Benchmarking Financial Systems around the World

- Financial systems are multidimensional. Four characteristics are of particular interest for benchmarking financial systems: financial depth, access, efficiency, and stability. These characteristics need to be measured for financial institutions and markets.

- Financial systems come in all shapes and sizes, and differ widely in terms of the four characteristics. As economies develop, services provided by financial markets tend to become more important than those provided by banks.

- The global financial crisis was not only about financial instability. In some economies, the crisis was associated with important changes in financial depth and access.

A growing body of evidence suggests that financial institutions—such as banks and insurance companies—and financial markets—stock markets, bond markets, derivative markets, and so on—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, 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 their investments and scrutinize managerial performance, this boosts the efficiency of corporations and reduces 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 transaction costs, this facilitates trade and specialization—fundamental inputs to technological innovation (Smith 1776).

When financial systems perform these functions poorly, they hinder economic growth, curtail economic opportunities, and destabilize economies. For example, if financial systems collect funds and pass them along to cronies, the wealthy, and the politically
connected, it slows economic growth and blocks potential entrepreneurs. And if financial institutions fail to exert sound corporate governance over firms that they fund, that failure makes it easier for managers to pursue projects that benefit themselves rather than the firms and the economy. When financial institutions create complex financial instruments and sell them to unsophisticated investors, it might generate more income for financial engineers and executives associated with marketing the new instruments, distorting the allocation of society’s savings and impeding economic prosperity.

Evidence on the financial system’s role in shaping economic development is substantial and varied. But there are shortcomings associated with assessing financial systems. There are no good cross-country, cross-time measures of how they (a) enhance information about firms and hence the efficiency of resource allocation; (b) exert sound corporate governance over firms to which they channel those resources; (c) manage, pool, and diversify risk; (d) mobilize savings from savers so that these resources can be allocated to the most promising projects in the economy; and (e) facilitate trade. Instead, researchers have largely focused on the size of the banking industry as a proxy for financial development. But size is not a measure of quality, efficiency, or stability. And the banking sector is only one part of financial systems.

Accordingly, a key contribution of this chapter involves data. In recent years, substantial efforts have been made to improve these data, which this chapter uses. This report is accompanied by the new Global Financial Development Database, an extensive worldwide database that combines and updates several financial data sets (Čihák, Demirgüç-Kunt, Feyen, and Levine 2012). The database is available on the Global Financial Development Report Web page (http://www.worldbank.org/financialdevelopment).

But this chapter goes beyond compiling data. It answers some substantive questions using the data, such as how to empirically describe different characteristics of financial systems; how to compare financial systems across countries and regions and through time; and how financial systems have been affected by the global financial crisis.

To benchmark financial systems, the report measures the following four characteristics of financial institutions and markets: (a) the size of financial institutions and markets (financial depth), (b) the degree to which individuals can and do use financial institutions and markets (access), (c) the efficiency of financial institutions and markets in providing financial services (efficiency), and (d) the stability of financial institutions and markets (stability). These characteristics are measured separately for financial institutions and financial markets (both equity and bond markets), leading to a 4x2 matrix of financial system characteristics. The report uses these measures to characterize and compare financial systems across economies and over time and to assess the relationships between these measures and financial sector policies.

In focusing on these four characteristics of financial institutions and markets, the report gives empirical shape and substance to the complex, multifaceted, and sometimes amorphous concept of the functioning of financial systems. Financial depth, access, efficiency, and stability might not capture all features of financial systems, and the report does not try to construct a composite index of financial development. Instead, it uses these four characteristics to describe, compare, and analyze financial systems and their evolution in recent decades.

This chapter, together with the underlying data and analysis, highlights the multidimensional nature of financial systems. Deep financial systems do not necessarily provide broad financial access, highly efficient financial systems are not necessarily more stable than the less efficient ones, and so on. Each of these characteristics is associated with socioeconomic development, financial sector policies, and other parts of the enabling environment for finance. Financial systems differ widely in terms of the 4x2 characteristics, so it is crucial to measure and evaluate each one.
The chapter also suggests that the global financial crisis resulted in more than financial instability: in some countries, it also caused problems along the other dimensions, such as making people’s and firms’ access to financial services more difficult. Finance is about more than just stability. Having financial systems channel society’s savings to those with the most promising investment opportunities is essential for fostering economic growth, alleviating poverty, and enabling people to pursue their economic goals.

Finally, this chapter is linked to future editions of the *Global Financial Development Report*. The report is envisaged as part of a series, with future reports returning to the analysis of financial systems using updated and extended data. They will use the measurement framework introduced here to examine new topics, such as financial inclusion, capital market development, and others. Future editions might expand or improve on the framework, which is designed to be flexible to accommodate such adjustments if needed—for example, if new types of financial data become available.

### THE IMPORTANCE OF FINANCIAL SYSTEMS TO DEVELOPMENT

Finance is central to development. This may seem obvious to financial development experts. It may also seem obvious to bank depositors who just had their entire life savings wiped out by a financial crisis. But financial crises get forgotten after a period of time. And when compared with other factors that are also important—health, the environment, and so on—the case for finance may appear less obvious. Indeed, when panels of the world’s leading economists tried to identify “the 10 great global challenges” in both 2004 and 2008 as part of the Copenhagen Consensus Project, the list did not include any financial issues.¹

This section argues that finance indeed matters. It matters both when it functions well and when it malfunctions. When operating effectively, finance works quietly in the background, contributing to economic growth and poverty reduction. But when things go wrong, the malfunctioning of the financial system can slow growth, throw more people into poverty, and destabilize entire economies. Indeed, financial crises hurt not only those who work in finance or those who access financial systems. When the government undertakes costly bailouts of bankrupt financial institutions, this can lead to increases in public indebtedness, thus undermining governments’ ability to support key social objectives, including the funding of education, health, and infrastructure programs. As a result, malfunctioning financial systems can also lay the foundations for enduring economic crises, as illustrated quite dramatically by recent events.

With so much attention focused on stability issues following the recent crisis, the powerful linkages between the functioning of the financial system and economic development have been somewhat underemphasized. Although the focus on stability has been understandable, sound financial sector policies are not only about avoiding crises. Finance is also about the efficient allocation of capital, economic growth, and expanding economic horizons. Therefore, an important goal is to raise awareness of policies to enhance the operation of financial systems, develop a better understanding, and foster debate. To help in framing the debate, this section clarifies the definition of financial development and provides a review of the literature on the linkages between financial sector development, economic growth, and poverty reduction.

### What is financial development?

Financial markets are imperfect. Acquiring and processing information about potential investments is costly. 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, thus curtailing economic development.

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 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 transaction costs. For example, the creation of credit registries tends to improve acquisition and dissemination of information about potential borrowers, improving the allocation of resources with positive effects on economic development. As another example, countries with effective legal and regulatory systems have facilitated the development of equity and bond markets that allow investors to hold more diversified portfolios 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, Levine (2005) and others have developed broader definitions that focus on what the financial system actually does.²

At a broader level, financial development can be defined as improvements in the quality of five key financial functions: (a) producing and processing information about possible investments and allocating capital based on these assessments; (b) monitoring individuals and firms and exerting corporate governance after allocating capital; (c) facilitating the trading, diversification, and management of risk; (d) mobilizing and pooling savings; and (e) 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 report sometimes focuses on the role of the financial systems in reducing information, contracting, and transaction costs, it primarily adopts a broader view of finance and stresses the key functions provided by the financial system to the overall economy.

**Financial development and economic growth**

Economists have long debated the financial sector’s role in economic growth. Lucas (1988), for example, dismissed finance as an overstressed determinant of economic growth, and Robinson (1952, 86) quipped that “where enterprise leads finance follows.” From this perspective, finance responds to demands from the nonfinancial sector: it does not cause economic growth. At the other extreme, Miller (1998, 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 ignored without limiting understanding of economic growth.

Recent literature reviews (such as Levine 2005) conclude that 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: countries 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 (Demirgüç-Kunt and Levine 2008).³ 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 boost from available resources.

Financial development and poverty reduction

Beyond long-run growth, finance can also shape the gap between the rich and the poor and the degree to which that gap persists across generations (Demirgüç-Kunt and Levine 2009). Financial development may affect to what extent a person’s economic opportunities are determined by individual skill and initiative, or whether parental wealth, social status, and political connections largely shape economic horizons. The financial system influences who can start a business and who cannot, who can pay for education and who cannot, who can attempt to realize his or her economic aspirations and who cannot. Furthermore, by affecting the allocation of capital, finance can alter both the rate of economic growth and the demand for labor, with potentially profound implications for poverty and income distribution.

Potentially, finance can have rather complex effects on the income distribution. It could boost returns to high-skilled workers or to low-skilled workers. The mechanisms are complex and could be good or bad for the poor and reduce or increase income inequality.

There is an emerging body of empirical research, however, suggesting that in practice, improvements in financial contracts, markets, and intermediaries actually do tend to expand economic opportunities and reduce persistent income inequality. Figure 1.1 provides a basic empirical illustration of the link between financial development (approximated here in a simplified way by the ratio of private sector credit to gross domestic product) and income inequality (approximated by changes in the Gini coefficient). The graph illustrates that higher levels of financial development are associated with declines in inequality.

More in-depth empirical research is consistent with this basic observation. 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).
and accounting systems influence the costs associated with evaluating firms and writing and enforcing contracts and, hence, in identifying and financing an economy’s most promising endeavors. Regulatory, supervisory, and tax systems all affect the incentives facing the executives of financial institutions and participants in securities markets. Thus, these components of the enabling environment for finance also shape the allocation and use of capital. And the state often plays a more direct role in shaping the operation of financial systems, running state-owned banks, subsidizing agriculture or housing, or issuing government securities. Thus, the entire legal, accounting, regulatory, and policy apparatus influences the operation of financial systems.

Given the importance of finance for economic development and poverty alleviation, it is natural to ask: Why does this chapter focus on measuring the functioning of the financial system rather than on examining the direct impact of financial sector policy, regulations, and the rest of the enabling environment on economic growth, poverty alleviation, and the availability of economic opportunities?

The answer is that to provide guidance to policy makers, one needs a detailed understanding of the mechanisms through which the enabling environment for finance influence the functioning of financial systems. It is not enough to assess the associations between financial sector policies and development outcomes because these correlations might reflect reverse causality—in which economic development shapes the types of financial sector policies that a country adopts—or the correlations might simply reflect the impact of some other factor on both economic development and financial sector policies. To provide more accurate assessments about the enabling environment for finance, it is vital to trace through the channels from particular policies and regulations to the operation of financial systems and on to particular economic development outcomes.

This report contributes to this goal of providing more sound advice to policy makers by

**Financial development and the enabling environment for finance**

Many factors shape the functioning of financial systems and hence their impact on economic growth and poverty alleviation. Legal

**Figure 1.1 Financial Depth and Income Inequality**


*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 2005 on the private sector credit-to-GDP ratio (logarithm, 1960–2005 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.

Besides the direct benefits of enhanced access to financial services, finance also reduces inequality, particularly through indirect labor market mechanisms. Specifically, accumulating evidence shows that financial development accelerates economic growth, intensifies competition, and boosts the demand for labor. Importantly, it usually brings relatively bigger benefits to those at the lower end of the income distribution (Beck, Demirgüç-Kunt, and Levine 2007; Beck, Levine, and Levkov 2010). Hence, finance, with good policies, can be both pro-growth and pro-poverty reduction.
To measure the functioning of financial systems, country officials, researchers, and others would ideally like to have direct measures of how well financial institutions and financial markets (a) produce information ex ante about possible investments and allocate capital; (b) monitor investments and exert corporate governance after providing finance; (c) facilitate the trading, diversification, and management of risk; (d) mobilize and pool savings; and (e) ease the exchange of goods and services. So if data were not an issue, the ideal approach to measurement would involve the following determinations: in terms of producing information about possible investments and allocating capital, the financial sector functions (examples)

- Regulation (micro- and macro-prudential, business conduct, etc.)
- Direct interventions (state ownership, guarantees, subsidies, liquidity provision)
- Competition policy in finance (level playing field, entry/exit, etc.)
- Promotion of financial infrastructure/technology

Financial development outcomes (empirical proxies, measured separately for financial institutions and markets)

- Depth
- Access
- Efficiency
- Stability

Other policies and features (examples)

- Macroeconomic policy framework (e.g., exchange rate regime, monetary policy, tax policy, capital controls)
- Legal framework, social capital, etc.
- Concentration in the system
- Internationalization, dollarization

(a) developing and analyzing measures of the functioning of financial institutions and markets (chapter 1) and (b) assembling databases on regulations, supervision, and institutional structures that shape financial system operations (chapters 2 to 5).

To summarize the discussion in this section, figure 1.2 presents in a visual form the relationships between socioeconomic development, financial development, and the enabling environment. It is important to care about the process of financial development because it has a well-documented association with economic and social development more generally. It improves sustainable long-term growth and reduces poverty, thereby improving social welfare. One can think about these as the ultimate developmental objectives. Figure 1.2 also highlights that financial systems do not exist in a vacuum. Financial system characteristics depend on the enabling environment, which consists of financial sector policies and other relevant policies and features.
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.

So, instead of the direct measures, empirical studies have focused on proxy variables, such as various measures of financial depth and access. And despite evidence of the crucial role of finance for economic development, there is a surprising lack of comprehensive data on basic aspects of financial systems across countries and over time. For example, there are major gaps in data on trading volumes in securities markets. Even data on financial institutions become rather patchy when one looks beyond the world’s major, publicly listed banks.

Against this background, one of the key contributions of the Global Financial Development Report is the launch of a new, comprehensive online database on financial systems—the Global Financial Development Database, which is made available online together with the report. The database, which will be updated on a regular basis, compiles and disseminates data on the characteristics of financial systems in 205 jurisdictions around the world. The database has data going back some 50 years (to 1960), although some measures of financial system traits do not go back that far. The data from the Global Financial Development Database are integrated with the World Bank’s Open Data initiative. Some of the data are new, and this is the first time such comprehensive data are available. The data are made available in a Web-friendly form, allowing the users of the database to interact with the data, for example, by creating their own country peer groups and their own tables and charts.

**The 4x2 measurement framework**

This chapter develops and presents four measures of the characteristics of financial systems: depth, access, efficiency, and stability. The focus here is on empirically characterizing financial systems (the middle part of figure 1.2). For completeness, the accompanying database includes some variables that measure social welfare (the upper part of figure 1.2) as well as financial sector policies and the other factors that define the enabling environment for finance (the bottom of figure 1.2). The following subsections introduce each dimension of this measurement framework. The annex to this chapter and Čihák, Demirgüç-Kunt, Feyen, and Levine (2012) provide more detailed information on each component of the measures of the four financial system traits in the matrix.

To obtain a comprehensive characterization of financial systems, one must measure the four categories for the two key components of the financial sector, namely financial institutions (banks and nonbank financial institutions) and financial markets (stock market, bond market, and other markets). Therefore, to be comprehensive, one needs to assemble a 4x2 matrix: four characteristics for two components. Table 1.1 provides a summary representation of such a 4x2 matrix, with examples of variables that can be used to fill in each cell of the matrix. The same structure is used to organize the underlying database. The following subsections go through the individual characteristics in turn.

Box 1.1 focuses on the selection of representative variables within the individual characteristics. Box 1.2 discusses the challenges of aggregating across the four dimensions.

Critically, this chapter looks beyond the size of banks and stock markets. Many factors shape the mixture of financial intermediaries and markets operating in an economy. Different types and combinations of information, enforcement, and transaction costs in conjunction with different legal, regulatory, and tax systems have motivated distinct financial contracts, markets, and intermediaries across countries and throughout history. Thus, financial institutions and markets can and do look very different across countries and over time, but these structural differences do not necessarily translate into differences in the quality of the services provided by the financial system to the economy. To measure financial systems, this chapter digs deeper into the functioning of financial
The literature on financial development is private credit, defined as credit to the private sector from deposit money banks, as a percentage of GDP. There is a wide literature demonstrating the link between financial depth, approximated by private sector credit to GDP, and long-term economic growth and poverty reduction. Private credit varies widely across countries. For example, averaged over 1980–2010, private credit was less than 10 percent of GDP in Angola, Cambodia, and the Republic of Yemen, while exceeding systems and does not just look at the size of particular institutions and markets.

First characteristic: Financial depth

The most common way to characterize financial systems is by measuring the size of financial institutions or markets relative to the size of the economy. “Financial depth” is an analytically incomplete, though empirically ubiquitous, measure of the functioning of financial systems.

For financial institutions, the variable that has received much attention in the empirical literature on financial development is private credit, defined as credit to the private sector from deposit money banks, as a percentage of GDP. There is a wide literature demonstrating the link between financial depth, approximated by private sector credit to GDP, on one hand, and long-term economic growth and poverty reduction on the other hand (for example, Demirgüç-Kunt and Levine 2008). Private credit varies widely across countries. For example, averaged over 1980–2010, private credit was less than 10 percent of GDP in Angola, Cambodia, and the Republic of Yemen, while exceeding systems and does not just look at the size of particular institutions and markets.

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In the literature on financial development. In any case, the two variables are rather closely correlated, with a correlation coefficient of about 0.98 (figure 1.3), so private credit can provide a reasonably close approximation for total banking assets.

Despite the literature’s focus on banks, the global financial crisis has highlighted issues in some nonbank financial institutions (NBFIs). Data coverage of NBFIs is less comprehensive than coverage of banks. Nonetheless, recognizing the importance of NBFIs, the Global Financial Development Database includes total assets of NBFIs to GDP, which includes 85 percent of GDP in Austria, China, and the United Kingdom. The annual average value of private credit across countries was 39 percent, with a standard deviation of 36 percent.

An alternative to private credit is total banking assets to GDP, a variable that is also included in the Global Financial Development Database. Compared to private credit, this variable also includes credit to government and bank assets other than credit. It is arguably a more comprehensive measure of size, but it is available for a smaller number of countries 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 0.98 (figure 1.3), so private credit can provide a reasonably close approximation for total banking assets.

How should one pick among such competing variables? For the purpose of presenting the raw data in the database, it is not necessary to pick. Indeed, the Global Financial Development Database shows the competing variables, so that users can examine the data for themselves. However, for the purpose of characterizing financial systems and for comparisons across the dimensions, it is useful to pick one of the competing variables.

The general approach is to select indicators that are widely available and have a clearly documented link to long-term economic growth or poverty reduction in the literature. When two variables capture the same dimension, and both have a link to economic development, one would select the variable that—even if it is perhaps less sophisticated—has greater country coverage. The more sophisticated variable is still included in the Global Financial Development Database, and relationships between some of these variables are explored in Čihák, Demirgüç-Kunt, Feyen, and Levine (2012). For most of the variables, the competing indicators tend to be highly (although not perfectly) correlated. For example, the correlation coefficient for private sector credit to GDP and total banking assets to GDP is 0.98 (figure 1.3).

The chapter’s illustrative comparison of the 4x2 characteristics across countries selects one variable from each dimension. The selected variables are highlighted in bold in table 1.1.
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, the two main segments for which consistent worldwide data can be collected are stock markets and bond markets (both sovereign and corporate). To approximate the size of stock markets, the most common choice in the literature is stock market capitalization to GDP. For the size of the bond markets, the mostly commonly used proxy for size is the outstanding volume of debt securities (private and public) to GDP.

To measure the depth of stock markets, this report primarily uses the stock value traded indicator, which equals the value of stock market transactions as a share of GDP. This market development indicator incorporates information on the size and activity of the stock market, not simply on the value of listed shares. 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 growth. There is substantial variation across countries. Although the mean value of stock value traded is about 29 percent of GDP, the standard deviation is about double this value. In Armenia, Tanzania, and Uruguay, stock value traded annually averaged less than 0.23 percent over the 1980–2008 sample (10th percentile). In contrast, stock value traded averaged over 75 percent in China (both mainland and Hong Kong SAR, China), Saudi Arabia, Switzerland, and the Unites States (90th percentile). Also, this report confirms Levine’s and Zervos’s results using other market development indicators. In particular, it examines stock market capitalization, which simply measures the value of listed shares on a country’s stock exchanges as a share of GDP and securities market capitalization, which equals the capitalization of the stock market plus the capitalization of the private domestic bond markets, divided by GDP.

The relative size of banks and markets—called the financial structure ratio—measures the ratio of private credit to stock market capitalization and provides information on the mixture of financial institutions and markets operating in a financial system. The degree to which the financial system is relatively bank based or market based has been an important topic in the financial development literature. In a recent contribution to this literature, Demirgüç-Kunt, Feyen, and Levine (2012) find that as economies develop, services provided by financial markets tend to become relatively more important than those provided by banks.

Second characteristic: Financial access (inclusion)

But finance is not just about the size of financial institutions and securities; finance is also about the ability of individuals and firms in an economy to access financial services. Measures of financial access are indeed strongly associated with economic development, a relationship that is separate from the association between financial depth and economic development. Besides the direct benefits of enhanced access to financial services, finance
also reduces inequality, particularly through indirect labor market mechanisms. Specifically, accumulated evidence shows that financial access accelerates economic growth, intensifies competition, and boosts the demand for labor—and it usually brings bigger benefits to those at the lower end of the income distribution (see, for instance, Beck, Demirgüç-Kunt, and Levine 2007, and Beck, Levine, and Levkov 2010). It is important to emphasize that the issue is not only access to any form of finance, but also the quality of financial services available to people. In other words, having a bank account is nice, but it is also important to have a competitive interest rate, reliable payment services, and so on.

A well-functioning financial system offers savings, payments, and risk-management products to as large a set of participants as possible. It seeks out and finances good growth opportunities wherever they may be. Without inclusive financial systems, poor individuals and small enterprises need to rely on their personal wealth or internal resources to invest in their education, become entrepreneurs, or take advantage of promising growth opportunities. Though still far from conclusive, the existing body of evidence suggests that developing the financial sector and improving access to finance are likely not only to accelerate economic growth but also to reduce income inequality and poverty.

Access to financial services—financial inclusion—implies an absence of obstacles to the use of these services, whether the obstacles are price or nonprice barriers to finance. It is important to distinguish between access to—the possibility to use—and actual use of financial services. In some cases, a person or business has access to services but decides not to use them. But in other cases, price barriers or discrimination, for example, bar access. Failure to make this distinction can complicate efforts to define and measure access. Financial market imperfections, such as information asymmetries and transaction costs, are likely to be especially binding on the talented poor and on micro- and small enterprises that lack collateral, credit histories, and connections. Without inclusive financial systems, these individuals and enterprises with promising opportunities are limited to their own savings and earnings. Financial access has been overlooked in traditional literature on financial system characteristics, mostly because of serious data gaps on who has access to which financial services and a lack of systematic information on the barriers to broader access. The Global Financial Development Database contains both variables that measure the use of financial services (which reflects both supply and demand) as well as variables that focus more closely on the supply of financial services.

The main proxy variable in the financial access category for financial institutions 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 toward 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).

The measure of access in financial markets relies on various measures of concentration in the market, the idea being that a high degree of concentration reflects difficulties for access for newer or smaller issuers. The variables in this category include the percentage of market capitalization outside of the top 10 largest companies, the percentage of value traded outside of the top 10 traded companies, government bond yields (3 month and 10 year), ratio of domestic to total debt securities, ratio of private to total debt securities (domestic), and ratio of new corporate bond issues to GDP.

The data for the financial access dimension of the Global Financial Development Database came largely from the IMF’s recently established Access to Finance database, based on earlier work by Beck, Demirgüç-Kunt, and Martínez Pería (2007). In
addition, a part of the financial access data is based on the Global Financial Inclusion Indicators database (Global Findex) that is being built at the World Bank (Demirgüç-Kunt and Klapper 2012). The Global Findex is the first public database of indicators that consistently measures individuals’ usage of financial products across countries and over time. It can be used to track the effect of financial inclusion policies and facilitate a deeper and more nuanced understanding of how adults around the world save, borrow, and make payments. The data will be based on interviews with at least 1,000 people per country in up to 150 countries about their financial behavior through the Gallup World Poll survey. The survey was rolled out in January 2011. The first data set was made available to the public in April 2012, and the full database will be updated every three years, with headline indicators of the use of bank accounts and formal credit, which are collected on an annual basis.

Third characteristic: Financial efficiency

To perform its functions well, a financial sector should be efficient. It should perform its intermediating functions in the least costly way possible. If intermediation is costly, the higher costs may get passed on to households, firms, and governments. (In)efficiency measures for institutions include indicators such as overhead costs to total assets, net interest margin, lending-deposits spread, noninterest income to total income, and cost to income ratio (table 1.1). 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).

As with the other dimensions, these are relatively crude measures of (in)efficiency. For a subset of countries, it is possible to calculate efficiency indices based on data envelopment analysis and other more sophisticated measures; for example, Angelidis and Lyroudi (2006) apply data envelopment analysis and neural networks to calculate efficiency indexes using bank-by-bank data for the Italian banking industry. But the data required for this type of analysis are available only for a small subsample of countries, and therefore much additional data-collection work would be needed to compile a comprehensive cross-country database. The background paper by Čihák, Demirgüç-Kunt, Feyen, and Levine (2012) contains a discussion on data envelopment analysis and other examples of more sophisticated measures.

For financial markets, the basic measure of efficiency in the stock market is the turnover ratio, that is, the ratio of turnover to capitalization in the stock market. The rationale of using this variable is that the higher turnover relative to capitalization means relatively higher volumes of trading in the market and more liquidity. This in turn means more scope for price discovery, better transmission of information in the price, and greater efficiency of the market. In the bond market, the most commonly used variable is the tightness of the bid-ask spread (with the U.S. and Western European markets showing low spreads, and the Dominican Republic, Pakistan, Peru, Qatar, and Vietnam 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 have been used in empirical literature (table 1.1). 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. It is based on the notion that a market operates efficiently when prices are informative about the performance of individual firms. When their movements are highly synchronized, they are less likely to provide such individualized information (although one also needs to control for common shocks to economywide fundamentals to establish a benchmark for this variable). Also, 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.

Fourth characteristic: Financial stability

Last, but not least, the degree of financial stability is an important feature of the financial sector. There is a vast literature specifically on measuring systemic risk. Because of the importance of financial stability for broader macroeconomic stability, the topic is sometimes treated as separate from the other three dimensions. But financial stability is an important feature of financial systems, and it is closely interlinked with the broader process of financial development. To illustrate this, imagine a country where banks’ lending standards become very loose, with banks providing loans left and right, without proper risk management and loan monitoring. On the surface, one could observe the rapid growth as a sign of deepening and increased access to finance. Also on the surface, the financial sector can seem efficient, for some period of time: without the loan approval process, such banks would be able to lower their costs, at least until the loans turned bad. And this is the problem, of course: the system would be unstable and likely would end in a crisis. For more on the complex linkages between financial development, financial fragility, and growth, see, for example, Loayza and Ranciere (2006).

The key variable used here to measure financial stability is the z-score, defined as the sum of capital to assets and return on assets, divided by the standard deviation of return on assets. This variable explicitly compares buffers (capitalization and returns) with the potential for risk (volatility of returns). The z-score has a direct link with the probability of default, and for this reason the variable has been used extensively in the empirical literature. 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-references the Financial Soundness Indicators database available on the IMF website (http://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 of the few reliable forward-looking indicators of financial instability is excessive credit growth. The focus here is on excessive credit growth. A well-developing financial sector is likely to report expansion in credit growth. Without credit growth, financial sectors would lack depth or would not be able to provide good access to financial services. Credit growth is important, and indeed may be necessary, even if it is connected with some instability. But a very rapid growth in credit is one of the most robust common factors associated with banking crises (Demirgüç-Kunt and Detragiache 1997; Kaminsky and Reinhart 1999). IMF (2004), for example, estimated that about 75 percent of credit booms in emerging markets end in banking crises. Typically, credit expansions are fueled by overly optimistic expectations of future income and asset prices, often combined with capital inflows. Over time, households and firms accumulate substantial debt while income does not keep pace. A decline in income or asset prices then leads to an increase in nonperforming loans and defaults. If the problem is severe, the country experiences a banking crisis. Drehmann, Borio, and Tsatsaronis (2011) examine the performance of different variables as anchors for setting the level of the countercyclical regulatory capital buffer requirements for banks, finding that the gap between the ratio of credit to GDP and its long-term backward-looking trend performs best as an indicator for the accumulation of capital, because this variable captures the build-up of systemwide vulnerabilities that typically lead to banking crises.
For financial markets, the most commonly used proxy variable for (in)stability is market volatility, although other proxies are also included in the database (table 1.1). One of these variables is the skewness, the reason being that a market with a more negative skewed distribution of stock returns is likely to deliver large negative returns, and likely to be prone to instability. Other variables approximating (in)stability in the stock market are the price-to-earnings ratio (P/E ratio) and duration (a refined version of the P/E ratio that takes into account factors such as long-term growth and interest rates). These variables are based on the empirical fact that market prices contain expectations of future cash flows and growth.

The advantage of the credit growth variable is that it is relatively easy to observe and monitor. Also, unlike some of the other measures (for instance, those that include nonperforming loan ratios), it is a forward-looking measure of instability. A disadvantage is that the definition of “excessive” credit growth is not trivial. Also, this measure does not, by itself, capture situations where financial sector problems have already crystallized in a full-blown crisis. In such situations, credit is declining in real terms rather than growing. It is therefore important to amend the excessive credit growth indicator, as an ex ante measure of financial instability, by including credit declines as ex post proxies for situations of financial instability.

To provide a rough sense of how financial systems stack up across the 4x2 dimensions, it is helpful to convert the individual characteristics to the same scale. To prepare for this, the 95th and 5th percentile for each variable for the entire pooled country-year data set are calculated, and the top and bottom 5 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. In effect, the 5th and 95th percentile become the minimum and maximum of the new (truncated) data set. The main reason for truncating the “tails” of the distribution is that sometimes the best and worst scores are very extreme and may reflect some peculiar (idiosyncratic) features of a single jurisdiction. However, the top and bottom 5 percent of observations are not dropped from the sample completely. If they were dropped, the calculations would lose too much of the potentially valuable information. Replacing the top and bottom 5 percent of observations with the 95th and 5th percentile value, respectively, ensures that much of the original information is still retained. This so-called winsorizing is consistent with approaches used in earlier literature.
instead of current fundamentals only, and therefore stock prices may be more volatile and negatively skewed in the future.

**Measuring the enabling environment for finance: A start and an important area for further data work**

The focus of the 4x2 matrix is on characterizing financial systems (the middle part of figure 1.2). It does not explicitly include variables capturing financial sector policy, such as features of financial sector regulation and supervision (the bottom of figure 1.2). The reason for focusing on measures of the functioning of financial systems is that those indicators bridge the gap between policy measures and final objectives, such as growth, poverty alleviation, and the expansion of economic opportunities. Financial depth, access, efficiency, and stability function as “intermediate” indicators and targets. To some extent, this is an analogy with monetary policy, where intermediate targets have a relatively clear link to the policy variable (such as a central bank’s interest rate) and an impact on the policy target (such as future inflation rate).

This report, however, has started the process of assembling comprehensive data on the enabling environment for finance: financial sector policies, regulations, supervisory practices, legal and accounting systems, and so forth. As part of the work underlying chapter 2 of this report, a comprehensive and updated data set on bank regulation and supervision around the world was put together, building on earlier work by Barth, Caprio, and Levine (2004). The database also covers policies and issues that go beyond the narrow concept of banking regulation and supervision, such as deposit protection systems and resolution issues. Also, the World Bank has recently published a comprehensive update on payment systems and the related policies around the world—some of these results are featured in chapter 5. As part of chapter 4, new data are presented on development financial institutions and some other forms of direct government interventions. Finally, another group of indicators relates to the features of the underlying financial infrastructure. This includes basic indicators on information disclosure, contract enforcement, and other quantitative characteristics of financial infrastructure (for example, public registry coverage in percent of adults, private bureau coverage in percent of adults, procedures to enforce contracts, time to enforce contract, and cost to enforce contracts). Several other traits of the enabling environment for finance are included in the Global Financial Development Database and listed in this chapter’s annex.

But this is just a start. For policy evaluation and policy design purposes, it is important to start collecting more consistent and more comprehensive information on government policies in the financial sector (for example, on supervision of nonbank financial institutions and financial markets). This is an important gap in the globally available data; future reports hope to go in more depth into how this gap might be filled.

**SELECTED FINDINGS**

**Financial system multidimensionality**

One basic, yet important, observation derived from the Global Financial Development Database is that the four characteristics of financial systems are far from closely correlated across countries (figure 1.4). Each characteristic captures a different, separate facet of financial systems. Capturing only financial institutions and not financial markets would be insufficient. Also, looking only at financial depth as the only proxy would not be sufficient. And similarly, focusing only on financial stability or on access or on efficiency would be insufficient. Stability has particularly low correlation with the other three characteristics.

**Important differences across regions and income groups**

A regional comparison shows major differences in the four characteristics of financial
FIGURE 1.4 Correlations among Financial System Characteristics

a. Financial Institutions

Depth vs. Access
Correlation = 0.80*

Depth vs. Stability
Correlation = 0.02

Access vs. Efficiency
Correlation = 0.46*

Efficiency vs. Stability
Correlation = 0.18

(figure continues next page)
FIGURE 1.4 Correlations among Financial System Characteristics (continued)

b. Financial Markets

Depth vs. Access
Correlation = 0.39*

(Stock market capitalization + outstanding domestic private debt securities)/GDP

Percent market capitalization out of the top 10 largest companies (%)
- High income
- Low income
- Lower middle income
- Upper middle income

Depth vs. (in)stability
Correlation = 0.09

(Stock market capitalization + outstanding domestic private debt securities)/GDP

Asset price volatility
- High income
- Low income
- Lower middle income
- Upper middle income

Access vs. (in)stability
Correlation = 0.21

Percent market capitalization out of the top 10 largest companies (%)

Depth vs. Efficiency
Correlation = 0.47*

(Stock market capitalization + outstanding domestic private debt securities)/GDP

Stock market turnover ratio (%)
- High income
- Low income
- Lower middle income
- Upper middle income

Access vs. Efficiency
Correlation = 0.51*

Percent market capitalization out of the top 10 largest companies (%)

Efficiency vs. (in)stability
Correlation = 0.24*

(Stock market capitalization + outstanding domestic private debt securities)/GDP

Asset price volatility
- High income
- Low income
- Lower middle income
- Upper middle income

*Indicates a significant correlation coefficient at the 5% level or better.
Large disparities in financial systems across countries

Behind these regional and peer group averages are vast differences among individual countries, and in some cases also major differences among different parts of each country’s financial sector. The data from the Global Financial Development Database demonstrate rather strikingly the large differences in financial systems around the globe. For example, the largest financial system in the sample is more than 34,500 times the smallest one. Even if the financial systems are rescaled by the size of the corresponding economies (that is, by their GDP), 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 the economy. Similar orders of magnitude are obtained for the other characteristics of financial systems. In other words, when one examines country-level data, one finds vast differences in financial sector depth, as well as in the other characteristics.

The cross-country differentiation along the key characteristics of financial systems can be seen from the scatter plots in figure 1.4 as well as from cartograms such as the

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**TABLE 1.2** Financial System Characteristics: Summary (continued)

<table>
<thead>
<tr>
<th>Financial Institutions (Mean)</th>
<th>High income</th>
<th>Upper middle income</th>
<th>Lower middle income</th>
<th>Low income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth</td>
<td>94</td>
<td>44</td>
<td>28</td>
<td>13</td>
</tr>
<tr>
<td>Access</td>
<td>55</td>
<td>32</td>
<td>19</td>
<td>5</td>
</tr>
<tr>
<td>Efficiency</td>
<td>86</td>
<td>75</td>
<td>61</td>
<td>42</td>
</tr>
<tr>
<td>Stability</td>
<td>35</td>
<td>38</td>
<td>40</td>
<td>35</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Financial Markets (Mean)</th>
<th>High income</th>
<th>Upper middle income</th>
<th>Lower middle income</th>
<th>Low income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth</td>
<td>51</td>
<td>27</td>
<td>16</td>
<td>10</td>
</tr>
<tr>
<td>Access</td>
<td>53</td>
<td>58</td>
<td>69</td>
<td>29</td>
</tr>
<tr>
<td>Efficiency</td>
<td>45</td>
<td>19</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>Stability</td>
<td>53</td>
<td>60</td>
<td>53</td>
<td>44</td>
</tr>
</tbody>
</table>

Source: Calculations based on the Global Financial Development Database.
Note: The summary statistics refer to the winsorized and rescaled variables (0–100), as described in the text. Financial Institutions—Depth: Private Credit/GDP (%); Access: Number of Accounts Per 1,000 Adults; Commercial Banks; Efficiency: Net Interest Margin; Stability: z-score. Under Financial Markets—Depth: (Stock Market Capitalization + Outstanding Domestic Private Debt Securities)/GDP; Access: Percent Market Capitalization Out of the Top 10 Largest Companies (%); Efficiency: Stock Market Turnover Ratio (%); Stability: Asset Price Volatility.

**FIGURE 1.5** Financial System Characteristics, by Income Group, 2010

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Source: Calculations based on the Global Financial Development Database.
Note: The summary statistics refer to the winsorized and rescaled variables (0–100), as described in the text. See also table 1.2.
liquidity shocks. In addition, financial institutions on average rebounded faster than markets, showing improvements in depth and efficiency after the crisis. This improvement 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 (box 1.3), and many Sub-Saharan African countries (see, for example, World Bank 2012). However, the medium-term effect of the crisis on financial systems still remains to be seen, and will be examined further in future issues of the Global Financial Development Report.

Increased importance of securities markets at higher income levels

The Global Financial Development Database allows for an examination of the relative size of financial institutions and financial markets around the world. The issue of financial structure—usually approximated by the relative size of bank credit and stock market capitalization—has been an important topic in the policy debate.

In a recent paper that used data that are part of the Global Financial Development Database...
Database, Demirgüç-Kunt, Feyen, and Levine (2012) examine empirically the issue of financial structure and find that, as economies develop, use of services provided by securities markets increases relative to those provided by banks. This work suggests that policies and institutions should adapt as countries develop in order to allow financial structure to evolve.

The existing research and policy work do not provide enough guidance to justify targeting a particular financial structure for a particular country. However, if market or bank development is too skewed compared to what one could expect given their level of economic development, the above research findings provide a reason to dig deeper: one would need to find out if taxes, regulations, legal impediments, or other distortions are leading to excessive reliance on banks or markets. Using policy to facilitate a shift from a bank-centric system to a more market-based system is never an easy task. Actively intervening to develop markets is likely to be problematic. Interventions should be more along the lines of fostering an enabling environment and reducing impediments. Even in systems with a relatively strong state role in the economy, shifts in the financial sector structure do not occur overnight. China (box 1.3) is a case in point: despite policy intentions and reforms aimed at promoting nonbank financial institutions and markets, the financial system remains very much...
Three risk-taking strategies that generated excess returns to bank shareholders and staff. Subsequently, as these risks materialized, the “miracle” turned into a mirage.

The “bright” and “dark” sides of financial systems

The data from the Global Financial Development Database can be used to examine the notion that growth of financial systems may seem explosive. To some extent, this notion reflects the inadequacy of some of the available proxies for financial systems. For instance, in the case of the United Kingdom, the nominal value-added of the financial sector (as measured in the System of National Accounts) grew at the fastest pace on record in the fourth quarter of 2008, around the Lehman failure. On the surface, it may seem as if the U.K. financial sector underwent a “productivity miracle” from the 1980s onward, as finance appeared to rise as a share of GDP despite a declining labor and capital share. However, a decomposition of returns to banking suggests that much of the growth reflected the effects of higher risk taking (Haldane, Brennan, and Madouros 2010). Leverage, higher trading profits, and investments in deep-out-of-the-money options were the risk-taking strategies that generated excess returns to bank shareholders and staff. Subsequently, as these risks materialized, the “miracle” turned into a mirage.
They observe that financial systems development paths exhibit “convexitities,” as rising participation and interconnectedness generate positive externalities that promote further participation and interconnectedness. Thus,

More examples of the explosive growth of financial systems using the data from the Global Financial Development Database can be found in de la Torre, Ize, and Schmukler (2011) and de la Torre, Feyen, and Ize (2011).
much of financial system growth may be explosive. According to the authors, a counterpart of such explosiveness is that the association between financial development (approximated, for example, as private credit to GDP) and real development (output growth) exhibits decreasing returns. In other words, the association between finance and growth levels off at some point. This result is consistent with findings of recent papers that regress output growth against financial depth indicators.\textsuperscript{13}

A different aspect of this convexity has been brought up recently by Čihák, Muñoz, and Scuazzarella (2011). Using a subset of data from the Global Financial Development Database, and building on an earlier theoretical paper by Nier and others (2007), they examine the “bright” and “dark” sides of cross-border financial interlinkages. They ask whether making a country’s banking sector more linked to the global banking network renders that country more or less prone to banking crises. Their answer, interestingly, is that it depends on how connected the country’s banking sector already is. For banking sectors that are not very connected to the global banking network, increases in interconnectedness are associated with a reduced probability of a banking crisis. Once interconnectedness reaches a certain value (estimated to be at about the 95th percentile of the distribution of countries in terms of interconnectedness), further increases in interconnectedness can increase the probability of a banking crisis. Also, the analysis suggests that it is important to distinguish whether the cross-border interlinkages are stemming primarily from banks’ asset side or from their liabilities side: increasing interconnectedness on the liabilities (borrowing) side is more likely to become detrimental to banking stability than increasing interconnectedness on the asset (creditor) side.

\section*{Analysis of the crisis: Increased instability in the run-up, decreased access in the aftermath}

The rich data set in the Global Financial Development Database allows one to examine in more depth the developments in the run-up to the crisis. For example, the financial stability indicators for many countries show deterioration several years prior to the crisis (see figure B1.3.1 in box 1.3 for an illustration for China). This finding is consistent with the observation by Anginer and Demirgüç-Kunt (2011), who construct a default risk measure for publicly traded banks using the Merton contingent claim model, and examine the evolution of the correlation structure of default risk for some 1,800 banks in over 60 countries. Based on their measure, which is a more sophisticated analogue of the z-score used in this chapter, they find a significant increase in default risk codependence over the three-year period leading to the financial crisis. They also find that countries that are more integrated, and that have liberalized financial systems and weak banking supervision, have higher codependence in their banking sector. The results support an increase in scope for international supervisory cooperation, as well as capital charges for “too-connected-to-fail” institutions that can impose significant externalities.

The 4x2 framework also allows examining the effects of the global financial crisis. Box 1.4 illustrates this in the case of Romania, a country whose financial sector seemed relatively sound based on conventional ratios (such as capital adequacy and nonperforming loan ratios) but that was subjected to rather large shocks during the crisis. Figures 1.7 and 1.8 examine the crisis effect in a cross-section of countries.

\section*{Conclusion}

The 4x2 framework presented in this chapter puts a spotlight on the multifaceted nature of modern financial systems. Focusing only on one dimension—say, financial depth or financial stability—would be shortsighted. Also, focusing only on financial institutions, or just on banks, is too much of a simplification and can lead to distorted results and biased policy conclusions.

This chapter illustrates that financial sectors come in different shapes and sizes, and they differ widely in terms of the 4x2
In the run-up to the global financial crisis, Romania’s financial sector has gone through a period of rapid growth, reflected in an increase in the measured financial depth. Similarly to many other countries in the region, the rapid growth of domestic credit was fueled by ample funding provided by parents of foreign-owned banks to their subsidiaries in Romania. In terms of the 4x2 framework, Romania’s score for financial institutions’ depth grew from only 3 in 2000 to 28 in 2007, and its score for financial markets’ depth grew from 1 to 13 over the same period.

The Romanian banking system, which dominates the financial sector, entered the crisis with relatively high reported capitalization and liquidity ratios (IMF 2009). Also, the ratios of nonperforming loans to total loans reported before the crisis were rather low; however, this finding was mostly just a reflection of the high credit growth that masked to some extent the underlying weaknesses in the system. The z-score, that is, the proxy for stability used in the 4x2 framework, suggested that the soundness of Romanian banks was far from perfect in the run-up to the crisis.

A rapid deterioration in market confidence in the Romanian economy has led to bouts of downward pressure on the exchange rate, upward pressure on interest rates, and a large decline in equity values (some 80 percent between 2008 and 2009). These effects led to sharp increases in nonperforming loans, putting strains on bank capital positions. Stress-testing analysis performed during the recent Financial Sector Assessment Program (FSAP) (IMF 2009) suggested that some banks were at risk of becoming undercapitalized as the downturn continues. The FSAP therefore called for strengthening of capital positions of some banks and for maintaining by parents of foreign-owned banks those lines of credit to their subsidiaries and corporate borrowers in Romania. In terms of the 4x2 framework, these stability challenges are reflected in major declines of the stability indicators, both for financial institutions and financial markets, in 2008 and 2009. Also, the framework highlights that the crisis has halted, at least temporarily, Romania’s increases in financial depth.

Dimensions. More specifically, the chapter also documents developments during the global financial crisis, not only in terms of financial instability, but also in terms of financial depth, access, and efficiency.

Despite the remarkable progress in gathering data and information on financial systems around the world in recent years, researchers’ and practitioners’ ability to properly measure financial systems has been constrained by lack of comprehensive data. The data that are being made publicly available, together with this report, should help country officials, researchers, and anybody else with interest in the matter to better benchmark financial systems. The Statistical Appendix to the report includes country tables with select indicators, as well as aggregates across regions and income groups. A pocket edition of the database is also made available as Little Data Book on Financial Development. Finally, readers are encouraged to go online and explore this large and interesting source of data by themselves.
Future versions of the *Global Financial Development Report* will revisit issues of measurement of financial systems around the world. They will also report on substantial new trends or observations, and they will focus on the relevant theme at hand, such as financial inclusion or capital market development, or other issues of policy relevance.

**Chapter 1 Annex: Overview of the Data Sources Underlying the Global Financial Development Database**

This annex is a summary. For more on the Global Financial Development Database, including the individual country data and metadata, see this report’s Statistical Appendix and the *Global Financial Development Report* website at http://www.worldbank.org/financialdevelopment.

**Database on Financial Development and Structure** (updated November 2010). This database was used a starting point for many of the basic indicators of size, activity, and efficiency of financial intermediaries and markets. Beck, Demirgüç-Kunt, and Levine (2010) describe the sources and construction of, and the intuition behind, different indicators and present descriptive statistics.

**Bankscope** (Bureau van Dijk, http://www.bvdbinfo.com/Products/Company-Information/International/BANKSCOPE.aspx) was used to obtain and update data on banks. Bankscope combines widely sourced data with flexible software for searching and analyzing banks. Bankscope contains comprehensive information on banks across the globe. It can be used to research individual banks and find banks with specific profiles and analyze them. Bankscope has up to 16 years of detailed accounts for each bank.

**Bloomberg** (http://www.bloomberg.com/), **Dealogic** (http://www.dealogic.com/), and **Thomson Reuters Datastream** (http://thomsonreuters.com/products_services/financial/financial_products/a-z/datastream/) were used to obtain higher frequency data on stock exchange and bond markets that were aggregate on a country level.

The **Doing Business** database (http://www.doingbusiness.org/data), a part of the *Doing Business* project, offers an expansive array of economic data in 183 countries, covering the period from 2003 to the present. The data cover various aspects of business regulations, including those relevant to financial sector development issues, such as enforcing contracts and obtaining credit.

**IMF’s Access to Finance database** (http://fas.imf.org/) aims to systematically measure access to and use of financial services. Following Beck, Demirgüç-Kunt, and Martínez Pería (2007), the database measures the reach of financial services by bank branch network, and availability of automated teller machines, and does so by using four key financial instruments: deposits, loans, debt securities issued, and insurance. The website contains annual data from about 140 respondents for the six-year period, including data for all G-20 countries.

The **Global Financial Inclusion Index** (Global Findex) is a new database of demand-side data on financial inclusion, which documents financial usage across gender, age, education, geographic regions, and national income levels. The core set of indicators and subindicators of financial inclusion, based on the Global Findex database, includes *Use of bank accounts* (% of adults with an account at a formal financial institution, purpose of accounts, frequency of transactions; % of adults with an active account at a formal financial institution, mode of access); *Savings* (% of adults who saved in the past 12 months
using a formal financial institution, % of adults who saved in the past 12 months using an informal savings club or a person outside the family, % of adults who otherwise saved in the past 12 months; Borrowing (% of adults who borrowed in the past 12 months from a formal financial institution, % of adults who borrowed in the past 12 months from informal sources, % of adults with an outstanding loan to purchase a home or an apartment); Payments (% of adults who used a formal account to receive wages or government payments in the past 12 months, % of adults who used a formal account to receive or send money to family members living elsewhere in the past 12 months, % of adults who used a mobile phone to pay bills or send or receive money in the past 12 months); Insurance (% of adults who personally purchased private health insurance, % of adults who work in farming, forestry, or fishing and personally paid for crop, rainfall, or livestock insurance).

Financial Soundness Indicators database (http://fsi.imf.org/), hosted by the IMF, disseminates data and metadata on selected financial soundness indicators provided by participating countries.

World Development Indicators (http://data.worldbank.org/data-catalog/world-development-indicators) is the primary World Bank collection of development indicators, compiled from officially recognized international sources. It presents the most current and accurate global development data available, and includes national, regional, and global estimates.

International Financial Statistics (http://elibrary-data.imf.org/FindDataReports.aspx?d=33061&e=169393), from the IMF, provides a standard source of international statistics on all aspects of international and domestic finance. It reports, for most countries of the world, basic financial and economic data on international banking, money and banking, interest rates, prices, production, international transactions, international liquidity, government accounts, exchange rates, and national accounts.

Bank for International Settlements (BIS) (http://www.bis.org/) statistics were used for the aggregate data on bond statistics, including domestic debt securities by residence and type of instrument (bonds and notes vs. money market instruments, issued by financial and nonfinancial corporations; based on publicly available or country-reported data). Domestic debt securities (Quarterly Review Table 16) for a given country comprise issues by residents in domestic currency targeted at resident investors, whereas international debt securities (Quarterly Review Table 11) are the ones targeted at nonresidents (a) in domestic currency on the domestic market, (b) in domestic and foreign currency on the international market, plus (c) the issues in foreign currency in the domestic market (further information can be found in the Guide to the International Financial Statistics, http://www.bis.org/publ/bppdf/bispap14.htm).

Two different collection systems are used (s-b-s for international debt securities and aggregated data for domestic debt securities), resulting in some possible overlap (between domestic debt securities and international debt securities) and inconsistencies (classification of issuers).

Country authorities’ websites were used to reconfirm and fill in some of the gaps in the data.

NOTES

1. See http://www.copenhagenconsensus.com. Among the top 30 solutions, microfinance was considered as a way to improve livelihoods of poor women, but this topic did not make it to the top 10.

2. This is not the only approach to classifying the functions provided by the financial system, but it is not dramatically different from other approaches (such as Merton 1992; Merton and Bodie 2004), and it is an approach that fits rather well with the large finance literature, including recent research.

3. In the empirical literature, identifying the impact of finance has sometimes proved challenging. Some of the early literature on the subject requires the problematic iden-
tifying assumption that legal origins matter for development only through their impacts on finance. But subsequent papers have tried more nuanced and more persuasive approaches to identification (such as Rajan and Zingales 1998).


5. The data source is IMF’s International Financial Statistics (see annex). Private credit isolates credit issued to the private sector and therefore excludes credit issued to governments, government agencies, and public enterprises. Private credit also excludes credit issued by central banks.

6. This report includes other measures as well. Also relevant are indicators of structure within the individual financial segments, such as the concentration ratios (Herfindahl index, shares of various types of financial institutions in total assets and in GDP, and shares of individual markets in total market capitalization). Some of these measures (for example, the percentage of assets of the three or five largest financial institutions in GDP) are important for the stability dimension, because they provide a rough approximation for the potential for impact in the case of a major financial disruption.

7. 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).

8. See annex.

9. For example, many central banks around the world publish reports focused almost exclusively on financial stability (Čihák, Muñoz, Teh Sharifuddin, and Tintchev 2012). Similarly, the IMF’s Global Financial Stability Report has a clear stability focus. There are, however, many complementarities between financial stability, depth, access, and efficiency, as emphasized for instance in the World Bank–IMF’s Financial Sector Assessment Program.

10. Ranciere, Tornell, and Westermann (2008), for example, find that countries that have experienced occasional financial crises have, on average, grown faster than countries with stable financial conditions.

11. In contrast, efficiency seems surprisingly relatively high in Middle East and North Africa, as well as in South Asia. This is in part because an important part of bank lending goes to large companies and to the public sector, leading to relatively lower reported margins.

12. To put this in a more anthropomorphic perspective, the tallest adult person on earth is less than 5 times taller than the smallest person (http://www.guinnessworldrecords.com).

13. For example, Rioja and Valev (2004) find (a) no statistically significant relationship between finance and growth at low levels of financial development, (b) a strong positive relationship at intermediate levels of financial development, and (c) a weaker but still positive effect at higher levels of financial development. Arcand, Berkes, and Panizza (2011) find that finance actually starts having a negative effect on output growth when credit to the private sector exceeds 110 percent of GDP. Similarly, Cecchetti and Kharroubi (2012) find that the aggregate productivity growth in an economy increases with private sector credit to GDP, but only up to a point; after that point, increases in private sector credit to GDP are associated with lower aggregate productivity growth.