country	D_1 (Pen.)	D_2 (Avail)	D_3 (Usage)	IFI	IFI Rank
Low Financial Inclusion (< 0.3)					
Jordan	0.230	0.238	0.232	0.296	20
Brazil	0.261	0.316	0.264	0.282	21
Lebanon	0.158	0.368	0.158	0.263	22
Dominican Republic	0.309	0.172	0.312	0.257	23
Guyana	0.241	0.075	0.243	0.254	24
Namibia	0.216	0.160	0.218	0.238	25
Guatemala	0.211	0.334	0.213	0.231	26
Colombia	0.266	0.187	0.269	0.229	27
El Salvador	0.205	0.135	0.207	0.216	28
India	0.185	0.096	0.186	0.194	29
Venezuela	0.212	0.160	0.214	0.182	30
Ecuador	0.184	0.181	0.185	0.174	31
Philippines	0.136	0.157	0.136	0.165	32
Bosnia & Herzegovina	0.151	0.066	0.151	0.163	33
Saudi Arabia	0.104	0.193	0.104	0.155	34

IFI values (all dimensions)–contd.

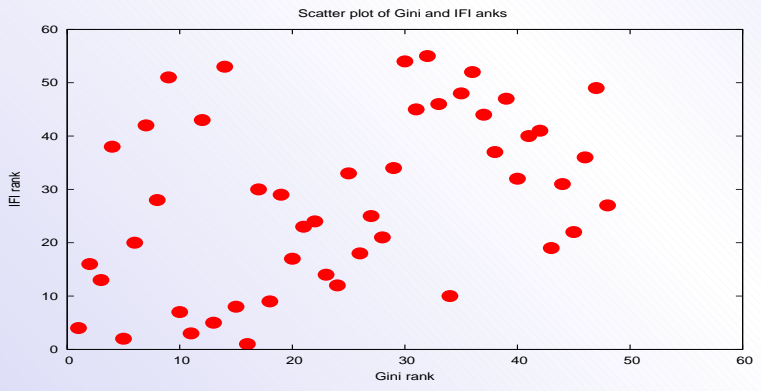
Country	D_1 (Pen.)	D_2 (Avail)	D_3 (Usage)	IFI	IFI Rank
Honduras	0.138	0.026	0.139	0.150	35
Argentina	0.147	0.223	0.147	0.149	36
Mexico	0.136	0.220	0.136	0.148	37
Peru	0.136	0.092	0.136	0.126	38
Bangladesh	0.102	0.052	0.101	0.115	39
Pakistan	0.090	0.079	0.089	0.110	40
Kenya	0.030	0.022	0.028	0.105	41
Zimbabwe	0.082	0.072	0.081	0.096	42
Albania	0.060	0.034	0.059	0.079	43
Nicaragua	0.043	0.062	0.042	0.076	44
Bolivia	0.012	0.047	0.010	0.066	45
Papua New Guinea	0.054	0.019	0.052	0.056	46
Armenia	0.036	0.103	0.034	0.037	47
Uganda	0.021	0.005	0.019	0.021	48
Madagascar	0.000	0.003	0.003	0.009	49

- Most of the high IFI countries are OECD countries; middle income countries like Malaysia, Thailand and Iran also have high IFI.
- Majority of the countries including India and its neighbours belong to low IFI category. These are mostly low income countries from Africa, Asia and Latin America.
- The IFI rankings for European countries are in broad agreement with a recent report by European Commission on financial exclusion based on surveys of individuals aged 18+ (EC 2008).

Comparing HDI and IFI Ranks



Comparing Gini and IFI Ranks



IFI with only two dimensions

IFI values (Availability and Usage dimensions)

Country	D_2 (Avail)	D_3 (Usage)	IFI	IFI Rank
High Financial Inclusion (0.5 – 1)				
Canada	0.986	1.000	0.990	1
Portugal	1.000	0.857	0.899	2
Spain	1.000	0.804	0.861	3
Germany	0.883	0.789	0.829	4
Austria	0.978	0.706	0.791	5
Denmark	0.740	0.797	0.767	6
Netherlands	0.661	0.993	0.760	7
Belgium	0.910	0.619	0.723	8
France	0.877	0.579	0.690	9
New Zealand	0.601	0.780	0.678	10
Australia	0.673	0.676	0.674	11
Ireland	0.527	1.000	0.666	12
Italy	0.902	0.494	0.635	13
Japan	0.465	1.000	0.622	14
United Kingdom	0.414	1.000	0.585	15
United States	0.793	0.436	0.575	16
Greece	0.591	0.526	0.557	17
Lebanon	0.366	1.000	0.552	18
Korea	0.521	0.577	0.548	19
Sweden	0.417	0.717	0.542	20

IFI values (Availability and Usage dimensions) – contd.

Country	D_2 (Avail)	D_3 (Usage)	IFI	IFI Rank
Medium Financial Inclusion (0.3 – 0.5)				
Norway	0.513	0.468	0.490	21
Finland	0.558	0.406	0.477	22
Malaysia	0.240	0.918	0.459	23
Israel	0.305	0.652	0.450	24
Croatia	0.477	0.412	0.443	25
Jordan	0.239	0.764	0.436	26
Thailand	0.173	0.734	0.386	27
Hungary	0.499	0.285	0.383	28
Bahrain	0.327	0.410	0.367	29
Estonia	0.410	0.241	0.321	30
Chile	0.240	0.404	0.317	31
China	0.028	1.000	0.313	32
Kuwait	0.215	0.424	0.311	33
Belize	0.249	0.371	0.308	34
Slovenia	0.252	0.361	0.304	35

IFI values (Availability and Usage dimensions) – contd.

Country	D_2 (Avail)	D_3 (Usage)	IFI	IFI Rank
Low Financial Inclusion (< 0.3)				
Brazil	0.309	0.272	0.291	36
South Africa	0.181	0.419	0.290	37
Morocco	0.112	0.473	0.270	38
Czech Republic	0.219	0.316	0.266	39
Bulgaria	0.289	0.242	0.265	40
Slovak Republic	0.248	0.275	0.261	41
Egypt	0.066	0.498	0.250	42
Kenya	0.027	0.563	0.246	43
Guyana	0.074	0.447	0.237	44
Guatemala	0.313	0.156	0.231	45
Namibia	0.148	0.322	0.230	46
Costa Rica	0.208	0.244	0.226	47
Saudi Arabia	0.178	0.255	0.216	48
Trinidad and Tobago	0.213	0.215	0.214	49
Philippines	0.163	0.256	0.208	50
Turkey	0.215	0.194	0.205	51
India	0.108	0.308	0.202	52

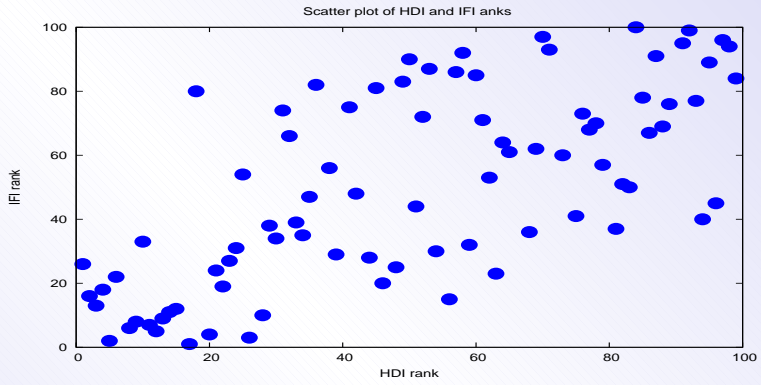
IFI values (Availability and Usage dimensions) – contd.

Country	D_2 (Avail)	D_3 (Usage)	IFI	IFI Rank
El Salvador	0.128	0.269	0.195	53
Indonesia	0.156	0.206	0.181	54
Poland	0.174	0.178	0.176	55
Uruguay	0.094	0.262	0.174	56
Sri Lanka	0.123	0.216	0.168	57
Iran	0.144	0.190	0.166	58
Bosnia & Herzegovina	0.068	0.265	0.160	59
Ecuador	0.186	0.120	0.152	60
Bolivia	0.046	0.265	0.149	61
Colombia	0.187	0.111	0.148	62
Lithuania	0.147	0.147	0.147	63
Mexico	0.206	0.091	0.147	64
Pakistan	0.089	0.201	0.143	65
Argentina	0.217	0.071	0.141	66
Honduras	0.025	0.274	0.140	67
Bangladesh	0.076	0.209	0.140	68
Dominican Republic	0.161	0.110	0.135	69
Nicaragua	0.066	0.193	0.127	70
Botswana	0.109	0.138	0.124	71
Romania	0.233	0.025	0.123	72

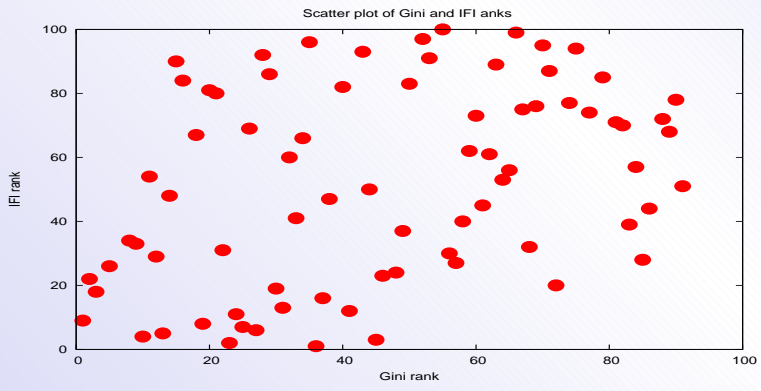
IFI values (Availability and Usage dimensions) – contd.

Country	D_2 (Avail)	D_3 (Usage)	IFI	IFI Rank
Zimbabwe	0.076	0.150	0.112	73
Nepal	0.027	0.186	0.103	74
Albania	0.038	0.171	0.102	75
Venezuela	0.144	0.052	0.097	76
Russia	0.047	0.145	0.095	77
Peru	0.093	0.095	0.094	78
Kazakhstan	0.059	0.122	0.090	79
Ethiopia	0.003	0.156	0.076	80
Azerbaijan	0.115	0.020	0.066	81
Belarus	0.079	0.052	0.065	82
Armenia	0.114	0.004	0.057	83
Papua New Guinea	0.026	0.089	0.057	84
Nigeria	0.028	0.085	0.056	85
Ghana	0.025	0.080	0.052	86
Zambia	0.030	0.048	0.039	87
Georgia	0.044	0.012	0.028	88
Madagascar	0.008	0.046	0.027	89
Kyrgyz Republic	0.049	0.000	0.024	90
Tanzania	0.006	0.042	0.024	91
Uganda	0.010	0.032	0.021	92
Cambodia	0.000	0.034	0.017	93

Comparing HDI and IFI Ranks



Comparing Gini and IFI Ranks



Limitations and thoughts

- Like any other macro index, the IFI also suffers from the loss of country specific information due to aggregation – eg., geographical and gender related aspects of financial inclusion are not reflected in the present index.
- The present index does not distinguish between resident bank accounts from non-resident accounts. Tax havens and overseas financial centres had to be dropped from the analysis due to this reason.
- Due to lack of appropriate data, we are unable to incorporate important aspects of an inclusive financial system such as affordability, timeliness and quality of financial services.
- Organisations like UNDP, IMF and World Bank, with their experience and reach, should periodically collect and disseminate data on different dimensions of financial inclusion.

Further work

- A paper on explaining financial inclusion by country specific factors (literacy, poverty, unemployment, rural population, health and asset shares of the financial system, infrastructure,)
- Construct a country specific IFI for India – analyse the status of financial inclusion in India by analysing IFI across States and over a long period of time.

Concluding remarks –

- We have proposed an Index of Financial Inclusion (IFI) – a measure developed in line with well known development indexes such as HDI, HPI and GDI.
- IFI can be used to compare extent of financial inclusion across different economies.
- IFI can be used to monitor the progress of the economies with respect to financial inclusion over time.
- IFI can be used to empirically investigate academically interesting questions such as the relationship between economic development and financial inclusion and between income inequality and financial inclusion.
- The examples of IFI calculations based on the latest available data indicate that many economies are at low levels of financial inclusion. In general, IFI tend to move similarly with HDI and Gini; however exceptions may exist.

Thank you