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Introducing a New Broad-based
Index of Financial Development

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I N T E R N A T I O N A L   M O N E T A R Y   F U N D

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Introducing a New Broad-based Index of Financial Development[1]

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Abstract

There is a vast body of literature estimating the impact of financial development on economic growth, inequality, and economic stability. A typical empirical study approximates financial development with either one of two measures of financial depth – the ratio of private credit to GDP or stock market capitalization to GDP. However, these indicators do not take into account the complex multidimensional nature of financial development. The contribution of this paper is to create nine indices that summarize how developed financial institutions and financial markets are in terms of their depth, access, and efficiency. These indices are then aggregated into an overall index of financial development. With the coverage of 183 countries on annual frequency between 1980 and 2013, the database should offer a useful analytical tool for researchers and policy makers.


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I. INTRODUCTION

A large body of literature has developed to assess the impact of financial development on economic growth, inequality, and economic stability (see Levine, 2005, Demirgüç-Kunt and Levine, 2009, and Dabla-Norris and Srivisal, 2013 for respective literature surveys). Financial development involves improvements in such functions provided by the financial systems as: (i) pooling of savings; (ii) allocating capital to productive investments; (iii) monitoring those investments; (iv) risk diversification; and (v) exchange of goods and services (Levine, 2005). Each of these financial functions can influence saving and investment decisions and the efficiency with which funds are allocated. As a result, finance affects the accumulation of physical and human capital and total factor productivity – the three factors that determine economic growth. To the extent that financial development reduces informational asymmetries and financial constraints and promotes risk sharing, it can enhance the ability of financial systems to absorb shocks and reduce the amplification of cycles through the financial accelerator (Bernanke, Gertler, and Gilchrist 1999), lowering macroeconomic volatility and inequality.

Most of the empirical literature since the 1970s approximates financial development by two measures of financial depth – the ratio of private credit to GDP and, to a lesser extent, by stock market capitalization, also as a ratio to GDP. For example, in an influential industry-level study Rajan and Zingales (1998) use both measures to show that more financial development facilitates economic growth. More recently, Arcand, Berkes, and Panizza (2012) use credit to GDP ratio to establish that there is a threshold above which financial development no longer has a positive effect on economic growth. On the macroeconomic volatility side, Dabla-Norris and Srivisal (2013) find that financial development, as measured by private credit to GDP from banks and other financial institutions, plays a significant role in dampening the volatility of output, consumption, and investment growth, but only up to a certain point. Most researchers in this field use variations of these two measures to examine the role of the financial system in economic development.

And yet, financial development is a multidimensional process. With the passage of time, financial sectors have evolved across the globe and modern financial systems have become multifaceted. For example, while banks are typically the largest and most important, investment banks, insurance companies, mutual funds, pension funds, venture capital firms, and many other types of nonbank financial institutions now play substantive roles. Similarly, financial markets have developed in ways that allow individuals and firms to diversify their savings, and firms can now raise money through stocks, bonds, and wholesale money markets, by-passing traditional bank lending. The constellation of such financial institutions and markets facilitates the provision of financial services. Furthermore, an important feature of financial systems is their access and efficiency. Large financial systems are of limited use if they are not accessible to a sufficiently large proportion of the population and firms. Even if financial systems are sizeable and have a broad reach, their contribution to economic development would be limited if they were wasteful and inefficient. This point is made also, for example, in Čihák et al. (2012) and Aizenman, Jinjarak, and Park (2015). The diversity of financial systems across countries implies that one needs to look at multiple indicators to measure financial development.

To overcome the shortcomings of single indicators as proxies for financial development, we create a number of indices that summarize how developed financial institutions and financial markets are in terms of their depth, access, and efficiency, culminating in the final index of financial development (Figure 1). These indices were originally developed in the context of the IMF Staff Discussion Note "Rethinking Financial Deepening: Stability and Growth in Emerging Markets" (Sahay et al., 2015). This paper presents and explains the methodology that underpins them. The sub-indices and the final overall index are constructed for 183 countries on annual frequency between 1980 and 2013. Financial institutions include banks, insurance companies, mutual funds, and pension funds. Financial markets include stock and bond markets. Financial development is defined as a combination of depth (size and liquidity of markets), access (ability of individuals and companies to access financial services), and efficiency (ability of institutions to provide financial services at low cost and with sustainable revenues, and the level of activity of capital markets). This broad multi-dimensional approach to defining financial development follows the matrix of financial system characteristics developed by Čihák et al. (2012).

Figure 1. Financial Development Index Pyramid
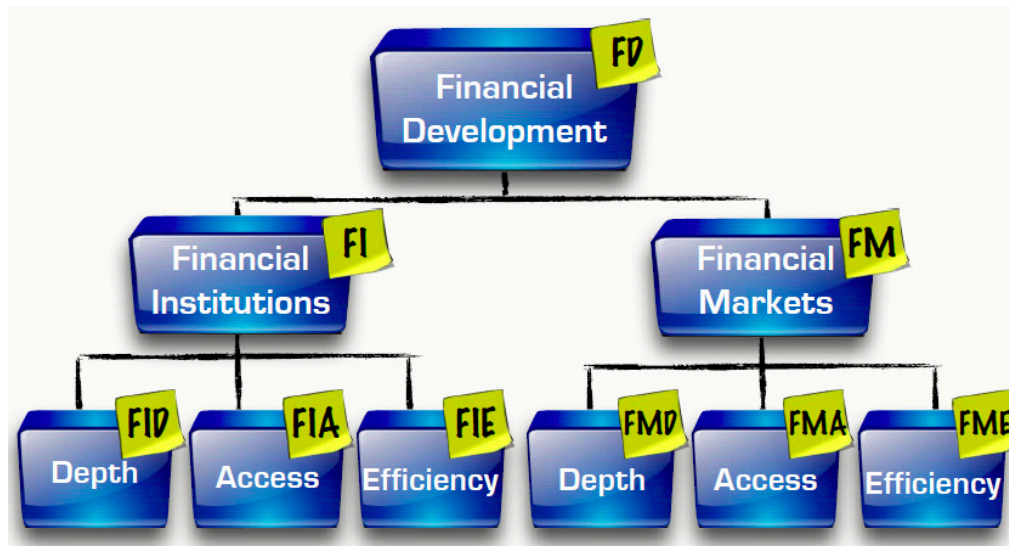
Source: IMF staff, based on Čihák and et al. (2012)

While this paper follows Čihák et al. (2012) in their conceptual approach to defining financial development, the contribution of this paper is quite distinct. First, we supplement the World Bank FinStats, a more updated version of the Global Financial Development Database (GFDD) introduced by Čihák and co-authors, with additional data from the Bank of International Settlements (BIS) debt securities database, Dealogic corporate debt database, and IMF Financial Access Survey. Second, we summarize this diverse information in several easy to use indices. Given the wealth of information on financial system properties – there are 105 distinct indicators in GFDD and 46 indicators in FinStats – it is not feasible to track all of these different indicators individually, especially in empirical work. And even if it were possible, not one single indicator, when taken on its own, would offer a comprehensive understanding of the level of financial development. The sub-indices and the final index pull together these various indicators and allow a comprehensive assessment of particular

features of financial systems and the overall level of financial development. As a result, the indices allow to pin down where deficiencies in financial development lie or which aspects of financial development affect macroeconomic performance, which could then be investigated in greater detail using the disaggregated data from FinStats or GFDD.

The paper also provides additional robustness checks and deviates in some ways from the Staff Discussion Note. More specifically, the number of issuers (one of the indicators for financial market access) is now scaled by population to bring it in line with financial institutions access measures. As a result, the relative ranking of some countries changes, with countries with larger population receiving lower scores in the new database compared to the original release. Missing data treatment is now applied iteratively and no longer uses the data on profit growth in reconstruction. The database is also updated for the more recent releases of Finstats and Dealogic data.

In what follows, the paper describes the methodology used to construct the indices, including data sources, treatment of missing values, functional form and weights used in aggregation. It shows how the new indices compare with traditional measures and the key stylized facts on financial development across the globe. It concludes with a discussion of some caveats and limitations of the indices.

II. METHODOLOGY

The financial development index is constructed using a standard three-step approach found in the literature on reducing multidimensional data into one summary index: (i) normalization of variables; (ii) aggregation of normalized variables into the sub-indices representing a particular functional dimension; and (iii) aggregation of the sub-indices into the final index. This procedure follows the OECD Handbook on Constructing Composite Indicators (OECD, 2008), which is a good reference for methodological suggestions. There are a number of examples in the literature of constructing composite indices that compare and rank country performance. These include the IMF Financial Stress Index (Cardarelli, Elekdag, and Lall, 2008; Cardarelli, Elekdag, and Lall, 2009), various financial inclusion indices (Amidžić, Massara, and Mialou, 2014; Camara and Tuesta, 2014), and the United Nations Development Programme well-being indices, such as the Human Development Index, Gender-Inequality Index, Gender Development Index, and Multidimensional Poverty Index (UNDP, 2014).

For this paper, we construct a total of nine indices, which assess at varying levels of abstraction how developed financial systems are across countries. Starting from the bottom of the pyramid in Figure 1, six lower level sub-indices are constructed using a list of indicators to measure how deep, accessible, and efficient financial institutions and financial markets are. These sub-indices are called FID, FIA, FIE, FMD, FMA, and FME, where the letters I and M denote institutions and markets, and the letters D, A, and E denote depth, access, and efficiency. These sub-indices are aggregated into two higher level sub-indices, FI and FM, which measure how developed financial institutions and financial markets are overall. Finally, FI and FM sub-indices are aggregated into the overall measure of financial development – the FD index.

A number of choices need to be made in the process of the index construction: (i) which data series to use for the sub-indices; (ii) how to treat missing data; and (iii) normalization and treatment of outliers; (iv) functional form of the aggregator; and (v) weights to use in the aggregation. These choices are covered in the subsections below.

A. Data sources

The dataset puts together 33 years of annual data between 1980 and 2013 for 183 advanced, emerging, and low-income developing countries. It draws on a number of data sources: the World Bank FinStats 2015 (Feyen, Kibuuka, and Sourrouille, 2014), IMF's Financial Access Survey, Dealogic corporate debt database, and Bank for International Settlement (BIS) debt securities database.

A set of key indicators is chosen to capture the different aspects of the financial system characteristics (Table 1). Only variables that cover a sufficiently wide range of countries across a sufficiently long time period are selected. As a result, a number of potentially useful indicators could not be included, as discussed below. Instead, the database relies on a set of key proxy variables that may have limitations, but are well established and available for a broad country-time sample. Table 1 provides detailed information on data sources, and Table 2 gives the summary statistics of the raw data.

For a small number of countries, private sector credit data is adjusted for butt splicing. More specifically, the data is corrected for one off jumps in the coverage of the banking system by the International Financial Statistics (IFS) database, the original source of FinStats data. This is only the case for a few advanced countries, when credit to GDP more than doubles in a single year as a result of revisions in banking system coverage. For example, in original source data, credit to GDP in Denmark jumps from 30 percent of GDP in 1999 to 135 percent in 2000, and in Sweden it jumps from 40 to 93 percent of GDP in 2001. If taken at face value, it would imply an impressive increase in financial depth, rather than data revisions. The data are corrected to take the most recent level as the most representative and downward shifts are merged through growth rates. This adjustment is cross checked with IFS notes on data breaks and does not affect the gradual buildup in credit during credit booms (Thailand in late 1990s, Cyprus and Iceland in 2000s) or jumps in credit in crisis or hyperinflation episodes (Argentina and Brazil at the end of 1980s and in early 1990s).

Financial institutions depth sub-index then adds to the standard banking sector depth measure used in the literature (bank credit to the private sector) indicators for other financial institutions: the assets of the mutual fund and pension fund industries and the size of life and non-life insurance premiums. Insurance premiums data is preferred to insurance companies assets because it covers more countries (a maximum of 153 versus 128) for a longer time period (starting in 1990 as opposed to 2000). As a result the country-year coverage doubles for this indicator.

Financial institution access and efficiency measures are more bank specific, given the lack of this information for other financial institutions. Financial institutions access is proxied by the number of bank branches and ATMs per 100,000 adults. Additional indicators were considered, such as the number of bank accounts per 1,000 adults, percent of firms with line of credit, and usage of mobile phones to send and receive money. These indicators were not included in the sub-index because

they lack sufficiently large country and time coverage. For example, the World Bank Global Financial Inclusion (Global Findex) database (Demirgüç-Kunt and Klapper, 2012) provides a wealth of user-side data on access, including on the extent of mobile banking in Africa. However, these data are only available for 2011 and 2014 and cannot be used for the sub-indices measuring access because they do not cover a sufficiently long time period.

Financial institutions efficiency sub-index relies on three aspects of bank efficiency: (i) efficiency in intermediating savings to investment, as measured by the net interest margin (the accounting value of bank's net interest revenue as a share of its average interest-bearing assets) and lending-deposit spread; (ii) operational efficiency measures, such as non-interest income to total income and overhead costs to total assets; and (iii) profitability measures, such as return on assets and return on equity. As with the other dimensions, these are relatively crude measures of efficiency. For example,

Table 1. Data Sources

CATEGORY	INDICATOR	DATA SOURCE
Financial Institutions		
Depth	Private-sector credit to GDP	FinStats 2015
	Pension fund assets to GDP	FinStats 2015
	Mutual fund assets to GDP	FinStats 2015
	Insurance premiums, life and non-life to GDP	FinStats 2015
Access	Bank branches per 100,000 adults	FinStats 2015
	ATMs per 100,000 adults	IMF Financial Access Survey
Efficiency	Net interest margin	FinStats 2015
	Lending-deposits spread	FinStats 2015
	Non-interest income to total income	FinStats 2015
	Overhead costs to total assets	FinStats 2015
	Return on assets	FinStats 2015
	Return on equity	FinStats 2015
Financial Markets		
Depth	Stock market capitalization to GDP	FinStats 2015
	Stocks traded to GDP	FinStats 2015
	International debt securities of government to GDP	BIS debt securities database
	Total debt securities of financial corporations to GDP	Dealogic corporate debt database
	Total debt securities of nonfinancial corporations to GDP	Dealogic corporate debt database
Access	Percent of market capitalization outside of top 10 largest companies	FinStats 2015
	Total number of issuers of debt (domestic and external, nonfinancial and financial corporations)	FinStats 2015
Efficiency	Stock market turnover ratio (stocks traded to capitalization)	FinStats 2015

Source: IMF staff estimates.

Table 2. Summary Statistics of the Underlying Data

Code	Name	Obs	Mean	Median	St. Dev.	Min	Max
Financial Institutions Depth							
FID1	Private sector credit to GDP	5,328	43	30	39	0.30	319
FID2	Pension fund assets to GDP	942	20	8	28	0.00	157
FID3	Mutual fund assets to GDP	972	87	10	519	0.00	5,232
FID4	Insurance premiums (life + non-life) to GDP	3,371	3	2	3	0.01	18
Financial Institutions Access							
FIA1	Bank branches per 100,000 adults	1,722	18	13	18	0.13	98
FIA2	ATMs per 100,000 adults	1,516	40	28	43	0.01	290
Financial Institutions Efficiency							
FIE1	Net interest margin	3,391	5	4	4	0.02	44
FIE2	Lending-deposits spread	4,750	8	6	8	0.03	92
FIE3	Non-interest income to total income	3,527	39	37	16	0.01	100
FIE4	Overhead costs to total assets	3,419	4	3	3	0.04	48
FIE5	Return on assets	3,434	1	1	3	-109	21
FIE6	Return on equity	3,422	12	14	45	-1,792	192
Financial Markets Depth							
FMD1	Stock market capitalization to GDP	2,517	45	26	57	0.00	549
FMD2	Stocks traded to GDP	2,312	28	5	58	0.000	756
FMD3	International debt securities of government to GDP	1,564	8	4	10	0.003	98
FMD4	Total debt securities of financial corporation to GDP	1,751	25	3	103	0.000	1,912
FMD5	Total debt securities of nonfinancial corporation to GDP	2,229	15	6	25	0.000	341
Financial Markets Access							
FMA1	Percent of market capitalization outside of top 10 largest companies	669	55	53	19	14	99
FMA2	Total number of issuers of debt (domestic and external, fin. and non-fin. corporations) per 100,000 adults	1,804	0.3	0.1	0.6	0	8
Financial Markets Efficiency							
FME1	Stock market turnover ratio (value traded/stock market capitalization)	2,313	43	22	57	0.01	581

Source: IMF staff estimates.

efficient financial institutions tend to be more profitable, but this relationship is not necessarily one for one, e.g. inefficient institutions can report profits when they operate in an economic upswing, while otherwise efficient institutions when hit by an adverse shock may generate losses.

We chose not to include in the efficiency sub-index indicators of microstructure, such as banking system concentration ratios – Herfindahl index or the share of top three banks in total banking system assets. They are important to assess the financial stability features as they provide a rough approximation for the potential impact in the case of a major financial disruption (Čihák and Schaeck, 2010). But there is no clear bottom line in the literature on whether more concentrated banking systems are more or less efficient. As surveyed in Berger et al. (2004), the findings for a range of efficiency indicators – loan pricing, interest margins, profitability, and firm access to credit, among others – are mixed and are not robust to controlling for institutional development, legal impediments to competition, and the different competitive effects of foreign-owned and state-owned banks.

Financial market indicators focus on stock market and debt market development. The depth sub-index includes the size of the stock market (capitalization, or the value of listed shares) and how active it is (stocks traded), the outstanding volume of international debt securities of sovereigns and international and domestic debt securities of financial and nonfinancial corporations. Corporate debt securities data are based on the nationality, rather than residence principle, to better align it with the sovereign debt data. We do not include the data on the outstanding volumes of domestic sovereign debt securities because these are provided to the BIS on a voluntary basis by the central banks and have low country coverage (18 countries at best). Dealogic corporate securities data have wider coverage than the BIS database and is therefore the preferred source of corporate debt data. It does not however allow a good distinction among the holders of corporate debt into domestic and external.

For the financial market access, we use the percentage of market capitalization outside of top 10 largest companies to proxy access to stock markets. A higher degree of stock market concentration should reflect greater difficulties in accessing the stock market for newer or smaller issuers. For bond market access, we use the number of financial and nonfinancial corporate issuers on the domestic and external debt market in a given year per 100,000 adults. This variable reflects the number of distinct issuers, such that repeat issuance by the same company in a given year is only counted once. It would be preferable to scale this variable by the total pool of potential issuers, but data limitations are a constraint. Dealogic only reports the number of companies that issue. Data on the number of listed domestic companies from the World Bank's World Development Indicators only cover companies that issue on the domestic stock market and cover about 60 percent of our country-year sample. However, the correlation between this indicator and population size is 60 percent, which indicates that population size is a relatively good proxy.

Financial market efficiency sub-index relies on the stock market turnover ratio – the ratio of the value of stocks traded to stock market capitalization. A higher turnover should indicate higher liquidity and greater efficiency in the market. In the bond market, the most commonly used variable is the tightness of the bid-ask spread. Bloomberg data on the bid-ask spread in the sovereign bond market

covers on average 37 countries (20 percent of the country sample) starting only in 2000. Given poor coverage, it is not used in the sub-index.

A number of variables are not included for conceptual reasons. The purpose of the index is to capture the key features of financial systems – how deep, accessible, and efficient they are. That is separate from capturing the underlying drivers of these features, such as the institutional, regulatory, and legal frameworks, or their outcomes, such as whether financial systems are more growth-enhancing or more stable. Therefore, the indices do not include potentially interesting indicators from the World Bank Doing Business database on the ease of getting credit (captured by the strength of legal rights, depth of credit information, and credit registry coverage), protection of minority investors, time and cost to enforce contracts, and the ease of resolving insolvency. Similarly, the database does not include financial stability indicators, such as z-scores, capital adequacy or liquidity ratios, and frequency of banking crises.

B. Treatment of missing data

There is a tradeoff between creating a comprehensive measure of financial development and data availability. The extent of missing data (Table 3) varies considerably across indicators. More data is available for a larger sample of countries in the most recent twenty years rather than earlier in the sample. Data coverage is strong for private credit, debt issuance, and financial institutions efficiency measures. It is weaker for non-bank financial institutions and other financial markets measures, especially in the LIDC sample. In some cases, such as financial institutions access measures, data are missing because they were not being collected before 2004 on a comprehensive basis. In other cases, lack of data indicates that markets may be missing. For example, only few of the LIDCs have developed their own domestic stock markets.

Several approaches are taken to address the missing data problem. Where data are not yet available for the latest year (e.g. 2013), the values are set equal to the latest available observations (e.g. 2012). This is the case, for example, with stock market capitalization and stocks traded data, which FinStats sources from the World Bank Development Indicators database and which are only available until 2012. If the data series is completely not available for a country, the entire series is set at zero, indicating this market does not exist or that its access or efficiency properties are very poor.

A more complicated case of missing variables arises when putting together series where database collection started at different points in time. For example, while observations on credit to GDP become available already in the 1960s, financial access data only started to be collected in 2004. This particular case of missing data can be treated in several ways: (i) treat the data as truly missing, excluding the series from the index average when the data are not available; (ii) treat the data as zero, assuming that the absence of data implies this market does not exist or its accessibility and efficiency are very poor; (iii) splice the two indices from before and after the data series becomes available.

As demonstrated in Figures 2 and 3, splicing is the preferred method. It avoids generating movements in the FD index that are unrelated to financial development, but are instead driven by the addition of new series. In Figure 2, series 2 is added to the index on which a country has worse

performance relative to the other indicators and for which data are only available for the later part of the sample. The aggregate index should not drop as the series gets introduced (as it would if we were to treat the missing data as truly missing) because it is unlikely the country had a higher level of development before this market or data on this market appeared. In other words, the index should have started from a lower base (red or yellow line). In Figure 3, a missing series is added to the index on which a country has better performance relative to other indicators. Under missing or zero treatment, the index jumps as the series gets introduced, but it should not. This is a case where a country has a higher level of financial development on an indicator, but the data availability starts late. For example, just because the data on access to banking services is available starting in 2004, this does not mean that households did not have access to banking services before 2004.

Table 3. Percent of Countries and Years with Data Availability
Average by Decade and Income Group

Variable	1980s	1990s	2000s	2010s	AM	EM	LIDC	Total
Total number of countries/years		18	83		26	89	68	183*34
	(percent of country-years)				(percent of countries in the income group)			(percent of country-years)
Financial Institutions Depth								
Private sector credit to GDP	73	87	93	94	96	83	85	86
Pension fund assets to GDP	0	2	33	42	33	20	2	15
Mutual fund assets to GDP	2	4	32	39	47	17	2	16
Insurance premiums (life + non-life) to GDP	0	60	88	91	67	59	43	54
Financial Institutions Access								
Bank branches per 100,000 adults	0	0	55	97	29	27	28	28
ATMs per 100,000 adults	0	0	47	91	27	25	22	24
Financial Institutions Efficiency								
Net interest margin	0	54	93	95	66	56	48	55
Lending-deposits spread	53	78	91	93	90	71	78	76
Non-interest income to total income	0	61	93	95	68	58	51	57
Overhead costs to total assets	0	55	94	95	66	56	49	55
Return on assets	0	56	94	95	66	56	50	55
Return on equity	0	54	93	95	66	56	49	55
Financial Markets Depth								
Stock market capitalization to GDP	6	46	61	62	71	50	16	40
Stocks traded to GDP	3	41	59	60	68	46	13	37
International debt securities of government to GDP	0	24	43	46	53	33	4	25
Total debt securities of financial corporation to GDP	0	22	51	58	53	37	7	28
Total debt securities of nonfinancial corporation to GDP	0	27	65	77	54	43	20	36
Financial Markets Access								
Percent of market capitalization outside of top 10 largest companies	0	4	22	26	30	13	0	11
Total number of issuers of debt (domestic and external, fin. and non-fin. corporations)	19	27	37	40	68	46	13	29
Financial Markets Efficiency								
Stock market turnover ratio (value traded/stock market capitalization)	3	41	59	60	68	46	13	37

Source: IMF staff estimates.

There is a simple intuitive explanation for what splicing accomplishes. If we were to assess in 2013, when all the data are available, the state of financial development across countries, we would do it by taking a weighted average across the performance on various indicators. We take this level of the index to determine the cross-country levels of financial development. When some data become unavailable as we go back in time, we move the index backwards using the average growth rate in the available series. In this way, we make an informed judgment as to whether data are missing but markets exist (for example, there was a bond issuance but there are no data on it), or whether missing data indicate non-existent markets (that is, there was no bond market). This method is preferred to some of the alternatives, such as fitting a trend line backwards into historical data, because it does not assume that financial development is a linear process. Indeed, like with economic developments, some countries go through stages of development, but then regress.

Figure 2. Treatment of Missing Data: Example 1
One series is missing on which a country has worse performance
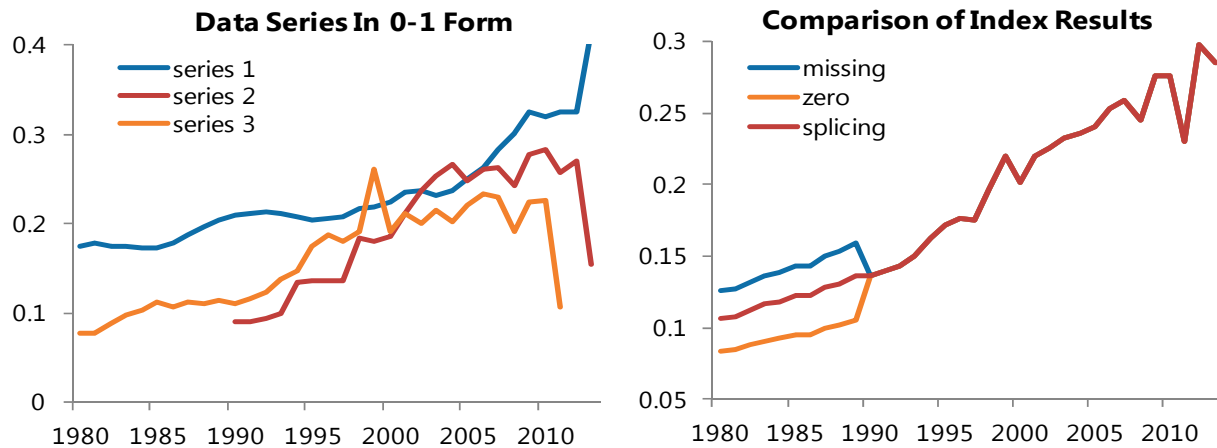
Source: IMF staff estimates.

Figure 3. Treatment of Missing Data: Example 2
One series is missing on which a country has better performance
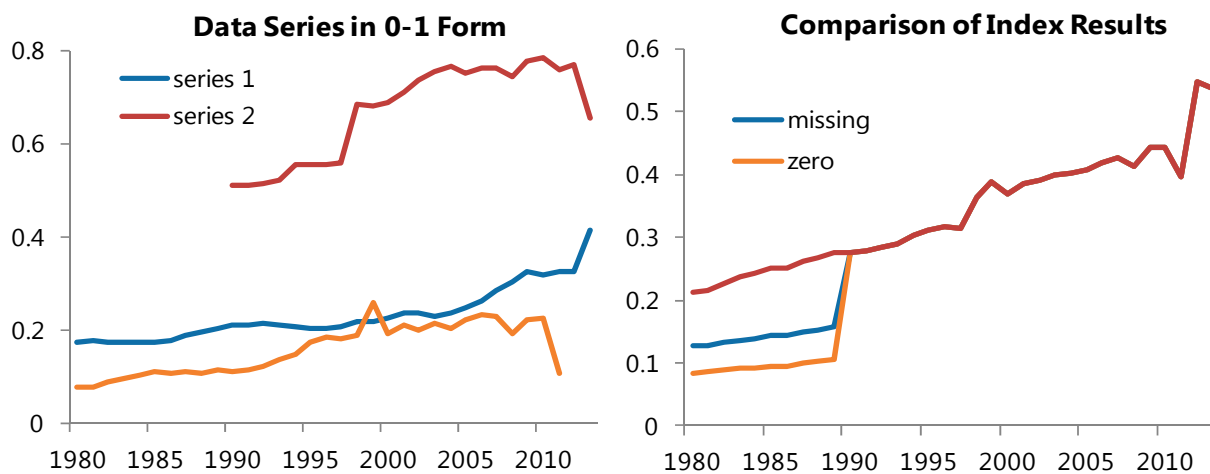
Source: IMF staff estimates.

The only case where this approach could be inappropriate is when a big bang financial development event happens. Such a big bang event could be a country that develops a bond market from scratch with one or a few issuances in the first year such that: (i) their size is sufficiently large to place the country high in the cross-country rankings on the size of bond markets; (ii) the country rating is higher than its other financial development indicators and as a result there is an improvement in the composite index; and (iii) the country is able to sustain this size of the bond market going forward. Such a scenario would justify having a discrete jump in the index. In practice, such cases are rare in the data. In the last ten years, a typical first-time sovereign issuance averaged four percent of GDP (Guscina, Pedras, and Presciuttini, 2014), in line with the average in this dataset.

In the data set, splicing is applied at the level of the raw data. First, we identify series with data missing in the earlier years. Then missing data are filled in retrospectively, starting from the first available observation and applying the average growth rate of the other indicators with data available for previous years. This procedure is applied iteratively, using first the growth rates of similar series within the particular sub-index (e.g. financial institutions depth), then the growth rates of series for the same type of financial services provider (e.g. financial institutions), and only then across providers (from financial institutions to financial markets). The only series that are not used in this procedure are the two profit indicators. Given that they span the negative and positive range, the growth rates of these series would overstate movement in the other indicators.

It is very important to stress that the goal of this exercise is not to create artificial data. The new indicators should not be and are not used as standalone series. Instead, the series are adjusted such that the indices that are based on these indicators reflect financial system development, rather than data availability. In practice, about 27 percent of our sample is reconstructed through splicing, and 32 percent of our sample consists of "missing" markets (Figure 4).

Figure 4. Databank Composition: Raw, Reconstructed, and Missing Data Shares
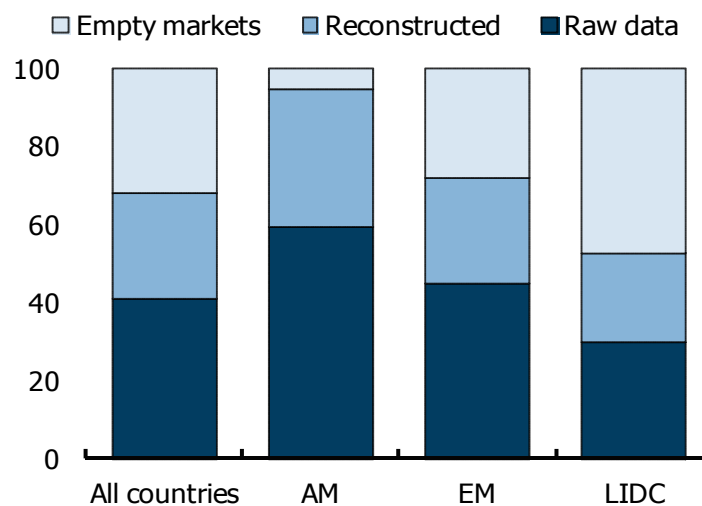
Source: IMF staff estimates.

C. Normalization and treatment of outliers

Each series is winsorized to prevent extreme values from distorting the 0-1 indicators. For example, a particularly large negative ROE during a crisis will cause a bunching of the rest of the 0-1 ratings for ROE around 1. To avoid that, each indicator is winsorized, with the 5th and 95th percentiles set at the cutoff levels, so as not to lose data. Global distribution – across countries and time – is assessed to determine the cutoff levels.

Winsorized indicators are then normalized between 0 and 1, using the min-max procedures (equations 1 and 2) to facilitate aggregation over variables expressed in different measurement units:

$$I_x = \frac{x - x_{min}}{x_{max} - x_{min}} \qquad (1)$$

$$I_x = 1 - \frac{x - x_{min}}{x_{max} - x_{min}} \qquad (2)$$

where x is the underlying raw data and I_x is the transformed continuous 0-1 indicator.

The procedure normalizes indicators to have an identical range [0, 1] by subtracting the minimum value and dividing by the range of the indicator values. It relates country performance on an indicator to the global minimum and maximum across all countries and years. Thus, the highest (lowest) value of a given variable across time and countries is equal to one (zero) and all other values are measured relative to these maximum (minimum) values. For some series – net interest margin, lending-deposits spread, noninterest income to total income, and overhead costs to total assets – a higher value indicates a worse performance on efficiency. For these cases, the ratings are rescaled according to the min max formula 2 so that a higher value indicates greater financial development. The Human Development Index is one example of an index using the min-max normalization. See OECD (2008) for alternative normalization methods. The more common methods are standardization, the min-max, and the distance to a reference point.

D. Functional form of the aggregator

Indicators are then aggregated into the six sub-indices at the bottom of the pyramid in Figure 1. The aggregation is a weighted linear average of the underlying series, where the weights are obtained from principal component analysis, reflecting the contribution of each underlying series to the variation in the specific sub-index. All of the sub-indices are then re-normalized using equation 1, so that there range is between 0 and 1.

$$FI_j = \sum_{i=1}^{n} w_i I_i \qquad (3)$$

$$FM_j = \sum_{i=1}^{n} w_i I_i \qquad (4)$$

where FI_j and FM_j stand in turn for financial institutions depth (FID), access (FIA), efficiency (FIE), and for financial markets depth (FMD), access (FMA), efficiency (FME).

Sub-indices are aggregated into higher-level indices using the same procedure as above, culminating at the most aggregated level in the FD index. The FI, FM, and FD indices are again re-normalized, so that there range is between 0 and 1.

$$FI = \sum_{j=1}^{n} w_j FI_j \qquad (6)$$

$$FM = \sum_{j=1}^{n} w_j FM_j \qquad (7)$$

$$FD = w_{FI} FI + w_{FM} FM \qquad (8)$$

The linear functional form of the aggregator is best suited for the data with a significant share of zero or close to zero observations. Linear aggregation assumes full compensability, such that poor performance in some indicators can be compensated for by sufficiently high values in other indicators. In other words, it assumes that the indicators are perfect substitutes. An alternative aggregation method could be a geometric mean (equation 5), which allows for imperfect substitutability among indicators. Under geometric aggregation, higher financial efficiency, for example, does not fully compensate for low financial depth. As a result, a country with a more unequal distribution of indicator scores would receive a lower index rating (Figure 5). While an attractive concept, for our dataset, geometric averaging introduces a substantial zero bias in the indicator ratings (Figure 6). This is due to the fact that zero or close to zero indicator ratings drive the multiplicative averaging down to zero. This is not acceptable for conceptual reasons since the penalty for underperformance on one indicator appears to be too large (Luxembourg example below). In addition, by introducing a large number of close to zero observations in the final index geometric average reduces variability in the final sample, which limits its usefulness for research.

$$FI_j = \prod_{i=1}^{n} I_i^{w_i} \qquad (5)$$

A particularly stark example is Luxembourg's FD rating (Figure 7). Luxembourg final FD score for 2013 would undergo the largest change if a geometric rather than linear aggregation were to be adopted. This is driven by financial market development (FM) rating, especially the one on financial markets depth (FMD). Luxembourg ranks the highest on the depth of its stock market and corporate debt market and is intermediate on government debt. But given that its stock market is relatively less traded, that particular indicator receives a very low normalization rating of 0.003. As a result, the FMD score for Luxembourg drops from 0.75 to 0.25 under geometric averaging and its ranking drops 29 places down. Given that other aspects of financial markets in Luxembourg are highly developed, it seems extreme to assign such a high weight to underperformance on one indicator out of five in assessing the depth of its financial markets.

Note that the particular needs of geometric averaging require a different normalization of data and several other adjustments to make the results meaningful. For geometric averaging, the distance to a reference point, instead of the min-max procedure, is used for normalization (equation 6), because it is centered on 1 and does not give rise to zero indicator ratings. For indicators where an increase indicates a worsening performance (some of the banking efficiency indicators), the second functional form is used. Observations with zeros in raw data are replaced with the minima observed for that indicator. The scales of ROA and ROE are moved uniformly into the non-negative territory as geometric averaging does not allow negative values.

$$I_x = \frac{x}{x_{max}} \quad or \quad I_x = \frac{x_{max}}{x} \quad (6)$$

Figure 5. Linear Versus Geometric Aggregation: Hypothetical Example, Equal Weights
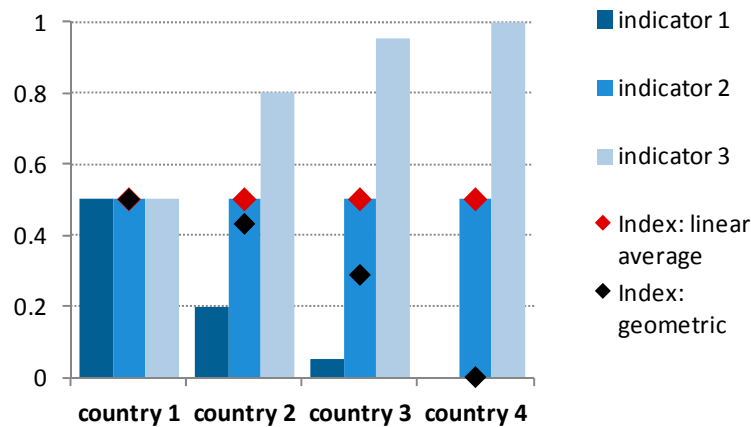
Source: IMF staff estimates.

Figure 6. Linear Versus Geometric Aggregation: 2013 FD Index Ratings
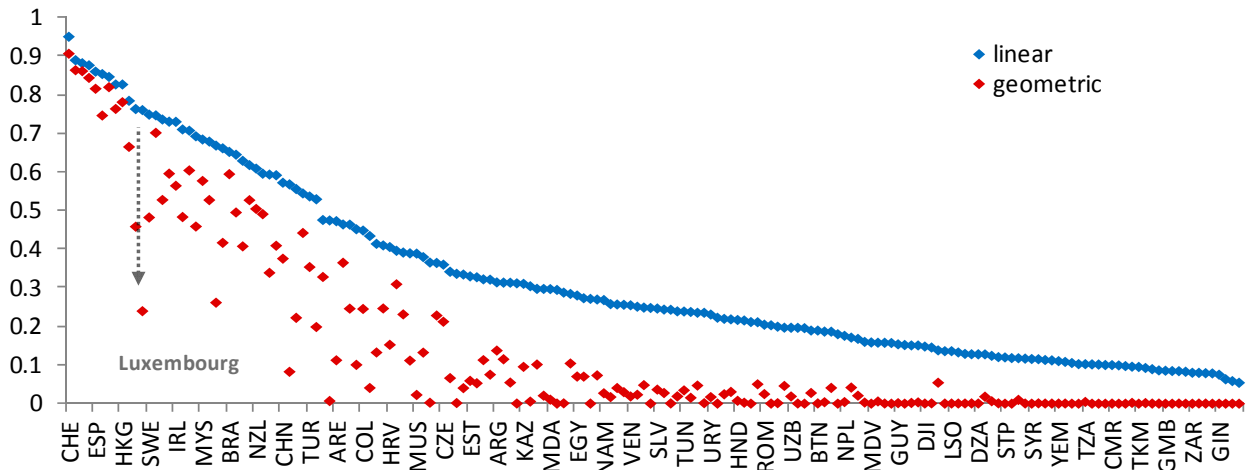
Source: IMF staff estimates.

Figure 7. Luxembourg Example: Index Ratings for 2013
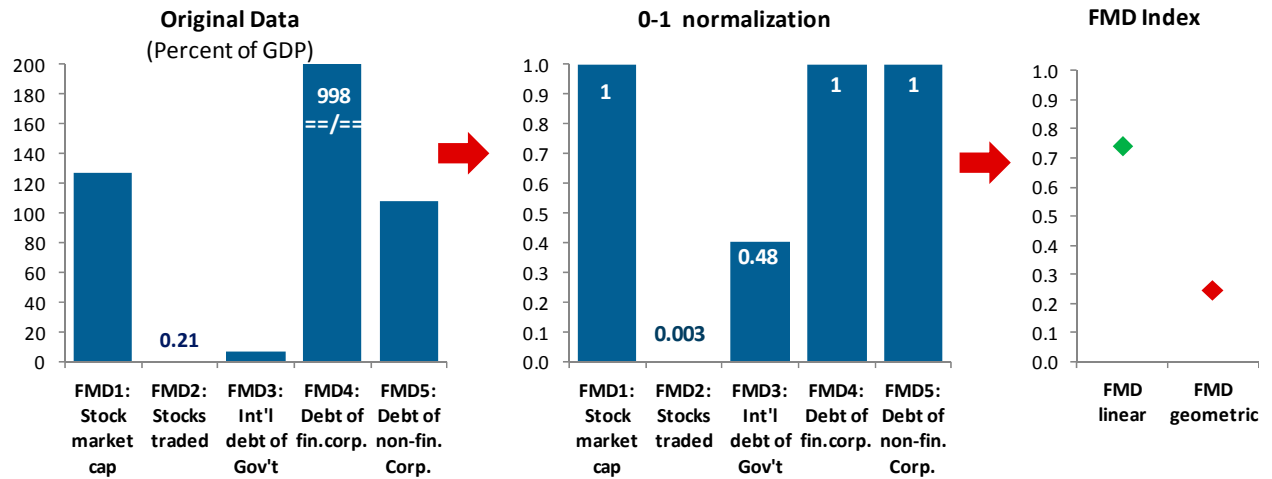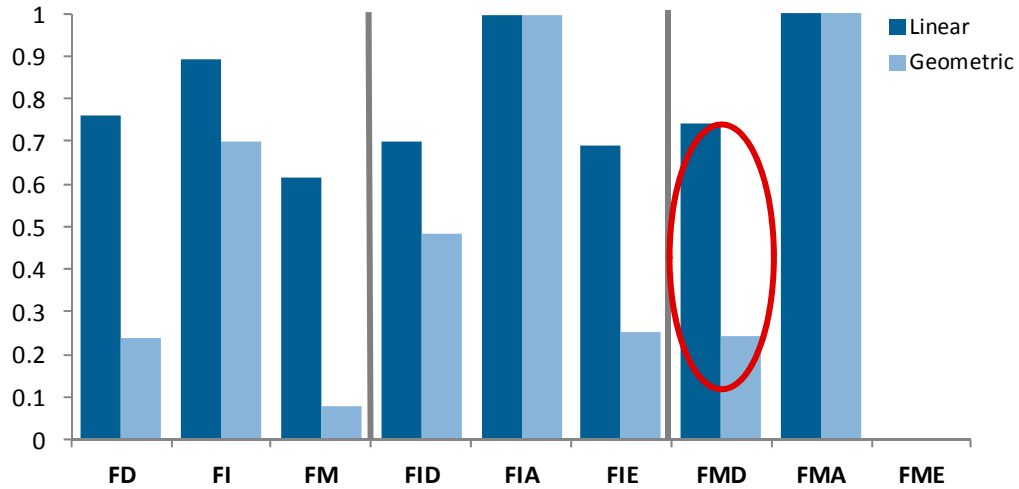
Source: IMF staff estimates.

In addition to being the more appropriate method, linear aggregation is simpler to implement and interpret. In particular, the contribution of changes in each indicator to the changes in the FD index under linear aggregation is its weight. In other words, an additive aggregation function permits the assessment of the marginal contribution of each variable separately. In the case of a geometric mean, the contribution of changes in an indicator to changes in the index is more complex. It will depend on the level of other indicators, which may hinder the ease of interpretation.

E. Weights

When used in a benchmarking framework, weights can have a significant effect on the overall composite indicator and country rankings. A number of weighting techniques exist (see OECD, 2008 for an overview). Some are derived from statistical models, such as factor analysis, others from participatory methods, like analytical hierarchy process. Regardless of which method is used, weights are essentially value judgments. While some analysts might choose weights based only on statistical

methods, others might reward components that are deemed more influential, depending on expert opinion, to better reflect policy priorities or theoretical factors.

For the FD index, this paper relies on a statistical method – the principal component analysis (PCA) – so as not to prejudge the importance of particular indicators in measuring financial development. Principal component analysis groups together individual indicators which are collinear to form a composite indicator that captures as much as possible of the information common to individual indicators. The idea is to account for the highest possible variation in the indicator set using the smallest possible number of factors. As a result, the composite index no longer depends upon the dimensionality of the data set but rather is based on the statistical dimensions of the data.

Sub-indices are constructed as weighted averages of the normalized series, where the weights are squared factor loadings (such that their sum adds up to 1) from principal component analysis of the underlying series. Factor loadings are coefficients that relate the observed variables to the principal components, or factors. The square of factor loadings represents the proportion of the total unit variance of the indicator which is explained by the factor. The series that contributes more to the direction of common variation in the data gets a higher weight. Weighting intervenes only to correct for overlapping information between two or more correlated indicators and is not a measure of the theoretical importance of the associated indicator.

The factor loadings on the first principal component are chosen as weights (Figure 8). Given the wide ranging nature of the exercise, the first principal component can be interpreted to summarize the latent information on the degree of financial development. Depending on the sub-index, it sums up the information on financial depth, access, and efficiency and embodies between 51 and 92 percent of the variance in the sub-index data (Table 4). The other principal components within the sub-index could reflect latent information on broader issues relevant for financial systems, such as governance and regulation or structural features.

Figure 8. Principal Component Analysis: Normalized Weights
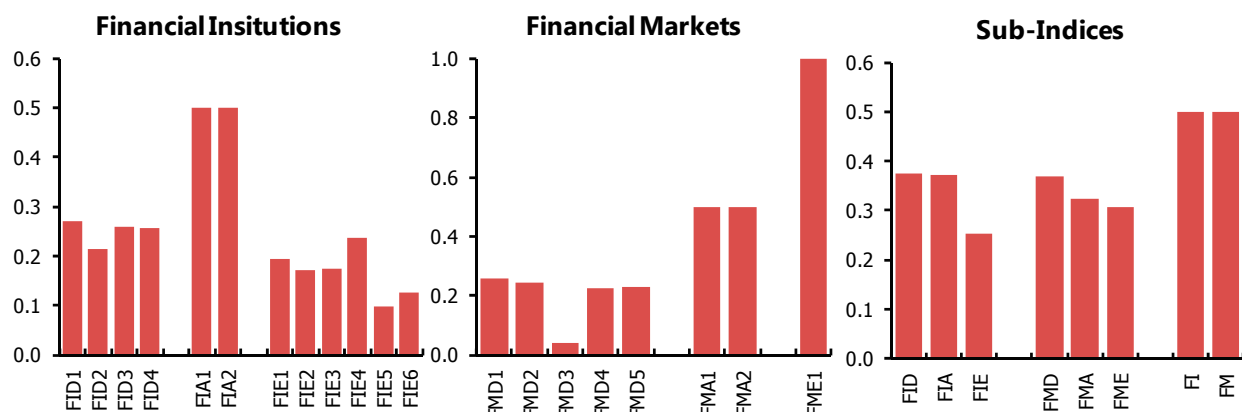
Source: IMF staff estimates.

Table 4. Share of Variance Explained by PCA Components

	Financial Institutions			Financial Markets			Sub-indices		
	Depth	Access	Efficiency	Depth	Access	Efficiency	FI	FM	FD
PC$_1$	0.7001	0.8824	0.5364	0.5896	0.6698	...	0.6749	0.7685	0.8595
PC$_2$	0.1288	0.1176	0.2676	0.1937	0.3302		0.218	0.1523	0.1405
PC$_3$	0.0983		0.0949	0.1007			0.1071	0.0792	
PC$_4$	0.0728		0.07	0.0752					
PC$_5$			0.0181	0.0408					
PC$_6$			0.013						

Source: IMF staff estimates.

To summarize, PCA is done by pooling together all series in a particular sub-index across all countries (LIDC, EM, AM) and all years (1980-2013) to find the linear combination in the direction of the largest variation. A higher weight is given to a series that contributes more to the direction of common variation. Then sub-indices are combined into higher indices using the same procedure.

As Figure 8 shows, banking system credit to the private sector, while still a relevant component of financial development, has a weight of 0.25 within the depth subcomponent of FI, which in turn has a weight of less than 0.40 in the FI subcomponent. In other words, bank credit still plays an important role, reflecting the role of banks in many financial systems, but it is far from being the only driver of the results.

F. Putting it all together

To summarize, the procedure is as follows: (i) apply missing data treatment to actual data; (ii) winsorize to set the 5th and 95th percentiles at the cutoff levels to avoid extreme observations driving the best and worse scores; (iii) construct a relative ranking of countries for each indicator using the min-max procedure, where higher value indicates greater financial depth; (iv) construct sub-indices as weighted average of the underlying series, where the weights are squared factor loadings (sum to 1) from principal component analysis of the underlying series; (v) combine sub-indices into higher indices via a similar procedure.

The result is a relative ranking of countries on depth, access, and efficiency of financial institutions and financial markets, on the development of financial institutions and markets, and on the overall level of financial development. Figure 9 gives a world view of the state of financial development in 2013. Financial market development is low in Africa, and more advanced in Russia and China. See Annexes 1-3 for exact numbers behind these figures and the depth, access, and efficiency rankings that drive them and Table 5 for summary statistics.

The indices are an improvement over the traditional measures of financial development. Conceptually, they incorporate information on a broader range of financial development features for a wider array of financial agents. Indeed, as Figures 10 and 11 show, while the indices are correlated with the traditional measures – private credit to GDP and stock market capitalization to GDP – the correlation is not one for one, e.g. the indices contain more information.

Figure 9. World Map of Financial Development, 2013

Overall Financial Development

■	< 0.101
■	0.101 to 0.181
■	0.181 to 0.292
■	0.292 to 0.442
■	0.442 to 0.657
■	> 0.657

Financial Institutions

■	< 0.133
■	0.133 to 0.242
■	0.242 to 0.357
■	0.357 to 0.479
■	0.479 to 0.674
■	> 0.674
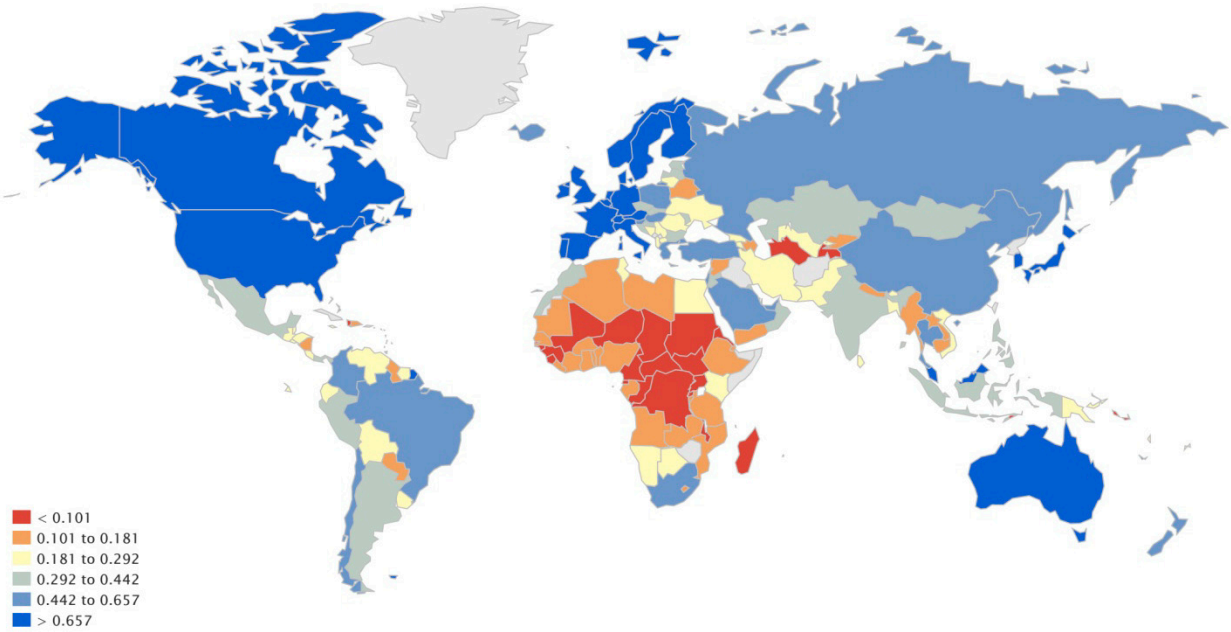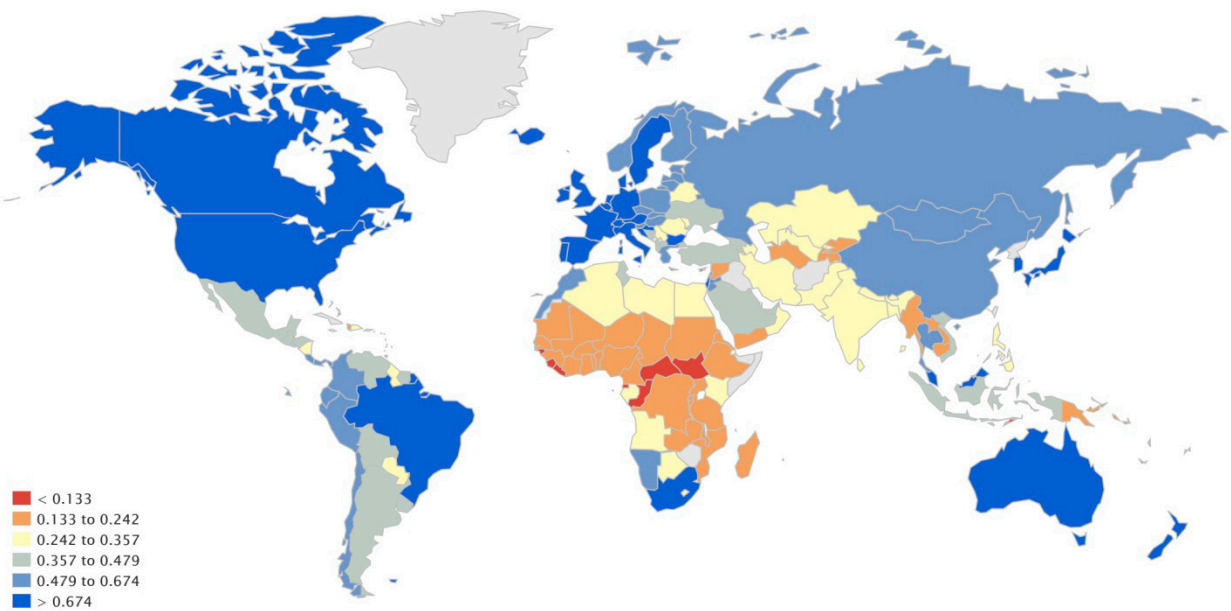
Source: IMF staff estimates.

Figure 9. World Map of Financial Development, 2013 (ctd)
Financial Markets
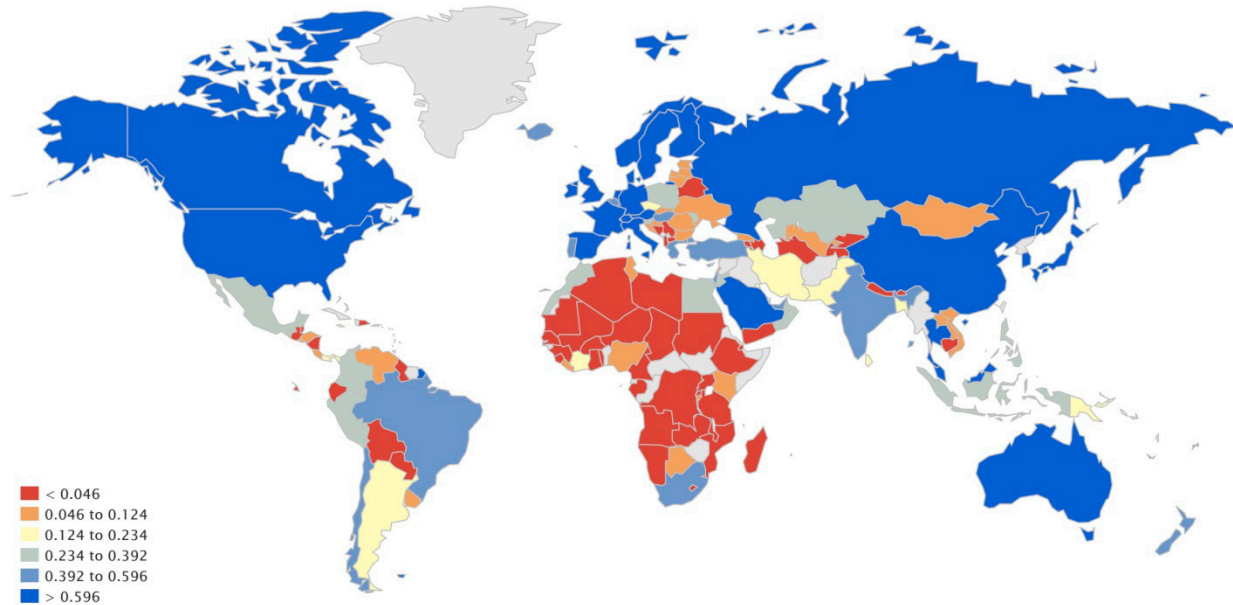
Source: IMF staff estimates.

Table 5. Summary Statistics of the Financial Development Index

Var.	Obs	Mean	Median	St. Dev.	Min	Max	Var.	Obs	Mean	Median	St. Dev.	Min	Max
		All countries							**Advanced Markets**				
FD	6222	0.23	0.16	0.21	0.00	1.00	FD	884	0.57	0.58	0.21	0.00	1.00
FI	6222	0.31	0.26	0.23	0.00	1.00	FI	884	0.66	0.71	0.20	0.00	1.00
FM	6222	0.15	0.03	0.22	0.00	1.00	FM	884	0.47	0.47	0.26	0.00	1.00
FID	6222	0.20	0.11	0.23	0.00	1.00	FID	884	0.58	0.61	0.23	0.00	1.00
FIA	6222	0.23	0.12	0.27	0.00	1.00	FIA	884	0.59	0.67	0.31	0.00	1.00
FIE	6222	0.48	0.53	0.23	0.00	1.00	FIE	884	0.64	0.66	0.12	0.00	0.97
FMD	6222	0.14	0.04	0.22	0.00	1.00	FMD	884	0.45	0.42	0.31	0.00	1.00
FMA	6222	0.15	0.00	0.24	0.00	1.00	FMA	884	0.47	0.49	0.29	0.00	1.00
FME	6222	0.15	0.01	0.28	0.00	1.00	FME	884	0.45	0.39	0.34	0.00	1.00
		Emerging Markets							**Low-Income and Developing Countries**				
FD	3026	0.23	0.21	0.17	0.00	0.85	FD	2312	0.11	0.10	0.07	0.00	0.39
FI	3026	0.30	0.29	0.19	0.00	0.87	FI	2312	0.18	0.18	0.12	0.00	0.61
FM	3026	0.15	0.07	0.19	0.00	0.90	FM	2312	0.03	0.00	0.07	0.00	0.52
FID	3026	0.18	0.13	0.18	0.00	0.99	FID	2312	0.07	0.05	0.08	0.00	0.50
FIA	3026	0.23	0.17	0.22	0.00	1.00	FIA	2312	0.08	0.03	0.14	0.00	1.00
FIE	3026	0.47	0.54	0.25	0.00	0.95	FIE	2312	0.42	0.47	0.22	0.00	1.00
FMD	3026	0.13	0.05	0.18	0.00	0.90	FMD	2312	0.03	0.01	0.07	0.00	0.50
FMA	3026	0.16	0.04	0.21	0.00	1.00	FMA	2312	0.01	0.00	0.05	0.00	0.50
FME	3026	0.16	0.03	0.26	0.00	1.00	FME	2312	0.04	0.00	0.16	0.00	1.00

Source: IMF staff calculations.
Note: FD = financial development; FI = financial institutions; FM = financial markets;
FID = financial institutions depth; FIA = financial institutions access; FIE = financial institutions efficiency;
FMD = financial markets; FMA = financial markets access; FME financial markets efficiency.

Figure 10. Correlation of FD Index with Traditional Measures: Private Credit to GDP
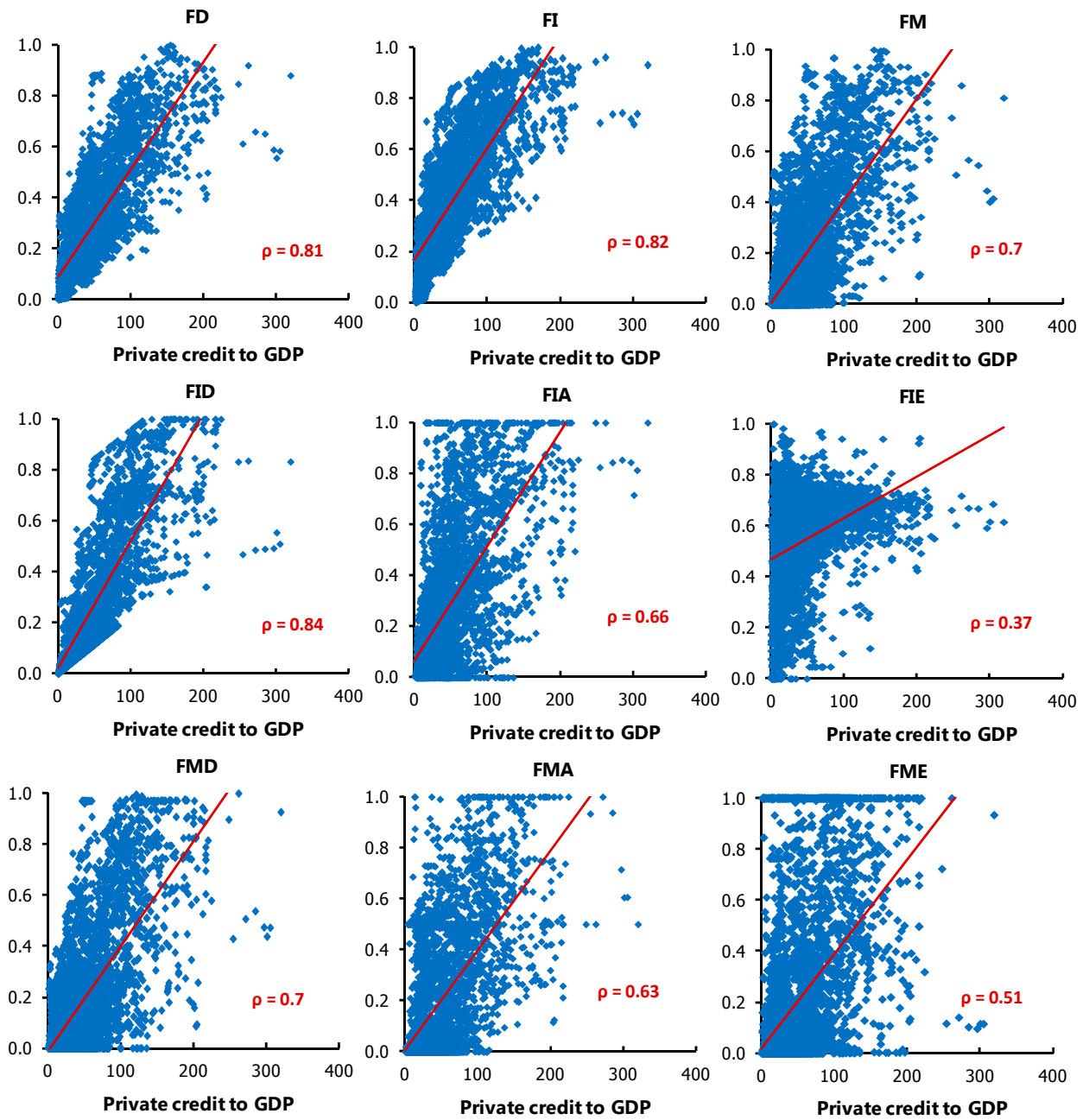
Source: IMF staff estimates.

Figure 11. Correlation of FD Index with Traditional Measures: Stock Market Capitalization/GDP
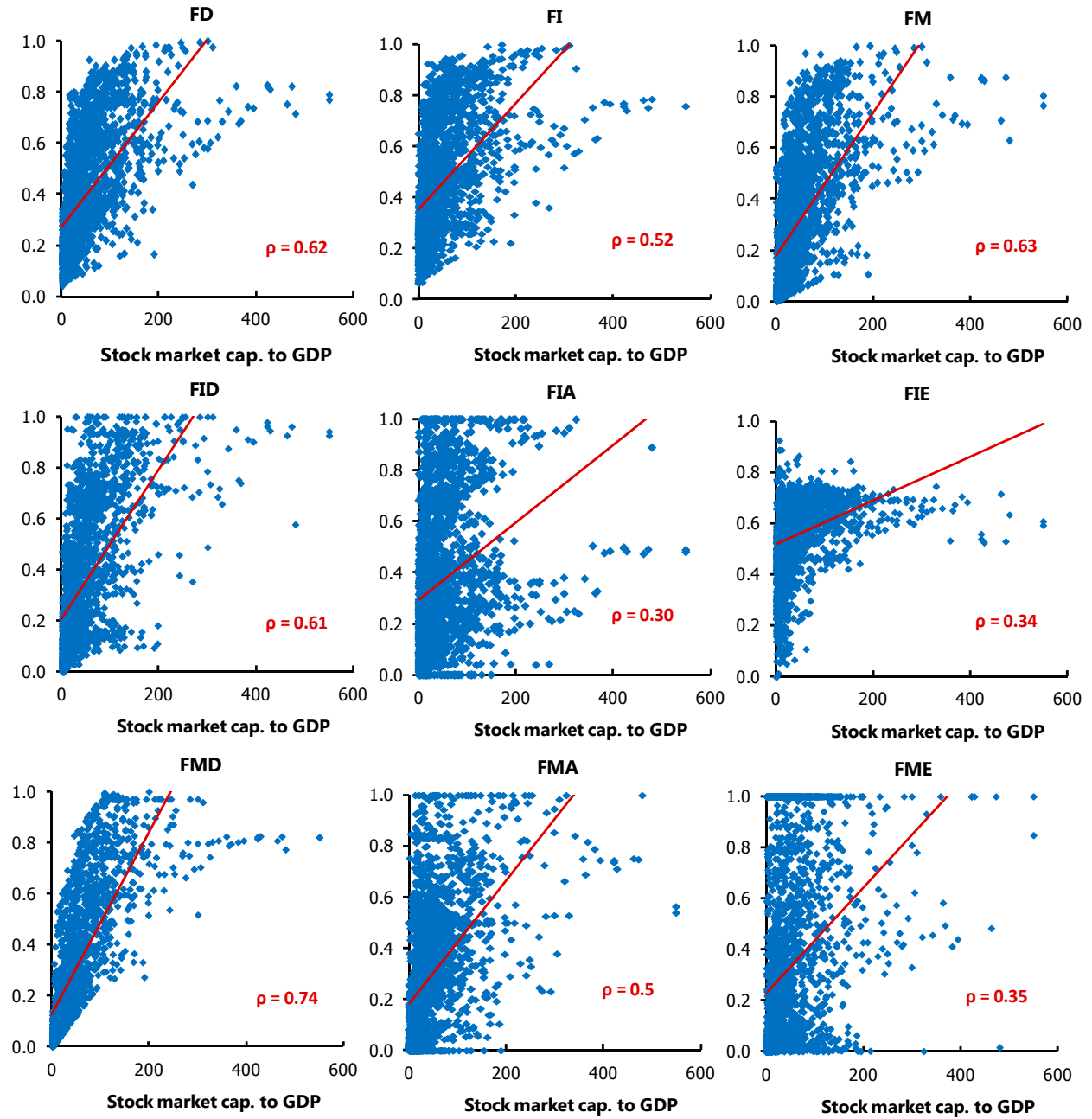
Source: IMF staff estimates.

A few specific country examples could help interpret the FD rankings. Among advanced markets, it may seem surprising that the global financial centers, such as the United Kingdom and Hong Kong, rank somewhat lower than Korea and Australia on financial market development in 2013 (Annex 1). While the United Kingdom has the deepest financial markets among these four countries, it ranks the lowest in this group of four on financial market access and efficiency. In the UK, market capitalization outside of top 10 companies in 2013 is 30 percent, compared to 50 percent in Australia and 38 percent in Korea. Corporate issuance per 100,000 adults stands at 0.6 versus 0.9 in Australia and 1 in Korea. Finally, its stock market turnover is 84 percent, while it is 85 percent in Australia and 139 percent in Korea. Similarly, while Hong Kong ranks highly on financial market efficiency, its overall FM indicator is brought down by lower depth and access.

A similar picture holds in other regions and income groups. Trinidad and Tobago, the wealthiest and most developed nation in the Caribbean region, receives a lower FD rating compared to St. Kitts and Nevis. This is due to lower ratings on financial institutions development. While financial institutions are larger in Trinidad and Tobago, they rank lower on access and efficiency measures. In terms of branches and ATMs per 100,000 adults, Trinidad and Tobago has 13 and 41, while St. Kitts and Nevis has 55 and 107. In terms of efficiency, Trinidad and Tobago has higher net interest margins and overhead costs at five and four percent, compared to St. Kitts and Nevis' 0.7 and 1.3 percent.

These examples help highlight the fact that financial system development needs to be assessed in a comprehensive way. Countries that we would typically associate with the most developed status either globally or regionally due to the size of their financial institutions and markets may not necessarily be so, at least up to a margin, once we take into account how accessible their financial systems are to households and corporates and how efficient they are in delivering their services.

III. LANDSCAPE OF FINANCIAL DEVELOPMENT

The evolution of the FD index over the sample period (1980–2013) shows a pattern that generally confirms priors (Figure 12). Overall, financial development has progressed quite noticeably in both advanced economies (AEs) and emerging markets (EMs), and to a lesser extent in low-income developing countries (LIDCs). However, as one would expect, the gap between the first two groups widened significantly between the mid-1990s and early 2000s, reflecting particularly rapid growth in AEs' financial systems. This episode marks the "Greenspan Era" in the United States, a period when European cross-border banking expanded considerably, as did investment banking and internet banking.[2] On the other hand, during this period financial development proceeded more moderately in EMs and was relatively stagnant in LIDCs. The gap in financial development between the AEs and EMs has subsequently declined after the global financial crisis, reflecting deleveraging in AEs.

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[2] Figure 11 shows simple averages across countries, so the weight of the United States is relatively small. Also, direct cross-border bank lending is not captured by the index to the extent that it is not reflected in domestic credit provision.

A snapshot comparison across peer groups presents quite a diverse picture (Figure 13). In particular, the "gap" in financial development between AEs and EMs differs across the various dimensions of financial development highlighted in the figure. For example, EMs are closer to AEs in financial markets development rather than in financial institutions. Also, despite lower depth, the efficiency of EM and LIDC financial institutions is relatively high. Finally, access seems to be particularly low in LIDCs, making this an area of potential improvement.

Looking at individual country rankings as of 2013, there is substantial variation in financial development within and across income groups (Figure 14). Some large EMs, such as Malaysia, Brazil, and South Africa, have higher levels of financial development than certain AEs, such as New Zealand and Greece. Also, several EMs , such as Tunisia and Armenia, have lower levels of financial development than some LIDCs, such as Mongolia and Bangladesh.

Figure 12. Financial Development through Time
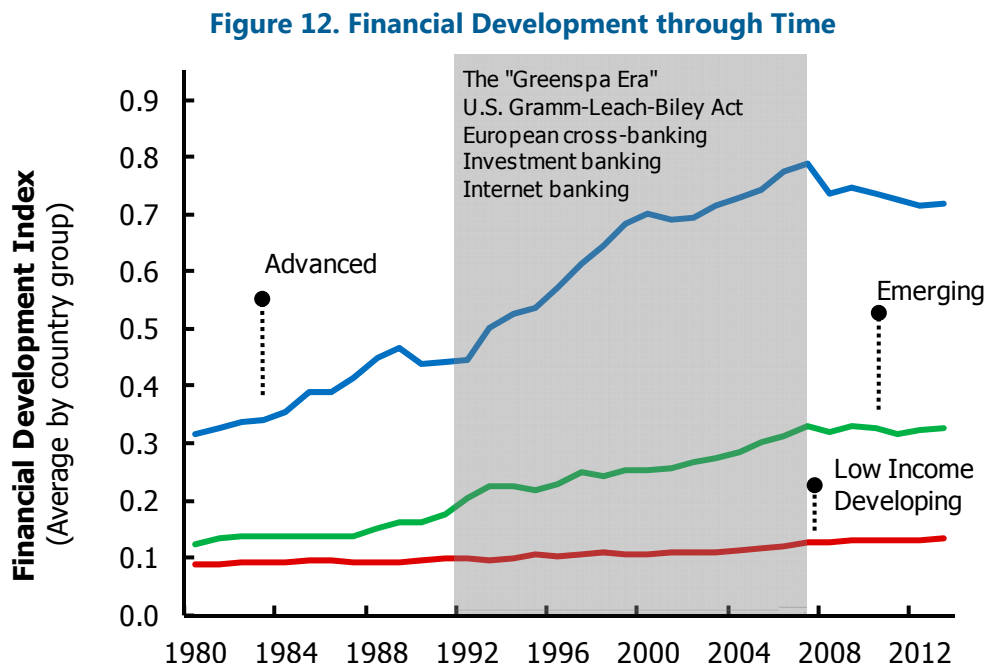
Source: IMF staff estimates

Figure 13. Financial Development Index: Peer Group Averages
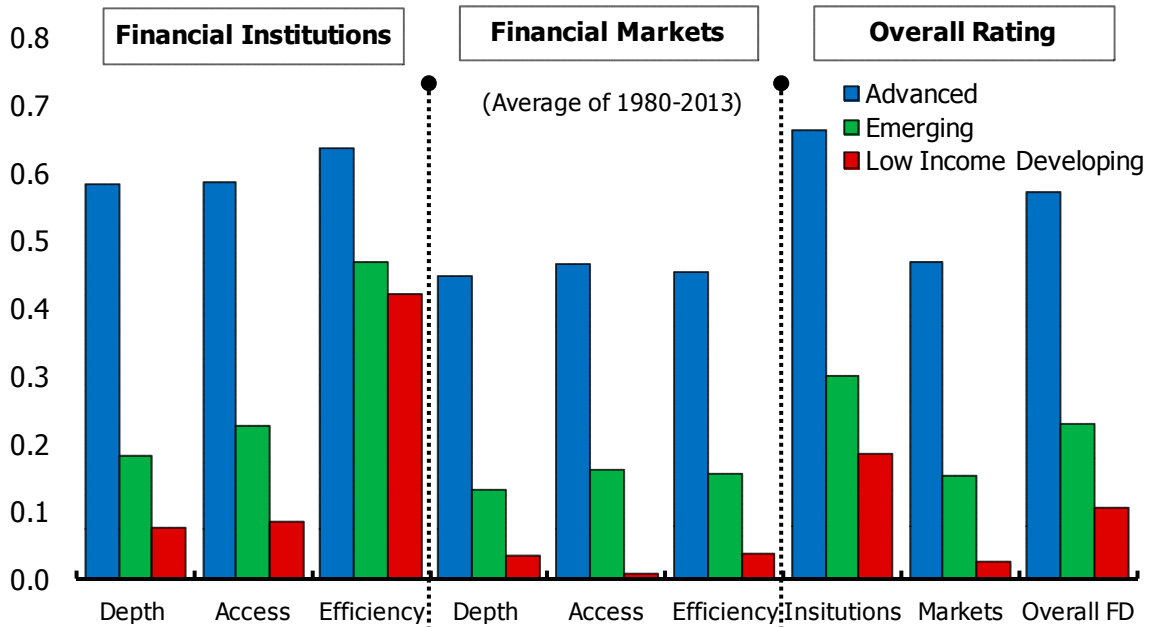
Source: IMF staff estimates

Figure 14. Financial Development Index: Selected Countries, 2013
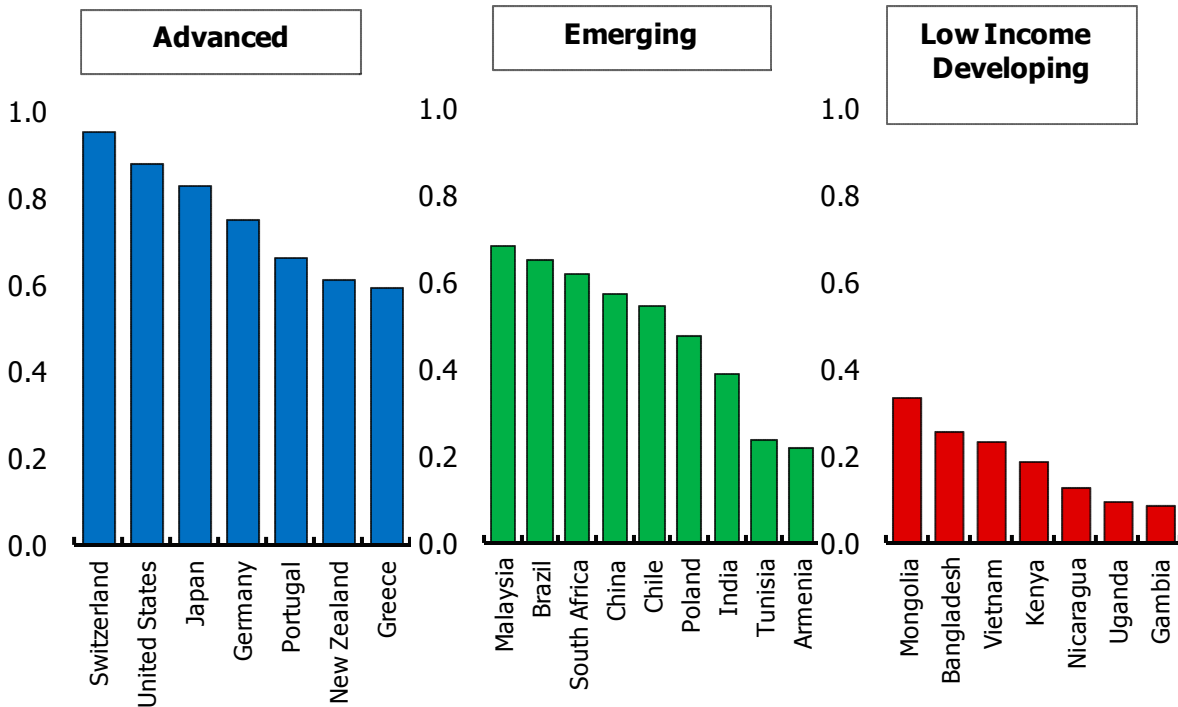
Source: IMF staff estimates

IV. CAVEATS AND LIMITATIONS

A challenge for all empirical literature is that the broad measures of financial development capture only partially the various functions of finance, such as its ability to facilitate risk management, exert corporate control, pool savings, allocate capital to productive investment, and facilitate exchange of goods (Levine 2005). This paper addresses the challenge by relying on a broad set of indicators to develop a more comprehensive index of financial development.

There are a number of limitations to the FD index that need to be taken into account when interpreting empirical results. On the data coverage side, it was not possible to find sufficiently extensive country and time period data on some institutions and activities. One example is shadow banks, whose importance has been rising in a number of EMs, with associated risks (for a recent analysis on this topic for a smaller country sample, see IMF 2014). Different forms of financial payments, such as credit transfers, direct debits, and mobile banking, are undeniably relevant aspects of depth and access in many countries, but indicators of these are currently not available on a sufficiently long time horizon to warrant inclusion in the FD index. Other potentially relevant features of financial development – such as the diversity in the types of financial intermediaries and the organizational complexity of institutions and instruments – are not incorporated in the index.

There are also caveats on the conceptual side. First, by design the FD index only captures the characteristics of financial systems (depth, access, efficiency). It does not include their underlying drivers (such as the institutional, regulatory, and legal frameworks) or outcomes (financial stability measures). Second, some of the measures that the index uses may overstate the true level of financial development. In some countries some of the efficiency measures could reflect government controls, for example on lending and deposit rates, which may inflate efficiency ratings. Finally, researchers need to benchmark the FD index vis-à-vis its determinants, e.g. various country characteristics (see for more detailed guidance Feyen, Kibuuka, and Sourrouille, 2014). Higher FD ranking may not necessarily be a good thing, but may instead indicate that a country's financial system is stretched beyond it structural and regulatory capabilities, with negative implications for growth and stability.

While there are challenges in constructing the index, it serves as an important step toward measuring financial development more comprehensively than before and should aid researchers studying the various relationships between financial development and economic outcomes. We strive to continue improving the financial development indices as new information becomes available.

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Annex 1. 2013 Country Rankings on Financial Development

	Financial Development Index			Financial Insitutions Index			Financial Markets Index	
1	Switzerland	0.951	1	Switzerland	1.000	1	United States	0.903
2	Australia	0.890	2	Luxembourg	0.893	2	Korea, Republic of	0.902
3	United Kingdom	0.882	3	France	0.892	3	Switzerland	0.883
4	United States	0.877	4	United Kingdom	0.892	4	Australia	0.873
5	Spain	0.860	5	Canada	0.890	5	Hong Kong	0.869
6	Korea, Republic of	0.854	6	Japan	0.890	6	United Kingdom	0.855
7	Canada	0.847	7	Australia	0.889	7	Spain	0.836
8	Japan	0.827	8	Spain	0.867	8	Canada	0.786
9	Hong Kong	0.827	9	Denmark	0.856	9	Norway	0.764
10	Italy	0.785	10	Belgium	0.847	10	Sweden	0.762
11	France	0.763	11	Ireland	0.841	11	Japan	0.748
12	Luxembourg	0.761	12	Portugal	0.838	12	Italy	0.741
13	Sweden	0.749	13	United States	0.833	13	Germany	0.731
14	Germany	0.747	14	Italy	0.814	14	Finland	0.727
15	Denmark	0.736	15	Brazil	0.790	15	Netherlands	0.717
16	Singapore	0.731	16	Korea, Republic of	0.789	16	Singapore	0.695
17	Ireland	0.730	17	Iceland	0.780	17	Austria	0.654
18	Netherlands	0.710	18	Malta	0.778	18	Saudi Arabia	0.653
19	Austria	0.707	19	Hong Kong	0.769	19	Russian Federation	0.623
20	Belgium	0.693	20	Israel	0.765	20	China, Mainland	0.622
21	Malaysia	0.685	21	Singapore	0.752	21	France	0.620
22	Norway	0.679	22	New Zealand	0.751	22	Malaysia	0.617
23	Finland	0.669	23	Germany	0.748	23	Luxembourg	0.613
24	Portugal	0.662	24	Austria	0.746	24	Thailand	0.612
25	Brazil	0.652	25	Malaysia	0.739	25	Ireland	0.605
26	Thailand	0.645	26	Bahamas, The	0.725	26	Denmark	0.602
27	Iceland	0.629	27	Sweden	0.722	27	Turkey	0.589
28	South Africa	0.618	28	South Africa	0.713	28	Greece	0.540
29	New Zealand	0.609	29	Cyprus	0.699	29	Belgium	0.525
30	Israel	0.596	30	Netherlands	0.690	30	South Africa	0.511
31	Greece	0.594	31	Croatia	0.684	31	Brazil	0.502
32	Russian Federation	0.592	32	Bulgaria	0.682	32	U.A.E.	0.488
33	China, Mainland	0.572	33	Thailand	0.666	33	Portugal	0.473
34	Malta	0.568	34	Chile	0.655	34	Iceland	0.466
35	Cyprus	0.556	35	Slovenia	0.653	35	New Zealand	0.456
36	Chile	0.545	36	St. Kitts and Nevis	0.643	36	Qatar	0.450
37	Turkey	0.537	37	Greece	0.636	37	Hungary	0.436
38	Saudi Arabia	0.530	38	Antigua & Barbuda	0.618	38	India	0.431
39	Poland	0.476	39	Poland	0.598	39	Chile	0.424
40	Bahamas, The	0.475	40	Finland	0.597	40	Israel	0.415
41	U.A.E.	0.473	41	Norway	0.581	41	Cyprus	0.403
42	Hungary	0.464	42	Seychelles	0.573	42	Philippines	0.381
43	Slovenia	0.464	43	Mauritius	0.562	43	Malta	0.347
44	Qatar	0.452	44	Mongolia	0.558	44	Poland	0.344
45	Colombia	0.449	45	Colombia	0.556	45	Mexico	0.341
46	Barbados	0.435	46	Russian Federation	0.549	46	Colombia	0.333

Annex 1. 2013 Country Rankings on Financial Development (ctd.)

Financial Development Index			Financial Insitutions Index			Financial Markets Index		
47	Jordan	0.414	47	Slovak Republic	0.547	47	Barbados	0.328
48	Peru	0.410	48	Estonia	0.546	48	Jordan	0.312
49	Croatia	0.406	49	Panama	0.539	49	Bahrain	0.311
50	Mexico	0.396	50	Grenada	0.538	50	Peru	0.288
51	India	0.392	51	St. Lucia	0.536	51	Egypt	0.281
52	Morocco	0.390	52	Lebanon	0.535	52	Kazakhstan	0.267
53	Mauritius	0.389	53	Czech Republic	0.533	53	Slovenia	0.267
54	Bulgaria	0.380	54	Barbados	0.532	54	Indonesia	0.259
55	St. Kitts and Nevis	0.366	55	Morocco	0.528	55	Moldova	0.250
56	Philippines	0.365	56	Peru	0.524	56	Oman	0.249
57	Czech Republic	0.360	57	China, Mainland	0.511	57	Morocco	0.243
58	Panama	0.342	58	Jordan	0.509	58	Argentina	0.225
59	Brunei Darussalam	0.336	59	Costa Rica	0.503	59	Bahamas, The	0.216
60	Mongolia	0.335	60	Latvia	0.499	60	Bangladesh	0.213
61	Estonia	0.330	61	Dominica	0.491	61	Mauritius	0.208
62	Trinidad & Tobago	0.328	62	Lithuania	0.491	62	Jamaica	0.187
63	Indonesia	0.322	63	Ecuador	0.489	63	Sri Lanka	0.185
64	Lebanon	0.321	64	Namibia	0.488	64	Iran, I. Rep. Of	0.182
65	Argentina	0.314	65	Trinidad & Tobago	0.488	65	Brunei Darussalam	0.181
66	Slovak Republic	0.314	66	Brunei Darussalam	0.485	66	Czech Republic	0.181
67	Kuwait	0.313	67	Hungary	0.484	67	Kuwait	0.174
68	Antigua & Barbuda	0.312	68	Cape Verde	0.480	68	Trinidad & Tobago	0.161
69	Kazakhstan	0.311	69	Turkey	0.474	69	Papua New Guinea	0.155
70	Bahrain	0.304	70	Macedonia, FYR	0.468	70	Cote D'Ivoire	0.138
71	Latvia	0.298	71	Bosnia and Herzegovina	0.464	71	Panama	0.138
72	Oman	0.297	72	U.A.E.	0.449	72	Pakistan	0.129
73	Moldova	0.297	73	Kuwait	0.447	73	Croatia	0.120
74	Seychelles	0.295	74	Qatar	0.446	74	Estonia	0.107
75	St. Lucia	0.288	75	Mexico	0.443	75	Mongolia	0.105
76	Costa Rica	0.284	76	Guatemala	0.443	76	Vietnam	0.103
77	Egypt	0.280	77	Belize	0.436	77	Lebanon	0.101
78	Lithuania	0.273	78	Ukraine	0.429	78	Botswana	0.091
79	Grenada	0.272	79	Venezuela	0.426	79	Latvia	0.090
80	Sri Lanka	0.270	80	Georgia	0.426	80	Liberia	0.088
81	Namibia	0.269	81	Vanuatu	0.419	81	Laos	0.088
82	Ecuador	0.258	82	El Salvador	0.417	82	Burundi	0.085
83	Ukraine	0.257	83	Armenia	0.416	83	St. Kitts and Nevis	0.081
84	Bangladesh	0.256	84	Fiji	0.411	84	Ukraine	0.080
85	Venezuela	0.255	85	St. Vincent and the Gren	0.402	85	Uzbekistan	0.079
86	Macedonia, FYR	0.251	86	Uruguay	0.402	86	Venezuela	0.079
87	Iran, I. Rep. Of	0.249	87	Tunisia	0.400	87	Slovak Republic	0.074
88	Dominica	0.248	88	Argentina	0.398	88	Tunisia	0.074
89	El Salvador	0.247	89	Saudi Arabia	0.396	89	El Salvador	0.071
90	Guatemala	0.244	90	Albania	0.393	90	Kenya	0.071
91	Cape Verde	0.243	91	Suriname	0.390	91	Bulgaria	0.071
92	Georgia	0.239	92	Macao SAR, China	0.388	92	Honduras	0.065

Annex 1. 2013 Country Rankings on Financial Development (ctd.)

Financial Development Index			Financial Insitutions Index			Financial Markets Index		
93	Tunisia	0.239	93	Bolivia	0.387	93	Costa Rica	0.061
94	Jamaica	0.238	94	Indonesia	0.379	94	Romania	0.059
95	Vietnam	0.236	95	Honduras	0.365	95	Uruguay	0.055
96	Bosnia and Herzegovina	0.236	96	Vietnam	0.364	96	Lithuania	0.051
97	Uruguay	0.231	97	Samoa	0.357	97	Nigeria	0.049
98	Belize	0.223	98	Sri Lanka	0.349	98	Georgia	0.048
99	Armenia	0.220	99	Kazakhstan	0.349	99	Namibia	0.043
100	Botswana	0.219	100	Romania	0.346	100	Djibouti	0.043
101	Honduras	0.217	101	Bhutan	0.346	101	Serbia	0.042
102	Fiji	0.216	102	India	0.344	102	Paraguay	0.041
103	Vanuatu	0.212	103	Botswana	0.342	103	Guatemala	0.040
104	Bolivia	0.211	104	Philippines	0.342	104	Mozambique	0.036
105	Romania	0.205	105	Oman	0.340	105	Uganda	0.036
106	St. Vincent and the Gren	0.203	106	Moldova	0.338	106	Zambia	0.035
107	Albania	0.200	107	Serbia	0.334	107	St. Lucia	0.034
108	Pakistan	0.197	108	Nepal	0.323	108	Bolivia	0.031
109	Uzbekistan	0.197	109	Maldives	0.314	109	Azerbaijan	0.031
110	Suriname	0.197	110	Iran, I. Rep. Of	0.312	110	Macedonia, FYR	0.030
111	Macao SAR, China	0.196	111	Aruba	0.312	111	Bhutan	0.029
112	Serbia	0.190	112	Uzbekistan	0.310	112	Ghana	0.029
113	Bhutan	0.189	113	Tonga	0.301	113	Nepal	0.026
114	Papua New Guinea	0.187	114	Kenya	0.299	114	Turkmenistan	0.025
115	Kenya	0.187	115	Paraguay	0.298	115	Angola	0.023
116	Samoa	0.180	116	Bangladesh	0.294	116	Ecuador	0.022
117	Nepal	0.176	117	Dominican Republic	0.293	117	Malawi	0.022
118	Paraguay	0.171	118	Bahrain	0.291	118	Guyana	0.021
119	Cote D'Ivoire	0.168	119	Belarus	0.289	119	Kyrgyz Republic	0.021
120	Azerbaijan	0.160	120	Azerbaijan	0.287	120	Dominican Republic	0.020
121	Maldives	0.159	121	Guyana	0.283	121	Armenia	0.020
122	Dominican Republic	0.158	122	Jamaica	0.283	122	Yemen	0.018
123	Laos	0.158	123	Swaziland	0.282	123	Niger	0.018
124	Aruba	0.157	124	Angola	0.276	124	Tanzania	0.016
125	Guyana	0.154	125	Egypt	0.274	125	Gabon	0.016
126	Tonga	0.152	126	Libya	0.270	126	Fiji	0.016
127	Belarus	0.151	127	Lesotho	0.268	127	Ethiopia	0.015
128	Angola	0.151	128	Pakistan	0.261	128	Mauritania	0.011
129	Djibouti	0.148	129	Algeria	0.251	129	Seychelles	0.011
130	Swaziland	0.146	130	Djibouti	0.251	130	Belarus	0.010
131	Nigeria	0.138	131	Nicaragua	0.250	131	Cambodia	0.010
132	Libya	0.136	132	Gabon	0.247	132	Chad	0.010
133	Lesotho	0.136	133	Sao Tome and Principe	0.238	133	Madagascar	0.009
134	Gabon	0.133	134	Micronesia, Fed. Sts.	0.234	134	Swaziland	0.006
135	Nicaragua	0.129	135	Syria	0.230	135	Senegal	0.006
136	Mozambique	0.128	136	Cambodia	0.229	136	Belize	0.006
137	Algeria	0.128	137	Nigeria	0.225	137	Sierra Leone	0.006
138	Zambia	0.128	138	Kyrgyz Republic	0.225	138	Nicaragua	0.006

Annex 1. 2013 Country Rankings on Financial Development (ctd.)

Financial Development Index			Financial Insitutions Index			Financial Markets Index		
139	Kyrgyz Republic	0.124	139	Laos	0.224	139	Burkina Faso	0.005
140	Cambodia	0.121	140	Zambia	0.219	140	Guinea	0.004
141	Sao Tome and Principe	0.120	141	Senegal	0.218	141	Cameroon	0.003
142	Micronesia, Fed. Sts.	0.118	142	Mozambique	0.218	142	Togo	0.003
143	Ghana	0.118	143	Burkina Faso	0.217	143	Bosnia and Herzegovina	0.003
144	Burundi	0.117	144	Papua New Guinea	0.215	144	Algeria	0.002
145	Syria	0.116	145	Ethiopia	0.214	145	Lesotho	0.002
146	Ethiopia	0.115	146	Togo	0.211	146	Rwanda	0.002
147	Senegal	0.113	147	Ghana	0.205	147	Albania	0.002
148	Burkina Faso	0.112	148	Myanmar	0.203	148	Cape Verde	0.002
149	Yemen	0.110	149	Benin	0.201	149	Sudan	0.000
150	Togo	0.108	150	Yemen	0.201	150	Tajikistan	0.000
151	Liberia	0.106	151	Kiribati	0.199	151	Libya	0.000
152	Myanmar	0.103	152	Mali	0.197	152	Mali	0.000
153	Tanzania	0.103	153	Cameroon	0.195	153	Congo, Dem. Rep. of	0.000
154	Mauritania	0.102	154	Cote D'Ivoire	0.194	154	French Polynesia	0.000
155	Benin	0.102	155	Solomon Islands	0.193	155	South Sudan	0.000
156	Kiribati	0.100	156	Mauritania	0.190	156	Guinea-Bissau	0.000
157	Cameroon	0.100	157	Tanzania	0.187	157	Timor Leste	0.000
158	Mali	0.099	158	Sudan	0.171	158	Comoros	0.000
159	Solomon Islands	0.098	159	Gambia, The	0.169	159	Equatorial Guinea	0.000
160	Uganda	0.096	160	Haiti	0.168	160	Marshall Islands	0.000
161	Turkmenistan	0.095	161	Tajikistan	0.167	161	C.A.R.	0.000
162	Malawi	0.093	162	Turkmenistan	0.164	162	Congo, Republic of	0.000
163	Niger	0.089	163	Malawi	0.162	163	Eritrea	0.000
164	Sudan	0.086	164	Niger	0.160	164	Haiti	0.000
165	Gambia, The	0.085	165	Congo, Dem. Rep. of	0.159	165	Gambia, The	0.000
166	Haiti	0.085	166	Rwanda	0.156	166	Solomon Islands	0.000
167	Tajikistan	0.084	167	Eritrea	0.156	167	Kiribati	0.000
168	Chad	0.083	168	Chad	0.154	168	Benin	0.000
169	Congo, Dem. Rep. of	0.080	169	Uganda	0.154	169	Myanmar	0.000
170	Rwanda	0.080	170	Madagascar	0.147	170	Syria	0.000
171	Madagascar	0.079	171	Burundi	0.146	171	Micronesia, Fed. Sts.	0.000
172	Eritrea	0.079	172	Guinea	0.145	172	Sao Tome and Principe	0.000
173	Guinea	0.075	173	Liberia	0.121	173	Tonga	0.000
174	Sierra Leone	0.063	174	Sierra Leone	0.120	174	Aruba	0.000
175	Congo, Republic of	0.059	175	Congo, Republic of	0.116	175	Maldives	0.000
176	C.A.R.	0.054	176	C.A.R.	0.108	176	Samoa	0.000
177	Marshall Islands	0.050	177	Marshall Islands	0.099	177	Macao SAR, China	0.000
178	Equatorial Guinea	0.041	178	Equatorial Guinea	0.081	178	Suriname	0.000
179	Comoros	0.035	179	Comoros	0.068	179	St. Vincent and the Gren	0.000
180	Timor Leste	0.024	180	Timor Leste	0.048	180	Vanuatu	0.000
181	Guinea-Bissau	0.017	181	Guinea-Bissau	0.033	181	Dominica	0.000
182	South Sudan	0.012	182	South Sudan	0.024	182	Grenada	0.000
183	French Polynesia	0.000	183	French Polynesia	0.000	183	Antigua & Barbuda	0.000

Source: IMF staff estimates.

Annex 2. 2013 Country Rankings on Financial Institutions Depth, Access, Efficiency

	Financial Institutions Depth			Financial Institutions Access			Financial Institutions Efficiency	
1	Ireland	1.000	1	St. Kitts and Nevis	1.000	1	Greece	0.784
2	Denmark	1.000	2	Brazil	1.000	2	New Zealand	0.751
3	United Kingdom	1.000	3	Portugal	1.000	3	Japan	0.749
4	Switzerland	1.000	4	Spain	1.000	4	China, Mainland	0.747
5	Hong Kong	0.979	5	Luxembourg	0.994	5	Australia	0.735
6	Singapore	0.945	6	Switzerland	0.990	6	Qatar	0.729
7	Canada	0.929	7	Bulgaria	0.954	7	Malaysia	0.726
8	Malaysia	0.894	8	Italy	0.948	8	Sweden	0.723
9	South Africa	0.890	9	France	0.922	9	Estonia	0.717
10	United States	0.817	10	Russian Federation	0.919	10	Bahrain	0.712
11	Australia	0.813	11	Belgium	0.913	11	Korea, Republic of	0.711
12	Sweden	0.802	12	Bahamas, The	0.878	12	Malta	0.710
13	France	0.777	13	Croatia	0.877	13	Norway	0.703
14	Japan	0.773	14	United States	0.870	14	Kuwait	0.699
15	Netherlands	0.746	15	Japan	0.869	15	Barbados	0.697
16	Germany	0.741	16	Slovenia	0.867	16	Finland	0.694
17	Korea, Republic of	0.724	17	Iceland	0.836	17	Oman	0.693
18	Austria	0.707	18	Australia	0.835	18	Singapore	0.692
19	Luxembourg	0.699	19	Seychelles	0.823	19	Libya	0.691
20	Iceland	0.680	20	Antigua & Barbuda	0.806	20	Spain	0.690
21	Malta	0.680	21	Canada	0.766	21	Lebanon	0.690
22	Israel	0.678	22	Mongolia	0.748	22	Czech Republic	0.690
23	Belgium	0.674	23	United Kingdom	0.743	23	U.A.E.	0.690
24	Finland	0.658	24	Malta	0.718	24	Macao SAR, China	0.689
25	Chile	0.638	25	Israel	0.717	25	Netherlands	0.689
26	Spain	0.629	26	Cyprus	0.716	26	Luxembourg	0.688
27	Italy	0.622	27	Ecuador	0.703	27	Panama	0.685
28	New Zealand	0.612	28	Korea, Republic of	0.700	28	Vietnam	0.684
29	Portugal	0.604	29	Colombia	0.695	29	Slovak Republic	0.681
30	Brazil	0.585	30	New Zealand	0.692	30	Nepal	0.681
31	Norway	0.573	31	Peru	0.689	31	Thailand	0.680
32	Cyprus	0.555	32	Austria	0.670	32	Algeria	0.679
33	Thailand	0.515	33	Ireland	0.669	33	Belgium	0.678
34	Morocco	0.471	34	Germany	0.660	34	Egypt	0.676
35	St. Lucia	0.470	35	Brunei Darussalam	0.653	35	Denmark	0.674
36	Mauritius	0.467	36	Greece	0.640	36	Bhutan	0.673
37	Trinidad & Tobago	0.461	37	Poland	0.637	37	France	0.671
38	Bahamas, The	0.432	38	Thailand	0.633	38	Canada	0.668
39	Barbados	0.422	39	Grenada	0.618	39	Israel	0.667
40	China, Mainland	0.413	40	Denmark	0.608	40	Sri Lanka	0.667
41	Jordan	0.399	41	Costa Rica	0.593	41	Jordan	0.664
42	Croatia	0.379	42	Guatemala	0.586	42	Lithuania	0.664
43	Poland	0.373	43	Serbia	0.582	43	Bangladesh	0.660
44	Namibia	0.370	44	Turkey	0.578	44	Bahamas, The	0.654
45	Greece	0.366	45	Cape Verde	0.573	45	Mauritius	0.650
46	Hungary	0.365	46	Slovak Republic	0.568	46	Chile	0.649

Annex 2. 2013 Country Rankings on Financial Institutions Depth, Access, Efficiency (ctd.)

	Financial Institutions Depth			Financial Institutions Access			Financial Institutions Efficiency	
47	Slovenia	0.359	47	Latvia	0.567	47	Mongolia	0.646
48	Antigua & Barbuda	0.350	48	Iran, I. Rep. Of	0.556	48	Myanmar	0.645
49	Grenada	0.347	49	Panama	0.555	49	Philippines	0.644
50	El Salvador	0.320	50	Lithuania	0.548	50	Poland	0.644
51	Czech Republic	0.317	51	Bosnia and Herzegovina	0.547	51	Venezuela	0.644
52	Bolivia	0.313	52	Georgia	0.543	52	Pakistan	0.642
53	Estonia	0.302	53	Lebanon	0.542	53	Indonesia	0.641
54	Fiji	0.300	54	Estonia	0.533	54	Albania	0.640
55	Slovak Republic	0.295	55	Macedonia, FYR	0.526	55	Suriname	0.634
56	Bulgaria	0.288	56	Dominica	0.521	56	Seychelles	0.633
57	Dominica	0.287	57	Ukraine	0.510	57	Austria	0.626
58	Panama	0.285	58	Czech Republic	0.504	58	Switzerland	0.625
59	Lebanon	0.285	59	Chile	0.503	59	Tunisia	0.625
60	Colombia	0.276	60	Hong Kong	0.495	60	Ethiopia	0.623
61	India	0.272	61	Belize	0.494	61	Portugal	0.620
62	Kenya	0.271	62	Armenia	0.493	62	Yemen	0.620
63	Costa Rica	0.269	63	Uzbekistan	0.475	63	Brunei Darussalam	0.617
64	Vietnam	0.266	64	Qatar	0.463	64	Cyprus	0.616
65	Mexico	0.264	65	St. Lucia	0.460	65	El Salvador	0.612
66	Belize	0.247	66	Kuwait	0.458	66	Morocco	0.612
67	Latvia	0.245	67	Netherlands	0.451	67	Namibia	0.610
68	Peru	0.244	68	Mauritius	0.450	68	South Africa	0.609
69	Uruguay	0.240	69	Sweden	0.448	69	Syria	0.607
70	St. Vincent and the Gren	0.238	70	Hungary	0.446	70	St. Kitts and Nevis	0.605
71	Tunisia	0.227	71	Saudi Arabia	0.440	71	Macedonia, FYR	0.604
72	Bahrain	0.221	72	Argentina	0.428	72	United Kingdom	0.602
73	Turkey	0.220	73	Vanuatu	0.427	73	Bulgaria	0.602
74	Jamaica	0.219	74	Samoa	0.426	74	Germany	0.598
75	Lesotho	0.209	75	U.A.E.	0.425	75	Mexico	0.597
76	Bosnia and Herzegovina	0.208	76	South Africa	0.416	76	Burkina Faso	0.596
77	Argentina	0.206	77	Macao SAR, China	0.415	77	Cape Verde	0.596
78	Ukraine	0.199	78	Mexico	0.404	78	Vanuatu	0.594
79	Macedonia, FYR	0.198	79	Albania	0.401	79	Djibouti	0.591
80	Venezuela	0.196	80	Singapore	0.400	80	Croatia	0.589
81	U.A.E.	0.193	81	Venezuela	0.399	81	Aruba	0.589
82	Botswana	0.190	82	Namibia	0.396	82	Latvia	0.585
83	Lithuania	0.189	83	Malaysia	0.395	83	Italy	0.585
84	Cape Verde	0.186	84	Barbados	0.391	84	Armenia	0.578
85	Honduras	0.185	85	Morocco	0.389	85	Botswana	0.577
86	Vanuatu	0.185	86	Kazakhstan	0.387	86	Moldova	0.576
87	Nepal	0.183	87	Honduras	0.387	87	Guyana	0.576
88	Philippines	0.183	88	St. Vincent and the Gren	0.385	88	Turkmenistan	0.572
89	Russian Federation	0.178	89	Jordan	0.379	89	Saudi Arabia	0.564
90	Kazakhstan	0.168	90	Tonga	0.366	90	Guatemala	0.563
91	Serbia	0.167	91	Uruguay	0.360	91	Trinidad & Tobago	0.562
92	Mongolia	0.165	92	Sao Tome and Principe	0.356	92	Dominica	0.561

Annex 2. 2013 Country Rankings on Financial Institutions Depth, Access, Efficiency (ctd.)

Financial Institutions Depth			Financial Institutions Access			Financial Institutions Efficiency		
93	Suriname	0.165	93	Norway	0.353	93	Georgia	0.560
94	Paraguay	0.164	94	Suriname	0.348	94	Hong Kong	0.560
95	Indonesia	0.160	95	Trinidad & Tobago	0.337	95	Colombia	0.552
96	Romania	0.152	96	Fiji	0.325	96	Uruguay	0.550
97	Kuwait	0.150	97	Romania	0.321	97	Iceland	0.544
98	St. Kitts and Nevis	0.149	98	Indonesia	0.321	98	Fiji	0.544
99	Bangladesh	0.143	99	Tunisia	0.316	99	Cameroon	0.543
100	Togo	0.143	100	China, Mainland	0.316	100	Bosnia and Herzegovina	0.541
101	Aruba	0.142	101	Finland	0.313	101	St. Lucia	0.538
102	Saudi Arabia	0.137	102	Maldives	0.308	102	Romania	0.536
103	Seychelles	0.136	103	Moldova	0.297	103	India	0.534
104	Ecuador	0.135	104	Dominican Republic	0.289	104	Ireland	0.530
105	Swaziland	0.133	105	Bolivia	0.285	105	Maldives	0.529
106	Malawi	0.133	106	Sri Lanka	0.284	106	Hungary	0.529
107	Dominican Republic	0.133	107	Bhutan	0.278	107	Swaziland	0.528
108	Oman	0.131	108	Azerbaijan	0.276	108	Papua New Guinea	0.528
109	Moldova	0.131	109	El Salvador	0.273	109	Laos	0.523
110	Armenia	0.123	110	Belarus	0.266	110	Congo, Dem. Rep. of	0.523
111	Djibouti	0.123	111	Botswana	0.246	111	Costa Rica	0.522
112	Qatar	0.122	112	Angola	0.244	112	Slovenia	0.521
113	Albania	0.118	113	Marshall Islands	0.241	113	St. Vincent and the Gren	0.516
114	Mozambique	0.112	114	Micronesia, Fed. Sts.	0.238	114	Turkey	0.515
115	Nicaragua	0.111	115	Paraguay	0.226	115	Cambodia	0.514
116	Cambodia	0.111	116	Oman	0.221	116	Benin	0.513
117	Samoa	0.110	117	Jamaica	0.213	117	Ecuador	0.511
118	Senegal	0.110	118	Aruba	0.213	118	Gabon	0.510
119	Guyana	0.109	119	Philippines	0.207	119	Kiribati	0.509
120	Sri Lanka	0.109	120	India	0.198	120	Angola	0.508
121	Georgia	0.109	121	Swaziland	0.191	121	Belarus	0.507
122	Guatemala	0.107	122	Kyrgyz Republic	0.190	122	Lesotho	0.506
123	Brunei Darussalam	0.105	123	Gabon	0.188	123	Senegal	0.504
124	Bhutan	0.102	124	Guyana	0.186	124	Azerbaijan	0.504
125	Papua New Guinea	0.100	125	Nicaragua	0.156	125	Kenya	0.502
126	Zambia	0.099	126	Vietnam	0.150	126	Chad	0.501
127	Maldives	0.095	127	Libya	0.147	127	Antigua & Barbuda	0.500
128	Egypt	0.094	128	Kiribati	0.136	128	Nicaragua	0.499
129	Cote D'Ivoire	0.093	129	Nepal	0.135	129	Peru	0.496
130	Belarus	0.089	130	Pakistan	0.134	130	Grenada	0.495
131	Nigeria	0.086	131	Solomon Islands	0.133	131	Bolivia	0.494
132	Mauritania	0.086	132	Nigeria	0.132	132	Mozambique	0.491
133	Iran, I. Rep. Of	0.082	133	Tajikistan	0.125	133	Paraguay	0.488
134	Burkina Faso	0.081	134	Equatorial Guinea	0.121	134	Eritrea	0.486
135	Benin	0.081	135	Bangladesh	0.120	135	Micronesia, Fed. Sts.	0.485
136	Angola	0.079	136	Laos	0.117	136	Tanzania	0.484
137	Ghana	0.077	137	Egypt	0.110	137	Argentina	0.484
138	Azerbaijan	0.077	138	Kenya	0.110	138	Ukraine	0.484

Annex 2. 2013 Country Rankings on Financial Institutions Depth, Access, Efficiency (ctd.)

Financial Institutions Depth			Financial Institutions Access			Financial Institutions Efficiency		
139	Laos	0.071	139	Ghana	0.106	139	Zambia	0.484
140	Sao Tome and Principe	0.069	140	Zambia	0.102	140	Samoa	0.482
141	Tonga	0.068	141	Gambia, The	0.096	141	Nigeria	0.481
142	Mali	0.068	142	Lesotho	0.094	142	Mali	0.481
143	Tanzania	0.066	143	Cambodia	0.093	143	Brazil	0.479
144	Cameroon	0.066	144	Rwanda	0.091	144	Mauritania	0.479
145	Syria	0.065	145	Algeria	0.088	145	United States	0.479
146	Pakistan	0.064	146	Cote D'Ivoire	0.082	146	Sudan	0.473
147	Gabon	0.063	147	Djibouti	0.082	147	Haiti	0.471
148	Algeria	0.060	148	Mali	0.082	148	Kyrgyz Republic	0.461
149	Ethiopia	0.060	149	Mozambique	0.081	149	Belize	0.461
150	Congo, Republic of	0.059	150	Syria	0.078	150	Ghana	0.460
151	Macao SAR, China	0.057	151	Togo	0.076	151	Niger	0.459
152	Uganda	0.057	152	Senegal	0.076	152	Honduras	0.457
153	Haiti	0.056	153	Timor Leste	0.071	153	Guinea	0.448
154	Gambia, The	0.055	154	Papua New Guinea	0.062	154	Tonga	0.436
155	Rwanda	0.054	155	Malawi	0.059	155	Cote D'Ivoire	0.434
156	Solomon Islands	0.052	156	Congo, Republic of	0.058	156	Togo	0.430
157	Tajikistan	0.052	157	Benin	0.058	157	Kazakhstan	0.426
158	Niger	0.051	158	Tanzania	0.056	158	Dominican Republic	0.422
159	Comoros	0.051	159	Uganda	0.055	159	Solomon Islands	0.416
160	Madagascar	0.049	160	Sudan	0.054	160	Madagascar	0.412
161	Eritrea	0.047	161	Liberia	0.053	161	Burundi	0.395
162	Burundi	0.044	162	Comoros	0.052	162	Uzbekistan	0.395
163	C.A.R.	0.043	163	Mauritania	0.050	163	Uganda	0.384
164	Kyrgyz Republic	0.042	164	Guinea-Bissau	0.048	164	Gambia, The	0.381
165	Sudan	0.038	165	Yemen	0.044	165	Jamaica	0.372
166	Libya	0.037	166	Burundi	0.041	166	Russian Federation	0.345
167	Guinea-Bissau	0.031	167	Burkina Faso	0.040	167	Rwanda	0.344
168	Equatorial Guinea	0.026	168	Cameroon	0.037	168	Sierra Leone	0.344
169	Myanmar	0.024	169	Ethiopia	0.034	169	Liberia	0.336
170	Sierra Leone	0.023	170	Sierra Leone	0.034	170	Tajikistan	0.335
171	Chad	0.023	171	Myanmar	0.031	171	C.A.R.	0.296
172	Guinea	0.021	172	Haiti	0.030	172	Malawi	0.293
173	Yemen	0.021	173	Madagascar	0.028	173	Congo, Republic of	0.242
174	Congo, Dem. Rep. of	0.019	174	Guinea	0.026	174	Sao Tome and Principe	0.222
175	Liberia	0.012	175	Niger	0.024	175	Iran, I. Rep. Of	0.175
176	Uzbekistan	0.011	176	South Sudan	0.019	176	Comoros	0.093
177	Turkmenistan	0.009	177	C.A.R.	0.016	177	Serbia	0.089
178	South Sudan	0.003	178	Congo, Dem. Rep. of	0.011	178	Equatorial Guinea	0.074
179	French Polynesia	0.000	179	Chad	0.011	179	Timor Leste	0.067
180	Timor Leste	0.000	180	French Polynesia	0.000	180	South Sudan	0.055
181	Marshall Islands	0.000	181	Eritrea	0.000	181	French Polynesia	0.000
182	Kiribati	0.000	182	Turkmenistan	0.000	182	Guinea-Bissau	0.000
183	Micronesia, Fed. Sts.	0.000	183	Bahrain	0.000	183	Marshall Islands	0.000

Source: IMF staff estimates.

Annex 3. 2013 Country Rankings on Financial Markets Depth, Access, Efficiency

Financial Markets Depth			Financial Markets Access			Financial Markets Efficiency		
1	Sweden	0.996	1	Norway	1.000	1	Saudi Arabia	1.000
2	Canada	0.987	2	Ireland	1.000	2	Turkey	1.000
3	United Kingdom	0.973	3	Luxembourg	1.000	3	China, Mainland	1.000
4	United States	0.971	4	Switzerland	0.977	4	Italy	1.000
5	Switzerland	0.970	5	Austria	0.908	5	Hong Kong	1.000
6	Spain	0.908	6	Australia	0.835	6	Korea, Republic of	1.000
7	Australia	0.904	7	Malta	0.832	7	Spain	1.000
8	Netherlands	0.902	8	U.A.E.	0.764	8	United States	1.000
9	Singapore	0.895	9	Korea, Republic of	0.754	9	Japan	0.950
10	Korea, Republic of	0.890	10	Hong Kong	0.737	10	Germany	0.874
11	Finland	0.820	11	United Kingdom	0.708	11	Russian Federation	0.834
12	Malaysia	0.817	12	Greece	0.700	12	Australia	0.806
13	Hong Kong	0.815	13	Canada	0.687	13	United Kingdom	0.800
14	France	0.811	14	Qatar	0.684	14	Finland	0.795
15	Japan	0.757	15	Singapore	0.681	15	Moldova	0.763
16	Luxembourg	0.743	16	Malaysia	0.670	16	Sweden	0.695
17	Denmark	0.738	17	United States	0.665	17	Netherlands	0.674
18	South Africa	0.735	18	Germany	0.611	18	Thailand	0.671
19	Belgium	0.710	19	Cyprus	0.605	19	Brazil	0.646
20	Thailand	0.700	20	New Zealand	0.592	20	France	0.632
21	Norway	0.696	21	Italy	0.580	21	Switzerland	0.607
22	Germany	0.667	22	Argentina	0.578	22	Canada	0.586
23	Ireland	0.635	23	Russian Federation	0.576	23	Bangladesh	0.582
24	Portugal	0.630	24	Chile	0.575	24	Norway	0.536
25	Philippines	0.626	25	Slovenia	0.560	25	South Africa	0.523
26	Italy	0.614	26	Kazakhstan	0.552	26	India	0.520
27	China, Mainland	0.591	27	Peru	0.551	27	Hungary	0.520
28	Bahrain	0.590	28	Colombia	0.551	28	Denmark	0.497
29	Iceland	0.569	29	Hungary	0.550	29	Austria	0.477
30	Austria	0.535	30	Spain	0.534	30	Israel	0.437
31	Saudi Arabia	0.516	31	Brunei Darussalam	0.500	31	Singapore	0.412
32	Greece	0.512	32	Iceland	0.500	32	Poland	0.405
33	India	0.508	33	Finland	0.500	33	Portugal	0.398
34	Qatar	0.492	34	Denmark	0.500	34	Belgium	0.371
35	Barbados	0.491	35	Sweden	0.500	35	Greece	0.361
36	Chile	0.489	36	Netherlands	0.492	36	Egypt	0.360
37	Russian Federation	0.445	37	Japan	0.487	37	New Zealand	0.314
38	Cyprus	0.438	38	Morocco	0.477	38	Pakistan	0.298
39	New Zealand	0.423	39	Jordan	0.470	39	Malaysia	0.272
40	U.A.E.	0.418	40	Mexico	0.444	40	Iceland	0.269
41	Brazil	0.408	41	Brazil	0.433	41	Czech Republic	0.257
42	Papua New Guinea	0.406	42	Israel	0.427	42	U.A.E.	0.241
43	Turkey	0.398	43	Barbados	0.427	43	Mexico	0.241
44	Jamaica	0.388	44	Saudi Arabia	0.427	44	Indonesia	0.222
45	Israel	0.359	45	Belgium	0.421	45	Kuwait	0.221
46	Cote D'Ivoire	0.342	46	Thailand	0.409	46	Iran, I. Rep. Of	0.169

Annex 3. 2013 Country Rankings on Financial Markets Depth, Access, Efficiency (ctd.)

	Financial Markets Depth			Financial Markets Access			Financial Markets Efficiency	
47	Jordan	0.330	47	Mauritius	0.402	47	Philippines	0.154
48	Mexico	0.311	48	Poland	0.377	48	Chile	0.152
49	Colombia	0.307	49	Turkey	0.371	49	Tunisia	0.128
50	Panama	0.297	50	France	0.343	50	Oman	0.127
51	Bahamas, The	0.288	51	Egypt	0.339	51	Vietnam	0.125
52	Oman	0.282	52	Sri Lanka	0.336	52	Qatar	0.116
53	Croatia	0.273	53	Portugal	0.329	53	Cyprus	0.114
54	Trinidad & Tobago	0.260	54	Bahamas, The	0.322	54	Romania	0.109
55	Kuwait	0.245	55	Indonesia	0.310	55	Colombia	0.107
56	Poland	0.240	56	Oman	0.310	56	Ireland	0.106
57	Hungary	0.234	57	Philippines	0.289	57	Jordan	0.098
58	Liberia	0.234	58	Iran, I. Rep. Of	0.266	58	Sri Lanka	0.087
59	Laos	0.234	59	China, Mainland	0.250	59	Estonia	0.087
60	Peru	0.233	60	Bahrain	0.250	60	Nigeria	0.084
61	Indonesia	0.228	61	India	0.226	61	Kenya	0.077
62	Lebanon	0.213	62	South Africa	0.207	62	Guatemala	0.061
63	Burundi	0.212	63	Trinidad & Tobago	0.181	63	Slovenia	0.059
64	St. Kitts and Nevis	0.208	64	Latvia	0.172	64	Morocco	0.059
65	Czech Republic	0.200	65	Estonia	0.098	65	Uzbekistan	0.056
66	Venezuela	0.199	66	Jamaica	0.096	66	Peru	0.054
67	Kazakhstan	0.194	67	Mongolia	0.087	67	Zambia	0.053
68	Mongolia	0.180	68	Uruguay	0.083	68	Paraguay	0.052
69	Malta	0.178	69	Costa Rica	0.075	69	Macedonia, FYR	0.052
70	Morocco	0.176	70	Namibia	0.071	70	Ukraine	0.050
71	Vietnam	0.165	71	Czech Republic	0.071	71	Bulgaria	0.046
72	Mauritius	0.165	72	Panama	0.068	72	Lithuania	0.040
73	Slovenia	0.163	73	Botswana	0.068	73	Mauritius	0.038
74	El Salvador	0.162	74	Slovak Republic	0.066	74	Lebanon	0.038
75	Botswana	0.160	75	Armenia	0.042	75	Argentina	0.036
76	Honduras	0.158	76	Paraguay	0.041	76	Serbia	0.035
77	Ukraine	0.153	77	Lithuania	0.039	77	Slovak Republic	0.034
78	Egypt	0.145	78	Uzbekistan	0.037	78	Kyrgyz Republic	0.032
79	Uzbekistan	0.131	79	Bulgaria	0.035	79	Kazakhstan	0.032
80	Estonia	0.125	80	Kuwait	0.035	80	Jamaica	0.029
81	Sri Lanka	0.122	81	Croatia	0.030	81	Latvia	0.028
82	Kenya	0.119	82	Guatemala	0.030	82	Mongolia	0.027
83	Bulgaria	0.117	83	Georgia	0.028	83	Botswana	0.025
84	Djibouti	0.114	84	Lebanon	0.027	84	Ecuador	0.022
85	Slovak Republic	0.109	85	Dominican Republic	0.026	85	Cote D'Ivoire	0.022
86	Iran, I. Rep. Of	0.105	86	Azerbaijan	0.025	86	Croatia	0.022
87	Georgia	0.101	87	El Salvador	0.025	87	Costa Rica	0.019
88	Uganda	0.094	88	Kyrgyz Republic	0.024	88	Bahrain	0.018
89	Pakistan	0.091	89	Ukraine	0.021	89	Namibia	0.016
90	St. Lucia	0.090	90	Bolivia	0.021	90	Ghana	0.016
91	Mozambique	0.090	91	Honduras	0.017	91	Tanzania	0.015
92	Serbia	0.081	92	Burundi	0.016	92	Fiji	0.015

Annex 3. 2013 Country Rankings on Financial Markets Depth, Access, Efficiency (ctd.)

Financial Markets Depth			Financial Markets Access			Financial Markets Efficiency		
93	Costa Rica	0.079	93	Ecuador	0.013	93	Malawi	0.014
94	Bhutan	0.078	94	Belarus	0.013	94	Nepal	0.012
95	Tunisia	0.077	95	Tunisia	0.012	95	Malta	0.012
96	Bangladesh	0.076	96	Angola	0.009	96	Panama	0.009
97	Lithuania	0.067	97	Venezuela	0.009	97	St. Kitts and Nevis	0.008
98	Uruguay	0.066	98	Cote D'Ivoire	0.008	98	Uruguay	0.008
99	Turkmenistan	0.066	99	Mozambique	0.006	99	Trinidad & Tobago	0.007
100	Ghana	0.064	100	Tanzania	0.006	100	Armenia	0.007
101	Latvia	0.063	101	Romania	0.006	101	El Salvador	0.006
102	Bolivia	0.062	102	Algeria	0.005	102	Papua New Guinea	0.006
103	Romania	0.061	103	Kenya	0.004	103	Bolivia	0.004
104	Azerbaijan	0.059	104	Nigeria	0.004	104	Barbados	0.004
105	Nepal	0.059	105	Bangladesh	0.002	105	Guyana	0.003
106	Argentina	0.056	106	Ethiopia	0.002	106	Georgia	0.002
107	Nigeria	0.056	107	Vietnam	0.001	107	Venezuela	0.002
108	Angola	0.054	108	Pakistan	0.001	108	Luxembourg	0.002
109	Guyana	0.054	109	French Polynesia	0.000	109	Uganda	0.001
110	Zambia	0.047	110	South Sudan	0.000	110	Swaziland	0.000
111	Yemen	0.047	111	Guinea-Bissau	0.000	111	French Polynesia	0.000
112	Niger	0.046	112	Timor Leste	0.000	112	South Sudan	0.000
113	Malawi	0.045	113	Comoros	0.000	113	Guinea-Bissau	0.000
114	Gabon	0.043	114	Equatorial Guinea	0.000	114	Timor Leste	0.000
115	Brunei Darussalam	0.040	115	Marshall Islands	0.000	115	Comoros	0.000
116	Namibia	0.039	116	C.A.R.	0.000	116	Equatorial Guinea	0.000
117	Ethiopia	0.038	117	Congo, Republic of	0.000	117	Marshall Islands	0.000
118	Macedonia, FYR	0.035	118	Sierra Leone	0.000	118	C.A.R.	0.000
119	Dominican Republic	0.031	119	Guinea	0.000	119	Congo, Republic of	0.000
120	Mauritania	0.030	120	Eritrea	0.000	120	Sierra Leone	0.000
121	Seychelles	0.030	121	Madagascar	0.000	121	Guinea	0.000
122	Paraguay	0.029	122	Rwanda	0.000	122	Eritrea	0.000
123	Ecuador	0.029	123	Congo, Dem. Rep. of	0.000	123	Madagascar	0.000
124	Fiji	0.029	124	Chad	0.000	124	Rwanda	0.000
125	Guatemala	0.027	125	Tajikistan	0.000	125	Congo, Dem. Rep. of	0.000
126	Cambodia	0.027	126	Haiti	0.000	126	Chad	0.000
127	Chad	0.026	127	Gambia, The	0.000	127	Tajikistan	0.000
128	Tanzania	0.025	128	Sudan	0.000	128	Haiti	0.000
129	Madagascar	0.025	129	Niger	0.000	129	Gambia, The	0.000
130	Moldova	0.023	130	Malawi	0.000	130	Sudan	0.000
131	Belarus	0.017	131	Turkmenistan	0.000	131	Niger	0.000
132	Swaziland	0.017	132	Uganda	0.000	132	Turkmenistan	0.000
133	Senegal	0.016	133	Solomon Islands	0.000	133	Solomon Islands	0.000
134	Belize	0.015	134	Mali	0.000	134	Mali	0.000
135	Sierra Leone	0.015	135	Cameroon	0.000	135	Cameroon	0.000
136	Nicaragua	0.015	136	Kiribati	0.000	136	Kiribati	0.000
137	Burkina Faso	0.013	137	Benin	0.000	137	Benin	0.000
138	Guinea	0.010	138	Mauritania	0.000	138	Mauritania	0.000

Annex 3. 2013 Country Rankings on Financial Markets Depth, Access, Efficiency (ctd.)

Financial Markets Depth			Financial Markets Access			Financial Markets Efficiency		
139	Cameroon	0.009	139	Myanmar	0.000	139	Myanmar	0.000
140	Armenia	0.009	140	Liberia	0.000	140	Liberia	0.000
141	Togo	0.009	141	Togo	0.000	141	Togo	0.000
142	Bosnia and Herzegovina	0.007	142	Yemen	0.000	142	Yemen	0.000
143	Kyrgyz Republic	0.007	143	Burkina Faso	0.000	143	Burkina Faso	0.000
144	Lesotho	0.005	144	Senegal	0.000	144	Senegal	0.000
145	Rwanda	0.005	145	Syria	0.000	145	Ethiopia	0.000
146	Albania	0.005	146	Ghana	0.000	146	Syria	0.000
147	Cape Verde	0.005	147	Micronesia, Fed. Sts.	0.000	147	Burundi	0.000
148	Algeria	0.001	148	Sao Tome and Principe	0.000	148	Micronesia, Fed. Sts.	0.000
149	Sudan	0.001	149	Cambodia	0.000	149	Sao Tome and Principe	0.000
150	Tajikistan	0.001	150	Zambia	0.000	150	Cambodia	0.000
151	Libya	0.000	151	Nicaragua	0.000	151	Algeria	0.000
152	Mali	0.000	152	Gabon	0.000	152	Mozambique	0.000
153	Congo, Dem. Rep. of	0.000	153	Lesotho	0.000	153	Nicaragua	0.000
154	French Polynesia	0.000	154	Libya	0.000	154	Gabon	0.000
155	South Sudan	0.000	155	Swaziland	0.000	155	Lesotho	0.000
156	Guinea-Bissau	0.000	156	Djibouti	0.000	156	Libya	0.000
157	Timor Leste	0.000	157	Tonga	0.000	157	Djibouti	0.000
158	Comoros	0.000	158	Guyana	0.000	158	Angola	0.000
159	Equatorial Guinea	0.000	159	Aruba	0.000	159	Belarus	0.000
160	Marshall Islands	0.000	160	Laos	0.000	160	Tonga	0.000
161	C.A.R.	0.000	161	Maldives	0.000	161	Aruba	0.000
162	Congo, Republic of	0.000	162	Nepal	0.000	162	Laos	0.000
163	Eritrea	0.000	163	Samoa	0.000	163	Dominican Republic	0.000
164	Haiti	0.000	164	Papua New Guinea	0.000	164	Maldives	0.000
165	Gambia, The	0.000	165	Bhutan	0.000	165	Azerbaijan	0.000
166	Solomon Islands	0.000	166	Serbia	0.000	166	Samoa	0.000
167	Kiribati	0.000	167	Macao SAR, China	0.000	167	Bhutan	0.000
168	Benin	0.000	168	Suriname	0.000	168	Macao SAR, China	0.000
169	Myanmar	0.000	169	Albania	0.000	169	Suriname	0.000
170	Syria	0.000	170	St. Vincent and the Gren	0.000	170	Albania	0.000
171	Micronesia, Fed. Sts.	0.000	171	Vanuatu	0.000	171	St. Vincent and the Gren	0.000
172	Sao Tome and Principe	0.000	172	Fiji	0.000	172	Vanuatu	0.000
173	Tonga	0.000	173	Belize	0.000	173	Honduras	0.000
174	Aruba	0.000	174	Bosnia and Herzegovina	0.000	174	Belize	0.000
175	Maldives	0.000	175	Cape Verde	0.000	175	Bosnia and Herzegovina	0.000
176	Samoa	0.000	176	Dominica	0.000	176	Cape Verde	0.000
177	Macao SAR, China	0.000	177	Macedonia, FYR	0.000	177	Dominica	0.000
178	Suriname	0.000	178	Grenada	0.000	178	Grenada	0.000
179	St. Vincent and the Gren	0.000	179	St. Lucia	0.000	179	St. Lucia	0.000
180	Vanuatu	0.000	180	Seychelles	0.000	180	Seychelles	0.000
181	Dominica	0.000	181	Moldova	0.000	181	Antigua & Barbuda	0.000
182	Grenada	0.000	182	Antigua & Barbuda	0.000	182	Brunei Darussalam	0.000
183	Antigua & Barbuda	0.000	183	St. Kitts and Nevis	0.000	183	Bahamas, The	0.000

Source: IMF staff estimates.