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A Measurement of Financial Inclusion - Index Development and its Relationships

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Abstract

The aim of this study is to develop a composite index for financial inclusion. It is a multi-dimensional index as financial inclusion is based on many different aspects of financial systems. This study is an effort to develop a more appropriate, significant and accurate index using more indicators of financial inclusion. The index is developed using indicators on bank accounts, bank branches, number of ATMs, number of POS terminals, number of credit cards, number of debit cards, borrowings, savings, credit purchases, deposits, withdrawals, credit card usage, debit card usage, internet usage and mobile usage for transactions. This study is carried out with the objective of improving the number of variables and assigning weights for the variables methodologically. Accordingly, the composite index for financial inclusion is developed by using the correlation matrix of the variables to derive the weights and then taking the arithmetic mean of the dimensions. The results of the index developed are compared with the countries' income classification, literacy rate, Gini coefficient and the OECD country representation. The analysis shows that the index is developed with more relevant indicators or that the variables well represent the countries' financial inclusion. This index can be used as an indication of the country's financial inclusion and will give a better representation of the financial inclusion ranking of the country and hence, can be used to measure the development of financial inclusion of a country.

***Key Words**: Financial Inclusion, Financial Instruments*

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1. Introduction

Financial Inclusion (FI) has become a subject of considerable interest developed in the last decade, among many stakeholders of economies, mainly researchers and policy makers. It is fast becoming an important aspect in financial systems developments and thereby in economic development, at a rapid rate.

FI is derived from financial exclusion, an alternative to financial inclusion, which was the subject in discussion previously. Financial exclusion is defined broadly as the inability of some societal groups to access the financial system, by Carbo et al.

Financial exclusion can be either voluntary, due to not having an interest or need, or because of cultural or religious reasons. Or, it can be involuntary, due to insufficient income, high risk profile, discrimination, market failures and imperfections. The development of an economy needs, first to minimize involuntary financial exclusion. It cannot ignore voluntary exclusion as well. Therefore, policy initiatives must first focus on involuntary exclusion as it can be addressed by appropriate economic programs and activities, which can be designed to increase income levels and correct market failures and imperfections. Then, it is required to take initiatives to improve the interest of people towards financial activities (which improves financial intermediation) and to consider cultural and religious aspects in financial activities (well-known example is Sharia law in financial intermediation).

FI is a broad concept. In simple, for the purpose of this paper, FI can be defined as the 'depth and spread of the possibilities of formal financial activities among and throughout the population of an economy.

Improving FI or better FI means higher possibilities for financial activities. This can be achieved by lowering barriers such as geographical and legal difficulties, tight regulations, costs, market failures or imperfections and improve knowledge/knowhow (literacy and information). Having considered these, policy developers have been taking many initiatives to improve FI.

In addition to Central Banks' (policy developers') initiatives, the IMF, G20, International Finance Corporation (IFC), the Alliance for Financial Inclusion (AFI), and the Consultative Group to Assist the Poor (CGAP) are assuming an increasingly active role at the international level in collecting the data and setting standards to improve FI.

Higher FI allows broader access to financial services, brings in more people into formal financial channels, especially the low-income people or disadvantaged groups. It stimulates those disadvantaged groups or the low-income people to be active in financial environments and make benefits for the betterment of them. Further, the availability of appropriate and promising financial services has a direct positive impact on the welfare of the poor. This leads to both social and economic growth (by allowing a greater number of people to support

aggregate demand) of the country, while reducing the inequality or improving the wealth distribution. On the other hand, better FI helps poverty alleviation and overcomes the forms of social exclusion in employment, housing, education and health services.

With the development of technology which improves FI and vise-versa, financial activities have become more efficient and less costly, and thus created avenues for new and innovative financial products and services. These developments in the financial sector lead to make peoples' lives better, allowing people to buy goods and services anytime anywhere, instantaneously. Improved FI allows all stakeholders to see a better picture of the economy's financial strength. Ultimately, FI supports financial stability and restores confidence that has been affected by domestic shocks and global crises.

As mentioned above, there are several policy initiatives already taken in different economies, which are country initiatives, regional initiatives, initiatives by economic cooperation and international initiatives. FI can be mainly driven by policy initiatives and therefore, the regulatory framework needs to support FI though there are conflicts in promoting FI and tightening regulations in order to maintain financial system stability.

To understand the FI state of an economy (a region, a country or a state/ province) and to compare its FI with other economies or peer economies, or to compare its own development through time, or to see development opportunities and generate development insights, it is important have a measurement. But there are several factors that affect FI in an economy and many of them are substantially important. Since there is no dominant factor, FI cannot be measured simply or easily. These factors include, an account in a financial institution, frequency and proximity to access the account, easiness and the quality of the access and financial products, financial literacy, individuals needs and wants, technology developments, availability, access and developments in financial products and services, etc. etc.

The aim of this study is to develop a composite index to measure FI, which will be a multi-dimensional index. In the literature there are a few studies that developed indices of financial inclusion. This study is an effort to develop a more appropriate, significant and accurate index using more indicators of financial inclusion as opposed to literature. The study focuses on combining the important aspects of methodologies that have been used in the past studies to overcome the drawbacks of the methodologies used in those individual studies. Therefore, this study is carried out with the objective of improving the usage of variables and assigning weights for the variables methodologically. The developed FI index can be used as an indication or measurement of a country's FI and its ranking. The FI index relationship to income classifications, literacy rate, Gini coefficient and the OECD countries' representation will be tested in order to examine the relevance of the results.

The rest of the paper is structured as follows. Section Two discusses the literature on FI index developments. Section Three discusses the data and the methodology adopted in this study.

Then given the focus of this study, Section Four is devoted to results and the analysis of the results by testing the relationships. Section Five concludes the study and provides recommendations for further study.

2. Literature Review

2.1 Index for Financial Inclusion

Though it is evident that FI is an important topic in the current context, and as mentioned above many policy initiatives have been taken to improve FI, comparatively, the literature on FI is insufficient. Most studies have looked at the appropriate measures of financial inclusion at the levels of a country or an economy. Some studies focused on the role of financial access in lowering poverty and income inequality. Further, some research are on varying levels of financial inclusion, comparing economies to provide key policy insights for sustainable development.

Burgess and Pande, noticed that the expansion of bank branches in rural India had a significant impact on poverty alleviation. Since the increased interest on FI, it was a time to explore this emerging aspect by measuring the current state within and across countries and following up with the developments. Different approaches have been proposed in the literature including the use of a variety of FI dimensions to econometric estimation. One of the first efforts at measuring financial sector outreach across countries were by Beck et al.. The indicators of banking sector outreach were three dimensional; physical access, affordability, and eligibility. The considered banking services were deposits, loans, and payments.

Honohan constructed a financial access indicator that captures the fraction of adult population in a given economy with access to formal financial intermediaries. The composite financial access indicator was constructed using household survey data for economies with available data on financial access. For those without household survey on financial access, the indicator was derived using information on bank account numbers and GDP per capita. The dataset was constructed as a cross-section series using the most recent data as the reference year, which varies across economies. The measure provided a snapshot of financial inclusion and might not be applicable for understanding changes over time and across economies.

Rojas-Suarez used the same indicator constructed by Honohan to test the significance of various macroeconomic and country characteristics for a group of emerging economies, including some from developing Asia. The results show that economic volatility, weak rule of law, higher income inequality, and social underdevelopment and regulatory constraints significantly lower financial access. In addition, various country groupings were also found to be significant, especially for large emerging economies. However, unlike the estimation of Honohan, Rojas-Suarez used weighted least squares estimation.

Brune et al. conducted field experiments in rural Malawi analyzing venues through which access to formal financial services improve the lives of the poor, with respect to savings products helping them in their farming agriculture activities. Allen et al. explore determinants of financial development and inclusion among African countries and found that by tapping underprivileged households, commercial banks can help improve financial access of the poor in Kenya.

Sarma (measure of financial sector inclusiveness) follows an approach similar to that, which was used by the United Nations Development Programme (UNDP) for the computation of some well-known development indexes such as HDI, HPI and GDI, to construct the indicator (this index has been evolved from Sarma's previous publications in 2008 and 2010).

Sarma first computed a dimension index for each dimension of financial inclusion, assigning weight indicating the relative importance of the dimension in quantifying the inclusiveness of a financial system. He then computes the normalized Euclidean distance of the country's achievement in the n-dimensional space between the worst point and the ideal/best point in the same n-dimensional space. (Normalization done by the distance between the worst point and the ideal/best point to make the value of X lie between 0 and 1). Sarma assigns weightage to each dimension using intuition and then develops the final Index of Financial Inclusion (IFI) by taking the geometric average (normalized inverse Euclidean distance from ideal points).

The three (3) dimensions that Sarma used in his computation of the IFI are;

i. Banking Penetration
   Indicator - Number of deposit bank accounts (per 1000 adult population)

ii. Availability of banking services
   Indicators - Number of bank outlets (per 1000 population)
   Number of ATM (per 1000 population)

iii. Usage
   Indicators - Volume of credit to the private sector / country's GDP
   Volume of deposit mobilized from the private/ country's GDP

The main data source of Sarma's analysis is the Financial Access Survey (FAS) database of the International Monetary Fund (IMF), which disseminates annual data of geographic and demographic outreach on financial services indicators of more than 140 countries from year 2004 to 2010. He enriches his database with data from Central Banks around the world, Bank for International Settlement's 'payment and settlement statistics', International Financial Statistics (IFS) database of the IMF and World Bank's World Development Indicators (WDI). The main limitation he found in developing the index was the insufficiency of data. However, he has come up with an IFI for 94 countries from 2004 to 2010.

Sarma in his study in 2010 compares the computed indices with the European Commission's study on financial exclusion in the EU (25 countries) in 2008, and claims that the index fairly represents the EU study.

Although it is a significant study, Sarma's use of intuition rather than a logic based development of dimension weights/ sub- dimension weights is a significant limitation.

Massara et al. derive a composite index by aggregating intermediate sub-indices of different dimensions. Similar to the indices discussed above, this is also a multidimensional index by aggregating dimensional sub-indices determined after normalizing the variables. This index also follows the same basic sequence of development of HDI, HPI, and GDI similar to the studies discussed above. Massara et al. distinguished or improved their study by proving that the statistical identification of financial inclusion dimensions obtained from a factor analysis are the same as the theoretical dimensions. Further, it assigns various weights for each dimension, different for years, which implies the importance of one measure versus another. The aggregation technique follows a weighted geometric mean. The two dimensions used in this study are;

i. Availability of banking services
   Indicators - Number of bank branches (per 1000 km^2)
   Number of ATM (per 1000 km^2)
ii. Usage
   Indicators - Total resident household depositors with ODCs per 1,000 adults
   Total resident household borrowers with ODCs per 1,000 adults

The data sources of Massara et al. are also the FAS of the IMF with World Bank database. Massara et al. claim that the index they developed for financial inclusion addresses many criticisms made against the similar indices previously developed, namely the lack of an adequate weighting scheme for variables and dimensions and the inability of certain aggregators to capture imperfect substitutability between dimensions. The use of the factor analysis method made the identification of financial inclusion dimensions less arbitrary. They propose improvements in the index by adding SME indices, and also considering other financial institutions (ex: insurance corporations).

The study by Massara et al. also has limitations with regard to data availability. Moreover, they used only two (2) dimensions for the index and excluded account penetration which is as an important dimension. Massara et al. stated that they excluded the variable 'Account' because in the FAS database, data is available as the 'No of accounts per 1000 adults', and therefore they believe that it could potentially introduce a bias in the dataset. Further they stated that in cases where an individual has multiple accounts, the use of formal financial services in a country would be overstated.

Nevertheless, Bank for International Settlements (BIS), '*Payment Aspects of FI'* discusses that having a transaction account as an important factor in FI (p.12). Further, account penetration can be considered as the base factor and the sustainable factor in making people carry out formal financial activities.

2.2 Sustainable Inclusion

The BIS consultative report on payment aspects of FI analyses the basis of setting guiding principles to assist countries that seek to advance financial inclusion in their markets through payments. It briefly discusses transaction accounts and the barriers to the access and usage of such accounts and gives an overview of the retail payments landscape from a financial inclusion perspective. Further, it outlines a framework for enabling access and usage of payment services for the financially excluded. It also discusses on some key policy objectives, suggestions and key actions for consideration in improving FI. The focus should be more on developing solutions to cater to the needs (payment, store value with safely, gateway to other financial services) of individuals and SMEs. The report premises that efficient, accessible, and safe retail payment systems and services are critical for greater financial inclusion while highlighting that a transaction account is an essential financial service that provides the facility to store value safely and serve as a gateway to other financial services.

Financial inclusion measurement is a key, not only for financial sector developments but also for economic and social sector developments in the current context. Yet, there is hardly any research done on developing a measurement instrument for FI. There is no commonly accepted and widely used world standard for a FI index. However, it needs to be a sophisticated and composite index due to the fact that FI is an outcome of several micro economic variables and as a result, the literature shows that there is a huge research gap in the area of FI and IFI, specially because of the unavailability of data. Further, comprehensive aggregating methodologies need to be developed to serve a composite index.

3. Methodology

3.1 Sample and Data Collection

Sources of data

The main source of data for this study is data banks of the World Bank (WB) and IMF. A vast amount of indicators are tabulated for series of years in these data banks and are used to compute several databases such as World Development Indicators, Poverty and Equity Database, Health Nutrition and Population Statistics, G20 Financial Inclusion Indicators and Global Findex (Global Financial Inclusion Database) in the WB 'DataBank' and, Consumer

Price Index, National Accounts, Balance of Payments and International Investment Position, (BOP&IIP) and FAS in the IMF database.

'Global Findex' is a comprehensive user-side survey-based database. It has more than a hundred indicator availability of financial instruments detailed in gender, age group, and household income. The indicators are based on interviews with about 150,000 nationally representative and randomly selected adults in more than 140 economies. This survey is done only for 2011 and 2014 since it is costly and time consuming, needing reasonable amount of effort. It is a joint effort with Gallup World Poll and Bill & Melinda Gates Foundation.

'Financial Access Survey' of the IMF is a database covering Geographical Outreach financial services in a number of financial institution branches, ATMS, mobile money outlets and the Use of financial services in a number of depositors, deposit accounts, borrowers, loan accounts, outstanding loans, and deposits, and mobile money, across 160 countries for the years starting 2006.

Both the sources were accessed to gather data for this study. Data from Global Findex from the World Bank and the FAS from the IMF have been extracted since Findex provides many important indicators but is available only for two years, whereas FAS data is available for a reasonable period of time but with limited indicators to compute IFI. Further, to study the relationships of literacy, wealth distribution and income category to computed IFI, the WDI, 'Poverty and Equity Database' of the WB and UNESCO database have been accessed.

Firstly, the data extracted for the following indicators of the Findex Database for the years 2011 and 2014 for 143 countries are as follows:

1) Account / Transaction Account (% age 15+)[3]
   Respondents who report having an account (by themselves or together with someone else) at a bank, at a financial institution or a mobile account.
2) Commercial bank branches (per 100,000 adults)[4]
3) Automated teller machines (ATMs) (per 100,000 adults)
4) Point-of-sale terminals (POS) (per 100,000 adults)
5) No of credit card holders (% age 15+)
6) No of debit card holders (% age 15+)
7) Borrowed from a financial institution (% age 15+)
   Respondents who report borrowing any money from a bank or another type of financial institution in the past 12 months

[3] (% age 15+) *Denotes the percentage of adult respondents,*
[4] (per 100,000 adults) *Denotes the total number divided by adult population and multiplied by 100,000*

8) Purchased on credit (% age 15+)
Denotes the percentage of respondents who made credit purchases in the past 12 months

9) Saved at a financial institution (% age 15+)
Denotes the percentage of respondents who report saving or setting aside any money at a bank or a of financial institution in the past 12 months

10) Credit card used in the past year (% age 15+)

11) Debit card used in the past year, female (% age 15+)

12) Deposit in the past year (% with an account, age 15+)
Denotes the percentage of respondents with an account who report one or more deposits into the account in the past 12 months. This includes cash or electronic deposits or fund transfers to the account (Ex: Salary receipt)

13) Withdrawal in the past year (% with an account, age 15+)

14) Used the internet to pay bills or buy things in the last year (% age 15+)

15) Used the mobile phone to pay bills or buy things in the last year (% age 15+)

Descriptive Statistics of the data are given in Annexure IV.

In order to expand the study, data for the years from 2010 to 2014 is extracted from the FAS for 123 countries, in the following indicators to represent the above indicators.

1) No of deposit accounts with commercial banks and credit unions per 1000 adults

2) Number of ATMs per 100,000 adults

3) Number of commercial bank & credit unions branches per 100,000 adults

4) Borrowers from commercial banks & credit unions per 1000 adults

5) Depositors with commercial banks & credit unions per 1000 adults

The Findex Database provides micro level data gathered from a sample of individual respondents representing the country, whereas the FAS provides macro level data of a country by getting the country totals against the adult population. Both surveys provide indicators with pros and cons. Sample selection is crucial in Findex, and, if not done effectively, the country representation is misinterpreted, although it provides more accurate and appropriate indicators for FI due to the individual respondents. In the FAS, as country aggregates are taken, the country is well represented, but the accuracy at an individual level is not represented. For the

computation of IFI, Findex data is more relevant. But the availability of data with a reasonable frequency is a matter of concern.

To study the relationships with the computed IFI, data for the following indicators are also tabulated for the period 2010 to 2014 for the countries considered above;

1) Literacy Rate
2) Gini Coefficient
3) Income Classification of Countries

3.2 Variable Selection

15 variables are considered for the computation of IFI, in 3 dimensions. The assignment of variables under the dimensions are as follows.

1. ACCOUNT
   Hold of a deposit account at a financial institution. This is the basic requirement to be financially inclusive, sustainably.
   Proxy : Number of Accounts per Adults

2. ACCESS
   The availability of financial infrastructure and instruments for people's easy access. Improvement in access develops the spread of financial activities.
   The 5 variables (variable 2 to 6) from the Findex database are considered as proxies to develop the dimension.
   Proxies : Number of bank branches, No of ATMs, No of POSs, No of credit cards and No of debit cards available

3. USAGE
   This refers to the use of the above instruments and infrastructure to make financial transactions in a formal channel (with a significant frequency). The objectives of financial inclusion cannot be achieved by simply having access to financial transactions. It is necessary to make the financial transactions through the available channels, in order to improve financial inclusion.
   The 9 variables (variable 7 to 15) from Findex database are considered as proxies to develop the dimension.
   Proxies: Number of adults who borrowed, purchased on credit, saved, used credit card, used debit card, withdrew, deposited, made an internet transaction and made a mobile transaction within the last 12 months

3.3 Computation of the Index

The development of the IFI is the determination of coefficients (XYZ) of dimensions and sub dimensions or assigning weights are carried out following a three-step sequence:

(i) normalization of variables

(ii) determination of coefficients (YZ) of sub dimensions

(iii) determination of coefficients (X) of dimensions

The most popular composite indices of well-being, constructed by the UNDP, such as the Human Development Index (HDI), Human Poverty Index (HPI), and Gender- related Development Index (GDI) follow this basic sequence in developing multidimensional indices.

Similarly, other indices of FI, such as those proposed by Sarma and Massara et al., are based on this three-step sequence.

As discussed previously Sarma computed the index by taking the Euclidean Distance Geometric Mean of the dimensions in his papers 2008 and 2012, which is a similar method used in the global indices above. However, the assignment of weights to the dimensions and sub dimensions is done arbitrarily in these studies of Sarma. Thereafter, he developed the computation to an Euclidian geometric mean in his study in 2012.

Massara et al. developed a comprehensive composite index by running a Factor Analysis, a statistical identification to assign the weights to dimensions and sub dimensions, and develop the Index by aggregating them by taking the simple geometric mean.

In this study the simple arithmetic mean is taken to compute the IFI, as in the case of HDI and GDI[5].

Variable Normalization

There are various normalization approaches in use, however, the most common practical methods are the standardization, the min-max, and the distance to a reference. In this study the distance to a reference method is used. The distance to a reference measures the relative position of a given variable with respect to its reference point. This reference point is named as Optimal Value and values of the variable can be moved in a range of zero to Optimal Value ($0 - O_i$), where O_i is the Optimal Value of i the variable.

The optimal value for the variables are taken from the indicators that are directly related to an individual's performance, such as 'Accounts', 'Credit Cards', 'Debit Cards', 'Credit Card Usage', 'Debit Cards Usage', 'Borrowings', 'Savings', 'Deposits' etc., is one (1) per adult (i.e.

5 HPI is computed using simple geometric mean

100 %)[6]. Then the optimal value for the variables taken from the indicators that are not directly related to an individual's performance, such as bank branches, ATMs and POS terminals need be set, considering its own values. This optimal value is set to the value at 3 Standard Deviations to the right tail from the mean in order to exclude the impact of outliers that can harm the development of a generalized index. This optimal value selection is different to the values taken for variable normalization in the studies of Sarma and Massara et al. Sarma has used set values for the upper bound or the maximum value and Massara et al. used the maximum value of the variable itself, when computing the variable normalization.

$$O_i = \mu_i + 3\,\sigma_i \quad (1)$$

μ_i - mean of ith variable
σ_i - standard deviation of ith variable

In the normalized variable, the score of 1 is the optimum value position, and the normalized value of a country represents its position against the optimal value. The variable normalization formula is;

$$n_{ic} = \frac{x_{ic}}{O_i} \quad (2)$$

x_{ic} - value of ith variable in cth country,
n_{ic} - normalized value of ith variable in cth country

Determination of coefficients for sub dimensions

When determining the coefficients for sub dimensions, the method used in this study defines values by analyzing the correlation matrix for all the variables. Since only the year 2014 has data for all the variables in consideration, it gives the full correlation matrix. For the year 2011, data for five variables, 'Credit Card Usage', 'Debit Card Usage', 'Withdrawals', 'Deposits' and 'Internet Usage' are not available. Therefore, the correlation matrix gives the correlation coefficients for the rest of the variables. It is interesting to see that the correlation matrices for both the years give similar values with a few exceptions.

The methodology adopted to compute the coefficient is to take the average correlation of one variable to the other variables within one dimension. This figure gives the general correlation of that variable with other variables within that dimension. From the two data sets for the years 2011 and 2014, final average correlation coefficient for each of the 15 variables. This

generalized correlation coefficient will be more accurate with availability of more data sets annually.

Considering the attribute of correlation, if two variables are perfectly correlated, it is adequate to take one variable to analyze the characteristics or to calculate the composite index. Conversely, if two variables are perfectly uncorrelated, the two variables need to be analyzed separately and should be considered to calculate a composite according to the importance. Whereas, if the two variables are moderately correlated, the characteristics analysis and composite calculation of the two variables can be considered as equally important. This is the basis to compute the coefficients for the variables using the correlation matrix. The logic is the relevance of selected variable to the composite index is higher when it has low generalized correlation to the other variables and vise-versa. Therefore, it was decided to use the difference between generalized correlation value and one (1.0), and compute the Generalized Variable Coefficient (GVC) as it adds up to one (1.0) in one dimension. Formula (5) calculates the GVC for the variables, which is the sub dimension coefficient.

$$\mathrm{ACV}_i = \frac{\sum_{i=1}^{n} \mathrm{CC}_{ij}}{n-1} \tag{3}$$

CC_{ij} - Correlation Coefficient if *i*th variable and *j*th variable (where $i \neq j$)
ACV_i - Average Correlation of *i*th variable

$$\mathrm{VC}_i = \frac{\sum_{y=1}^{m} (1-\mathrm{ACV}_{iy})}{m} \tag{4}$$

ACV_{iy} - Average Correlation of *i* th variable of year *y*
VC_i - *i*th Variable Coefficient

$$\mathrm{GVC}_i = \frac{\mathrm{VC}_i}{\sum_{i=1}^{n} \mathrm{VC}_i} \tag{5}$$

GVC_i - Generalized Variable Coefficient of *i*th Variable

Determination of coefficients for dimensions (Coefficients of the Composite index)

Dimension Values (DV) are then computed using the formula (6) for the years.

$$\mathrm{DV}_x = \sum_{i=1}^{n} \mathrm{GVC}_i \times \mathrm{VV}_i \tag{6}$$

After generating the DVs for all the countries in the respective years of the data set, IFI, the composite index is then developed computing the simple arithmetic mean[7]. The Final Index is presented as a per cent value, which means the value for 100 adults[8].

$$\mathrm{IFI}_c = \frac{\mathbf{100}}{\mathbf{3}} \sum_{x=1}^{3} \mathrm{DV}_x \tag{7}$$

4. Results and analysis

4.1 Development of IFI

The development of IFI starts with analyzing the correlation matrix for all the variables (Annexure I and II) to define the values for the sub dimensions and the results are tabulated below.

ACCESS

Table 1: GVC for ACCESS variables

Variables	Average Correlation of Variable (ACV)		Variable Coefficient (VC)	Generalized Variable Coefficient (GVC)	
	2014	2011			
Bank Branches	0.49	0.27	0.62	GVC_1	0.3
ATMs	0.64	0.54	0.41	GVC_2	0.2
POS s	0.62	0.55	0.42	GVC_3	0.2
Credit Cards	0.66	0.59	0.37	GVC_4	0.15
Debit Cards	0.63	0.61	0.38	GVC_5	0.15
			2.2		**1.0**

The formula derived for the dimension 'ACCESS' is;

DV access = (0.3 * Branches) + (0.2 * ATM) + (0.2 * POS) + (0.15 * CC) + (0.15* DC)

[7] Global composite indices such as HDI and GDI also adopt the simple arithmetic mean.
[8] From all 15 variables, only 3 variables could not be taken as optimal values per person, but optimal values per 100,000 adults. Since the 12 other variables can be considered as per person values, the overall index is considered as a percentage of per adult value.

USAGE

Table 2: GVC for USAGE variables

Variables	Average Correlation of Variable (ACV)		Variable Coefficient (VC)	Generalized Variable Coefficient (GVC)	
	2014	2011			
Borrowings	0.1	0.1	0.9	GVC6	0.2
Credit Purchases	0.1	0.1	0.9	GVC7	0.2
Savings	0.03	0.55	0.58	GVC8	0.1
CC Usage		0.55		GVC9	
DC Usage		0.58		GVC10	
Deposits		0.52	0.5	GVC11	0.1
Withdrawals		0.51	0.5	GVC12	0.1
Internet Usage		0.6	0.4	GVC13	0.1
Mobile Usage	-0.04	-0.04	1.4	GVC14	0.2
			5.18		**1.0**

Variables 'Credit Card Usage' and the 'Debit Card Usage' is omitted from the computation of the 'USAGE' since those two variables show the perfect correlation to the 'Credit Cards' and 'Debit Cards' respectively. This is discussed in detail in the next section (4.3).

The formula derived for the dimension 'USAGE' is;

$$DVUsage = (0.2 * Borrow) + (0.2 * Cr.Purchase) + (0.1 * Save) + (0.1 * Withdraw) + (0.1 * Deposit) + (0.1 * Internet\ Usage) + (0.2 * Mobile\ Usage)$$

Finally, the composite index formula is;

$$IFI = \frac{100}{3}(Account + Access + Usage)$$

4.2 Results and Discussion

It was noteworthy to find some important points regarding Correlation Matrices. Those are;

- Variable 'Account' is highly correlated with the variables 'Debit card' and 'Savings' with a value of 0.9 and 0.8, respectively. Vis-a-vis 'Withdrawal' and 'Deposits' also show a moderate correlation of 0.6 with the 'Account'. This is common for both

years and emphasizes the common practice, understanding and the commonly accepted logic that possessing a deposit account leads people to save and also to possess a debit card.

- Variables 'Credit Card Usage' and the 'Debit Card Usage' are perfectly correlated to the variables 'Credit Card' and 'Debit Card' respectively in the year 2014 (there is no data for the 'Credit Card Usage' in year 2011). This finding confirms that the usage of card transactions increase, as the number of cards issued increase. Therefore, it is reasonable to consider that possessing a card will lead to card transactions. Considering the perfect correlation, it was decided to drop the variables of 'Credit Card Usage' and the 'Debit Card Usage'.
- 'Internet Usage' for financial transactions is having a strong correlation with a coefficient of 0.9 with 'Credit Card Usage', 'Credit Card' and 'Debit Card', which indicates that improvement in internet transactions is based on the improvement of 'Credit Card Usage' 'Credit Card' and 'Debit Card' or vise-versa (Since there is no data for the 'Credit Card Usage' in year 2011, this correlation is shown in year 2014 only).
- A slightly moderate correlation of value 0.6 is shown for the variables 'ATMs' and 'Debit Cards' for both the years. A strong correlation is expected between these, as higher the debit cards higher the ATMs that are required for cash withdrawals and vise-versa. Also, debit cards are used more at present, for purchasing, reducing the requirement for cash withdrawals. This might have caused the correlation to be moderate.
- It is confusing to see the weak relationship between the variables 'Credit Purchases' against the 'Credit Cards' and the 'Credit Card Usage' with a coefficient of 0.2, as the most common instrument for credit purchases is the credit card.

IFIs are calculated for 143 countries for the years 2014 and 2011.[9] Due to the inadequacy of data, which is available only for the years 2014 and 2011, data for more years are extracted from the FAS in order to analyze the relevance of the composite index. A five-year span of consecutive years, from year 2010 to 2014 is taken, but with a reduction of variables only up to five variables. These variables are 'Account', 'Branches', 'ATMs', 'Borrowers' and 'Depositors'. Due to the availability of data in FAS, and in order to improve the significance, the above variables are taken for institutions, commercial banks and credit unions together for 124 countries. However, it is necessary to mention that the countries considered in the FAS dataset are not a subset of the countries considered in the Findex dataset.

[9] The accuracy of the IFIs calculated for the year 2011 deviates as the data for the variables 'Deposit', 'Withdrawal' and 'Internet Usage' is not available. Hence the values on the dimension 'USAGE' is affected.

Since the variables that can be taken for the years 2010 to 2014 in the FAS database are limited, the above formulae were re-formed as follows[10] to generate the IFIs for the respective years. Sub-dimensions were reduced to 2 for each of the dimensions 'Usage' and 'Access'.

ACCESS

Table 3: GVC re-formed for ACCESS variables (FAS Data)

Variables	Generalized Variable Coefficient (GVC)		GVC re-formed For FAS Data
Bank Branches	GVC1	0.3	0.6
ATMs	GVC2	0.2	0.4
POS s	GVC3	0.2	No Data
Credit Cards	GVC4	0.15	No Data
Debit Cards	GVC5	0.15	No Data
		1.0	1.0

USAGE

Table 4: GVC re-formed for USAGE variables (FAS Data)

Variables	Generalized Variable Coefficient (GVC)		GVC re-formed For FAS Data
Borrowings	GVC6	0.2	0.66
Credit Purchases	GVC7	0.2	No Data
Savings	GVC8	0.1	0.33
Deposits	GVC11	0.1	No Data
Withdrawals	GVC12	0.1	No Data
Internet Usage	GVC13	0.1	No Data
Mobile Usage	GVC14	0.2	No Data
		1.0	1.0

Then the new formulae for the dimensions are:

DV access = (0.6 * Branches) + (0.4 * ATM)

DVUsage = (0.66 * Borrow) + (0.33 * Save)

[10] The new GVCs are calculated according the ratios of weightages derived in the formulae developed above.

4.3 Analysis

For the year 2014 the Findex database has provided appropriate data and detailed indicators for the computation of IFI. Even though the indicators are the same, a lesser amount of data is available for the year 2011. Thus, the Financial Inclusion Index is developed for 143 countries using data for the years 2011 and 2014. The IFI values and the respective ranks are given in Annexure III for 38 selected countries in the order of the 2014 ranking for easy reference, and Annexure V gives the full list of countries in the order of the 2014 ranking. The ten top ranked countries are Spain, Austria, Canada, New Zealand, Australia, Luxembourg, United Kingdom, Norway, Switzerland, and Denmark. In comparison to the OECD countries, the 26 countries with the heist IFI in 2014 represent the OECD countries[11] except Singapore. Again, in the year 2011 Singapore, Norway and Switzerland are the exceptions for the first 24 countries ranked as having the highest FI. Norway and Switzerland, along with Bhutan, Belize, and Nambia show a sharp increase in IFI and improvement in the rank from 2011 to 2014. The reason could be the unavailability of the data on the indicator 'Account' for the year 2011. Therefore, Singapore can be considered as the only exception to the high ranked countries. This is a good indication that the index developed fits well, because, out of the 34 OECD countries, 25 are ranked as the highest financially inclusive countries.

Therefore, the results of the IFI are analyzed against the income category of the countries for each year. The IFI was categorized as 'High IFI', 'Moderate IFI' and 'Low IFI' according the values for each year for the countries. High IFI countries represent the values above the 3rd Quartile of the respective year, while the low IFI Countries are countries blow the 1st Quartile. On average 25% of the high IFI countries represent the high-income countries in both the years. The majority of moderate IFI represent middle-income countries, while moderate IFI countries marginally represent the high and low-income countries. Low IFI countries, which are supposed to be represent the low-income countries majorly represent the middle-income countries as well. Figure 1 below explains this graphically.

The improvement in the literacy rate of a country, and the inequality or wealth distribution of a country influences the improvement in the FI. Therefore, this phenomenon is tested on the results of the developed IFI. The WDI database of the World Bank data provides the Gini Index indicator. The literacy rates of the countries were extracted from the UNESCO data bank. The data was not available for the full range of countries in this study, and for the year 2014, the most recent values for the literacy rates were considered.

[11] Out of 34 OECD countries

Figure 1: IFI Categories Vs. Income categories (IFI 2011 & 2014)

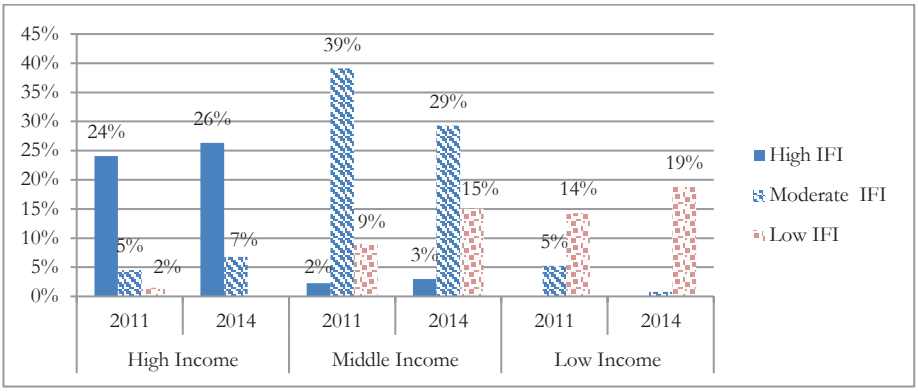


Table 5: IFI Categories Vs. Income categories (IFI 2011 & 2014)

		Countries with High FI	Countries with Moderate FI	Countries with Low FI
2011	High	32	6	2
	Upper Middle	2	33	2
	Lower Middle	1	19	10
	Low	0	7	19
2014	High	35	9	0
	Upper Middle	3	27	6
	Lower Middle	1	12	14
	Low	0	1	25

The correlation coefficients of the literacy rate and the IFI are 0.56 and 0.65 for the years 2011 and 2014, respectively. Although a high correlation between the literacy rate and the IFI is expected, the empirical results of this study show only a moderate correlation for the year 2011 and a correlation of 0.65 in the year 2014, which is a nearly strong correlation. Considering the data availability for the year 2014, which is richer compared to 2011, it is reasonable to conclude that the IFI composite index developed in this study is a better representation of FI.

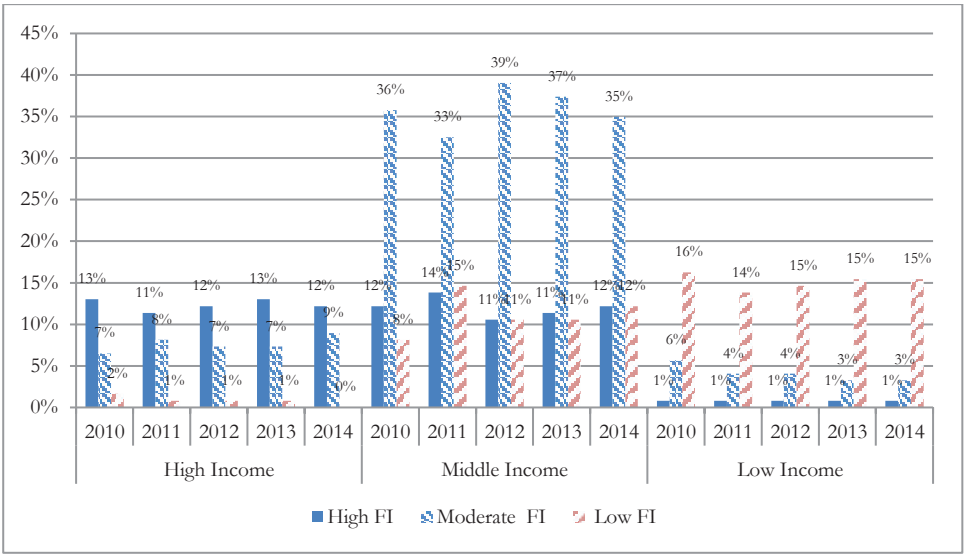
Gini coefficient and the IFI are also expected to be strongly correlated[12]. But the results show a weak correlation between these two indicators as 0.4 and 0.2. Therefore, this is an area of development in the study to examine the reasons for this deviation in empirical results.

With the objective of improving or enhancing the study, IFI_R (using re-formed formulae for ACCESS and USAGE) is calculated for the span of 5 years, from the year 2010, using the FAS data and the re-formed formulae generated in the previous chapter.

A comparison of the OECD countries in the top ranked FI countries gives only 10-12 OECD countries in the first 25 countries with high FI. This explains the importance of the original formulae aggregating more factors or indicators that are relevant and required to compute a comprehensive index. This observation is further elaborated in the analysis done subsequently.

Figure 2 below shows that unlike in previous IFI results, the IFI_R results do not clearly distinguish the high, low and middle-income categories in the high low and moderate FI. The middle-income category substantially blends the high FI and low FI countries. In addition, more moderate FI countries are in the category of the high-income countries.

Figure 2: IFI Categories Vs. Income categories (IFI_R 2010 to 2014)



[12] FI values and Gini coefficient are inversely correlated because higher inequality or the lower wealth distribution gives higher Gini Coefficient and vice versa. Further, better wealth distributions results in higher FI values.

Table 6: IFI Categories Vs. Income categories (IFI, IFI_R2011 & 2014)

		IFI with Original Formulae			IFI with re-formed Formulae		
		High IFI	Moderate IFI	Low IFI	High IFI	Moderate IFI	Low IFI
2011	High	32	6	2	14	10	1
	Upper	2	33	2	15	14	3
	Lower	1	19	10	2	26	15
	Low	0	7	19	1	5	17
2014	High	35	9	0	15	11	0
	Upper	3	27	6	13	19	3
	Lower	1	12	14	2	24	12
	Low	0	1	25	1	4	19

A comparison[13] is further done for the years 2011 and 2014 for the results obtained using the original formulae and the re-formed formulae for the dimension value calculation. Table 6 clearly shows that the IFI results obtained using the re-formed formulae deviates from the accuracy of categorization.

The movement of IFI_R results computed using fewer variables and the re-formed formulae against the literacy rate and the Gini coefficient. For all the 5 years considered in the study, the IFI calculation in the FAS data gives moderate correlation for both the literacy rate and the Gini coefficient. But it can be noticed that the IFI calculations from the Findex database gives improved correlation coefficients (Table 7).

Table 7: Relationship to Literacy and Gini Coefficient (IFI, IFI_R)

	IFI		IFI_R	
	Correlation Coefficeint_ IFI – Literacy	Correlation Coefficeint_ IFI – Gini	Correlation Coefficeint_ IFI – Literacy	Correlation Coefficeint_ IFI – Gini
2010			0.54	-0.38
2011	**0.53**	**-0.42**	**0.52**	**-0.41**
2012			0.54	-0.43
2013			0.57	-0.30
2014	**0.68**	**-0.44**	**0.60**	**-0.34**

[13] The comparison is made for the sub set of countries common to both the data sets.

5. Conclusion and Recommendations

5.1 Conclusion

Many definitions for financial inclusion are discussed in the literature, but for the purpose of this paper FI is defined as the 'depth and spread of the possibilities of formal financial activities among and throughout the population of an economy'.

Therefore, many aspects need to be taken into consideration when measuring FI. In the literature, there are different indices that have been developed to measure FI. As discussed throughout this paper, the limited data availability has influenced the accuracy or the significance of those indices.

With the availability of data in the Findex database, for the recent years, this study attempted to develop a more appropriate, significant and accurate index using more indicators. The index was developed using 13 indicators, such as 'Account', 'Bank Branches', 'Credit Cards', 'Borrowings', 'Deposits', 'Withdrawals', 'Mobile Usage' for transactions, etc.

Previous studies were only restricted to 4 – 6 variables due to the limitation of data. Massara et al. used Factor Analysis to derive the weights for the dimensions and sub dimensions, but excluded the 'Transaction Account' variable in the study, which is an important indicator in FI. Among other studies, Sarma assigned weights for the variables in sub-indices, arbitrarily. This study is carried out with the objective of developing an index, overcoming the major drawbacks in the previous two studies, as discussed above. Therefore, this study improved the usage of important and relevant variables of FI and derived the weights for the variables using the correlation matrix of the variables and then developed the composite index by taking the arithmetic mean of the dimensions.

Sri Lanka is ranked 59th in the year 2014, with an IFI of 34 out of 143 countries in the sample considered. This shows a decline in rank from 53 in the year 2011, but with an increase in the IFI from 28. Sri Lanka is in a better position when the variables of 'Account', 'No of 'Bank branches' and the 'Savings' are compared with the other countries, in both the years considered, that have ranks between 30 to 60 out of 143 (Annexure VI &VII). Therefore, these variables could impact mostly for Sri Lanka to obtain a comparatively higher rank in the Financial Inclusion Index. Also, these ranking are improved in the year 2014 compared to the year 2011 and that could have impacted the development in the IFI in the year 2014. The emerging trends in FI are electronic payments (credit cards, debit cards, internet payments and mobile payments). In comparison to the other countries in the data set, Sri Lanka is in a state that needs improvement in those areas. However, it can be considered that Sri Lanka is in a better state in FI compared to the other countries in the region and also due to its position as a developing country.

In order to measure the accuracy or the relevance of the developed index, the results of IFI were analyzed against the countries income classification, literacy rate, Gini coefficient and a comparison was made with the OECD countries.

The IFI and the literacy rate show a moderate to nearly strong correlation, but surprisingly the Gini index shows a weak relationship to the IFI developed. When the index results are compared according to the income classification of the countries the high, middle and low-income countries are well represented in high, medium and low IFI countries. Almost 75% of the OECD countries are ranked the highest IFI countries.

Therefore, the index developed with more relevant indicators or variables, well represents the Countries' FI. With the expectation that the Global Findex database will be updated with a reasonable frequency (annually) that this index can be used as an accurate indication of the country's FI and will give a better representation of the FI ranking of a country where, it can be used to measure the development of financial inclusion state of a country.

5.2 Limitations of the study and future research areas

Internet banking and mobile banking are emerging trend in the world. Therefore, this study can be developed by including those areas in to the development of the index. Further, facilities like prepaid cards can also be included when improving the index.

The major limitation of the study is the unavailability of data for a reasonable period for all the indicators. In the future, the Global Findex database will be updated with a reasonable frequency (annually) and therefore the IFI can be expected to be more accurate.

Empirical results of this study deviated from the expected results for the correlation between the IFI and Gini index and thus can be proposed as a lead for further research.

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Annexures

Annexure I: Correlation matrix for all the 15 variables for the year 2014

	Acc	CB Br	ATM	POS	Crd Card	Dbt Card	Borrow	Crd Purch	Save	CC Usage	DC Usage	Deposit	Withdrawal	Internet	Mobile
Acc	1	0.3	0.6	0.7	0.8	**0.9**	0	0.1	**0.8**	0.8	0.9	*0.6*	*0.6*	0.8	0.1
CB Br	0.3	1	0.3	0.3	0.2	0.3	-0.1	0	0.2	0.2	0.2	0.2	0.2	0.2	0
ATM	0.6	0.3	1	0.6	0.6	0.6	0.1	0.1	0.5	0.6	0.6	0.5	0.5	0.5	-0.1
POS	0.7	0.3	0.6	1	0.7	0.7	0.1	0.1	0.6	0.7	0.7	0.5	0.5	0.7	0
			0.6												
Crd	0.8	0.2		0.7	1	0.8	0	*0.2*	0.8	**1**	0.8	0.6	0.6	**0.9**	0
Dbt	0.9	0.3	*0.6*	0.7	0.8	1	0.1	0.1	0.8	0.8	**1**	0.7	0.7	**0.9**	0.1
Borrow	0	-	0.1	0.1	0	0.1	1	0	0.1	0.1	0.1	0.2	0.1	0.1	-0.2
Crd Pur	0.1	0	0.1	0.1	0.2	0.1	0	1	0.1	0.2	0.1	0.1	0.1	0.1	0
Save	0.8	0.2	0.5	0.6	0.8	0.8	0.1	0.1	1	0.8	0.8	0.6	0.6	0.9	0
CC U	0.8	0.2	0.6	0.7	1	0.8	0.1	*0.2*	0.8	1	0.8	0.6	0.6	**0.9**	0
DC U	0.9	0.2	0.6	0.7	0.8	1	0.1	0.1	0.8	0.8	1	0.7	0.7	0.9	0
Deposit	0.6	0.2	0.5	0.5	0.6	0.7	0.2	0.1	0.6	0.6	0.7	1	0.9	0.6	-0.1
Wtdwl	0.6	0.2	0.5	0.5	0.6	0.7	0.1	0.1	0.6	0.6	0.7	0.9	1	0.6	-0.1
Internet	0.8	0.2	0.5	0.7	0.9	0.9	0.1	0.1	0.9	0.9	0.9	0.6	0.6	1	0
		0	-0.1	0	0	0.1									
Mobile	0.1						-0.2	0	0	0	0	-0.1	-0.1	0	1

Annexure II: Correlation matrix for all the 15 variables for the year 2011

	Acc	CB Br	ATM	POS	Crd Card	Dbt Card	Borrow	Crd Purch	Save	CC Usage	DC Usage	Deposit	Withdrawal	Internet	Mobile
Acc	1	0.6	0.7	0.7	0.8	**0.9**	0	0	**0.8**						0.1
CB Br	0.6	1	0.5	0.5	0.5	0.5	0	0	0.3						0
ATM	0.7	0.5	1	0.7	0.7	0.6	-0.1	-0.1	0.5						-0.1
POS	0.7	0.5	0.7	1	0.7	0.6	0.1	0.1	0.6						0
Crd Card	0.8	0.5	0.7	0.7	1	0.8	0	*-0.1*	0.8						0.1
Dbt Card	0.9	0.5	*0.6*	0.6	0.8	1	0.1	0	0.8						0.1
Borrow	0	0	-0.1	0.1	0	0.1	1	0.3	0						-0.1
Crd Pur	0	0	-0.1	0.1	-0.1	0	0.3	1	0						0
Save	0.8	0.3	0.5	0.6	0.8	0.8	0	0	1						0
CC U															
DC U															
Deposit															
Wtdwl															
Internet															
Mobile	0.1	0	-0.1	0	0.1	0.1	-0.1	0	0						1.0

Annexure III

Country	Rank		IFI	
	2014	2011	2014	2011
Spain	1	1	68	61
Australia	2	2	67	59
Canada	3	6	67	56
New Zealand	4	4	65	56
Austria	5	5	63	56
Luxembourg	6	3	62	57
United Kingdom	7	7	62	54
Norway	8	108	61	9
Switzerland	9	79	60	16
Denmark	10	9	59	53
Netherlands	11	8	59	53
Belgium	12	15	59	51
Japan	13	21	59	47
France	14	10	59	52
Sweden	18	22	57	47
Italy	19	27	56	44
United States	20	24	56	46
Singapore	25	25	54	46
Germany	26	17	53	49
Iran, Islamic Rep.	29	35	51	38
Hong Kong, China	30	29	51	43
Korea, Rep.	33	13	50	51
United Arab Emirates	37	50	47	30
Brazil	40	39	47	36
Thailand	46	46	42	33
China	51	54	41	27
South Africa	56	56	38	26
Sri Lanka	59	53	37	28
Kenya	73	68	31	21
India	84	82	26	15
Indonesia	86	89	25	14
Bhutan	92	131	22	4
Philippines	98	94	20	13
Ethiopia	115	139	13	2
Iraq	131	114	8	6
Pakistan	132	115	8	6
Somalia	136	142	5	1
Niger	143	140	2	1

Annexure IV

Descriptive Statistics

2014	ACC		ATM__ADULTS	POS__ADULTS	CREDIT_CARD_	
Mean	53.21	22.51	51.55	1039	17.96	39.37
Median	50.34	15.26	48.81	597.99	10.71	32.94
Maximum	100	256.26	222.27	4889.6	77.07	98.63
Minimum	1.79	0.76	0.8	1.03	0.12	0.49
Std. Dev.	31.91	28.43	42.63	1162.54	19.99	30.77
Skewness	0.07	5.15	1.3	1.29	1.26	0.45
Kurtosis	1.57	39.8	5.17	4.04	3.56	1.89
Jarque-Bera	12.38	7425.43	55.3	23.94	39.18	12.24
Probability	0	-	-	0	-	0
Sum	7661.65	2745.96	5979.91	76886.13	2550.02	5669.32
Sum Sq. Dev.	145646.4	97789.21	209033	98659684	56340.62	135369.6
Observations	144	122	116	74	142	144

2014	BORROW__FI	SAVE__FI	CREDIT_PURCHAES	DEPOSIT_12M	WITHDRAWAL_12M	CC_USAGE_12M	DC_USAGE_12M	INTERNET_12M	MOBILE_12M
Mean	12.05	22.55	10.55	77.79	79.03	15.3	28.56	17.4	3.04
Median	11.78	15.3	8.7	80.02	80.76	8.12	17.67	5.81	1.68
Maximum	40.51	78.41	44.76	98.74	99.01	75.11	95.92	78.98	26.93
Minimum	1.28	0.65	0.59	38.01	41.03	0.03	0.04	0.07	0.06
Std. Dev.	7.47	18.8	8.2	13.04	13.27	18.07	28.78	21.83	4.53
Skewness	1	1.03	1.75	-0.61	-0.78	1.4	0.89	1.37	3.41
Kurtosis	4.46	3.13	6.6	2.99	3.24	4.11	2.53	3.62	15.92
Jarque-Bera	33.84	25.74	149.61	7.99	13.65	52.86	20.21	46.41	765.53
Probability	-	0	-	0.02	0	-	0	-	-
Sum	1590.14	3247.58	1497.46	10112.68	10274	2141.77	4055.41	2471.21	261.12
Sum Sq. Dev.	7319.37	50561.11	9482.23	21926.45	22700.23	45384.58	116771.7	67214.96	1743.62
Observations	132	144	142	130	130	140	142	142	86

2011	ACC	CB_BR_ _ADULTS	ATM__ ADULTS	POS__ADULTS	CREDIT_CARD_	DEBIT_CARD	BORROW__FI	SAVE_ __FI	CREDIT_ PURCHAES	MOBILE _12M
Mean	47.5	19.82	47.49	1039	18.01	32.72	9.92	19	8.41	2.9
Median	40.46	15.07	39.54	597.99	10.19	22.48	8.56	13.45	6.57	1.57
Maximum	99.74	102.19	282.49	4889.6	79.66	97.61	30.65	63.58	42.81	25.65
Minimum	0.4	0.63	0.32	1.03	0.14	0.27	0.84	0.12	0.33	0.06
Std. Dev.	32.59	18.97	47	1162.54	20.33	29.03	6.03	17.36	7.4	4.34
Skewness	0.28	1.75	1.85	1.29	1.25	0.73	0.94	1.05	1.85	3.39
Kurtosis	1.63	6.75	7.96	4.04	3.43	2.27	3.72	2.95	7.32	15.73
Jarque-Bera	12.01	145.1	206.36	23.94	34.7	14.77	22.51	24.45	177.72	736.45
Probability	0	-	-	0	-	0	0	0	-	-
Sum	6269.46	2616.34	6126.31	76886.13	2341.41	4319.32	1328.7	2507.63	1110.43	246.25
Sum Sq. Dev.	139135.7	47166.49	282692.5	98659684	53317.16	110387.4	4840.57	39476.04	7166.39	1581.31
Observations	132	132	129	74	130	132	134	132	132	85

Annexure V

Country	IFI Rank		Country	IFI Rank		Country	IFI Rank	
	2014	2011		2014	2011		2014	2011
Spain	1	1	Germany	26	17	China	51	54
Australia	2	2	Mongolia	27	30	Hungary	52	41
Canada	3	6	Malta	28	19	Kuwait	53	26
New Zealand	4	4	Iran, Islamic Rep.	29	35	Turkey	54	40
Austria	5	5	Hong Kong China	30	29	Jamaica	55	48
Luxembourg	6	3	Greece	31	28	South Africa	56	56
United	7	7	Latvia	32	31	Costa Rica	57	58
Norway	8	108	Korea, Rep.	33	13	Chile	58	61
Switzerland	9	79	Czech Republic	34	34	Sri Lanka	59	53
Denmark	10	9	Cyprus	35	14	Montenegro	60	55
Netherlands	11	8	Taiwan, China	36	37	Saudi Arabia	61	63
Belgium	12	15	United Arab	37	50	Romania	62	59
Japan	13	21	Slovak Republic	38	33	Puerto Rico	63	132
France	14	10	Colombia	39	77	Belarus	64	57
Portugal	15	11	Brazil	40	39	Venezuela, RB	65	60
Finland	16	20	Serbia	41	45	Ukraine	66	66
Slovenia	17	12	Poland	42	42	Namibia	67	123
Sweden	18	22	Mauritius	43	36	Bosnia and	68	52
Italy	19	27	Russian Federation	44	49	Peru	69	70
United States	20	24	Lithuania	45	43	Argentina	70	69
Ireland	21	18	Thailand	46	46	Lebanon	71	64
Estonia	22	23	Macedonia, FYR	47	38	Ecuador	72	65
Croatia	23	16	Malaysia	48	47	Kenya	73	68
Israel	24	32	Bulgaria	49	44	Kazakhstan	74	67
Singapore	25	25	Bahrain	50	51	Uruguay	75	88

Country	IFI Rank		Country	IFI Rank		Country	IFI Rank	
	2014	2011		2014	2011		2014	2011
Dominican	76	73	Vietnam	101	97	Haiti	126	101
Botswana	77	83	Jordan	102	84	Burkina Faso	127	117
Kosovo	78	62	Moldova	103	96	Togo	128	126
Georgia	79	72	Gabon	104	104	Mali	129	122
Belize	80	120	Uganda	105	105	Cambodia	130	136
Panama	81	76	Bangladesh	106	85	Iraq	131	114
Nigeria	82	93	Zambia	107	99	Pakistan	132	115
Guatemala	83	80	WB and Gaza	108	100	Tajikistan	133	125
India	84	82	Tunisia	109	113	Burundi	134	119
Mexico	85	78	Mauritania	110	106	Yemen, Rep.	135	135
Indonesia	86	89	Zimbabwe	111	75	Somalia	136	142
Bolivia	87	87	Myanmar	112	143	Congo, D. Rep.	137	138
Algeria	88	86	Nicaragua	113	112	Afghanistan	138	127
Uzbekistan	89	81	Tanzania	114	107	Chad	139	118
Albania	90	74	Ethiopia	115	139	Guinea	140	137
El Salvador	91	102	Malawi	116	111	Turkmenistan	141	141
Bhutan	92	131	Congo, Rep.	117	116	Madagascar	142	133
Azerbaijan	93	103	Kyrgyz Republic	118	130	Niger	143	140
Rwanda	94	90	Egypt, Arab Rep.	119	121			
Angola	95	71	Côte d'Ivoire	120	134			
Nepal	96	98	Cameroon	121	109			
Honduras	97	92	Sierra Leone	122	110			
Philippines	98	94	Senegal	123	129			
Ghana	99	95	Sudan	124	124			
Armenia	100	91	Benin	125	128			

Annexure VI

Ranking of the Countries by each Variable 2014

No	Country	Acc	CB Br	ATM	POS	Credit	Debit	Borrow	Credit	Save	Deposit	Withdr	Internet	Mobile
1	Afghanistan	134	114	115		118	138	75	124	130			135	86
2	Albania	89	45	73	55	88	88	123	78	109	122	116	93	2
3	Algeria	72	102	100	68	85	90	119	127	84	96	117	72	6
4	Angola	99	70	84	64	93	91	87	138	75	40	56	125	3
5	Argentina	73	67	35		38	60	16	82	126	52	23	63	55
6	Armenia	117	44	41	58	90	114	9	13	139	78	83	76	61
7	Australia	9	30	4	2	11	14	53	62	6	11	5	7	
8	Austria	16	64	10	1	22	21	19	79	8	17	15	19	
9	Azerbaijan	100	82	72	57	77	101	13	55	118	45	39	85	85
10	Bahrain	41				36	27	77	14	31	85	89	35	
11	Bangladesh	101	91	94		137	122	44	7	111	118	124	139	41
12	Belarus	51	122	116	54	60	63	31	17	74	34	61	40	16
13	Belgium	11	13	18	28	20	8	48	119	13	31	29	18	
14	Belize	75	38	65		71	84	94	91	58	109	125	78	
15	Benin	121	108	105		117	123	111	126	113	120	108	103	80
16	Bhutan	94	61	85		139	98	17	92	57	54	115	129	
17	Bolivia	83	62	74	63	83	85	46	123	54	67	65	126	43
18	Bosnia and	71	25	62	39	76	69	57	106	102	43	43	95	63
19	Botswana	74	85	79		74	67	64	35	46	58	77	69	32
20	Brazil	56	10	6	20	32	42	52	107	91	35	33	62	49
21	Bulgaria	60	7	20	33	62	45	105	95	81	59	40	49	67
22	Burkina Faso	126	122	116		101	125	129	90	104	81	84	113	79
23	Burundi	138	112	112	75	138	140	6	40	127			140	65
24	Cambodia	128	99	92	62	100	120	128	71	129	130	127	134	83
25	Cameroon	131	116	108		132	117	7	97	108	70	76	131	70

No	Country	Acc	CB Br	ATM	POS	Credit	Debit	Borrow	Credit	Save	Deposit	Withdr	Internet	Mobile
26	Canada	7	40	1	11	1	10		38	5	3	6	9	
27	Chad	137	119	114		119	133	34	105	124			105	22
28	Chile	59	57	44	42	35	49	79	43	73	91	88	50	57
29	China	43	92	47		53	56	36	131	26	46	73	43	47
30	Colombia	87	1	66		58	75		72	93	94	80	68	37
31	Congo, Dem.	133	120	113		106	129	108	129	123			101	84
32	Congo, Rep.	119	122	116		107	111	59	137	97	69	100	130	46
33	Costa Rica	58	46	22	75	56	50	121	44	53	55	60	57	86
34	Côte d'Ivoire	123	122	116		122	119	11	134	101	83	102	114	
35	Croatia	35	21	11	15	24	28	78	3	43	9	12	42	
36	Cyprus	30	15	51		39	54	58	114	59	53	47	34	
37	Czech	40	37	56	35	41	38	12	51	29	12	18	21	
38	Denmark	1	33	49	16	26	6		76	4	1	1	4	
39	Dominican	67	79	75		70	86	70	54	48	84	85	86	25
40	Ecuador	78	4	116		89	80	100	133	82	44	46	107	50
41	Egypt, Arab	125	104	90		109	113	28	57	125	116	109	119	72
42	El Salvador	91	78	76	49	79	89	42	61	83	79	68	88	86
43	Estonia	13	73	24	21	33	9	95	41	38	2	10	11	
44	Ethiopia	109	122	116		135	142	32	56	86	121	130	138	
45	Finland	1	76	70	59	7	4	39	12	12	25	2	2	
46	France	18	14	13	14	19	22	109	87	19	57	36	22	
47	Gabon	97	122	116		87	96	47	135	65	71	98	89	11
48	Georgia	85	35	40	53	49	76	21	80	141	29	28	75	69
49	Germany	10	66	116	32	17	11	91	66	11	41	25	13	
50	Ghana	92	97	97	69	125	112	76	112	64	104	107	99	59
51	Greece	32	31	37	4	66	46	61	103	89	62	52	54	
52	Guatemala	82	19	71	40	82	99	127	70	72	115	104	84	86
53	Guinea	140	118	110		105	130	107	88	135			108	51
54	Haiti	116				95	127	27	122	98	129	129	100	56

No	Country	Acc	CB Br	ATM	POS	Credit	Debit	Borrow	Credit	Save	Deposit	Withdr	Internet	Mobile
55	Honduras	98	41	81		84	102	90	117	78	102	92	96	53
56	Hong Kong	22	43	116		6	32	85	68	20	39	37	27	
57	Hungary	50	60	42	38	63	41	99	50	63	23	24	39	
58	India	69	68	87		94	87	56	118	80	127	128	120	31
59	Indonesia	90	80	57	56	113	79	4	83	47	65	74	74	82
60	Iran, Islamic	26	34	43	24	69	26	112	2	60	105	81	46	
61	Iraq	132	96	116		103	131	23	5	131			77	38
62	Ireland	23	47	21		16	16	1	98	21	16	22	15	
63	Israel	31	53	8		2	73	51	1	16	8	8	31	
64	Italy	34	8	19	9	27	37	69	28	32	76	51	24	
65	Jamaica	44	101	77	34	57	58	92	102	41	106	106	56	21
66	Japan	17	20	7		5	15	49	52	7	19	19	28	
67	Jordan	106	51	78		104	94	30	116	128	107	64	102	86
68	Kazakhstan	68	107	26	51	68	74	40	96	106	89	95	66	14
69	Kenya	66	98	93		92	68	24	19	40	82	96	79	4
70	Korea, Rep.	24	55	116		12	33	82	42	17	37	34	17	
71	Kosovo	76	49	68		59	70	45	59	112	125	31	73	7
72	Kuwait	49	56	116	31	40	31	50	22	50	87	87	37	
73	Kyrgyz	113	93	80		98	116		108	122	128	121	90	54
74	Latvia	29	50	32		43	18	35	67	51	5	9	20	26
75	Lebanon	77	28	61	26	72	72		31	66	30	78	80	77
76	Lithuania	46	122	54	22	73	36	83	34	42	24	20	33	36
77	Luxembourg	21	3	14		3	17	54	110	9	26	21	14	
78	Macedonia,	52	36	48	25	45	51	125	20	85	56	55	55	5
79	Madagascar	141	117	109	72	141	139	102	75	133			143	86
80	Malawi	120	109	104	71	114	105	18	63	114	119	119	121	64
81	Malaysia	42	83	53	30	47	62	120	47	33	88	93	44	29
82	Mali	127	122	116		128	128	80	141	134	114	111	136	75
83	Malta	20	16	45		21	23	93	136	25	73	41	25	

No	Country	Acc	CB Br	ATM	POS	Credit	Debit	Borrow	Credit	Save	Deposit	Withdr	Internet	Mobile
84	Mauritania	110	95	98		91	108	29	100	95	86	79	87	8
85	Mauritius	39	39	60	36	50	40	73	30	30	68	62	83	35
86	Mexico	86	63	58		48	77	103	36	79	101	67	71	17
87	Moldova	114	74	69		81	100	2	89	115	47	66	58	58
88	Mongolia	27	5	39	43	123	35	8	39	34	99	49	67	18
89	Montenegro	62	12	27		54	71		11	119	33	45	65	34
90	Myanmar	108	110	111		142	137	96	93	88	123	105	141	
91	Namibia	63	71	50	50	78	55	65	85	45	77	94	92	
92	Nepal	93	90	95		133	115	60	6	69	92	120	137	78
93	Netherlands	6	65	55	10	30	2	3	140	10	15	14	8	
94	New Zealand	5	29	28	3	9	7	41	26	3	10	3	6	
95	Nicaragua	112	94	91		97	107	130	77	105	124	113	106	62
96	Niger	142	122	116		115	143	104	125	137			124	74
97	Nigeria	80	100	89		102	66	5	113	44	74	82	94	45
98	Norway	1	89	59	7	4	1		73	1	6	4	1	
99	Pakistan	135	59	99	60	140	132	67	9	132			110	44
100	Panama	81	42	34	44	75	81		101	62	108	101	70	86
101	Peru	102	2	46	61	64	92	66	120	92	50	44	98	42
102	Philippines	103	88	82		99	93	20	24	76	103	112	91	33
103	Poland	47	22	31	48	52	53	81	48	61	20	27	23	
104	Portugal	33	9	3	8	34	34	68	64	52	32	35	38	
105	Puerto Rico	53			23	42	43		84	55	93	75	41	
106	Romania	61	26	30	41	65	57	74	69	87	80	72	53	60
107	Russian	57	18	2	46	46	59	89	74	71	51	69	47	40
108	Rwanda	88	105	103	74	120	124	62	81	49	28	58	111	52
109	Saudi Arabia	54	87	25		67	39	118	27	70	110	126	48	
110	Senegal	129	122	116		124	118	84	37	117	42	38	122	81
111	Serbia	37	27	63	29	55	44	115	58	103	22	32	60	27
112	Sierra Leone	124	122	116		129	121	43	132	94	66	57	109	68

No	Country	Acc	CB Br	ATM	POS	Credit	Debit	Borrow	Credit	Save	Deposit	Withdr	Internet	Mobile
113	Singapore	19	86	36	19	28	13	26	86	23	36	48	36	
114	Slovak	48	32	38	37	51	30	55	49	24	4	7	26	
115	Slovenia	15	24	16	18	29	12	124	23	36	21	103	30	
116	Somalia	136				130	134	63	18	136			97	
117	South Africa	55	81	29		61	47	98	15	35	64	86	64	12
118	Spain	14	6	9	5	14	20	25	16	22	38	17	12	
119	Sri Lanka	38	54	88		96	82	101	115	39	126	122	116	30
120	Sudan	122	111	106		134	110			110	98	91	123	15
121	Sweden	4	48	67		18	3	86	25	2	7	11	3	
122	Switzerland	12	11	15	17	15	19		111	14	18	30	16	
123	Taiwan,	28			27	13	29	116	65	28	75	59	29	
124	Tajikistan	130	122	116	73	126	126	97	104	140			127	1
125	Tanzania	111	115	101	67	127	106	38	142	100	117	123	118	9
126	Thailand	45	72	12		86	48	117	130	27	27	26	82	71
127	Togo	115	122	116		131	135		128	116	113	114	128	73
128	Tunisia	105	122	116	52	80	104	15	53	96	112	118	81	
129	Turkey	65	52	23	6	31	61	122	45	99	97	99	45	13
130	Turkmenistan	143				142	141	33	8	143			142	86
131	Uganda	104	113	107	70	112	97	88	32	68	72	70	112	20
132	Ukraine	70	121	17	45	37	64	37	60	107	49	54	52	39
133	United Arab	36	77	33		25	24	14	33	37	63	53	32	
134	United	8	122	5	12	8	5	10	46	18	14	13	5	
135	United States	25	23	116	13	10	25	72	29	15	13	16	10	
136	Uruguay	79	75	52	47	23	65	131	21	90	100	42	51	76
137	Uzbekistan	84	17	96		116	83	126	109	138	48	71	133	10
138	Venezuela,	64	58	64		44	52	22	121	56	60	50	59	48
139	Vietnam	96	106	83		108	78	110	139	77	90	97	61	19
140	West Bank	107	84	86		121	109	71	10	121	111	110	115	23
141	Yemen, Rep.	139	122	116	65	136	136	106	4	142			132	66

No	Country	Acc	CB Br	ATM	POS	Credit	Debit	Borrow	Credit	Save	Deposit	Withdr	Internet	Mobile
142	Zambia	95	103	116	66	110	95	113	99	67	95	90	104	28
143	Zimbabwe	118	69	102		111	103	113	94	120	61	63	117	24

Annexure VII

Ranking of the Countries by each Variable 2011

No	Country	Acc @ a FI	CB Br /adults	ATM /adults	POS /adults	Credit Card	Debit Card	Borrow - FI	Credit Purchase	Save - FI	Mobile 12M
1	Afghanistan	118	120	124		116	108	90	108	117	86
2	Albania	82	44	70	55	62	71	130	101	83	2
3	Algeria	73	103	104	68	113	83	77	80	107	6
4	Angola	68	80	90	64	48	59	94	93	60	3
5	Argentina	74	71	51		39	58	13	6	109	55
6	Armenia	102	53	58	58	98	106	19	7	128	61
7	Australia	4	30	4	2	5	14	73	69	2	
8	Austria	11	67	11	1	23	11	18	10	11	
9	Azerbaijan	107	83	76	57	95	96	6	99	119	85
10	Bahrain	46				43	26	5	23	57	
11	Bangladesh	77	90	115		115	117	24	25	54	41
12	Belarus	50	121	62	54	73	36	52	107	93	16
13	Belgium	15	12	20	28	13	12			22	
14	Belize		36	64				113	131		
15	Benin	113	112			127	131			91	80
16	Bhutan		64	93				21	122		
17	Bolivia	83	84	84	63	85	87	32	71	53	43
18	Bosnia and Herz.	52	29	67	39	57	53	101	77	98	63
19	Botswana	79	88	83		60	79	95	95	55	32
20	Brazil	53	11	10	20	33	44	83	66	76	49
21	Bulgaria	55	7	19	33	63	38	121	117	105	67
22	Burkina Faso	111				117	121	129	74	88	79

No	Country	Acc @ a FI	CB Br /adults	ATM /adults	POS /adults	Credit Card	Debit Card	Borrow - FI	Credit Purchase	Save - FI	Mobile 12M
23	Burundi	121	118	123	75	122	129	11	32	115	65
24	Cambodia	129	109	105	62	130	114	110	111	129	83
25	Cameroon	108	128	120		102	120	9	19	78	70
26	Canada	16	39	2	11	3	9	133	114	9	
27	Chad	119	131	126		80	104	84	48	92	22
28	Chile	64	59	30	42	37	64	91	115	70	57
29	China	47		75		72	46	39	56	28	47
30	Colombia	78	68	71		65	66	92	60	80	37
31	Congo, Dem. Rep.	126	132	125		107	125	120	132	120	84
32	Congo, Rep.	116	116	119		82	109	53	89	99	46
33	Costa Rica	57	42	46	75	55	40			42	86
34	Côte d'Ivoire		106	107				26	14		
35	Croatia	25	23	13	15	28	17	2	61	71	
36	Cyprus	29	1	26		17	37	59	54	30	
37	Czech Republic	31	43	57	35	35	29	14	75	25	
38	Denmark	1	19	32	16	20	6	108	98	6	
39	Dominican Republic	69	79	78		54	70	67	90	59	25
40	Ecuador	71	13	60		66	75	118	106	64	50
41	Egypt, Arab Rep.	117	105	98		108	107	115	121	130	72
42	El Salvador	110	75	74	49	79	92	87	31	68	86
43	Estonia	13	58	22	21	30	4			32	
44	Ethiopia		122	129				41	59		
45	Finland	2	66	68	59	6	7	15	87	7	
46	France	12	15	14	14	25	22	124	127	15	

No	Country	Acc @ a FI	CB Br /adults	ATM /adults	POS /adults	Credit Card	Debit Card	Borrow - FI	Credit Purchase	Save - FI	Mobile 12M
47	Gabon	100	99	96		94	99	47	84	82	11
48	Georgia	75	54	61	53	69	73	37	34	125	69
49	Germany	8	65	9	32	27	8	100	76	8	
50	Ghana	81	101	111	69	99	89	78	67	58	59
51	Greece	34	18	27	4	45	54	28	94	43	
52	Guatemala	91	22	81	40	76	85	123	91	77	86
53	Guinea	127	129			110	118	71	112	118	51
54	Haiti	92	117	127		104	116	29	37	46	56
55	Honduras	95	49	85		81	91	79	18	85	53
56	Hong Kong SAR, China	24	40	50		9	16	60	105	21	
57	Hungary	39	63	39	38	49	25	85	64	50	
58	India	72	77	100		103	100	68	96	74	31
59	Indonesia	98	85	89	56	126	94	1	2	62	82
60	Iran, Islamic Rep.	38	33	69	24	36	31	76	8	44	
61	Iraq	112	104	121		105	112	25	53	102	38
62	Ireland	19	34	21		12	21	20	12	13	
63	Israel	22	51	12		1	102	106	116	36	
64	Italy	41	4	17	9	29	51	80	86	61	
65	Jamaica	42	97	82	34	75	45	98	40	31	21
66	Japan	14	25	7		4	86	109	104	12	
67	Jordan	86	52	77		90	80	31	46	86	86
68	Kazakhstan	65	113	29	51	70	56	57	39	94	14
69	Kenya	63	102	99		78	57	22	30	38	4
70	Korea, Rep.	21	56	1		11	32	99	97	16	

No	Country	Acc @ a FI	CB Br /adults	ATM /adults	POS /adults	Credit Card	Debit Card	Borrow - FI	Credit Purchase	Save - FI	Mobile 12M
71	Kosovo	61	48	73		71	60	8	124	104	7
72	Kuwait	28	55	35	31	10	13	44	130	23	
73	Kyrgyz Republic	125	94	94		120	126	16	133	126	54
74	Latvia	23	31	31		41	15	45	73	67	26
75	Lebanon	70	32	66	26	59	69	122	88	52	77
76	Lithuania	36		52	22	52	28	75	65	41	36
77	Luxembourg	18	3	15		2	18	50	70	10	
78	Macedonia, FYR	37	38	48	25	47	50	125	15	89	5
79	Madagascar	124	127	122	72	131	128	61	100	122	86
80	Malawi	105	130	112	71	109	98	46	62	87	64
81	Malaysia	45	50	45	30	56	65	117	102	26	29
82	Mali	120	110	117		123	122	54	50	106	75
83	Malta	17	14	41		15	20	82	58	18	
84	Mauritania	103	107			84	103	27	24	97	8
85	Mauritius	32	47	59	36	50	35	89	44	29	35
86	Mexico	84	69	56		53	67	111	35	95	17
87	Moldova	101	74	80		97	77	4	22	112	58
88	Mongolia	35	5	72	43	101	30	7	20	39	18
89	Montenegro	56	16	28		51	68	112	113	114	34
90	Myanmar		125	130							
91	Namibia		91	49	50			49	17		
92	Nepal	87	92	102		124	111	35	109	79	78
93	Netherlands	6	46	40	10	22	1	3	9	5	
94	New Zealand	3	26	25	3	8	3	88	118	3	
95	Nicaragua	109	93	97		96	101	132	103	96	62

No	Country	Acc @ a FI	CB Br /adults	ATM /adults	POS /adults	Credit Card	Debit Card	Borrow - FI	Credit Purchase	Save - FI	Mobile 12M
96	Niger	131				128	130	127	38	123	74
97	Nigeria	80	98	95		119	74			37	45
98	Norway		76	42	7			62	43		
99	Pakistan	114	87	106	60	121	115	56	85	121	44
100	Panama	88	41	54	44	61	90	33	92	69	86
101	Peru	97	8	79	61	67	82	51	5	84	42
102	Philippines	85	89	88		92	84	58	72	63	33
103	Poland	43	28	44	48	44	47	72	110	47	
104	Portugal	30	6	3	8	32	24			35	
105	Puerto Rico				23			36	28		
106	Romania	60	27	34	41	58	63	86	82	81	60
107	Russian Federation	58	21	5	46	68	49	70	128	75	40
108	Rwanda	76	100	118	74	93	105	126	41	48	52
109	Saudi Arabia	59	86	33		46	43	119	119	51	
110	Senegal	123				118	124	38	13	110	81
111	Serbia	48	17	53	29	38	41	96	120	116	27
112	Sierra Leone	106	114	128		100	110	55	29	65	68
113	Singapore	7	81	38	19	26	61	43	26	4	
114	Slovak Republic	33	35	47	37	40	23	34	21	24	
115	Slovenia	10	20	16	18	24	5			33	
116	Somalia							65	36		
117	South Africa	54	78	36		74	39	66	49	40	12
118	Spain	20	2	6	5	21	27	17	52	27	
119	Sri Lanka	44	61	92		89	97	104	47	34	30
120	Sudan	122	115	116		125	113	42	45	113	15

No	Country	Acc @ a FI	CB Br /adults	ATM /adults	POS /adults	Credit Card	Debit Card	Borrow - FI	Credit Purchase	Save - FI	Mobile 12M
121	Sweden	5	45	55		14	2			1	
122	Switzerland		9	18	17	131		30	4		
123	Taiwan, China	27			27	18	48	105	81	17	
124	Tajikistan	130	95	101	73	112	123	93	68	131	1
125	Tanzania	104	123	108	67	88	88	12	123	72	9
126	Thailand	40	73	24		83	42	116	125	20	71
127	Togo	115				114	127	69	79	111	73
128	Tunisia		60	86	52	131		107	1		
129	Turkey	51	57	37	6	19	33	134	11	108	13
130	Turkmenistan	132				131	132	64	42	132	86
131	Uganda	96	119	113	70	106	95	74	78	56	20
132	Ukraine	66	126	23	45	42	55	48	57	103	39
133	United Arab Emirates	49	72	43		31	34	40	51	45	
134	United Kingdom	9	37	8	12	16	10	10	16	19	
135	United States	26	24		13	7	19	81	83	14	
136	Uruguay	89	70	65	47	34	76	131	129	100	76
137	Uzbekistan	90	10	109		91	72	128	126	127	10
138	Venezuela, RB	62	62	63		64	52	23	27	66	48
139	Vietnam	93	111	87		111	81	114	3	90	19
140	West Bank and Gaza	99	82	91		87	93	63	55	101	23
141	Yemen, Rep.	128	124	114	65	129	119	97	63	124	66
142	Zambia	94	108	103	66	86	78	102	33	73	28
143	Zimbabwe	67	96	110		77	62	102	133	49	24