FINANCIAL DEVELOPMENT IN 205 ECONOMIES, 1960 TO 2010

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NBER Working Paper No. 18946
April 2013
JEL No. G00,G01,G10,G20,O16

ABSTRACT

This paper describes our construction of the Global Financial Development Database and uses the data to compare financial systems around the world. The database provides information on financial systems in 205 economies over the period from 1960 to 2010 and includes measures of (1) size of financial institutions and markets (financial depth), (2) degree to which individuals and firms can and do use financial services (access), (3) efficiency of financial intermediaries and markets in intermediating resources and facilitating financial transactions (efficiency), and (4) stability of financial institutions and markets (stability).

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Introduction

A growing body of evidence suggests that financial institutions (such as banks and insurance companies) and financial markets (including stock markets, bond markets, and derivative markets) exert a powerful influence on economic development, poverty alleviation, and economic stability [Levine (2005)]. For example, when banks screen borrowers and identify firms with the most promising prospects, this is a key step that helps allocate resources efficiently, expand economic opportunities, and foster growth. When banks and securities markets mobilize savings from households to invest in promising projects, this is another crucial step in fostering economic development. When financial institutions monitor the use of investments and scrutinize managerial performance, this is an additional ingredient in boosting the efficiency of corporations and reducing waste and fraud by corporate insiders. But, that is not all. When equity, bond, and derivative markets enable the diversification of risk, this encourages investment in higher-return projects that might otherwise be shunned. And, when financial systems lower transactions costs, it facilitates trade and specialization—fundamental inputs to technological innovation [Smith (1776)].

But, when financial systems perform these functions poorly, they tend to hinder economic growth, curtail economic opportunities, and destabilize economies. For example, if financial systems simply collect funds with one hand and pass them along to cronies, the wealthy, and the politically-connected with the other hand, this slows economic growth and prohibits many potential entrepreneurs from even attempting to realize their economic dreams. And, if financial institutions fail to exert sound corporate governance over the firms that they fund, this makes it easier for managers to pursue projects that benefit themselves

rather than the firm and the overall economy. When financial institutions create complex financial instruments and sell them to unsophisticated investors, this might boost the bonuses of the financial engineers and executives associated with marketing the new-fangled instruments while simultaneously distorting the allocation of society's savings and impeding economic prosperity [Barth, Caprio, and Levine (2006, 2012)].

Although the evidence on the role of the financial system in shaping economic development is substantial and varied, there are serious shortcomings associated with measuring the central concept under consideration: the functioning of the financial system. Researchers do not have good cross-country, cross-time measures of the degree to which financial systems (1) enhance the quality of information about firms and hence the efficiency of resource allocation, (2) exert sound corporate governance over the firms to which they funnel those resources, (3) provide effective mechanisms for managing, pooling, and diversifying risk, (4) mobilize savings from disparate savers so these resources can be allocated to the most promising projects in the economy, and (5) facilitate trade. Instead, researchers have largely— though not exclusively—relied on measures of the size of the banking industry as a proxy. But, banking sector size is not a measure of quality, or efficiency, or stability. And, the banking sector is only one component of financial systems.

The major contribution of this paper is the construction of improved measures of the functioning of financial systems in 205 economies from 1960 to 2010. We call the resultant database the "Global Financial Development Database." It is available at www.worldbank.org/financialdevelopment and http://data.worldbank.org/data-catalog/global-financial-development.

To quantify the functioning of financial systems, we develop several measures of four broad characteristics of financial institutions and markets: (1) the size of financial institutions and markets (financial depth), (2) the degree to which individuals can and do use financial institutions and markets (access), (3) the efficiency of financial institutions and markets in providing financial services (efficiency), and (4) the stability of financial institutions and markets (stability). These four characteristics are measured both for (1) financial institutions (mostly for banks, which are the major financial institution in most economies, but also for insurance companies and other financial institutions) and (2) financial markets (equity and bond markets), thus leading to a 4x2 matrix of financial system characteristics. The paper then uses these measures to characterize and compare financial systems across countries and over time.

In focusing on these four characteristics of financial institutions and markets, we seek to provide empirical shape and substance to the complex, multifaceted and sometimes amorphous concept of the "functioning of financial systems." We recognize that financial depth, access, efficiency, and stability might not fully capture all features of financial systems. But they reflect features on which much of the empirical literature has been concentrating. We make these new and improved measures of financial development available so that others can use them to benchmark national financial systems and test particular hypotheses.

The analyses presented in this paper, together with the underlying datasets, highlight the multi-dimensional nature of financial systems. Deep financial systems do not necessarily provide high degrees of financial access; highly efficient financial systems are not necessarily more stable than the less efficient ones, and so on. The paper illustrates that financial systems

come in different shapes and sizes, and they differ widely in terms of the 4x2 matrix of characteristics.

The remainder of this paper proceeds as follows. It starts with a discussion on the role of the financial system in economic development. Then it proceeds to examine the measurement of key features of the financial system, namely financial depth, access to finance, the efficiency of financial systems, and the stability of financial systems. Measured for both financial institutions and financial markets, this yields the so-called 4x2 measurement framework, which is presented as a strategy for empirically characterizing financial systems around the world and tracing their development over time. The 4x2 measurement framework and the Global Financial Development Database are then used to examine and compare 205 financial systems around the world.

The concept of financial development and its links to economic development

There has been a considerable debate among economists on the role of financial development in economic growth and poverty reduction, but the balance of theoretical reasoning and empirical evidence suggests that finance has a central role in socio-economic development [Levine (1997, 2005)]. Economies with higher levels of financial development grow faster and experience faster reductions in poverty levels. This section introduces the concept of financial development and provides a brief review of the literature on the linkages between financial development, economic growth, and poverty reduction.

Markets are imperfect. It is costly to acquire and process information about potential investments. There are costs and uncertainties associated with writing, interpreting, and enforcing contracts. And, there are costs associated with transacting goods, services, and financial instruments. These market imperfections inhibit the flow of society's savings to those with the best ideas and projects, curtailing economic development and retarding improvements in living standards.

It is the existence of these costs—these market imperfections—that creates incentives for the emergence of financial contracts, markets and intermediaries. Motivated by profits, people create financial products and institutions to ameliorate the effects of these market imperfections. And, governments often provide an array of services—ranging from legal and accounting systems to government owned banks—with the stated goals of reducing these imperfections and enhancing resource allocation. Some economies are comparatively successful at developing financial systems that reduce these costs. Other economies are considerably less successful, with potentially large effects on economic development.

At the most basic, conceptual level, therefore, financial development occurs when financial instruments, markets, and intermediaries mitigate – though do not necessarily eliminate – the effects of imperfect information, limited enforcement, and transactions costs. For example, the creation of credit registries tended to improve acquisition and dissemination of information about potential borrowers, improving the allocation of resources with positive effects on economic development. As another example, economies with effective legal and regulatory systems have facilitated the development of equity and bond markets that allow investors to hold more diversified portfolio than they could without efficient securities markets.

This greater risk diversification can facilitate the flow of capital to higher return projects, boosting growth and enhancing living standards.

Defining financial development in terms of the degree to which the financial system eases market imperfections, however, is too narrow and does not provide much information on the actual functions provided by the financial system to the overall economy. Thus, Merton (1992), Levine (1997, 2005), Merton and Bodie (2004), and others have development broader definitions that focus on what the financial system actually does.

At a broader level, financial development can be defined as improvements in the quality of five key financial functions: (1) producing and processing information about possible investments and allocating capital based on these assessments; (2) monitoring individuals and firms and exerting corporate governance after allocating capital; (3) facilitating the trading, diversification, and management of risk; (4) mobilizing and pooling savings; and (5) easing the exchange of goods, services, and financial instruments. Financial institutions and markets around the world differ markedly in how well they provide these key services. Although this paper sometimes focuses on the role of the financial systems in reducing information, contracting, and transactions costs, it primarily adopts a broader view of finance and stresses the key functions provided by the financial system to the overall economy.

Economists have long debated the role of the financial sector in economic growth. Lucas (1988), for example, dismissed finance as an over-stressed determinant of economic growth. Robinson (1952, p. 86) quipped that "where enterprise leads finance follows." From this perspective, finance responds to demands from the non-financial sector; it does not cause economic growth. At the other extreme, Miller (1988, p.14) argued that the idea that financial

markets contribute to economic growth "is a proposition too obvious for serious discussion." Bagehot (1873) and others rejected the idea that the finance-growth nexus can be safely ignored without substantially limiting the understanding of economic growth.

Recent literature reviews, such as Levine (2005) and Demirgüç-Kunt and Levine (2008), conclude that the preponderance of evidence suggests a positive, first-order relationship between financial development and economic growth. In other words, well-functioning financial systems play an independent role in promoting long-run economic growth: economies with better-developed financial systems tend to grow faster over long periods of time, and a large body of evidence suggests that this effect is causal.

Moreover, research sheds light on the mechanisms through which finance affects growth—the financial system influences growth primarily by affecting the allocation of society's savings, not by affecting the aggregate savings rate. Thus, when financial systems do a good job of identifying and funding those firms with the best prospects, not those firms simply with the strongest political connections, this improves the capital allocation and fosters economic growth. Such financial systems promote the entry of new, promising firms and force the exit of less efficient enterprises. Such financial systems also expand economic opportunities, so that the allocation of credit—and hence opportunity—is less closely tied to accumulated wealth and more closely connected to the social value of the project. Furthermore, by improving the governance of firms, well-functioning financial markets and institutions reduce waste and fraud, boosting the efficient use of scarce resources. By facilitating risk management, financial systems can ease the financing of higher return endeavors with positive reverberations on living

standards. And, by pooling society's savings, financial systems make it possible to exploit economies of scale—getting the biggest development bang for available resources.

The 4x2 framework for benchmarking financial systems

To capture the key features of financial systems, one would ideally like to have direct measures of how well financial institutions and financial markets (1) produce information ex ante about possible investments and allocate capital; (2) monitor investments and exert corporate governance after providing finance; (3) facilitate the trading, diversification, and management of risk; (4) mobilize and pool savings; and (5) ease the exchange of goods and services. So, if measurement was not an issue, one would like to be able to say that in terms of producing information about possible investments and allocate capital, the financial sector in Country A, for example, scores 60 on a scale from 0 to 100, while Country B's financial sector scores 75; in terms of monitoring investments and exerting corporate governance after providing finance, Country A scores 90, while Country B scores only 20 on a scale from 0 to 100, and so on. But, researchers have so far been unable to obtain such direct measures of these financial functions.

The goal of this paper is to construct measures of four important characteristics of financial systems: (1) depth; (2) access; (3) efficiency, and (4) stability. These financial system characteristics are proxies of the services provided by the financial system. For example, "financial depth" is not a function in itself, but it is a proxy of the overall extent of services provided by the financial system. Similarly, our measures of "access" do not directly measure how well the financial system identifies good investments, regardless of the collateral of the

individual; but it provides an (imperfect, ex post) approximation of the breadth of use of particular financial institutions and instruments.

For each of the four characteristics, this paper presents measures for both financial institutions and financial markets. The resulting 4x2 matrix of financial system characteristics (Table 1), which builds on a large literature seeking to compare financial systems empirically, illustrates the multi-dimensional nature of financial systems.[2]

The resulting database that we construct—Global Financial Development Database— builds on, updates, and extends previous efforts, in particular the data collected for the "Database on Financial Development and Structure" by Beck, Demirgüç-Kunt, and Levine (2000, 2010). The database also incorporates data from the Financial Access Survey (fas.imf.org), the Global Findex (www.worldbank.org/globalfindex).

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[2] In each of the cells in the 4x2 matrix, Table 1 shows several variables. In some cases, the variables in the same cell are complementary (for example, total assets of banks to GDP and total assets of non-bank financial institutions to GDP are expressed in the same units and complement each other, so they can be summed up to approximate total assets of financial institutions to GDP). In other cases, the variables measure similar concepts in different ways, with different degrees of comprehensiveness. For example, private credit to GDP and total assets of financial institutions to GDP are both proxies for financial institutions' size. Private credit to GDP covers a sub-set of assets but is available for a larger number of economies. In Table 1, variables with the highest country coverage are highlighted in bold. The competing indicators tend to be highly but not perfectly correlated. For example, the correlation coefficient for private credit to GDP and banking sector's total assets to GDP is 0.9.

Financial depth

As regards financial depth, the variable that has received much attention in the empirical literature on financial development is private credit to GDP. More specifically, the variable is defined as domestic private credit to the real sector by deposit money banks as percentage of local currency GDP. The private credit, therefore, excludes credit issued to governments, government agencies, and public enterprises. It also excludes credit issued by central banks.

Private credit to GDP differs widely across countries, and it correlates strongly with income level. For example, private credit to GDP in high-income countries is 103 percent in high-income countries, more than 4 times the average ratio in low-income countries (Table 2). Based on this measure, economies with deep financial systems include many of those in Europe; Canada, Australia, and South Africa are also among those in the highest quartile in terms of private credit to GDP (Figure 1). China's financial system is also in the highest quartile in terms of this measure, higher than other major emerging markets such as Russia, Brazil, and India. The United States' financial system, while above average, is not as deep as China's. This reflects in part the more market-based nature of the U.S. financial system.

Financial depth, approximated by private credit to GDP, has a strong statistical link to long-term economic growth; it is also closely linked to poverty reduction [see, for example, Demirgüç-Kunt and Levine (2008)]. To illustrate, Table 3 summarizes the relationship between per capita GDP growth and various measures of financial intermediary depth. The reported cross-country growth regressions update the earlier analyses by King and Levine (1993b) by enhancing and extending their data. Figure 2 provides a basic empirical illustration of the link

between financial depth, approximated by the ratio of private sector credit to gross domestic product, and income inequality, approximated by changes in the Gini coefficient. The figure illustrates that higher levels of financial development are associated with declines in inequality. These observations are in line with more in-depth empirical research based on microeconomic data.[3]

Nonetheless, a high ratio of private sector credit to GDP is not necessarily a good thing. Indeed, all the 8 countries with the highest ratios of private sector credit to GDP as of 2010 (Cyprus, Ireland, Spain, Netherlands, Portugal, United Kingdom, Luxembourg, and Switzerland, going from the highest to the lowest) had a banking crisis episode since 2008.[4]

An alternative to private credit to GDP is total banking assets to GDP, a variable that is also included in the Global Financial Development Database. It is arguably a more comprehensive measure of size, because it includes not only credit to private sector, but also credit to government as well as bank assets other than credit. However, it is available for a smaller number of economies and has been used less extensively in the literature on financial development. In any case, the two variables are rather closely correlated (with a correlation coefficient of about 0.9 over the whole sample).

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[3] For example, evidence suggests that access to credit markets increases parental investment in the education of their children and reduces the substitution of children out of schooling and into labor markets when adverse shocks reduce family income (Belley and Lochner 2007). Better-functioning financial systems stimulate new firm formation and help small, promising firms expand as a wider array of firms gain access to the financial system. Moreover, better-functioning financial systems will identify and fund better projects, with less emphasis on collateral and incumbency. Not only do they allow new, efficient firms to enter, they also force old, inefficient firms to leave, as evidenced by data (Kerr and Nanda 2009).

[4] Hong Kong SAR, a jurisdiction that is not a country but reports data on a separate basis, would rank between United Kingdom and Luxembourg in terms of the variable.

Despite the literature's focus on banks, the recent crisis has highlighted issues in non-bank financial institutions (NBFIs). The coverage of NBFIs by data is much less comprehensive than that of banks. Nonetheless, to acknowledge this point, the Global Financial Development Database includes total assets of NBFIs to GDP, which includes pension fund assets to GDP, mutual fund assets to GDP, insurance company assets to GDP, insurance premiums (life) to GDP, and insurance premiums (non-life) to GDP.

For financial markets, earlier work by Levine and Zervos (1998) indicates that the trading of ownership claims on firms in an economy is closely tied to the rate of economic development. In the database, financial market depth is approximated using a combination of data on stock markets and bond markets. To approximate the size of stock markets, a common choice in the literature is stock market capitalization to GDP. For bond markets, a commonly used proxy for size is the outstanding volume of private debt securities to GDP. The sum of these two provides a rough indication of the relative size of the financial markets in various countries.

There is substantial variation among countries, by size and by income level (Table 4). For example, over the 2008-2010 period, the world-wide average value of this ratio was 131 percent, but individual country observations ranged from less than 1 percent to 533 percent. The average for developed economies was 151 percent, while the average for developing economies was about a half, at 76 percent. Also, in bigger countries, financial markets tend to play a relatively larger role relative to the size of the economy.[5] Countries in the highest quartile

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[5] In Table 4, this is illustrated by the fact that the world-wide median is only 49 percent, while the weighted average (with nominal GDP as weight) is 131 percent.

of the world-wide distribution include not only the United States, Canada, Japan, and other major developed economies, but for example also China and Malaysia (Figure 2).

The size of financial institutions relative to the size of financial markets is central to the study of 'financial structures' – [Demirgüç-Kunt and Levine (2001), Demirgüç-Kunt, Feyen, and Levine (2012)]. The literature on financial structures seeks to assess whether and under which conditions the mixture of financial institutions and financial markets in an economy exerts an influence on economic development that is independent of the overall level of financial development. Does the mixture of financial institutions and markets matter? We find that financial structure differs markedly across economies. Over the full sample period, the annual average value of the financial structure ratio is 279. Countries such as Australia, India, Singapore, and Sweden have this ratio at or below 2.35 (10th percentile), while Bolivia, Bulgaria, Serbia, and Uganda are examples of countries where this ratio is over 356 (90th percentile).

Financial access

Better functioning financial systems allocate capital based more on the expected quality of the project and entrepreneur and based less on the accumulated wealth and social connections of the entrepreneur. Under many conditions, therefore, better functioning financial systems that overcome market frictions will more effectively identify and fund the most promising firms and not just funnel credit to large companies and rich individuals. Thus, to develop informative proxies of financial development, it is useful to move beyond financial depth and also include indicators of financial access—the degree to which the public can access

financial services. As with the other measures, both financial institutions and financial markets

are examined.

As regards access to financial institutions, a common proxy variable is the number of

bank accounts per 1,000 adults. Other variables in this category include the number of bank

branches per 100,000 adults (commercial banks), the percentage of firms with line of credit (all

firms), and the percentage of firms with line of credit (small firms). When using these proxies,

one needs to be mindful of their weaknesses. For example, the number of bank branches is

becoming increasingly misleading with the move towards branchless banking. The number of

bank accounts does not suffer from the same issue, but it has its own limitations. In particular,

it focuses on banks only, and does not correct for the fact that some bank clients have

numerous accounts.

Much of the data for the financial access dimension of the Global Financial Development

Database come from the recently established Financial Access Survey database (fas.imf.org),

which is based on earlier work by Beck, Demirgüç-Kunt and Martínez Pería (2007) and currently

contains annual data for 187 jurisdictions for the period 2004 to 2011. A portion of the financial

access data is from the newly constructed *Global Financial Inclusion Indicators*, or "Global

Findex" dataset [Demirgüç-Kunt and Klapper (2012)]. The Global Findex is the first public

database of indicators that consistently measures individuals' usage of financial products across

economies. It can be used to track the potential impact of global financial inclusion policies and

facilitate a deeper and more nuanced understanding of how adults around the world save,

borrow and make payments. It is based on detailed interviews with at least 1,000 people per

economy in some 150 economies about their financial behavior through the Gallup World Poll survey.

Table 5 illustrates the wide dispersion in access to finance across countries, using the provider-side data. World-wide, there were about 1.34 bank accounts per adult in 2008-2010, but the observations ranged from less than 0.01 to 7.19 accounts per adult. The average for developing economies was 0.69 accounts per adult, a mere fraction of the 3.76 per adult in developed economies.

Figure 4 provides an additional illustration, based on the user-side data. Here, the focus is on account penetration, that is, the percentage of adults that have at least on account at a formal financial institution. Again, account penetration differs enormously between high-income and developing economies. While it is near universal in high-income economies, with 89 percent of adults reporting that they have an account at a formal financial institution, it is only 24 percent in low income economies. Globally, more than 2.5 billion adults do not have a formal account, and a majority of this group resides in developing economies. In several economies (such as Cambodia, the Democratic Republic of Congo, Guinea, the Kyrgyz Republic, Turkmenistan, and the Republic of Yemen) less than 5 percent of adults have a formal account.

Data on access to financial markets are relatively more scant. To approximate access to stock and bond markets, measures of market concentration are used, the idea being that a higher degree of concentration reflects greater difficulties for access for newer or smaller issuers. The variables in this category include the percentage of market capitalization outside of top 10 largest companies, the percentage of value traded outside of top 10 traded companies,

government bond yields (3 month and 10 years), ratio of domestic to total debt securities, ratio of private to total debt securities (domestic), and ratio of new corporate bond issues to GDP.

Table 6 provides a summary for one of these measures of access to financial markets contained in the Global Financial Development Database, namely the share of market capitalization that is outside of the top ten largest issuers. Interestingly, the difference between developed economies and developing economies is not as large as for some of the other indicators in the database. This suggests that in this case, other factors than income level play important roles. One of the other factors may be size: some large developing economies, such as China and India, have very dispersed financial markets (Figure 5), scoring in the top quartile of this proxy for financial market access.

Financial efficiency

For intermediaries, efficiency is primarily constructed to measure the cost of intermediating credit. Efficiency measures for institutions include indicators such as overhead costs to total assets, net interest margin, lending-deposits spread, non-interest income to total income, and cost to income ratio (Table 1). Closely related variables include measures such as return on assets and return on equity. While efficient financial institutions also tend to be more profitable, the relationship is not very close. For example, an inefficient financial system can post relatively high profitability if it operates in an economic upswing, while an otherwise efficient system hit by an adverse shock may generate losses.

Table 7 summarizes the key statistics for the lending-deposit spreads. The weighted average for developed economies is 2.2 percent, compared to 7.3 percent in developed economies, for a world-wide weighted average of 6.9 percent. There are relatively large

disparities among regions, with Latin America and Caribbean reporting the highest spreads, at

16.9 percent. Figure 6 illustrates that even within the same region, there are wide disparities,

so Latin America and Caribbean contains both countries with very high spreads (such as Brazil)

and those with low spreads (such as Colombia). Similarly, while Sub-Saharan Africa reports

generally high spreads (12.8 percent on average), Ethiophia (3.3 percent) is an example of

country with very low spreads.

Lending-deposit spreads are relatively crude measures of efficiency. For some

economies, it is possible to calculate efficiency indices based on more sophisticated measures .

For example, Angelidis and Lyroudi (2006) apply data envelopment analysis and neural

networks to measure efficiency in the Italian banking industry. However, the data required for

this type of analysis are available only for a small sub-set of economies.

For financial markets, a basic proxy for efficiency in the stock market is the turnover

ratio, that is, the ratio of stock market's annual turnover to its capitalization. The logic of using

this variable is that higher turnover means more liquidity, which in turn allows the market to be

more efficient. In the bond market, the most commonly used variable is the tightness of the

bid-ask spread (with the United States and Western European markets showing low spreads,

and Vietnam, Peru, Qatar, Dominican Republic, and Pakistan reporting high spreads) and the

turnover ratio (although the measurement of the latter often suffers from incomplete data).

A range of other proxies for efficiency in financial markets has been used in empirical

literature (Table 1). One of them is price synchronicity, calculated as a degree of co-movement

of individual stock returns in an equity market. The variable aims to capture the information

content of daily stock prices, as a market operates efficiently only when prices are informative

about the performance of individual firms. Another proxy variable for efficiency is private information trading, defined as the percentage of firms with trading patterns that arise from trading conducted through privately obtained information. This calculation is based on the examination of daily price-volume patterns, and helps indicate the prevalence of trading in a stock based on private or privileged information. Finally, efficiency can be approximated by the real transaction cost. Based on daily return data of the listed stocks, this variable attempts to approximate the transaction costs associated with trading a particular security. This variable helps determine the barriers to efficiency in the market. All these indicators are constructed by compiling and statistically processing firm-level data from a variety of market sources.

Table 8 summarizes the results for the stock market turnover ratio, illustrating the wide dispersion across countries and regions, as well as by income groups. The world-wide weighted average of the turnover ratio is 198 percent, but the country-by-country observations range from less than 1 percent to 343 percent. Developing economy average is 127 percent, compared to developed economy average of 218 percent. Among the regions, East Asia and Pacific scores the highest, at 167 percent, and Sub-Saharan Africa the lowest, at 62 percent. Again, country size is a helpful factor, as illustrated by the world map (Figure 7). The countries scoring highly include not only the developed economies of Europe and North America, but also China, India, Russia, Turkey, and Saudi Arabia, among others.

Financial stability

A common measure of financial stability is the z-score. It explicitly compares buffers (capitalization and returns) with risk (volatility of returns) to measure a bank's solvency risk. The z-score is defined as $z \equiv (k+\mu)/\sigma$, where k is equity capital as percent of assets, μ is return as

percent of assets, and σ is standard deviation of return on assets as a proxy for return volatility. The popularity of the z-score stems from the fact that it has a clear (negative) relationship to the probability of a financial institution's insolvency, that is, the probability that the value of its assets becomes lower than the value of its debt [see, for example, Boyd and Runkle (1993); Beck, Demirgüç-Kunt, Levine (2006); Demirgüç-Kunt, Detragiache, and Tressel (2008); Laeven and Levine (2009); Čihák and Hesse (2010)]. A higher z-score therefore implies a lower probability of insolvency.

The z-score has several limitations as a measure of financial stability. Perhaps the most important limitation is that the z-scores are based purely on accounting data. They are thus only as good as the underlying accounting and auditing framework. If financial institutions are able to smooth out the reported data, the z-score may provide an overly positive assessment of the financial institutions' stability. Also, the z-score looks at each financial institution separately, potentially overlooking the risk that a default in one financial institution may cause loss to other financial institutions in the system. An advantage of the z-score is that it can be also used for institutions for which more sophisticated, market based data are not available. Also, the z-scores allow comparing the risk of default in different groups of institutions, which may differ in their ownership or objectives, but face the risk of insolvency.

For other indicators, such as the regulatory capital to risk-weighted assets and nonperforming loans to total gross loans, the Global Financial Development Database cross-refers to financial soundness indicator database available on IMF's website (fsi.imf.org). Variables such as the nonperforming loan ratios may be better known than the z-score, but they are also known to be lagging indicators of soundness [Čihák and Schaeck (2010)].

One alternative indicator of financial instability is "excessive" credit growth, with the emphasis on *excessive*. A well-developing financial sector is likely to grow. But very rapid growth in credit is one of the most robust common factors associated with banking crises [Demirgüc-Kunt and Detragiache (1997) and Kaminsky and Reinhart (1999)]. Indeed, the IMF (2004) found that about 75 percent of credit booms in emerging markets end in banking crises. The credit growth measure also has pros and cons: Although it is easy to measure credit growth, it is difficult to assess *ex-ante* whether the growth is excessive.

Interestingly, there is not much of a difference between the reported measures of financial stability in different groups of countries (Table 9 and Figure 8). For example, the reported z-scores in developed economies and developing economies appear identical (Table 9). This is in line with the global financial crisis experience: financial instability occurred both in developed economies and in developing economies. The distinguishing factors were other things (such as quality of the regulatory and institutional framework) rather than the level of development.

For financial markets, the most commonly used proxy variable for stability is market volatility, although other proxies are also included in the database (Table 1). One of these variables is the skewness of stock returns, because a market with a more negative skewed distribution of stock returns is likely to deliver large negative returns, and likely to be prone to less stability. Another variable is vulnerability to earnings manipulation, which is derived from certain characteristics of information reported in the financial statements of companies that can be indicative of manipulation. It is defined as the percentage of firms listed on the stock exchange that are susceptible to such manipulation. In the United States, France, and most

other high-income economies, less than 10 percent of firms have issues concerning earnings

manipulation; in Zimbabwe, in contrast, almost all firms may experience manipulation of their

accounting statements. In Turkey, the number is close to 40 percent. Other variables

approximating volatility in the stock market are the price-to-earnings ratio and duration, which

is a refined version of the price-to-earnings ratio that takes into account factors such as long-

term growth and interest rates.

Table 10 and Figure 9 provide a summary of the measures of asset price volatility in

2008-2010. Developing economy markets show a relatively higher volatility than developed

economy markets but the difference is not significant (it is smaller than the cross-country

standard deviation). Also a comparison across regions does not show a clear pattern, suggesting

that all regions were affected by the increased volatility during the global financial crisis.

Selected findings

Overall comparisons by levels of development and by region (Table 11) confirm that

while developing economy financial systems tend to be much less deep, somewhat less

efficient, and provide less access, their stability has been comparable to developed economy

financial systems. Table 11 summarizes the recent data from the Global Financial Development

Database (2008–10) for the 8 key characteristics of financial systems.

For the purpose of these calculations, we provide "winsorized" and "rescaled" variables.

To prepare for this, the 95th and 5th percentile for each variable for the entire pooled country-

year dataset are calculated, and the top and bottom five percent of observations are truncated.

Specifically, all observations from the 5th percentile to the minimum are replaced by the value corresponding to the 5th percentile, and all observations from the 95th percentile to the maximum are replaced by the value corresponding to the 95th percentile. To convert all the variables to a 0-100 scale, each score is rescaled by the maximum for each indicator, and the minimum of the indicator. The rescaled indicator can be interpreted as the percent distance between the 'worst' (0) and the 'best' (100) value of the respective financial system characteristic, defined by the 5th and 95th percentile of the original distribution.

Financial systems are multidimensional.

One basic, yet important, observation highlighted by the Global Financial Development Database is that the four financial system characteristics are far from closely correlated across countries (Figure 10 and Figure 11). This underscores the point that each dimension captures a very different, separate facet of financial systems. In other words, looking only at financial depth would not be sufficient. Similarly, focusing only on financial stability or on access or on efficiency would not suffice. The same applies both to financial institutions and to financial markets.

Moreover, attempts to run a more rigorous "horse race" among the indicators from the four dimensions tend to end in a tie: that is, none of the indicators is clearly superior to the others in explaining long-term growth or poverty reduction.

There are massive disparities in financial systems around the globe.

A comparison at the regional level shows major differences in financial systems among the key regions (Table 11). The results are by and large in line as one could expect, with Sub-Saharan Africa scoring the lowest on average on most of the dimensions, and high income economies scoring the highest on most dimensions. A remarkable number is the relatively low score of Middle East and North Africa on access to finance (Table 11, upper panel). This resonates with the complaints heard during the unrest in the region in 2011.

Much of the differences among regions are correlated with differences in income levels. Countries that have lower income tend to also show lower degrees of financial development as approximated by the 4x2 framework (Table 11, lower panel).

Behind these regional and peer group averages are vast differences among individual countries. For example, the largest financial system in the sample is more than 34,500 times the smallest one. Even if the financial systems are re-scaled by the size of the corresponding economies (that is, by their gross domestic product), the largest (deepest) financial system is still some 110 times the smallest (least deep) one. And even if the top and bottom 5 percent of this distribution are taken out, the ratio of the largest to the smallest is about 28 – a large degree of disparity, considering that these are not raw figures but ratios relative to the size of economy. Similar orders of magnitude are obtained for the other characteristics of financial systems. To put this in a more anthropomorphic perspective, the tallest adult person on Earth is less than 5 times taller than the smallest person (www.guinessworldrecords.com). In other words, when one examines country-level data, there are vast differences in financial system characteristics.

The cross-country differentiation along the key characteristics of financial systems can be seen from the scatter plots in Figure 10 and Figure 11 as well as from cartograms such as the one shown for illustration in Figure 12. The scatter plots and the cartogram underscore the large cross-country differences. The measurement framework underscores that financial sectors in jurisdictions such as the United States and Korea exhibit a relatively great financial market depth, as one would expect. United States have less deep financial institutions, reflecting a less bank-centric (and more market-based) nature of the U.S. financial system. Several European countries exhibit relatively great financial depth.

Financial systems have converged somewhat during the crisis.

The most notable changes during the global financial crisis include large declines in the stability index, which in turn reflects the increased volatility in returns by financial institutions in some countries and in most financial markets. But the charts also illustrates that stability has not been the only dimension in decline and that to some extent it has been accompanied also by difficulties along other characteristics, such as reduced depth and access to finance and in some cases also reductions in efficiency, particularly in financial markets.

Overall, financial system disparities have somewhat subsided during the crisis, as financial sectors in many medium- and low- income countries were relatively more isolated from the global turmoil, and therefore less affected by the global liquidity shocks. In addition, financial institutions on average rebounded faster than markets, showing improvements in

depth and efficiency after the crisis. This seems to have been the case so far for example for

Brazil and other Latin American countries [de la Torre, Ize, and Schmukler (2011)], China, and

many Sub-Saharan African countries [see, for example, World Bank (2012)]. The medium-term

effect of the crisis on financial systems still remains to be seen.

Conclusions

This paper has presented the Global Financial Development Database, an extensive

dataset of financial system characteristics around the world since 1960s. The database is a one-

stop, cleaned-up database that builds on previous efforts, in particular the data collected and

the categorization of variables proposed by Beck, Demirgüç-Kunt, and Levine (2000, 2010).

The dataset can be used to illustrate cross-country and time-series patterns in financial

systems. The data can be used to better assess linkages between finance and economic

development and to assess the efficacy of different financial policies and regulations. The

database can be used to analyze financial sector development and trends in 205 jurisdictions

around the world. The Global Financial Development Database goes back some 50 years (to

1960), although some of the variables (such as the only recently defined financial stability

indicators) go back only to the 1990s.

The database and this paper highlight the multidimensional nature of financial systems.

Focusing on only one characteristic—say, financial stability—means missing important

characteristics of financial systems. And, focusing only on financial institutions, or just on banks,

misses important components of the overall financial system as equity and bond markets are

crucial components in many economies.

This paper illustrates that financial sectors come in different shapes and sizes, and they differ widely in terms of their performance. The paper also emphasizes a need for humility, and for further research. Despite the remarkable progress in gathering data and intelligence on financial systems around the world in recent years, researchers and practitioners still do not have precise measures of the functioning of financial systems.

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	FINANCIAL INSTITUTIONS	FINANCIAL MARKETS
DEPTH	**Private credit to GDP** Financial institutions' assets to GDP M2 to GDP Deposits to GDP Gross value-added of the financial sector to GDP	**Stock market capitalization plus outstanding domestic private debt securities to GDP** Private debt securities to GDP Public debt securities to GDP International debt securities to GDP Stock market capitalization to GDP Stocks traded to GDP
ACCESS	**Accounts per thousand adults** (commercial banks) Branches per 100,000 adults (commercial banks) % of people with a bank account % of firms with line of credit (all firms) % of firms with line of credit (small firms)	**Percent of market capitalization outside of top 10 largest companies** Percent of value traded outside of top 10 traded companies Government bond yields (3 month and 10 years) Ratio of domestic to total debt securities Ratio of private to total debt securities (domestic) Ratio of new corporate bond issues to GDP
EFFICIENCY	**Net interest margin** Lending-deposits spread Non-interest income to total income Overhead costs (% of total assets) Profitability (return on assets, return on equity) Boone indicator (or Herfindahl or H-statistics)	**Turnover ratio** (turnover/capitalization) for stock market Price synchronicity (co-movement) Private information trading Price impact Liquidity/transaction costs Quoted bid-ask spread for government bonds Turnover of bonds (private, public) on securities exchange Settlement efficiency
STABILITY	**Z-score** (or distance to default) capital adequacy ratios asset quality ratios liquidity ratios other (net foreign exchange position to capital etc.)	**Volatility** (standard deviation / average) of stock price index, sovereign bond index Skewness of the index (stock price, sovereign bond) Vulnerability to earnings manipulation Price/earnings ratio Duration Ratio of short-term to total bonds (domestic, int'l) Correlation with major bond returns (German, US)

Table 1: The 4x2 matrix of financial system characteristics

Note: This matrix contains a subset of the measures of financial development for of the categories defined by the 4X2 matrix. In bold, we highlight those measures within each category that are the most widely available. Private credit to GDP is domestic private credit to the real sector by deposit money banks to GDP. Accounts per thousand adults (commercial banks) is the number of depositors with commercial banks per 1,000 adults. For each type of institution, this is calculated as the (reported number of depositors)*1,000/adult population in the reporting country. The net interest margin is the accounting value of bank's net interest revenue as a share of its average interest-bearing (total earning) assets. The Z-score (or distance to default) is (ROA+equity/assets)/sd(ROA), where ROA is average annual return on end-year assets and sd(ROA) is the standard deviation of ROA. Stock market capitalization plus outstanding domestic private debt securities to GDP is defined as the value of listed shares to GDP plus amount of outstanding domestic private debt securities to GDP. Percent of market capitalization outside of top 10 largest companies is the market capitalization outside of top ten largest companies to total market capitalization. Turnover ratio (turnover/capitalization) for stock market is the ratio of the value of total shares traded to market capitalization. Volatility (standard deviation / average) of stock price index is the standard deviation of the sovereign bond index divided by the annual average of that index.

Private credit to GDP (%)		Number of countries	Average	Median	Standard deviation	Minimum	Maximum	Weighted average[a]
	World	173	56.3	38.8	54.6	3.2	361.7	89.9
By developed/developing economies								
	Developed economies	48	113.3	100.1	68.6	3.3	361.7	103.0
	Developing economies	125	34.5	26.3	24.9	3.2	112.0	60.5
By income level								
	High income	48	113.3	100.1	68.6	3.3	361.7	103.0
	Upper middle income	49	48.6	44.5	28.0	8.0	112.0	67.8
	Lower middle income	49	30.8	27.0	18.7	3.2	96.8	36.6
	Low income	27	15.4	12.8	9.8	3.3	44.7	24.9
By region								
	High income: OECD	30	124.0	109.4	52.2	43.2	228.2	103.7
	High income: non-OECD	17	97.3	65.6	90.7	3.3	361.7	80.7
	East Asia & Pacific	17	46.8	38.8	34.6	3.3	111.1	100.1
	Europe & Central Asia	19	44.9	41.1	19.6	16.0	88.1	40.4
	Latin America & Caribbean	29	41.5	32.0	24.2	12.3	112.0	33.4
	Middle East & North Africa	12	34.5	29.1	26.0	5.5	71.8	32.1
	South Asia	8	35.3	34.6	17.3	7.9	66.1	41.1
	Sub-Saharan Africa	41	20.1	16.4	16.9	3.2	80.8	38.7

Table 2: Depth—financial institutions, 2008–2010

Source: Authors' calculations based on the Global Financial Development Database.

Note: Domestic private credit to the real sector by deposit money banks as percentage of local currency GDP. Data on domestic private credit to the real sector by deposit money banks is from the International Financial Statistics (IFS) line 22D published by the International Monetary Fund (IMF). Local currency GDP is also from IFS. Missing observations are imputed by using GDP growth rates from World Development Indicators (WDI). Arithmetic average of annual observations for 2008-2010.

a. To calculate the group averages, country-by-country observations are weighted by nominal GDP.

Figure 1: Depth—financial institutions, 2008–2010

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Dependent Variable	Depth	Bank	Privy
Real per Capita GDP Growth	2.4**	3.2**	3.2**
	(0.007)	(0.005)	(0.002)
R2	0.50	0.50	0.52
Real per Capita Capital Growth	2.2**	2.2**	2.5**
	(0.006)	(0.008)	(0.007)
R2	0.65	0.62	0.64
Productivity Growth	1.8**	2.6**	2.5**
	(0.026)	(0.010)	(0.006)
R2	0.42	0.43	0.44

Table 3: Financial depth and economic growth, 1960-2010

Source: Authors' update on King and Levine (1993b), Table VII, using the Global Financial Development Database.

Notes: King and Levine (1993b) define 2 percent growth as 0.02; here, 2 percent growth is 2.00.

* significant at the 0.10 level, ** significant at the 0.05 level, p-values in parentheses, Observations: 77

Variable definitions: DEPTH = Liquid Liabilities/GDP, BANK = Deposit bank domestic credit/(deposit bank domestic credit + central bank domestic credit), PRIVY = Gross claims on the private sector / GDP

Productivity Growth = Real per capita GDP growth - (0.3)*(Real per capita Capital growth)

Other explanatory variables included in each of the nine regression results reported above:

logarithm of initial income, logarithm of initial secondary school enrollment, ratio of government consumption expenditures to GDP, inflation rate, and ratio of exports plus imports to GDP.
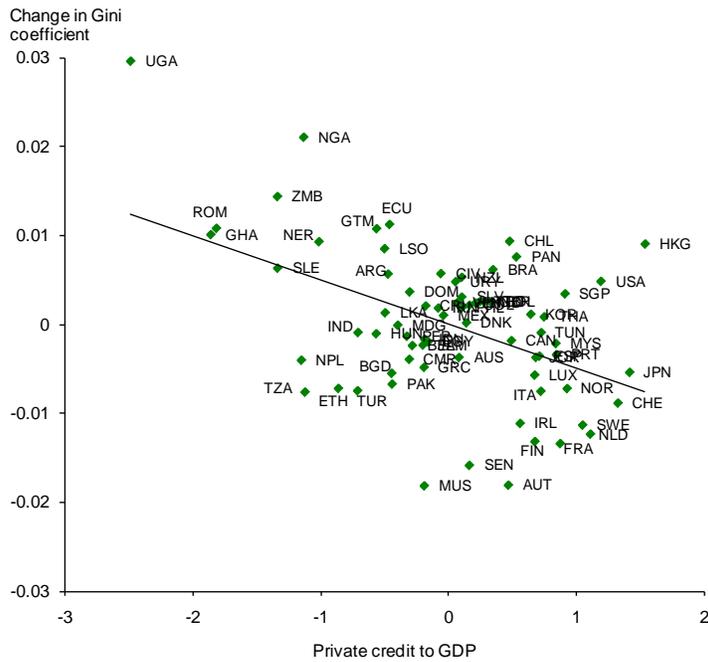
Figure 2. Financial depth and income inequality, 1960-2010

Source: Authors' update on Beck, Demirgüç-Kunt, and Levine (2007), using data from the Global Financial Development Database.

Note: The Gini coefficient is on a scale from 0 (total equality) to 1 (maximum inequality). The chart is a partial scatter plot, visually representing the regression of changes in the Gini coefficient between 1960 and 2010 on the private credit–to-GDP ratio (logarithm, 1960–2010 average), controlling for the initial (1960) Gini coefficient. Variables on both axes are residuals. The abbreviations next to some of the observations are the three-letter country codes as defined by the International Organization for Standardization.

Stock market capitalization plus outstanding domestic private debt securities to GDP (%)		Number of countries	Average	Median	Standard deviation	Minimum	Maximum	Weighted average[a]
	World	103	71.2	48.6	74.7	0.4	532.5	130.6
By developed/developing economies								
	Developed economies	43	111.1	91.1	88.0	10.9	532.5	152.1
	Developing economies	60	42.5	30.0	46.1	0.4	245.6	76.4
By income level								
	High income	43	111.1	91.1	88.0	10.9	532.5	152.1
	Upper middle income	33	51.9	32.1	55.1	0.4	245.6	82.0
	Lower middle income	21	33.6	23.2	31.8	1.3	136.5	56.7
	Low income	6	22.3	23.9	15.1	1.8	38.1	18.4
By region								
	High income: OECD	31	108.2	100.1	63.6	10.9	244.0	151.3
	High income: non-OECD	11	121.9	77.6	142.1	33.2	532.5	180.4
	East Asia & Pacific	9	70.9	49.7	57.2	10.3	173.2	100.0
	Europe & Central Asia	14	24.9	18.8	23.1	1.3	84.9	43.7
	Latin America & Caribbean	16	39.3	27.3	35.7	0.4	125.5	59.6
	Middle East & North Africa	6	57.0	43.3	50.2	15.3	148.3	42.3
	South Asia	5	34.5	22.1	29.8	9.1	84.7	72.6
	Sub-Saharan Africa	11	46.1	29.7	67.3	8.2	245.6	133.7

Table 4: Depth—financial markets, 2008–2010

Source: Authors' calculations based on the Global Financial Development Database.

Note: Stock market capitalization plus the amount of outstanding domestic private debt securities as percentage of GDP. Market capitalization (also known as market value) is the share price times the number of shares outstanding. Listed domestic companies are the domestically incorporated companies listed on the country's stock exchanges at the end of the year. Listed companies does not include investment companies, mutual funds, or other collective investment vehicles. Data is from Standard & Poor's, Global Stock Markets Factbook and supplemental S&P data, and is compiled and reported by the WDI. Amount of outstanding domestic private debt securities is from Table 16A (domestic debt amount) of the Securities Statistics by Bank for International Settlements. The amount includes all issuers except governments. Arithmetic average of annual observations for 2008-2010.

a. To calculate the group averages, country-by-country observations are weighted by nominal GDP.
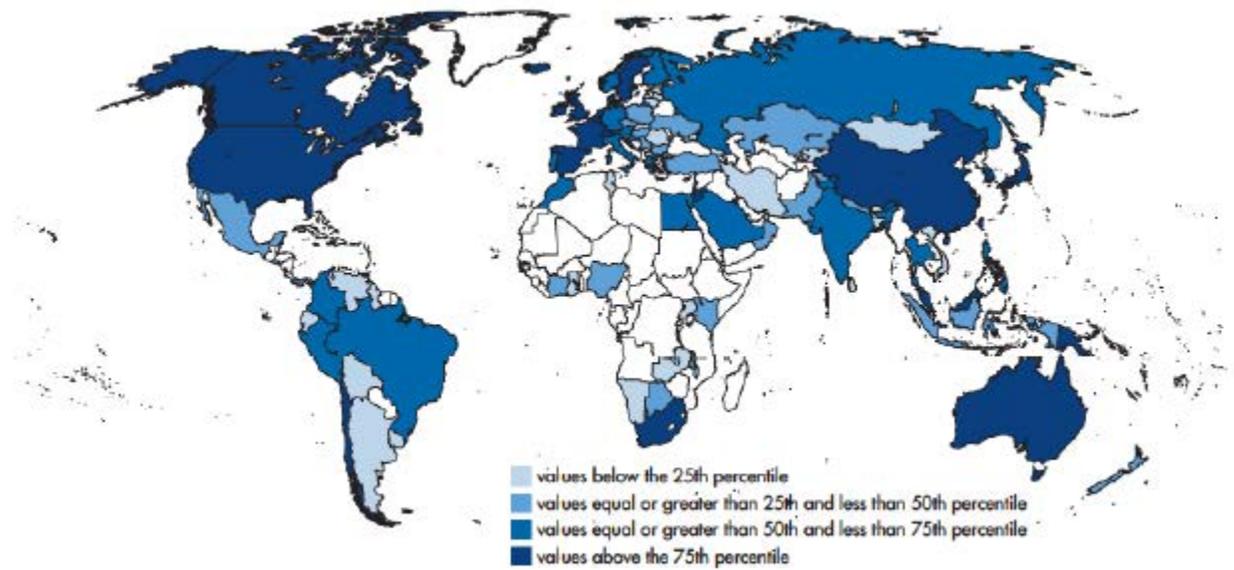
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Accounts per thousand adults from commercial banks		Number of countries	Average	Median	Standard deviation	Minimum	Maximum	Weighted average[a]
	World	79	904.7	584.2	1,147.3	2.4	7,185.2	1,339.0
By developed/developing economies								
	Developed economies	18	2,004.3	1,311.2	1,766.1	121.8	7,185.2	3,761.8
	Developing economies	61	580.2	395.8	598.2	2.4	3,176.4	691.5
By income level								
	High income	18	2,004.3	1,311.2	1,766.1	121.8	7,185.2	3,761.8
	Upper middle income	21	921.1	902.7	534.1	38.0	2,015.2	997.9
	Lower middle income	24	570.1	437.3	664.1	16.1	3,176.4	725.9
	Low income	16	147.9	128.9	112.0	2.4	365.5	222.5
By region								
	High income: OECD	12	2,320.2	1,581.8	1,945.7	513.6	7,185.2	3,933.9
	High income: non-OECD	6	1,372.5	878.1	1,248.0	121.8	3,561.8	1,082.9
	East Asia & Pacific	7	668.6	431.6	630.3	44.3	1,570.3	799.3
	Europe & Central Asia	13	1,047.8	909.2	811.2	38.0	3,176.4	1,645.5
	Latin America & Caribbean	7	873.6	667.2	587.6	329.4	2,015.2	967.0
	Middle East & North Africa	7	385.9	343.3	295.6	77.4	873.0	384.7
	South Asia	5	506.7	365.5	429.7	71.1	1,130.0	531.7
	Sub-Saharan Africa	22	261.0	150.3	294.5	2.4	1,132.0	281.1

Table 5: Access—financial institutions, 2008–2010
Source: Authors' calculations based on the Global Financial Development Database.
Note: Number of depositors with commercial banks per 1,000 adults. For each type of institution the calculation follows: (reported number of depositors)*1,000/adult population in the reporting country. Number of commercial bank depositors is from the Financial Access Survey (fas.imf.org). Adult population data is from WDI. Arithmetic average of annual observations for 2008-2010.
a. To calculate the group averages, country-by-country observations are weighted by total adult population.
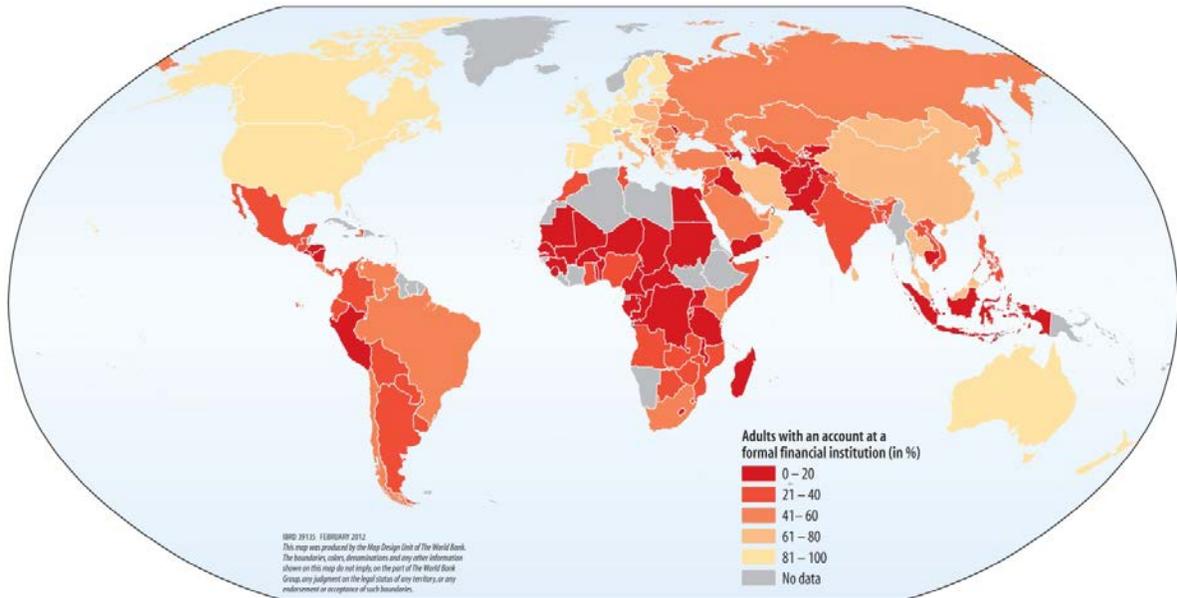
Figure 4: Access—financial institutions, 2008–2010

Source: Global Findex (Demirgüç-Kunt and Klapper 2012)

Note: Adults with an Account at a Formal Financial Institution

Note: Number of depositors with commercial banks per 1,000 adults. For each type of institution the calculation follows: (reported number of depositors)*1,000/adult population in the reporting country. Number of commercial bank depositors is from the Financial Access Survey (fas.imf.org). Adult population data is from WDI. Arithmetic average of annual observations for 2008-2010.

Market capitalization out of top 10 largest companies (%)		Number of countries	Average	Median	Standard deviation	Minimum	Maximum	Weighted average[a]
	World	46	44.8	44.8	18.2	3.7	74.2	63.6
By developed/developing economies								
	Developed economies	25	42.4	42.6	20.8	3.7	74.2	64.4
	Developing economies	21	47.6	51.2	14.6	24.6	72.1	60.9
By income level								
	High income	25	42.4	42.6	20.8	3.7	74.2	64.4
	Upper middle income	15	45.7	45.8	14.6	24.6	71.6	59.9
	Lower middle income	6	52.4	54.3	14.6	26.8	72.1	66.7
	Low income	0						
By region								
	High income: OECD	20	43.5	43.2	20.2	3.7	74.2	64.9
	High income: non-OECD	5	38.0	39.6	24.8	5.8	65.0	55.2
	East Asia & Pacific	5	58.2	53.2	8.8	51.2	71.6	69.6
	Europe & Central Asia	2	41.6	41.6	10.4	34.3	49.0	37.4
	Latin America & Caribbean	6	37.0	35.0	11.0	24.6	53.7	42.1
	Middle East & North Africa	4	41.8	42.3	15.3	26.8	56.0	44.8
	South Asia	2	63.7	63.7	11.9	55.3	72.1	72.2
	Sub-Saharan Africa	2	54.7	54.7	18.3	41.8	67.6	68.4

Table 6: Access—financial markets, 2008–2010

Source: Authors' calculations based on the Global Financial Development Database.

Note: Ratio of market capitalization outside of top ten largest companies to total market capitalization. The World Federation of Exchanges provides data on the exchange level. This variable is aggregated up to the country level by taking a simple average over exchanges. Arithmetic average of annual observations for 2008-2010.

Figure 5: Access—financial markets, 2008–2010
Source: Authors' calculations based on the Global Financial Development Database.
Note: Ratio of market capitalization outside of top ten largest companies to total market capitalization. The World Federation of Exchanges provides data on the exchange level. This variable is aggregated up to the country level by taking a simple average over exchanges. Arithmetic average of annual observations for 2008-2010.
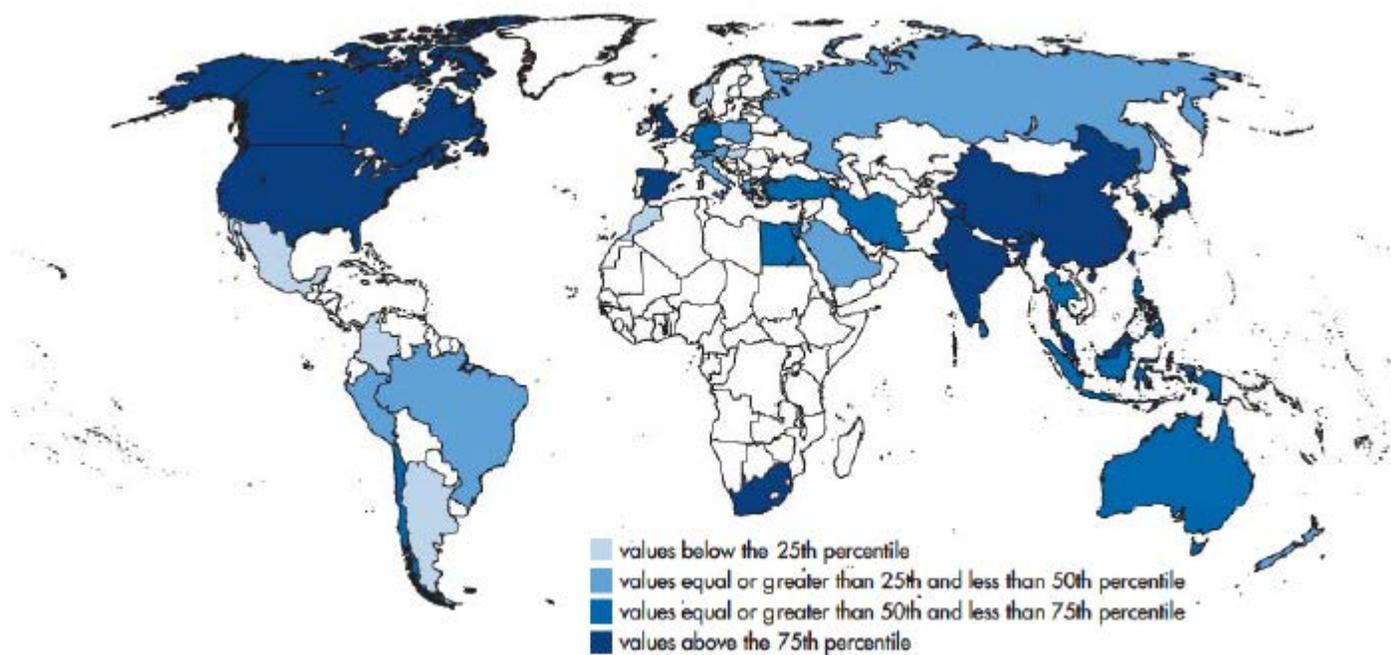
Lending-deposit spread (%)		Number of countries	Average	Median	Standard deviation	Minimum	Maximum	Weighted average[a]
	World	129	7.7	6.3	6.4	0.1	41.5	6.9
By developed/developing economies								
	Developed economies	28	3.8	3.5	2.0	0.2	8.1	2.2
	Developing economies	101	8.8	6.9	6.7	0.1	41.5	7.3
By income level								
	High income	28	3.8	3.5	2.0	0.2	8.1	2.2
	Upper middle income	43	6.7	6.2	5.3	0.1	34.0	6.5
	Lower middle income	39	8.8	8.0	4.7	2.4	24.8	6.0
	Low income	19	13.7	10.2	10.1	3.3	41.5	13.0
By region								
	High income: OECD	14	2.6	2.7	1.2	0.2	4.7	1.9
	High income: non-OECD	13	5.1	4.9	1.9	1.8	8.1	5.1
	East Asia & Pacific	17	7.3	5.5	4.7	2.4	20.2	3.6
	Europe & Central Asia	17	7.7	6.2	5.2	0.4	20.8	6.7
	Latin America & Caribbean	27	9.6	7.2	6.8	4.1	34.0	16.9
	Middle East & North Africa	10	4.6	4.9	2.6	0.1	9.5	4.6
	South Asia	5	5.9	5.9	0.5	5.2	6.4	6.0
	Sub-Saharan Africa	26	11.7	8.8	8.9	3.3	41.5	12.8

Table 7. Efficiency—financial institutions, 2008–2010
Source: Authors' calculations based on the Global Financial Development Database.
Note: Lending rate minus deposit rate. Lending rate is the average rate charged by banks on loans to the private sector and deposit interest rate is the average rate paid by commercial or similar banks for demand, time, or savings deposits. Both lending and deposit rate are from IFS line 60P and 60L, respectively. Arithmetic average of annual observations for 2008-2010.
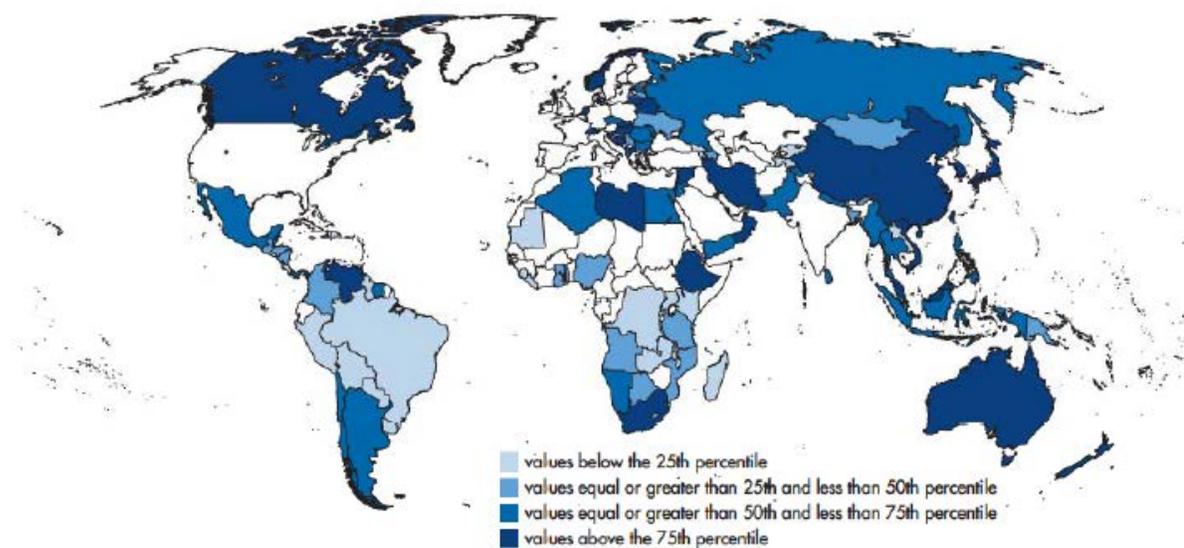a. To calculate the group averages, country-by-country observations are weighted by nominal GDP.

Figure 6: Efficiency—financial institutions, 2008–2010
Source: Authors' calculations based on the Global Financial Development Database.
Note: Lending rate minus deposit rate. Lending rate is the average rate charged by banks on loans to the private sector and deposit interest rate is the average rate paid by commercial or similar banks for demand, time, or savings deposits. Both lending and deposit rate are from IFS line 60P and 60L, respectively. Arithmetic average of annual observations for 2008-2010.

Stock market turnover ratio (%)		Number of countries	Average	Median	Standard deviation	Minimum	Maximum	Weighted average[a]
	World	103	56.9	28.8	65.3	0.3	342.7	197.5
By developed/developing economies								
	Developed economies	43	84.4	68.0	70.0	0.7	342.7	218.5
	Developing economies	60	37.2	10.3	54.2	0.3	216.1	127.0
By income level								
	High income	43	84.4	68.0	70.0	0.7	342.7	218.5
	Upper middle income	33	35.2	10.5	52.2	1.4	201.9	131.8
	Lower middle income	21	35.0	10.1	47.8	0.3	141.6	103.6
	Low income	6	56.6	10.1	87.0	0.5	216.1	69.5
By region								
	High income: OECD	31	98.9	97.0	69.9	0.7	342.7	223.4
	High income: non-OECD	11	51.1	13.9	58.2	1.3	155.8	131.9
	East Asia & Pacific	9	67.4	34.4	68.2	0.4	187.8	166.6
	Europe & Central Asia	14	35.7	8.2	62.2	0.4	201.9	121.5
	Latin America & Caribbean	16	12.8	4.8	21.0	0.3	83.0	56.9
	Middle East & North Africa	6	44.6	44.9	25.7	12.5	81.4	58.6
	South Asia	5	101.0	121.3	84.6	6.2	216.1	126.4
	Sub-Saharan Africa	11	13.9	5.9	19.9	0.5	69.9	62.1

Table 8: Efficiency—financial markets, 2008–2010
Source: Authors' calculations based on the Global Financial Development Database.
Note: Stock market turnover ratio, calculated as total value of shares traded during the period divided by the average market capitalization for the period. Average market capitalization is calculated as the average of the end-of-period values for the current period and the previous period. Data is from Standard & Poor's, Global Stock Markets Factbook and supplemental S&P data, and is compiled and reported by the WDI. Arithmetic average of annual observations for 2008-2010.
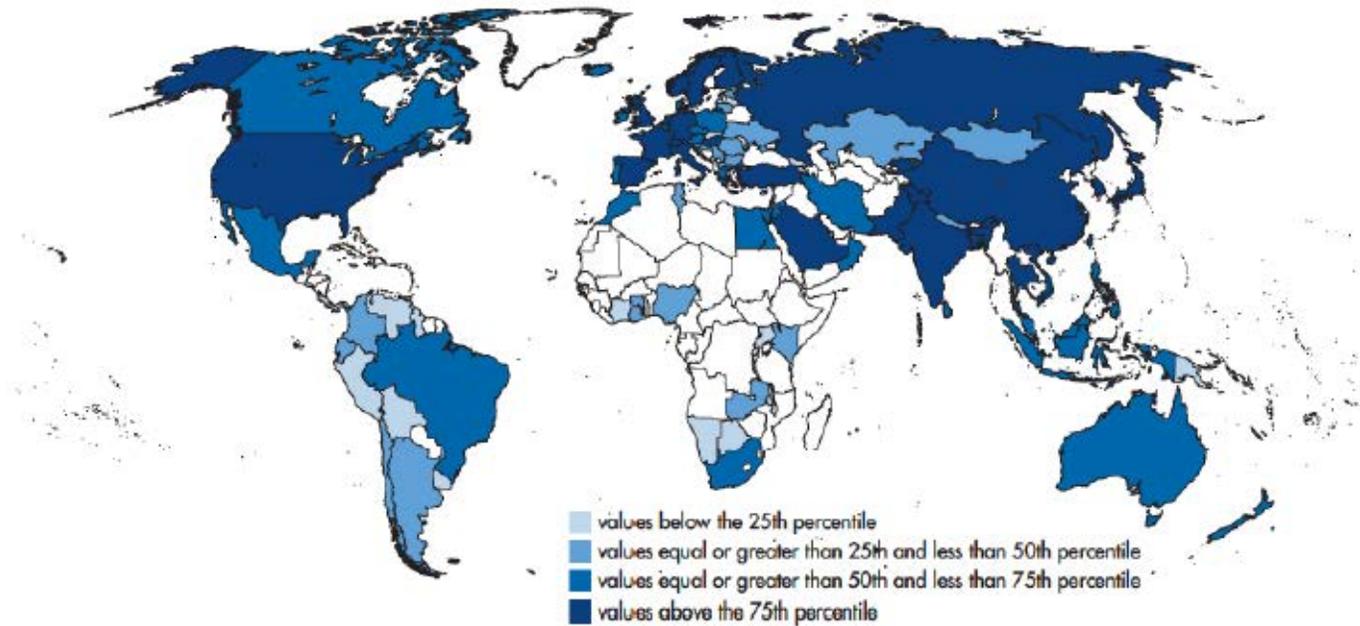a. To calculate the group averages, country-by-country observations are weighted by nominal GDP.

Figure 7: Efficiency—financial markets, 2008–2010
Source: Authors' calculations based on the Global Financial Development Database.
Note: Stock market turnover ratio, calculated as total value of shares traded during the period divided by the average market capitalization for the period. Average market capitalization is calculated as the average of the end-of-period values for the current period and the previous period. Data is from Standard & Poor's, Global Stock Markets Factbook and supplemental S&P data, and is compiled and reported by the WDI. Arithmetic average of annual observations for 2008-2010.

Z-score weighted average from commercial banks		Number of countries	Average	Median	Standard deviation	Minimum	Maximum	Weighted average[a]
	World	178	19.2	17.9	11.8	2.8	77.3	23.4
By developed/developing economies								
	Developed economies	53	21.6	19.6	11.2	3.7	57.3	23.4
	Developing economies	125	18.1	16.3	11.9	2.8	77.3	23.4
By income level								
	High income	53	21.6	19.6	11.2	3.7	57.3	23.4
	Upper middle income	48	18.2	15.3	13.5	3.0	77.3	26.8
	Lower middle income	47	21.5	19.3	12.0	4.4	65.8	23.6
	Low income	30	12.8	10.5	6.3	2.8	30.0	12.1
By region								
	High income: OECD	31	19.3	18.1	10.6	3.7	57.3	23.3
	High income: non-OECD	21	25.2	23.6	11.7	5.9	48.6	25.0
	East Asia & Pacific	15	24.6	23.2	14.0	3.2	54.9	30.0
	Europe & Central Asia	22	15.5	11.5	13.7	3.0	65.8	20.9
	Latin America & Caribbean	29	17.4	18.8	7.3	4.7	31.8	14.5
	Middle East & North Africa	11	29.5	23.1	19.1	11.6	77.3	24.3
	South Asia	8	14.7	13.5	6.9	7.8	27.8	23.5
	Sub-Saharan Africa	41	15.4	13.0	8.4	2.8	41.1	14.9

Table 9: Stability—financial institutions, 2008–2010

Source: Authors' calculations based on the Global Financial Development Database.

Note: Z- Score weighted average from Commercial Banks is estimated as (ROA + Equity / Assets)/(Standard Deviation of ROA). Return of Assets (ROA), Equity, and Assets are from Bankscope. The standard deviation of ROA is estimated as a 5-year moving average. Arithmetic average of annual observations for 2008-2010.

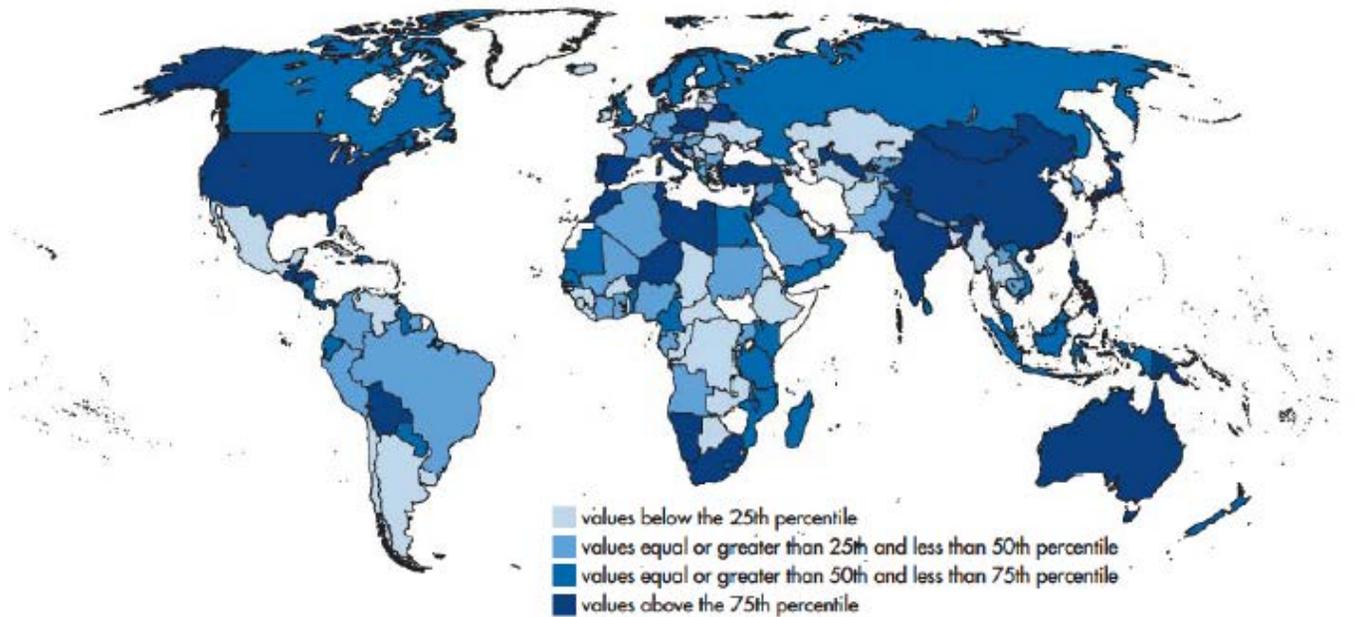a. To calculate the group averages, country-by-country observations are weighted by nominal GDP.

Figure 8: Stability—financial institutions, 2008–2010

Source: Authors' calculations based on the Global Financial Development Database.

Note: Z- Score weighted average from Commercial Banks is estimated (ROA + Equity / Assets)/(Standard Deviation of ROA). Return of Assets (ROA), Equity, and Assets are from Bankscope. The standard deviation of ROA is estimated as a 5-year moving average. Arithmetic average of annual observations for 2008-2010.

Asset price volatility		Number of countries	Average	Median	Standard deviation	Minimum	Maximum	Weighted average[a]
	World	84	33.6	33.1	10.8	11.3	67.3	38.0
By developed/developing economies								
	Developed economies	41	34.1	33.3	10.0	11.7	67.3	32.8
	Developing economies	43	33.2	31.7	11.6	11.3	58.8	39.3
By income level								
	High income	41	34.1	33.3	10.0	11.7	67.3	32.8
	Upper middle income	30	33.1	32.4	12.3	11.3	57.0	41.5
	Lower middle income	11	34.8	32.0	10.6	21.0	58.8	37.3
	Low income	2	26.9	26.9	0.1	26.9	27.0	27.1
By region								
	High income: OECD	30	36.3	34.9	9.2	20.9	67.3	33.0
	High income: non-OECD	11	28.2	30.6	10.0	11.7	45.3	30.5
	East Asia & Pacific	7	35.0	35.0	7.6	21.1	43.7	40.1
	Europe & Central Asia	11	38.8	34.3	11.4	22.1	58.8	49.0
	Latin America & Caribbean	10	34.0	34.3	14.9	11.3	57.0	42.3
	Middle East & North Africa	5	21.9	21.0	6.7	13.4	32.0	27.1
	South Asia	3	32.2	31.5	7.3	25.3	39.8	38.6
	Sub-Saharan Africa	7	30.1	27.0	10.5	16.4	48.1	28.0

Table 10: Stability—financial markets, 2008–2010

Source: Authors' calculations based on the Global Financial Development Database.
Note: Annual standard deviation of the price of a 1-year sovereign bond divided by the annual average price of the 1-year sovereign bond (both based on end-month data). Arithmetic average of annual observations for 2008-2010.
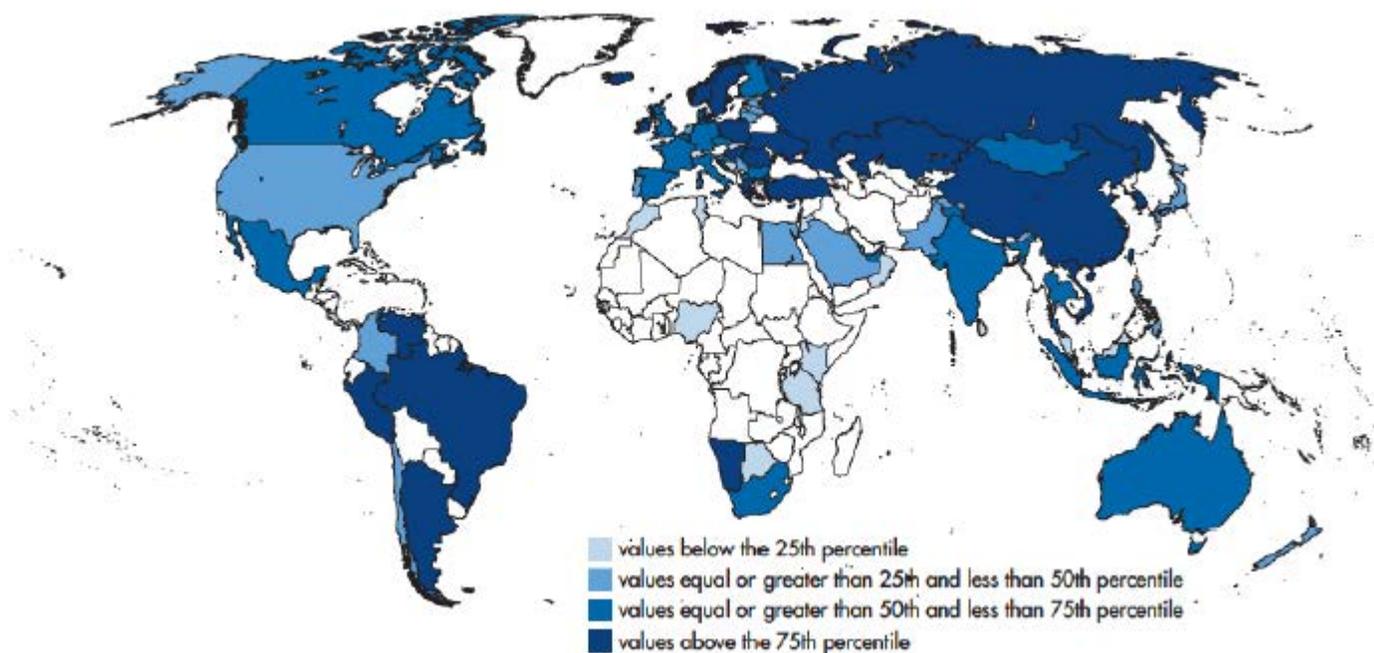a. To calculate the group averages, country-by-country observations are weighted by nominal GDP.

Figure 9: Stability—financial markets, 2008–2010

Source: Authors' calculations based on the Global Financial Development Database.
Note: Annual standard deviation of the price of a 1-year sovereign bond divided by the annual average price of the 1-year sovereign bond (both based on end-month data). Arithmetic average of annual observations for 2008-2010.

Financial Institutions (Mean)	High income	East Asia and Pacific	Europe and Central Asia	Latin America and the Caribbean	Middle East and North Africa	South Asia	Sub-Saharan Africa
Depth	69	43	37	37	33	32	17
Access	43	23	35	30	14	16	10
Efficiency	80	70	65	62	83	81	51
Stability	42	52	20	35	57	38	32

Financial Markets (Mean)	High income	East Asia and Pacific	Europe and Central Asia	Latin America and the Caribbean	Middle East and North Africa	South Asia	Sub-Saharan Africa
Depth	43	38	12	21	24	17	20
Access	46	80	56	40	50	85	77
Efficiency	29	40	17	8	24	49	7
Stability	66	60	43	64	81	56	54

Financial Institutions (Mean)	High income	Upper middle income	Lower middle income	Low income
Depth	84	44	28	13
Access	55	32	19	5
Efficiency	86	75	61	42
Stability	35	38	40	35

Financial Markets (Mean)	High income	Upper middle income	Lower middle income	Low income
Depth	51	27	16	10
Access	53	58	69	29
Efficiency	45	19	20	21
Stability	53	60	53	44

Table 11. Financial System Characteristics: Summary

Source: Authors' calculations based on the Global Financial Development Database.
Note: Financial Institutions—Depth: Private Credit/GDP (%); Access: Number of Accounts Per 1,000 Adults, Commercial Banks; Efficiency: Net Interest Margin; Stability: z-score. Financial Markets—Depth: (Stock Market Capitalization + Outstanding Domestic Private Debt Securities)/GDP ; Access: Percent Market Capitalization Outside of the Top 10 Largest Companies (%); Efficiency: Stock Market Turnover Ratio (%); Stability: Asset Price Volatility. The summary statistics refer to the winsorized and rescaled variables (0–100). To prepare for comparisons across the proxy variables, all the key development indicators are Winsorized, truncating the top 5 and bottom 5 percent of the distribution, i.e, for each variable (1) the 95th and 5th percentile over the whole sample are calculate, (2) all observations below the 5th percentile are replaced by the value corresponding to the 5th percentile, and (3) all observations above the 95th percentile are replaced by the value corresponding to the 95th percentile. Finally, we rescale each individual score by the maximum for each indicator, $⟦max⟧\_i$ and the minimum of the indicator. The rescaled indicator can be interpreted as the percent distance between "worst" and "best" practice.

Depth vs Access
Correlation=0.79*
*Indicates a significant correlation coefficient at the 5% level or better

Depth vs Efficiency
Correlation=0.46*
*Indicates a significant correlation coefficient at the 5% level or better
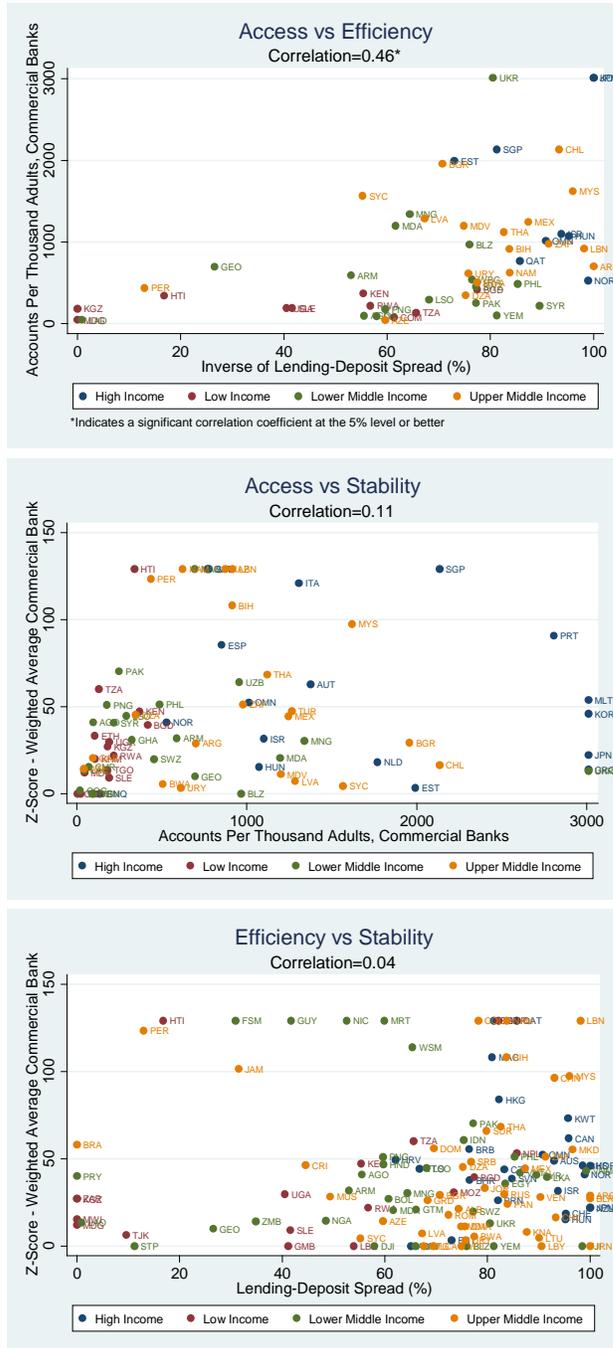
Depth vs Stability
Correlation=0.10
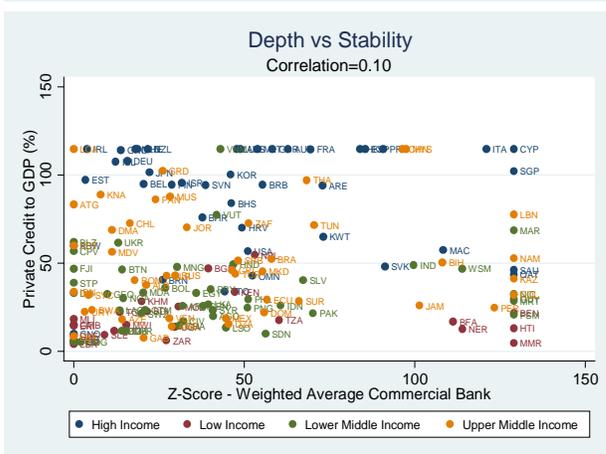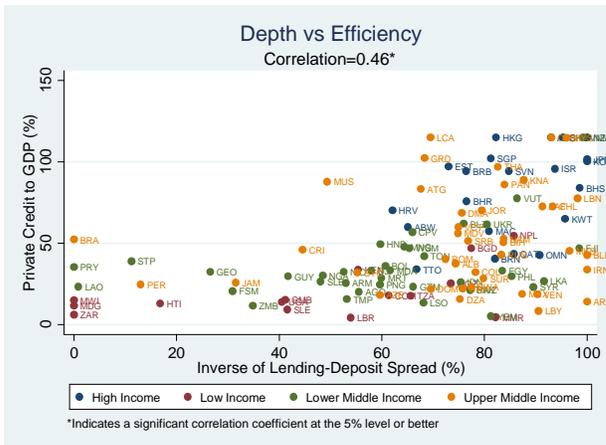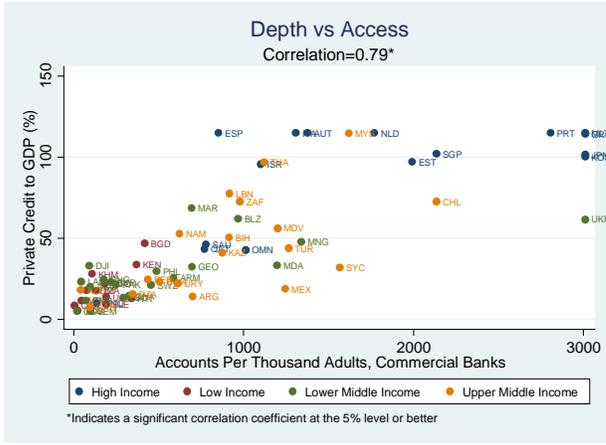
Figure 10. Correlations among financial system characteristics-financial institutions

Source: Authors' calculations based on the Global Financial Development Database.
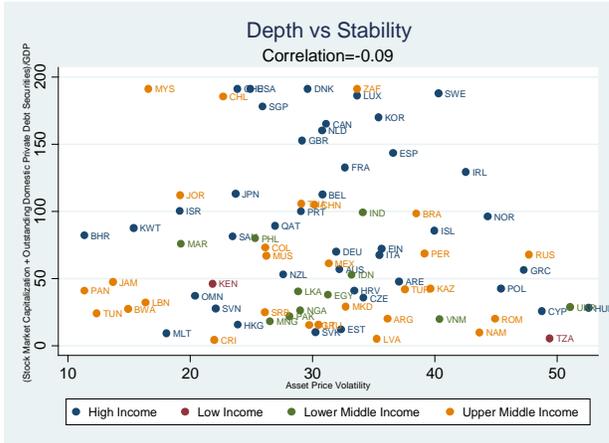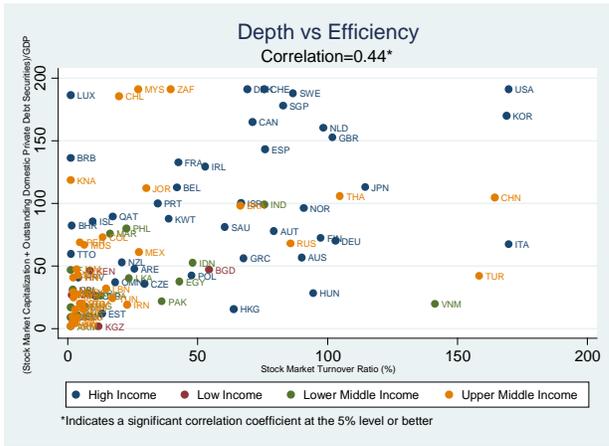
Notes: see Table 1.

Depth vs Access
Correlation=0.36*

*Indicates a significant correlation coefficient at the 5% level or better

Depth vs Efficiency
Correlation=0.44*

*Indicates a significant correlation coefficient at the 5% level or better
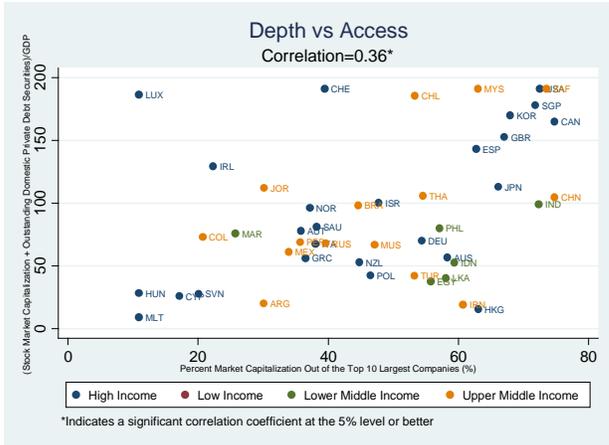

Depth vs Stability
Correlation=-0.09

Figure 11. Correlations among financial system characteristics-financial markets

Source: Authors' calculations based on the Global Financial Development Database.
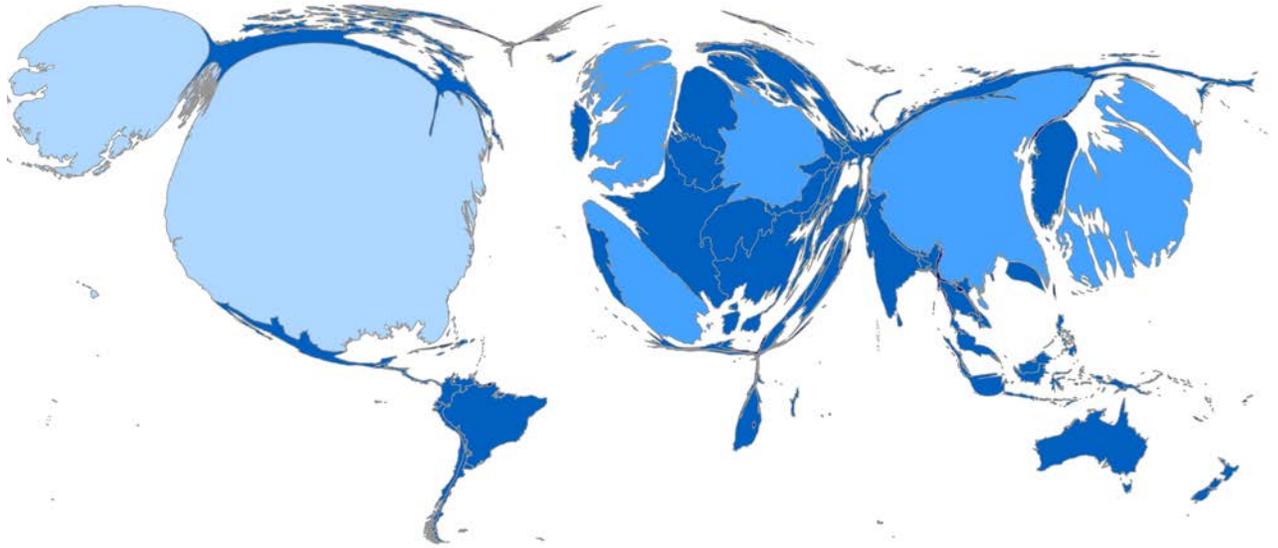Notes: see Table 1.

Figure 12. The uneven sizes of financial systems
Source: Authors' calculations based on the Global Financial Development Database.
Notes: The map is for illustration purposes only. Country sizes are adjusted to reflect the volume of financial sector assets in the jurisdiction, measured in U.S. dollars at the end of 2010. The image was created with the help of the MapWindow 4 and ScapeToad software.