

IMF STAFF DISCUSSION NOTE

Rethinking Financial Deepening: Stability and Growth in Emerging Markets

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**Rethinking Financial Deepening: Stability and Growth
in Emerging Markets**

Monetary and Capital Markets Department and Strategy and Policy Review Department,
with inputs from other departments¹

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EXECUTIVE SUMMARY

Financial development increases a country's resilience and boosts economic growth. It mobilizes savings, promotes information sharing, improves resource allocation, and facilitates diversification and management of risk. It also promotes financial stability to the extent that deep and liquid financial systems with diverse instruments help dampen the impact of shocks. But is there a point beyond which the benefits of financial development begin to decline and costs start to rise, and have emerging markets (EMs) reached these limits? This paper takes stock of where EMs are on the stability-growth tradeoff that financial development entails, and considers whether there is further scope for financial development, and how EMs can secure a safe process of financial development.

The 2008 global financial crisis raised some legitimate questions about financial deepening and financial development, given that the crisis originated in advanced economies (AEs), where the financial sector had grown both very large and very complex. Are there limits to financial development for growth and stability? Is there a right pace of development? Are there tradeoffs? What is the role of institutions in promoting a safe financial system? Are there lessons for EMs from AEs' experience to reap the benefits from financial development, while avoiding the pitfalls? In this regard, this study provides five key policy-relevant findings:

First and foremost, using a new, broad, measure of financial development, this study underscores that many benefits in terms of growth and stability can still be reaped from further financial development in most EMs. Financial development is defined as a combination of depth (size and liquidity of markets), access (ability of individuals to access financial services), and efficiency (ability of institutions to provide financial services at low cost and with sustainable revenues, and the level of activity of capital markets).

Second, the effect of financial development on economic growth is bell-shaped: it weakens at higher levels of financial development. This weakening effect stems from financial deepening, rather than from greater access or higher efficiency. The empirical evidence also suggests that this weakening effect reflects primarily the impact of financial deepening on total factor productivity growth, rather than on capital accumulation.

The third and related finding of the study is that the pace of financial development matters. When it proceeds too fast, deepening financial institutions can lead to economic and financial instability. It encourages greater risk-taking and high leverage, if poorly regulated and supervised. In other words, when it comes to financial deepening, there are speed limits. This puts a premium on developing good institutional and regulatory frameworks as financial development proceeds.

The fourth finding relates to the potential tradeoffs of financial regulation. One view is that tighter and more regulation to help safeguard financial stability can hamper financial development. This study provides a new angle. It finds that, among a large number of regulatory principles, there is a small subset that is critical for financial development as well as for financial stability. In other words, there is very little or no conflict between promoting financial stability and financial development. Better regulation is what promotes financial stability and development.

The fifth finding is that there is no "one-size-fits-all" in the sequencing of developing financial institutions versus markets, though as economies evolve the relative benefits from institutions decline and those from markets increase.

INTRODUCTION

1. Financial systems in emerging markets (EMs) have deepened substantially in recent decades, but most are well below the levels reached in advanced economies (AEs). As of end-2013, outstanding private credit accounted for close to 50 percent of GDP in the average EM, while stock markets have grown by 10–15 percent of GDP and have averaged about 40 percent of GDP since 2000. However, these levels still lag behind those in AEs, where private credit averages more than 130 percent of GDP and stock market capitalization is about 70 percent of GDP. This is despite the deleveraging process that has taken place following the 2008 global financial crisis.

2. The 2008 global financial crisis raised legitimate questions about what went wrong and whether there are lessons for EMs. Are there limits to financial development for growth and stability? Is there a right pace of development? Does financial integration help or hurt economies? What is the role of the regulatory and other institutional environment in ensuring a safe financial system? Some of these questions reflect the concerns of EM policymakers that witnessed this colossal crisis, which originated in AEs, where the financial sector had grown both complex and very large. This paper addresses each of these questions.

3. Financial development generally increases a country's resilience and boosts economic growth, but tradeoffs between growth and stability can emerge. A vast literature—both theoretical and empirical—shows that financial development has benefits: it mobilizes savings, promotes greater information sharing, improves resource allocation, and facilitates diversification and management of risk. It also promotes financial stability to the extent that deep and liquid financial systems with diverse instruments help enhance countries' resilience to shocks that emanate, for example, from volatile capital flows. But, there are costs as well, particularly at high levels of financial development. In fact, there can be instances where there is “too much finance”—that is, instances where the costs outweigh the benefits of financial development. One of the questions this paper tries to answer is whether EMs have reached such limits.

4. There are additional reasons for re-examining the role of financial development in EMs at this juncture. EMs are currently facing a dual challenge—a growth challenge in the context of slowing potential growth and an aging population across many EMs, and a stability challenge in a more interconnected and volatile world. How can financial development help EMs face these challenges? How can EMs reap the benefits of financial development while limiting the costs? And as the list of questions goes on and on, one thing becomes clear: there is a need to re-assess the scope of financial development.

5. A contribution of this paper is the development of a broad-based measure of financial development—called the FD index. Most of the empirical literature since the 1970s approximates financial development by the ratio of private credit to GDP, and to a lesser extent, by stock market capitalization, also as a ratio to GDP. The index developed for the analysis in this paper encompasses institutions—banking and nonbanking—as well as markets, and across three dimensions: depth, access, and efficiency.

6. The paper has five main findings. First, using the new comprehensive FD index, the analysis in this paper confirms the positive relationship between financial development and growth. Second, the marginal returns to growth from further financial development diminish at high levels of financial development—that is, there is a significant, bell-shaped, relationship between financial development and growth. A similar non-linear relationship arises for economic stability. The effects of financial development on growth and stability show that there are tradeoffs, since at some point the costs outweigh the benefits. Most EMs, however, are still in a favorable region where further financial development promotes both higher growth and stability. Interestingly, the weakening effect on growth at higher levels of financial development stems from financial deepening, rather than higher access or greater efficiency. Third, the pace of financial development matters. Evidence shows that too fast a pace leads to instability. Fourth, there is an avenue for pursuing financial development that entails very few or no tradeoffs with financial stability, in that a subset of strong regulatory and supervisory principles is found to promote both. And fifth, there is no “one-size-fits-all” in the sequencing of institutions and markets, but, as economies evolve, the relative benefits from institutions decline and those from markets increase.

7. The remainder of the paper is structured as follows. The next section summarizes findings in the literature on the relationship between financial development and growth/stability. The following section then introduces the broad-based FD index and provides an overview of financial development in the EM universe. The subsequent section examines the impact of financial development on growth and stability, as well as the tradeoff between them. The penultimate section provides evidence on how an enabling environment could improve the tradeoff. And the last section provides policy implications for EMs.

CONTEXT

8. Finance and economic growth (or level of per capita income) have a two-way relationship. As real activity expands, finance grows in response to increasing demand for its services from the nonfinancial sector. Or, in the words of Robinson (1952, pp. 86), “where enterprise leads, finance follows.” This view of finance is relatively well established in the literature. At the same time, finance can also lead to higher growth.

9. This paper explores the effects of finance on economic growth. Many authors, going back at least to Bagehot (1873), provide reasons for finance to have a role in facilitating economic growth. For example, McKinnon (1973) and Shaw (1973) argued that impediments to financial development (such as financial repression) were likely to hamper growth by limiting the amount of savings that could be mobilized for investment purposes, and by preventing financial intermediation from channeling these resources into the most productive activities. The 1990s saw many new theoretical models formalizing these ideas, relying on endogenous growth and focusing on the various functions of the financial system. As summarized in Levine (2005), the main channels through which finance is expected to influence growth include: producing information; allocating capital to productive uses; monitoring investments and exerting corporate control; facilitating trading, diversification, and management of risk; mobilizing and pooling savings; and easing the

exchange of goods and services. The variables used in the empirical literature on finance—such as the ratio of private credit to GDP and market capitalization to GDP—are rough proxies that do not necessarily capture how well finance accomplishes these various functions. This needs to be taken into account when interpreting empirical results.

10. Empirically, establishing causality from finance to economic growth has been a key challenge. King and Levine (1993) were the first to address this issue in a cross-country regression context. Their paper found that initial levels of financial depth—approximated by the size of the banking system relative to GDP—could predict subsequent growth rates over extended periods, even when controlling for other explanatory variables. Stock market depth was also incorporated later by Levine and Zervos (1998), with the finding that causality went from finance to growth. These results held up with further refinements of the approach, by using instrumental variables (Levine, Loayza, and Beck 2000). In the 2000s, the empirical work continued to evolve with the application of dynamic panel data techniques, using lagged values of the financial variables as instruments and controlling for other determinants of growth (Beck and Levine 2004). The present paper follows this last approach, using similar control variables and econometric techniques to ensure that the relationship is not one of simple correlations but of causality that goes from finance to growth.

11. Recent literature has found that the conventional positive finance-growth link weakens when post-1990 data are used. New studies find that the contribution of financial development to growth differs across regions, countries, and income levels (Barajas, Chami, and Yousefi 2013; Nili and Rastad 2007; and Khan, Senhadji, and Smith, 2001). The increased incidence of banking crises has also been identified as contributing to a “disappearing” empirical link between finance and growth (Rousseau and Wachtel 2011). Recent studies also show that there is a point beyond which additional deepening could actually reduce growth—the so-called “too much finance” effect (Arcand, Berkes, and Panizza, 2012); they point to nonlinearities related to financial depth. Aizenman, Jinjark, and Park (2015), examining sector-level data in 41 economies, also find that finance increases growth, but only up to a point, in addition to having heterogeneous effects across sectors.²

12. Many explanations have been proposed for the weakening of the finance-growth nexus, particularly at high levels of financial depth. Cecchetti and Kharroubi (2015) focus on the negative effects on allocative efficiency and on the crowding out of human capital away from the real sector and to the financial sector when it expands rapidly. A recent study by Dabla-Norris and others (2015) suggests that, before the 2008 global financial crisis, resources in advanced economies were being diverted toward the financial sector away from more productive sectors. De Gregorio and Guidotti (1995) suggest that high-income countries may have reached the point at which financial depth no longer contributes to increasing the efficiency of investment. Rajan (2005)

² Furthermore, their study provides evidence of the need to supplement conventional measures of depth—which they refer to as “quantity of finance”—with measures of “quality”, such as the spread between lending and deposit interest rates.

highlights the dangers of financial development that leads to large and complicated financial systems, which could end up in a “catastrophic meltdown.” Gennaioli, Shleifer, and Vishny (2012) show that in the presence of some neglected tail risk, financial innovation can increase financial fragility even in the absence of leverage.³

13. On the relationship between finance and economic stability, there are two opposing views. One view is that financial development lessens volatility by reducing frictions/informational asymmetries; it lowers the sensitivity of financing conditions to changes in the net worth of borrowers, thereby reducing the amplification of cycles that occurs through the financial accelerator (Bernanke, Gertler, and Gilchrist 1999). Financial development is also said to promote risk-sharing, which reduces financial constraints, enhances the ability of firms and households to absorb shocks, and allows greater consumption smoothing. The opposing view is that finance increases economic and financial volatility and the probability of a crisis, by promoting greater risk-taking and leverage, particularly when the financial system is poorly regulated and supervised.

³ Wolf (2009) noted that the U.S. financial sector grew six times faster than nominal GDP prior to the 2008 global financial crisis, arguing that “...instead of being a servant, finance has become the economy’s master...”

FINANCIAL DEVELOPMENT IN EMERGING MARKETS THROUGH THE LENS OF A BROAD INDEX

A. Measuring Financial Development: A New Index

14. With the passage of time, financial sectors have evolved across the globe and modern financial systems have become multifaceted. With regard to financial institutions, while banks are typically the largest and most important, investment banks, insurance companies, mutual funds, pension funds, venture capital firms, and many other types of nonbank financial institutions now play substantive roles (see examples in Boxes 1–3). Similarly, financial markets have evolved in ways that allow individuals and firms to diversify their savings, and firms to raise money through stocks, bonds, and foreign exchange markets. The constellation of such financial institutions and markets facilitates the provision of financial services. In turn, the efficiency of and access to these financial services help shape the level and rate of increase in economic prosperity.

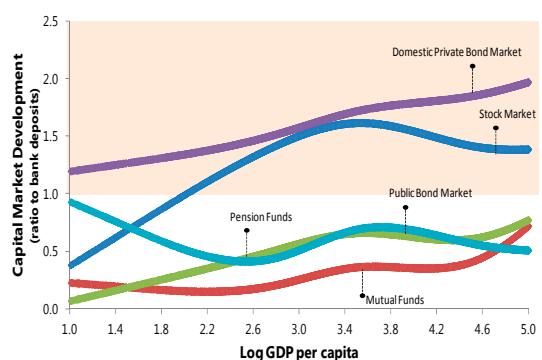
15. The diversity of financial systems across countries implies that one needs to look at multiple indicators to measure financial development. Figure 1 presents the typical evolution of the ratio of different financial markets to the banking system (size of deposits) at different levels of per capita income, using data for 128 countries from 1980 to 2013. The figure shows that, relative to the banking system,

domestic private bond markets and stock markets become larger as GDP per capita rises (the shaded area). Mutual funds and pension funds begin to grow rapidly at higher levels of income, while the relative size of public bond markets tends to fall. Therefore, relying solely on single, bank-centered measures can be misleading. Notably, the financial excesses of the 2000s in the United States could not be captured simply by measuring

bank credit to the private sector (in percent of GDP), which has been largely stable since 1980, while assets of nonbanks have more than doubled (Figure 2). Similarly, although Korea and Vietnam have similar levels of banking depth—a private credit to GDP ratio of close to 100 percent—use of banking accounts is virtually universal in Korea, but in Vietnam only one-quarter of adults have a bank account. Furthermore, an important feature of financial systems is their efficiency: even if they

Figure 1. Capital Market Development

As economies grow, nonbanks & private financial markets increase in size relative to the banking system.

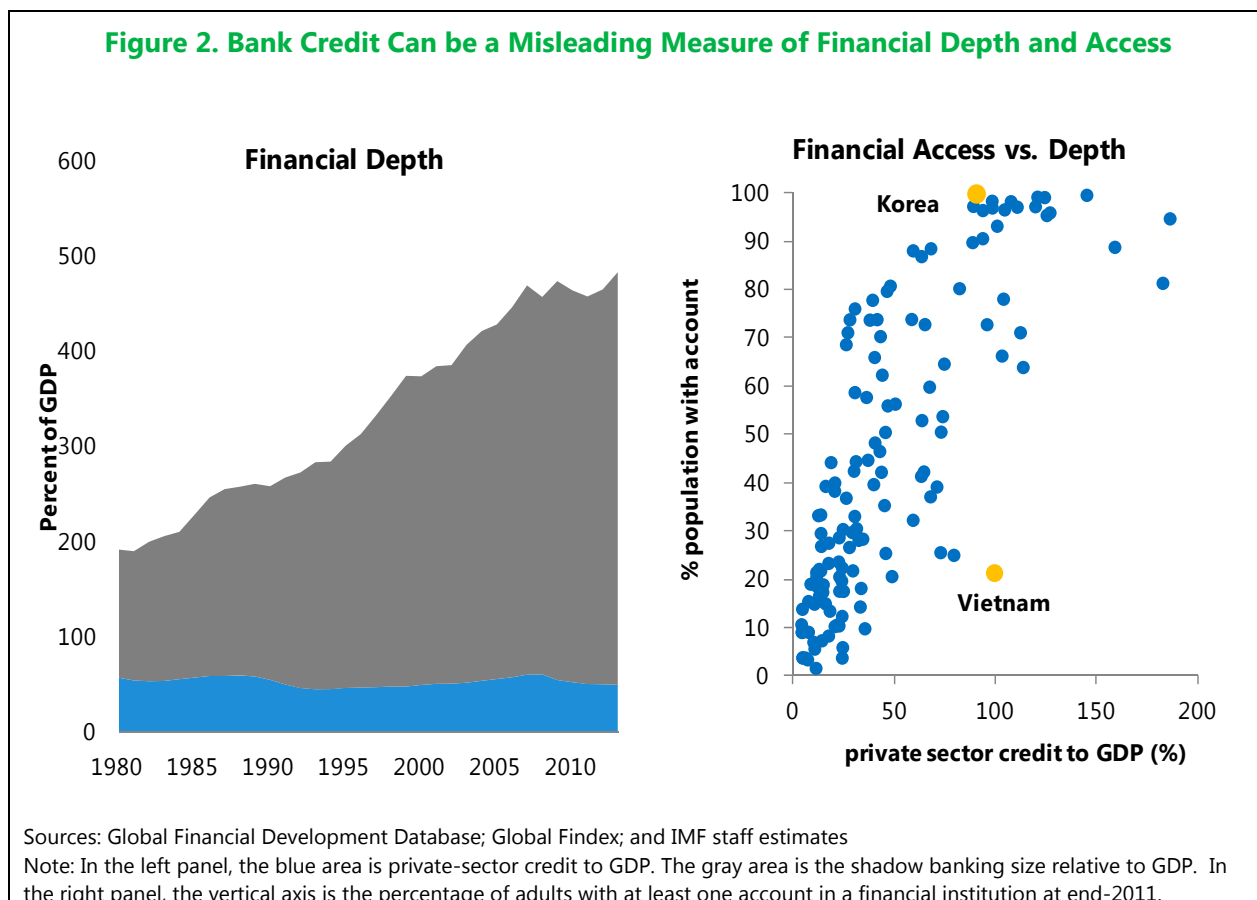


Source: IMF staff estimates.

Note: Based on data for 128 countries from 1980 to 2013.

The lines are derived from a 5-knot cubic spline regression of the respective indicators (divided by bank deposits) on GDP per capita, controlling for determinants of a country's financial structure, such as the legal origin and demographic variables.

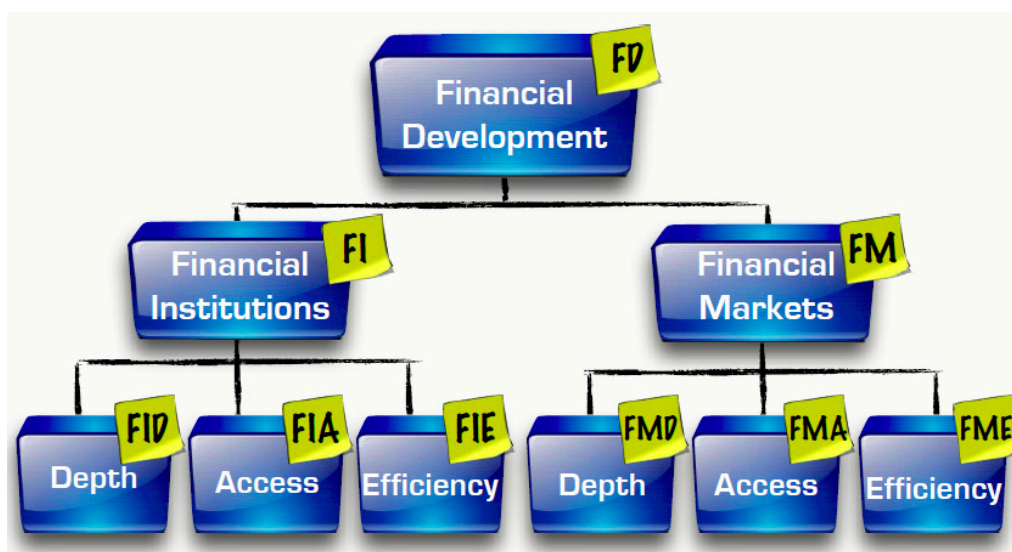
are sizeable and have a broad reach, their contribution to economic development would be limited if they were wasteful and inefficient.⁴



16. To overcome the shortcomings of single indicators as proxies for financial development, a new comprehensive index, capturing both financial institutions (FI) and markets (FM), is constructed. Financial institutions include banks, insurance companies, mutual funds, pension funds, and other types of nonbank financial institutions. Financial markets include mainly stock and bond markets. Within FI and FM, different dimensions of the financial system were measured: depth, access, and efficiency (Figure 3). As Annex I shows, banking system credit to the private sector, while still a relevant component of financial development, has a weight of 0.25 within the depth subcomponent of FI, which in turn has a weight of less than 0.40 in the FI subcomponent. In other words, bank credit still plays an important role, reflecting the role of banks in many financial systems, but it is far from being the only driver of the results. For this exercise, data are collected for 176 countries (25 AEs, 85 EMs, and 66 low-income developing countries, or LIDCs) for 1980–2013.

⁴ This point is made also, for example, in Čihák and others (2012) and Aizenman, Jinjarak, and Park (2015).

Figure 3. Financial Development Index



Source: IMF staff, based on Čihák and others (2012).

17. The FD index was constructed using standard practice in the literature, as follows:⁵

- A list of indicators is chosen to measure each sub-index at the bottom of the pyramid in Figure 3, that is, FID, FIA, FIE, FMD, FMA, and FME, with the letters D, A, and E denoting depth, access, and efficiency, respectively, and I and M denoting institutions and markets, respectively.
- Each indicator is normalized between 0 and 1. Thus, the highest (lowest) value of a given variable across time and countries is equal to one (zero) and all other values are measured relative to these maximum (minimum) values. To avoid pitfalls arising from extreme observations, the data are winsorized with the 5th and 95th percentiles as the cutoff levels. The indicators are defined so that higher values indicate greater financial development.
- Indicators are then aggregated into the six sub-indices at the bottom of the pyramid. The aggregation is a weighted average of the underlying series, where the weights are obtained from principal component analysis, reflecting the contribution of each underlying series to the variation in the specific sub-index.
- Finally, sub-indices are aggregated into higher-level indices using the same procedure as above, culminating at the most aggregated level in the FD index.

18. While there were challenges in constructing this index, it still serves as an important step toward measuring financial development more comprehensively than before. A challenge for all empirical literature is that the broad measures capture only partially the various functions of finance, such as its ability to facilitate risk management, exert corporate control, pool savings, and others (Levine 2005). This paper addresses the challenge by relying on a broad set of indicators, but it is still an issue that needs to be taken into account when interpreting empirical results. Another

⁵ For more details, see Annex I.

practical challenge was how to deal with missing data. The strategy adopted in this paper was to balance the comprehensiveness of the FD index with an adequate coverage of countries and time span, and, at the same time, avoid jumps in the index that are not related to actual changes in financial development, but driven by the addition of new data series. Annex I outlines how this was addressed.⁶ A second challenge was that it was not possible to find sufficiently extensive country and time period data on some institutions and activities. One example is shadow banks, whose importance has been rising in a number of EMs, with associated risks (for a recent analysis on this topic for a smaller country sample, see IMF 2014a). Finally, different forms of financial payments, such as credit transfers, direct debits, and mobile banking, are undeniably relevant aspects of depth and access in many countries, but indicators of these are currently not available for inclusion in the FD index. Given these challenges and data limitations, IMF staff will continue to improve the index over time as data coverage widens and more advanced aggregation methods develop.⁷

B. Landscape of Financial Development in Emerging Markets

19. The evolution of the FD index over the sample period (1980–2013) shows a pattern that confirms priors (Figure 4). Overall, financial development has progressed quite noticeably in both AEs and EMs, and to a lesser extent in LIDCs. However, as one would expect, the gap between the first two groups widened significantly between the mid-1990s and early 2000s, reflecting particularly rapid growth in AEs' financial systems. This episode marks the "Greenspan Era" in the United States, a period when European cross-border banking expanded considerably, as did investment banking and internet banking.⁸ On the other hand, during this period financial development proceeded more moderately in EMs and was relatively stagnant in LIDCs. The gap in financial development between the AEs and EMs subsequently declined after the global financial crisis, reflecting deleveraging in AEs.

20. A snapshot comparison across peer groups presents quite a diverse picture (Figure 5). In particular, the "gap" in financial development between AEs and EMs differs across the various dimensions of financial development highlighted in the figure. For example, EMs are closer to AEs in financial institutions than in financial markets. Also, despite lower depth, the efficiency of EM and LIDC financial institutions is relatively high. Finally, access is low, on average, across all income groups, making this an area of potential improvement.⁹

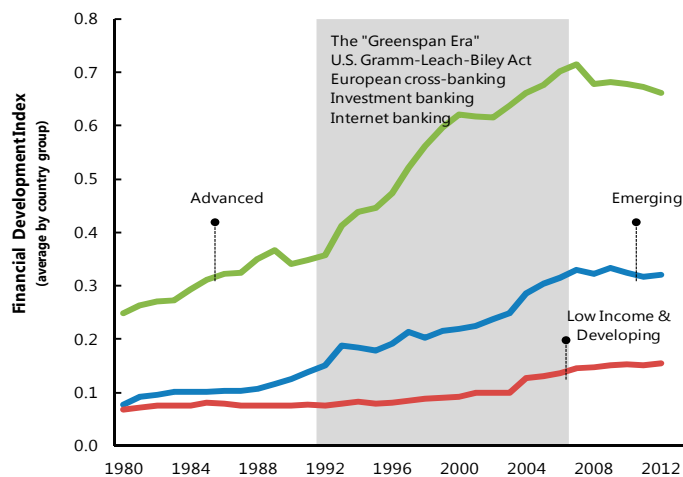
⁶ As explained in Annex I, missing values of some indicators in earlier years were "filled in backwards" by using the growth rates of other available indicators. Nonetheless, for every subcomponent of FD, there is at least one indicator with observations for the entire sample period.

⁷ Also due to data limitations, other potentially relevant features of financial development are not incorporated in the index. These include the diversity of types of financial intermediaries, and the organizational complexity of institutions as well as the complexity of instruments. The mix of debt vs. equity financing is included, as both types were captured in the index, while some of the supporting empirical analysis tested whether the debt-equity mix, for a given level of FD, altered the finance-growth relationship.

⁸ Figure 4 shows simple averages across countries, so the weight of the United States is relatively small. Also, direct cross-border lending is not captured by the index, which focuses on domestic aspects of financial development.

⁹ Although all the indices are relative measures—each country observation of a given variable is measured relative to the maximum level observed—the lower level of the average access subcomponent implies that there are a few countries that achieve a high level of access, but most countries are farther from that level than they are from a similar high standard for the two other dimensions of FD, namely depth and efficiency.

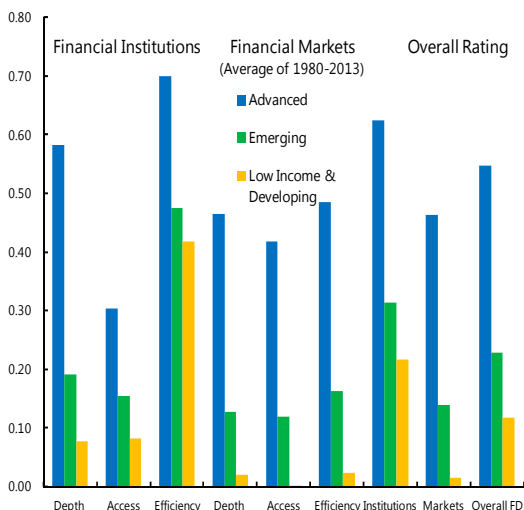
Figure 4. Financial Development Through Time



Source: IMF staff estimates.

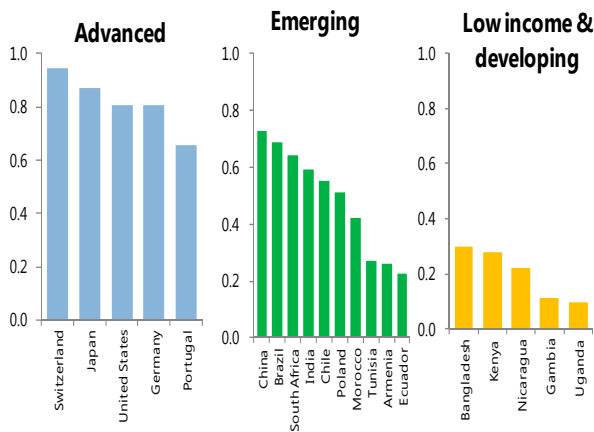
21. Looking at individual countries, there is variation in financial development within the same income group (Figure 6). Some large EMs, such as Brazil and China have higher levels of financial development than certain AEs, such as Greece and Portugal. Also, several EMs (such as Armenia, Ecuador, and Tunisia) have lower levels of financial development than some LIDCs.

Figure 5. Financial Development Index: Peer Group Averages



Source: IMF staff estimates

Figure 6. Financial Development Index: Selected Countries



Source: IMF staff estimates

REASSESSING BENEFITS AND RISKS OF FINANCIAL DEVELOPMENT: IS THERE A GROWTH-STABILITY TRADEOFF?

A. Financial Development and Growth

22. Empirical analysis indicates that there is a significant, bell-shaped, relationship between financial development and growth (Figure 7). The estimation approach used to derive this relationship, discussed in Annex 2, addresses the endogeneity problem and controls for crisis episodes as well as other standard growth determinants, such as initial income per capita, education, trade openness, foreign direct investment flows, inflation, and government consumption.¹⁰ Based on a sample of 128 countries over 1980–2013, this paper’s analysis suggests that financial development increases growth, but the effects weaken at higher levels of financial development, and eventually become negative. This relationship confirms recent findings in the literature (Arcand, Berkes, and Panizza 2012).

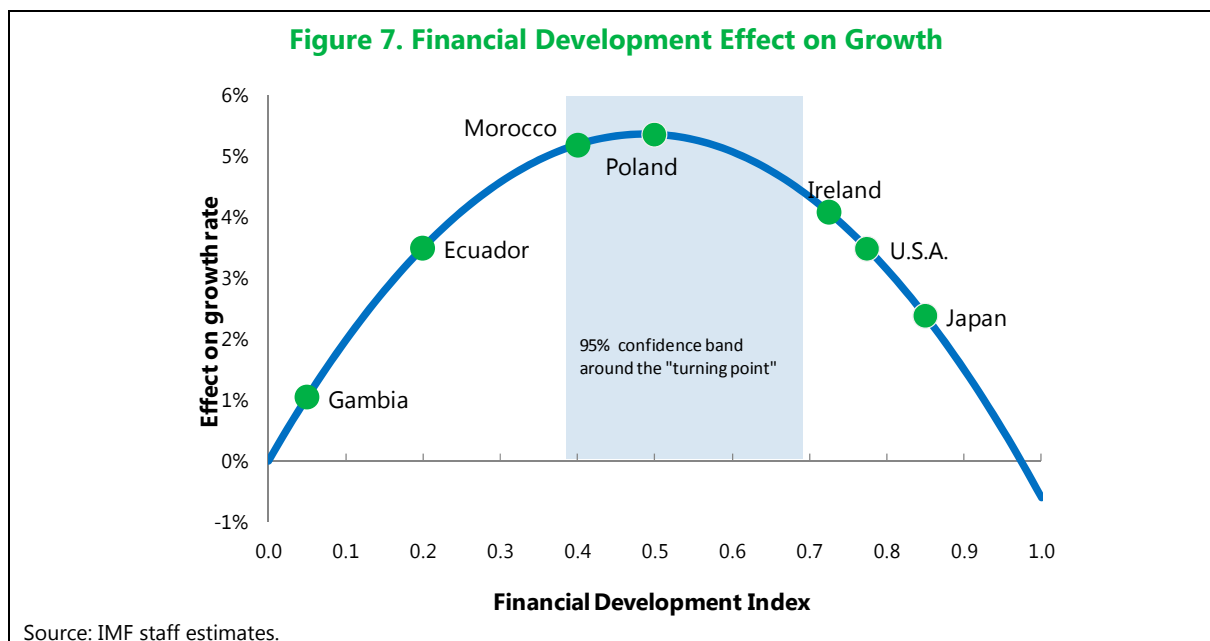
23. The level of financial development above for which the positive effects on growth begin to decline lies between 0.4 and 0.7 on the FD index (Figure 7). This estimate is an average across all countries, including AEs, EMs, and LIDCs, and over a time span of 30 years. Figure 7 illustrates where a set of countries at different stages of financial development would lie on the estimated curve. It is worth emphasizing, however, that there is a wide band around the “turning point,” reflecting variation in countries’ fundamentals and institutional settings. With a confidence level of 95 percent, the point at which the marginal impact of finance on growth becomes significantly negative is around 0.7.

24. Conceptually, there are several channels through which very high levels of finance could have a negative effect on growth (Eugster 2014; Arcand, Berkes, and Panizza 2012; Philippon and Reshef 2012 and 2013). One argument is that too much finance increases the frequency of booms and busts and leaves countries ultimately worse off and with lower real GDP growth. Another argument is that too much finance leads to a diversion of talent and human capital away from productive sectors and toward the financial sector. Some have also argued that a very large financial sector may be particularly susceptible to moral hazard or rent extraction from other sectors, both of which would lead to a misallocation of resources.

25. There is no one particular point of “too much finance” that holds for all countries at all times. The shape and the location of the bell may differ across countries depending on country characteristics including income levels, institutions, and regulatory and supervisory quality. In other words, a country to the right of the average “too much finance” range may still be at its optimum if it has above average quality of regulations and supervision; conversely, a country to the left of the

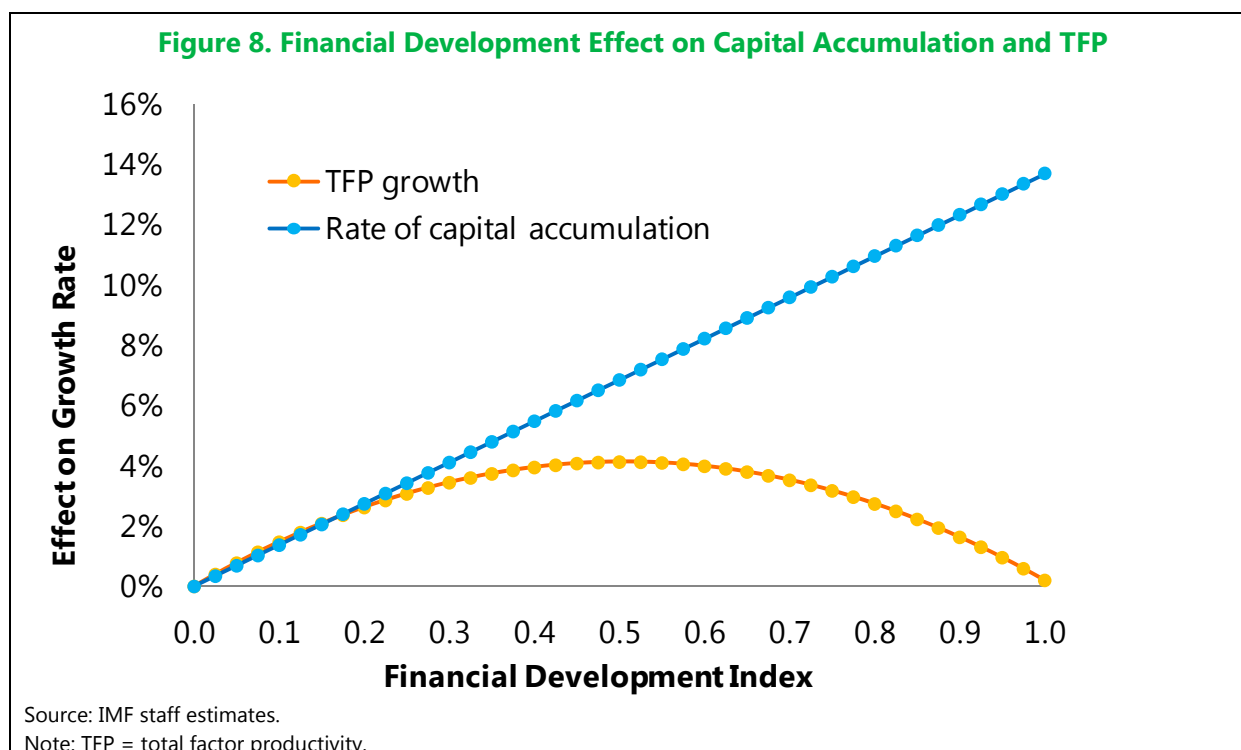
¹⁰ See Annex II, Table 1 for additional details on data, specification and estimation method.

range with weak institutions may have reached its maximum already. Broadly speaking, the estimated relationship suggests that an FD index between 0.45 and 0.7 (with 95 percent likelihood) could generate the largest cumulative growth returns (that is, moving from 0 to the growth-maximizing point) in the range of 4–5½ percentage points, holding constant other determinants of growth.



26. In contrast to previous literature, the estimated relationship is general enough to capture the link between growth and financial development for countries at various stages of development. Indeed, the empirical analysis suggests there are no “EM-specific” effects and no significant variation in the relationship between growth and financial development across levels of income. This is in stark contrast with the results of similar regressions in previous work that use narrower measures of financial development, such as the private credit to GDP. This weakening of observable heterogeneity in the finance-growth relationship when using the FD index suggests that it is overall a better measure of financial development, capturing more accurately relevant differences across countries.

27. Looking at two components of growth—total factor productivity (TFP) and capital accumulation—the empirical evidence suggests that the “too much finance” effect reflects primarily the impact of financial development on TFP growth (Figure 8). The results indicate that high levels of financial development do not impede capital accumulation, but lead to a loss of efficiency in investment, suggesting that the quality of finance—for instance, the allocation of financial resources toward productive activities and that of human capital across sectors—is impaired at high levels of financial development. In other words, many functions of the financial sector, such as mobilization of savings and transaction facilitation, may remain intact at high levels of financial development, but other functions, such as efficiency in the allocation of capital and the efficacy of corporate control, may begin to break down. Again, the estimates suggest no evidence of an EM-specific effect in this decomposition exercise.

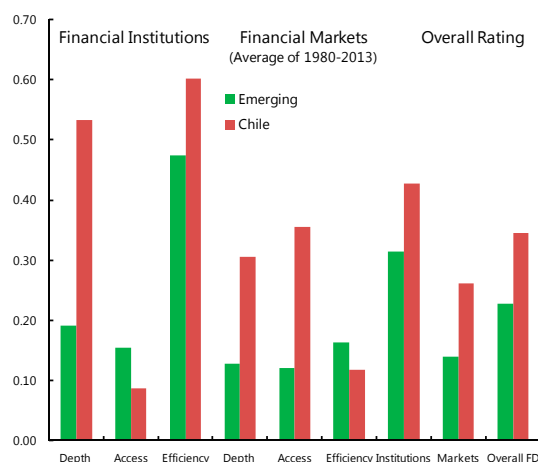


28. Analyzing the effect of sub-indices in the FD index, the weakening effect on growth at higher levels of financial development can be attributed to financial deepening, rather than to higher access or greater efficiency. The bell-shaped relationship between growth and the FD index pertains only to the depth components of the index, for both markets and institutions. Specifically, access has a positive linear relationship with growth, while efficiency on its own does not have a robust positive association with long-term growth. This implies that countries that may have reached the maximum benefits in terms of growth from deepening financial institutions and markets may still reap further growth benefits from better access. As an example, Chile stands out as a country with an above average FD index, with deep and efficient financial institutions, but could gain from greater access to both institutions and markets (Box 1). Morocco's FD index is at the emerging market average, with room for developing both markets and institutions (Box 2). Malaysia's FD index is about twice the emerging market average, reflecting a great increase in depth since the Asian crisis, but its financial institutions lag behind those of other EMs in access (Box 3).

Box 1. Financial Development in Chile^{1/}

Chile’s financial development started in earnest in 1974, when a rapid process of financial liberalization ended decades of financial repression.

Between 1974 and 1976, Chile’s government removed most banking-sector regulations, including interest rate and credit controls, and privatized state-owned banks. Financial deregulation continued with equity market reforms, followed by insurance market liberalization, the creation of a fully funded pension system, and measures to facilitate bond issuances. The process was interrupted by the 1982–84 banking crisis, which led to a massive government intervention in the banking sector and the reinstatement of financial controls. However, financial reforms resumed shortly after the crisis, and led to an impressive expansion of Chile’s capital market and the creation of a large pool of long-term institutional investors.



Special factors contributed to the sequencing of financial market development. The creation of a fully funded pension system contributed to the early development of a domestic institutional investor base, while the banking crisis of the early 1980s likely accelerated the growth of the equity and corporate bond markets. The establishment of a sovereign bond market early on facilitated the development of other markets as well. An improvement in contract enforcement, the creation of institutions that reduced information asymmetries, and the increased availability of collateral helped deepen the markets. Total bank credit to the private sector currently stands at 75 percent of GDP, below the OECD (Organisation for Economic Co-operation and Development) average but well above the average for Latin America. Moreover, the efficiency of Chile’s banks, measured by the lending-deposit rate spread, is close to the OECD average.

Chile’s capital markets are fairly large (text chart), but not very liquid. The domestic *bond market* (excluding government securities) represents almost 40 percent of GDP. The market is not very liquid and is dominated by long-term and inflation-linked bonds. The low liquidity, the long maturities, and the indexation to inflation are the result of high demand from institutional investors, especially life insurance companies that typically have inflation-linked, long-term liabilities. Chile also has a relatively large *equity market* (the market value of its listed companies is about 90 percent of GDP), exceeding by far that of its neighbors. However, the Chilean equity market is still relatively illiquid, with a low and declining turnover.

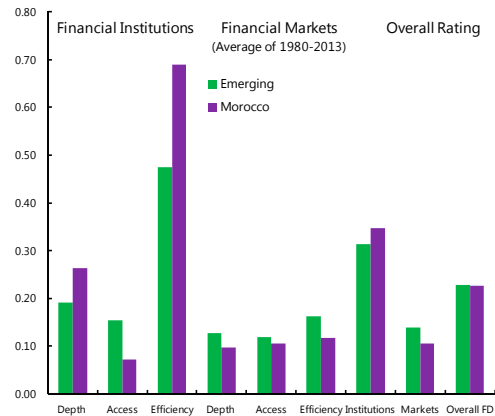
Institutional investors play a significant role in Chile’s financial sector. Pension funds, insurance companies, and asset managers (investment funds) account for nearly half of the financial sector assets. The presence of these investors has contributed to the strong development of the local capital market, but may have limited its liquidity because of the buy-and-hold strategies they typically employ. However, there is evidence that the presence of stable investors such as pension funds and insurance companies offers some protection to domestic financial systems against global financial shocks

Although Chile has made great strides in terms of financial market depth, challenges remain regarding market access. Only 45 percent of adults in Chile have a formal bank account (about half of the OECD average). In addition, the relative low liquidity of equities and corporate bond markets limits the ability of smaller firms to raise capital outside the banking system.

^{1/}Prepared by Nicolás Arregui and Luis Brandao-Marques, drawing in part on Gallego and Loayza (2000), de la Torre, Ize, and Schmuckler (2012), IMF (2014b), and World Bank (2014).

Box 2. Financial Deepening in Morocco^{1/}

Morocco has implemented substantial financial reforms during the past three decades, as part of an agenda to promote growth and financial stability. During the 1970s and 1980s, the public sector accounted for a large share of investment, absorbing high levels of domestic savings, while private investment remained modest. Reforms initially targeted the banking system and monetary policy, in parallel with a move toward a more market-based financing of the budget. These reforms were followed by efforts to deepen financial markets by introducing new instruments and reforming the stock market. As liberalization and deregulation of financial activities allowed market participants to assume greater risks, prudential regulations and bank supervision were strengthened. Reforms had a significant impact on financial intermediation and financial sector structure, but more is still needed to further strengthen financial supervision and further develop the stock market (text chart).



The banking sector dominates. It has grown large, with bank assets equivalent to 126 percent of GDP in 2013. The sector comprises 19 banks, including five majority public-owned and seven majority foreign-owned, and is dominated by five banks that own 80 percent of total bank assets. The depth of the Moroccan banking system places it ahead of its Middle East peers (with private credit and domestic deposits at 70 percent and 89 percent of GDP, respectively). Banks have relatively well-developed branch networks in the country; nonetheless, only 60 percent of the population had a bank account in 2013. Moreover, access to finance is difficult for some vulnerable groups and for small- and medium-sized enterprises (SMEs).

The nonbanking financial sector has room for development. Domestic debt markets are characterized by a long maturity structure and low secondary-market liquidity. Despite sizeable securitized debt issuance by the government, the public debt market is constrained by partial observance of the pre-announced auction calendar and limited foreign holdings. The limited public debt market infrastructure also affects the private debt market, which lags far behind global comparators for an economy of this size. The value of companies on the stock market is about 50 percent of GDP, but the market size obscures the low percentage of publicly floated shares and the low turnover rates. Nonbank financial institutions (mutual funds, pension funds, and insurance companies) represent almost 40 percent of financial sector assets. The insurance system’s total assets and premiums account for 20 percent and 3 percent of GDP, respectively. The mutual funds hold 80 percent of assets in fixed-income securities, but only 8 percent in listed securities. Insurance companies and pension funds dominate the assets of mutual funds with 45 percent of net assets. Morocco’s pension system is large but dominated by the public sector and in need of reform to ensure its viability and broaden its coverage. The stock market has limited trading volume, and the private fixed income market is largely undeveloped. Continuing with the development of the insurance and pension systems can help broaden the investor base and improve the depth and breadth of the capital market (IMF 2014c).

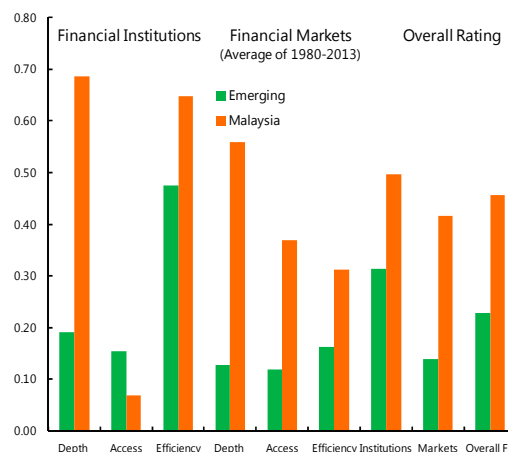
Lack of access to finance is still a significant constraint. For example, only 13 percent of firms use banks to finance investment (about half of the world average). Recognizing this constraint, in 2012 and 2014, Bank Al-Maghrib set up special refinancing mechanisms in favor of SMEs. Developing microfinance and Islamic finance, with an emphasis on the improvement of the financial infrastructure, could help move the financial inclusion agenda forward.

^{1/} Prepared by Pilar Garcia Martinez, Mark Fisher, Sami Ben Naceur, and Allan Gregory Auclair.

Box 3. Financial Deepening in Malaysia^{1/}

Malaysia's financial sector has grown to be sizeable, strong, diversified, and profitable. Malaysia's financial depth (400 percent of GDP) supports macroeconomic stability and increases resilience by helping absorb external terms of trade and capital account shocks. The financial depth also lowers the cost of funds, thus boosting public and private investment, including in infrastructure, and supporting economic growth.

Malaysia's financial sector comprises conventional and Islamic banks and nonbank financial institutions. Banks still dominate (about 50 percent of financial assets), but the nonbank sector has grown substantially (text chart). The banking system is large with assets of 200 percent of GDP (20 percent of which are held by Islamic banks), and is concentrated (five banking groups comprise 70 percent of assets). Nonbank financial institutions' (including development financial institutions, insurance companies, and capital market intermediaries) assets grew from 45 percent to 60 percent of GDP during 2009–13. The public Employees' Provident Fund (EPF) is a key institutional investor, with assets at 60 percent of GDP.



The changes in Malaysia's financial system reflect a concerted multiyear effort by Bank Negara Malaysia (BNM) and the Securities Commission of Malaysia (SC). The financial crisis of 1997 revealed weaknesses, including over-reliance on bank credit and a fragmented banking system dominated by small, weak institutions. In response, BNM focused on building a stable and strong financial system by consolidating banking groups and allowing foreign entry to enhance competition. BNM and the SC conduct systemic surveillance through a joint high-level Financial Stability Committee.

The development of deep and liquid domestic currency equity and bond markets has been a hallmark of financial deepening in Malaysia and helps buffer the economy against external shocks. The bond market has doubled over the past 10 years and there is significant foreign participation. About 40 percent of bonds are issued by the private sector (including government-linked companies). While the EPF and insurance companies invest most of their portfolios in the domestic bond market, the share of assets invested abroad has grown, reflecting gradual liberalization of portfolio restrictions on residents. Deep-pocketed domestic investors tend to buy significant amounts of domestic equities and bonds during turbulent periods of capital flow volatility, because the selling by foreign investors means profit opportunities. Deep financial markets have also enabled Malaysia to borrow in its own currency for infrastructure investment (IMF 2014e).

Notwithstanding the strong balance sheets of banks, financial risk is rising after years of rapid credit growth, low or negative real interest rates on deposits, and significant increase in leverage. Household debt has grown rapidly. Corporate sector debt has also increased and is now close to the average for Asia. Banks continue to expand overseas, but their overseas operations are largely funded by local currency deposits, limiting potential funding and exchange rate risks. Malaysian banks do not rely on offshore wholesale funding to fund domestic operations.

Promoting financial inclusion is a mandated objective for BNM, as outlined in the Central Bank Act 2009. Substantial progress has been made in reaching the underserved, for example, through the development of microfinance and a consumer education and protection framework. The development of Islamic finance also contributes to financial inclusion. The main challenge will be to strike a balance between targeted market interventions to advance its developmental agenda and create market-based incentives for sustainable innovation and healthy competition in retail payments and banking.

^{1/}Prepared by Alexandros Mourmouras and the IMF country team on Malaysia.

29. The composition of credit (to firms as opposed to households) matters for growth.

Following the approach of Beck and others (2009) and Angeles (2015), and based on a subsample of 30–34 countries with data available on credit composition, the analysis shows that credit to firms tends to have a greater growth impact than credit to households. Credit to firms removes financing constraints, thus leading to greater investment and growth. Credit to households, on the contrary, is likely to result in lower savings and therefore lower growth. Typically, household credit is higher in countries where market-based financial systems are larger, society is more urban, and the manufacturing sector is smaller—that is, AEs tend to have a larger share of credit to households. Indeed, among this relatively small sample of countries, the share of enterprise credit in EMs tends to be larger than in AEs.

30. The benefits from developing financial institutions are larger at low income levels and decline as income increases, whereas the opposite is true for markets (Figure 9).

Thus, an appropriate sequencing would emphasize developing institutions in the early stages, with increasing attention to developing markets as income per capita rises. Consistent with the literature, this result controls for other factors, such as initial GDP per capita, government size, trade openness, inflation, and time effects.

31. The effects of several additional characteristics of financial systems on growth were also explored, but the results were inconclusive.

These were: the impact of the funding mix (to what extent the banking system relied on internal funds),¹¹ the market structure (the level of development of institutions relative to that of markets), the pace of financial development (how rapidly the FD index or its subcomponents grew during each period), and the degree of global integration of the financial system. The inconclusive results on market structure are consistent with the literature, which generally does not find that either bank-oriented or market-oriented systems have an inherent advantage in terms of long-term growth. Regarding integration, the lack of sufficient data coverage greatly limited the ability to detect a robust effect on growth.¹²

B. Financial Development and Stability**32. The relationship between financial development and economic stability is also**

nonlinear (Figure 10 left panel, and Annex II).¹³ This finding is in line with recent studies.¹⁴ Financial development initially lowers growth volatility, as it allows for an expansion of opportunities for effective risk management and diversification. After a certain point, volatility begins to increase

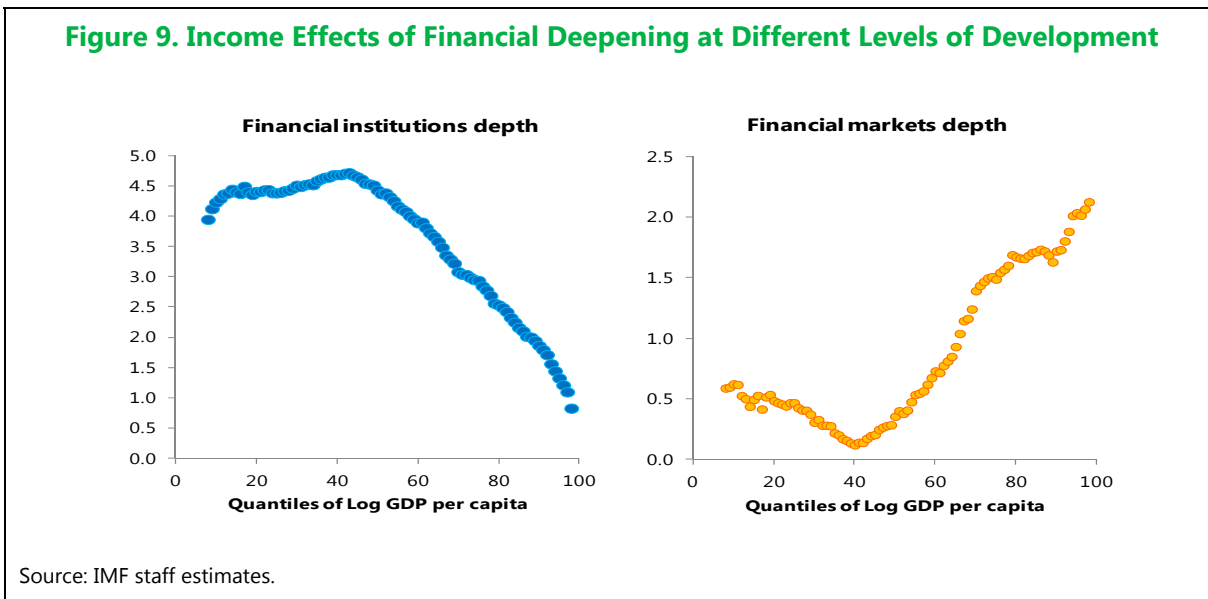
¹¹This was approximated by the ratio of loans to deposits. This result is in line with the post-2008 global financial crisis literature on Central and Eastern Europe, which shows that banks that were more reliant on domestic deposits as source of funding were also more resilient during the crisis; for example, Kamil and Rai (2010). The current paper analyzes a much broader sample in terms of both countries and period covered.

¹² See, for example, Beck and Levine (2004).

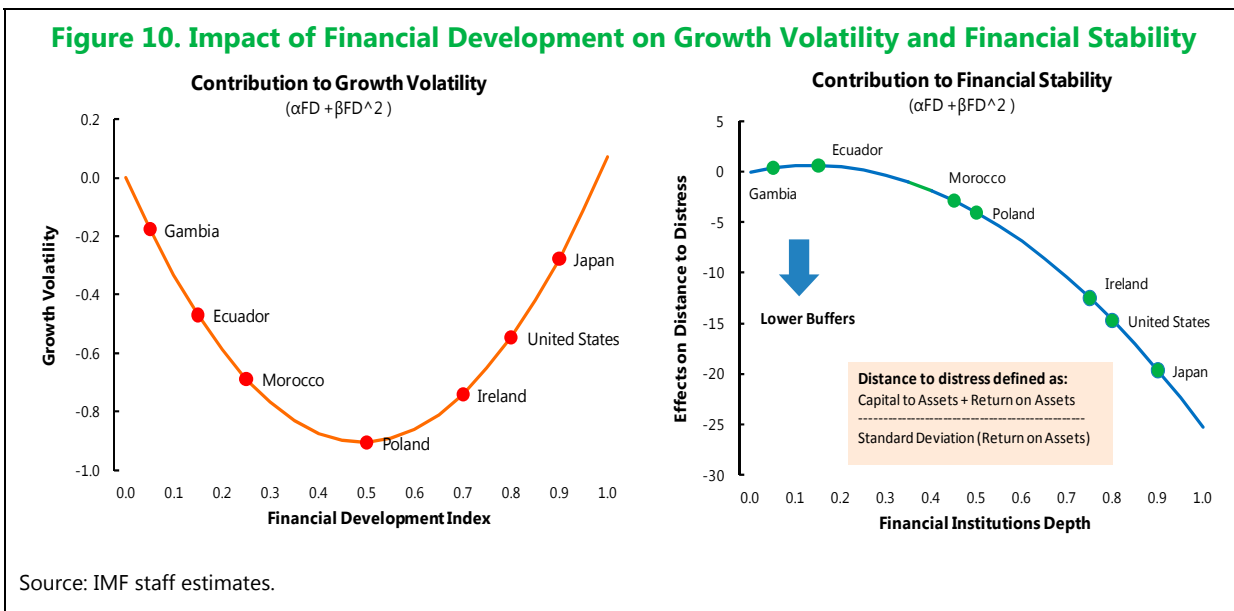
¹³ See Annex II, Table 2 for details of the estimation procedure and results.

¹⁴ Dabla-Norris and Srivisal (2013) in particular, analyze the link between private credit-to-GDP and macroeconomic volatility and find a similar, nonlinear relationship.

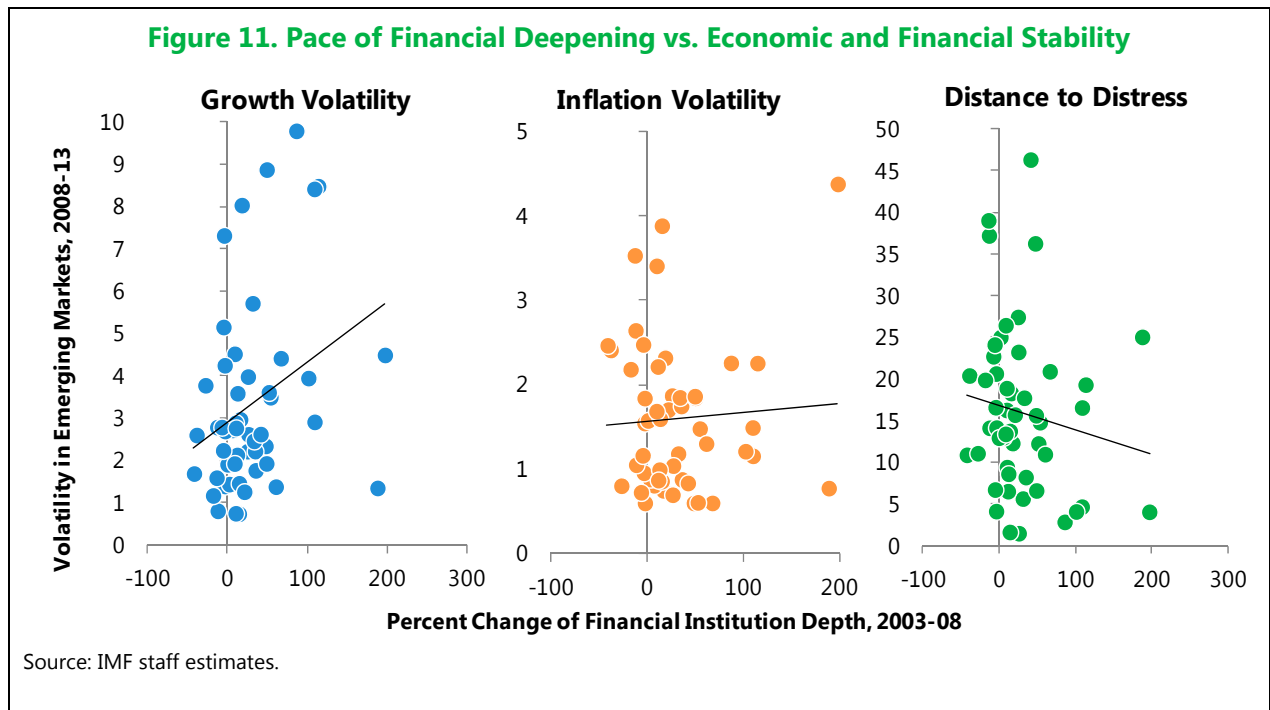
again. Interestingly, the “turning point” on the GDP growth volatility curve is very close to the one on the GDP growth curve in the previous section. This suggests that there is a wide range of financial development levels that promote both economic growth and economic stability.



33. Financial stability risks increase with financial institution depth (FID). For the purpose of this study, financial stability is approximated by the z-score, which measures the amount of buffers the banking system has to guard against shocks to earnings. A lower z-score means a lower distance-to-distress, that is, bigger financial stability risks. As illustrated in Figure 10 (right panel), with increasing *depth* of financial institutions, buffers tend to decline, other things being equal.



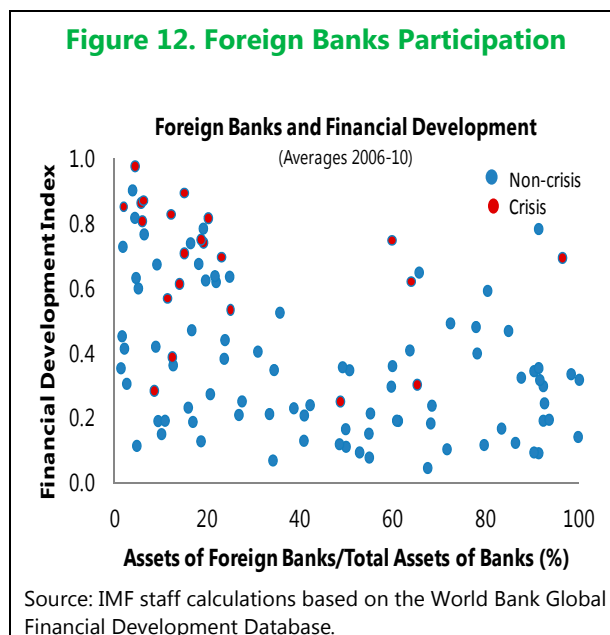
34. A faster pace of financial deepening means a greater risk of crisis and macroeconomic instability, other things being equal (Figure 11). An examination of the relationship between the pace of financial deepening and economic growth yielded inconclusive results. However, the relationship between the pace of financial deepening in institutions and the volatility of both GDP growth and inflation is significant and positive. In a similar direction, financial instability also rises with the pace of deepening. A plausible reason is that faster growth of institutions is accompanied by greater risk-taking and high leverage, particularly when the financial system is poorly regulated and supervised. Note that this relationship holds for financial institutions and not financial markets.¹⁵



¹⁵ This result is consistent with Loayza and Ranciere (2006), who find that while financial deepening has a positive impact on growth, credit growth (changes in credit-to-GDP ratio) is one of the most reliable predictors of financial crises.

35. With regard to the presence of foreign banks, preliminary evidence suggests that financial development does not require foreign bank entry, while its presence does not necessarily coincide with financial instability.

Foreign bank entry into domestic financial systems could be a practical option for some countries to boost financial development in the early stages, particularly when the size of the domestic market is limited. Such entry could help domestic financial systems benefit from economies of scale and enhance efficiency through greater competition and innovation. At the same time, foreign bank entry could pose supervisory challenges, and increase countries' vulnerability to external factors, thus undermining financial stability. However, the broad picture that emerges from a preliminary look at the data indicates that countries can develop their financial systems without the entry of foreign banks. But also, that their presence does not necessarily make the countries vulnerable to crises. Figure 12 plots the average FD index against the share of foreign bank assets in domestic financial systems over 2006–10 (the years for which data were available), and indicates in red those countries that have experienced a banking crisis during this period. It suggests that foreign ownership in the banking sector has no clear relationship with either the overall FD index level or the likelihood of a crisis.¹⁶

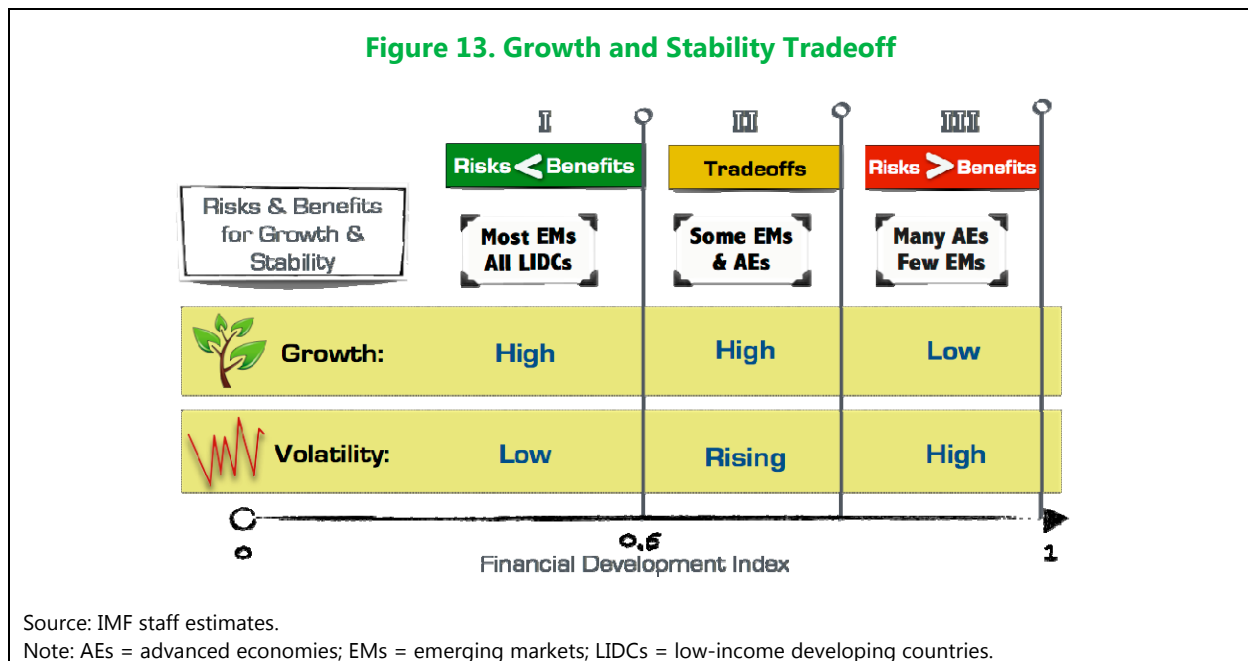


C. Taking Stock: Is There a Growth-Stability Tradeoff?

36. Combining the various pieces of empirical evidence, a picture of benefits and risks emerges as financial development moves from low to high (Figure 13). In the early stages of financial development, growth and macroeconomic stability are both enhanced by further financial development, although a more active (and less repressed) banking system will begin to reduce capital buffers and be subject to greater volatility of earnings (Region I). Overall, risks remain contained and benefits are large. Region I corresponds to a “benevolent” stage of FD, where most EMs are currently situated. Beyond a certain level, further financial development will increase economic volatility, while the growth effects continue to be positive and buffers continue to decline. This corresponds to the tradeoff region (Region II), where one finds some EMs and AEs. Finally, beyond a point, financial development leads to both lower growth and increased volatility (Region III), an indication that there is too much finance.

¹⁶ The absence of a link between foreign ownership of the banking sector and the likelihood of a crisis can be explained by the fact that countries with large foreign bank presence did not experience financial crises due to swift policy actions that stabilized credit.

37. In light of the benefits-risk tradeoff, a key question is whether it is possible to push the frontiers of the “benevolent” regions. As Box 4 illustrates, the three regions are also related to the marginal social costs and benefits of increasing financial development. One can think of a “social optimal” level of FD as the point at which these marginal costs and benefits are equalized (FD* in Box 4, Figure 1). While the exact location of the social optimum will vary by country—it will depend crucially on policymakers’ normative preferences of growth versus macroeconomic and financial stability—it necessarily occurs somewhere in Region II, where both marginal costs and benefits are positive. Can the frontiers between regions be pushed through policy actions? For example, are there circumstances under which countries in Region I (the “benevolent region”) can remain in that region even with higher levels of financial development? Or, can countries in Region III move to Regions II or I without necessarily scaling down their financial development? In other words, are there policy actions that can enable countries to achieve their social optimum at a higher level of FD? The next section aims to shed light on this issue.



Box 4. Marginal Social Benefits and Costs of Financial Development ¹⁷

The empirical analysis described in section C shows that financial development has non-linear effects on both economic growth and stability. A useful way to summarize the implications of these results for economic policy is to first define the marginal effect on growth as the marginal social benefits of financial development; then group together the marginal impacts on stability—both macroeconomic and financial—into marginal social costs of financial development. One can then define a “socially optimal” level of financial development as one where marginal costs and benefits are equalized.

This is illustrated in the chart below, where the level of financial development is shown on the horizontal axis, while the social costs and benefits are on the vertical axis. The *MBF* line corresponds to the marginal social benefit of finance, and equals the slope of the bell-shaped relationship between finance and growth in Figure 7. Marginal benefits are initially positive but declining, eventually reaching the point to the right of which they are negative. Marginal social costs of finance are represented by the *MCF* line, which has been drawn as initially negative but increasing, then becoming positive and finally surpassing marginal benefits. The construction of *MCF* is not as straightforward as that of *MBF* as it involves aggregating over three effects: those on output and inflation volatility and on financial stability. Thus, the policymaker must make a normative judgment, weighing the three stability objectives from a societal point of view. Furthermore, it also involves weighing the costs relative to the benefits. That is, the policymaker must decide, for instance, how much a percentage point of increased volatility is socially worth in terms of a percentage point of additional growth. One plausible representation is to have the negative marginal costs from reduced macroeconomic volatility initially outweighing the (constant) positive marginal costs arising from reduced buffers. Thus, *MCF* is shown in the figure as initially negative but increasing with financial development.

Three separate regions of financial development can be identified from this analysis. In the early stages, Region I, there are unambiguous benefits to pursuing financial development, as the marginal (growth) benefits are positive and the (stability) costs are negative. In Region II, marginal costs become positive, but further financial development will continue to have a net social benefit until FD^* when marginal benefits equal marginal costs. At FD^* , the “social optimum” (SO^*) is reached. Finally, Region III represents an area of “too much finance”; there are unambiguous costs to further financial development; marginal benefits are negative and costs are positive.¹⁸ Society would then clearly benefit from a contraction in finance, exiting Region 3.

In the Region II area to the right of FD^* , curbing financial development by moving to the left improves social welfare. However, the exact location of the social optimum will necessarily depend on the normative weighing of relative financial stability costs. In contrast, in Region III, the level of financial development is suboptimal regardless of the normative weighing by the policymaker.

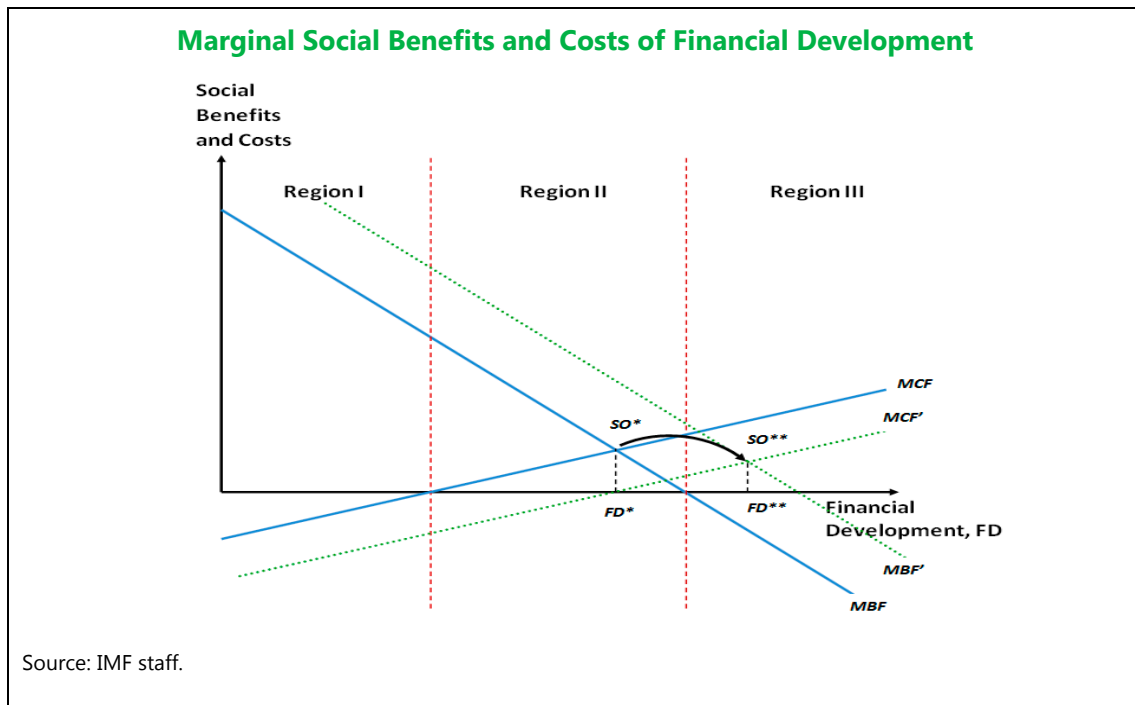
¹⁷ The authors are grateful to José Viñals for presenting this analysis.

¹⁸ Using the estimation results, the frontier between Regions II and III can be established at a level of 0.7, where the marginal growth impact of FD becomes statistically less than zero at a 95 percent level. As for the frontier between Regions I and II, it is unclear where overall marginal costs would become positive, as it involves a normative weighing of marginal costs of inflation volatility, which become positive at about 0.4, output volatility, which do so at a level of FD of about 0.5, and financial stability which are positive at all levels of FD. For illustrative purposes, the frontier between Regions I and II is set here at a level of FD of 0.4.

Box 4. Marginal Social Benefits and Costs of Financial Development (Concluded)

The figure has been drawn in a “static” manner, that is, assuming that the *MBF* and *MCF* curves do not move, and therefore the locations of regions and social optimum are also static. However, the results also suggest that selected actions in the enabling environment, and more specifically in regulatory principles, can potentially shift both curves to the right (say, from point *SO** to *SO***), therefore altering the growth-stability tradeoff as well as the social optimum. Thus, regulatory and institutional improvements can serve to expand the benevolent Region I or Region II, or to shrink Region III, by mitigating the negative growth and stability consequences of the higher levels of financial development.

Finally, the figure refers to *social* benefits and costs of financial development. In certain cases and at very high levels of finance, the social benefits of reducing financial development are vastly surpassed by the private benefits of finance. In this case, Region III applies and regulatory actions should aim to induce the private sector to reduce financial development to a level more consistent with social benefits.



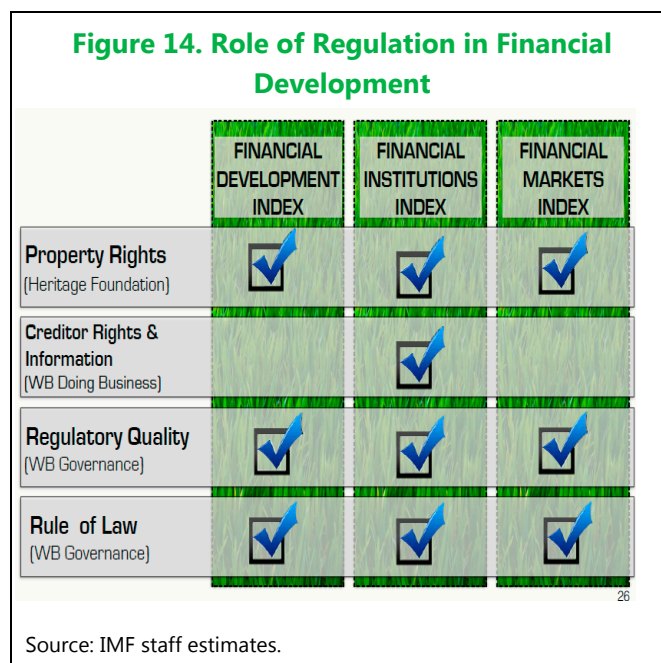
CREATING AN ENABLING ENVIRONMENT

38. This section examines factors that could help countries sustain a higher level of financial development while mitigating macroeconomic and financial stability risks.

39. A first step is to test the role of the institutional environment.¹⁹ As one might expect, stronger institutions—better protection of property rights, creditor rights and information, and higher regulatory quality and rule of law—are positively associated with greater financial development, both in the overall FD index and with regard to institutions and markets (Figure 14).²⁰ There is one exception: as one might also expect, improvements in creditor rights and information tend to have a measurable effect only on institutions.

40. Digging deeper, one finds a strong positive correlation between financial development and the quality of the regulatory framework. This is approximated here by the overall grades for country compliance with Basel Core Principles (BCP), Insurance Core Principles (ICP), and International Organization of Securities Commissions (IOSCO) Principles (Figure 14).

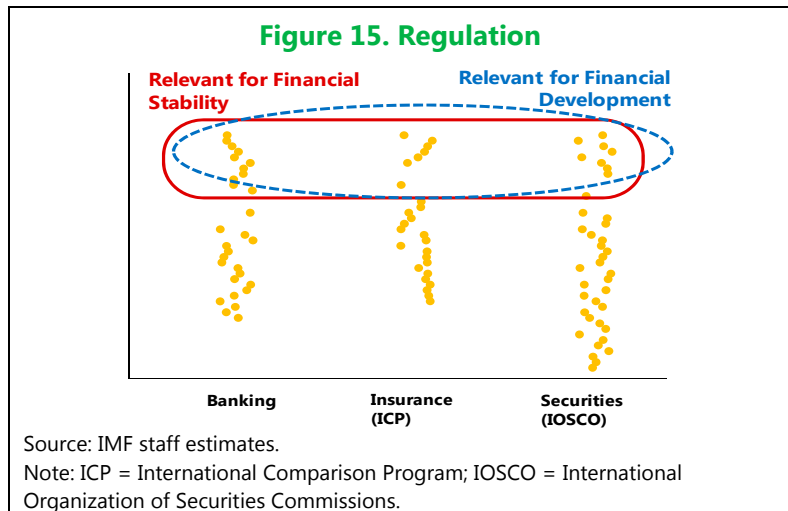
41. Digging even deeper, one finds that in terms of regulatory principles, there is very little tradeoff between financial development and financial stability. Are there some regulations that are effective in helping safeguard financial stability but hamper financial development? The analysis summarized in Figure 15 follows the methodology of the 2014 IMF Board Review of the Financial Sector Assessment Program (IMF 2014d). These principles are grouped into those for banking, insurance, and securities. A number of them have been identified in IMF (2014d) as significantly



¹⁹ Given the importance of institutional quality, it may seem natural to include it in the comprehensive FD index. Why is it not included? This paper's approach is to construct an index that would reflect conditions in the financial system itself. Obviously, institutional quality affects FD, but also influences other sectors of the economy. Furthermore, leaving it out of the FD index has the additional benefit of being able to test its relevance for and interaction with FD in affecting growth and stability.

²⁰ These findings are consistent with a broad range of previous work. For example, a joint paper by International Monetary Fund, World Bank, European Bank for Reconstruction and Development, and Organization for Economic Cooperation and Development (2013) highlighted the role of robust legal frameworks—in particular with respect to enforceability of collateral—in developing local currency bond markets.

associated with financial stability, in the sense that they reduce the probability of experiencing a banking crisis. These principles are circled by the red line in Figure 15. Using the same methodology, one can identify the principles that are positively associated with financial development, circled by the blue dashed line. It is striking that for the two sets of principles, the set that matters for financial stability and that for financial development, largely coincide. Specifically, 25 of the 93 regulatory principles (BCP, ICP, and IOSCO) were found critical for financial stability, and 23 of these were found critical for financial development. In general terms, these key principles capture: (1) the ability of regulators to set and demand adjustments to capital, loan loss provisioning, and employee compensation; (2) regulatory definitions, such as definitions of capital, nonperforming loans, and loan losses; and (3) financial reporting and disclosures.²¹ This is not to say that the remaining principles are unimportant. The standard setters have other relevant considerations and objectives in mind (such as safety and soundness, and policyholder protection) and the remaining principles are seen as useful from the perspective of the standard setters, but do not appear necessarily “critical” from the perspectives of financial stability²² and financial development.



42. These results imply that there are concrete actions on the regulatory front that many countries can take to promote financial development and stability simultaneously. Given that one channel through which “too much finance” operates is the propensity for larger financial systems to generate financial instability, the results above suggest that effective implementation of key regulatory principles could help shift the frontiers of the three regions in Figure 13 and Box 4, Figure 1 to the right; that is, increasing financial development without incurring additional costs in terms of lower growth or higher volatility.²³

²¹ More specifically, the following 25 principles (of the 93) were found critical for financial stability in the econometric analysis in IMF (2014d): BCP principles 2, 3, 5, 12, 13, 15, 17, 19, 22, 25, 27, and 28; ICP principles 5, 8, 16, 17, 19, and 25; and IOSCO objectives 1, 5, 14, 15, 16, 18, and 19. Of these 25 principles, only BCP 15 (operational risk) and IOSCO 15 (assistance to foreign regulators) were not critical for financial development.

²² Also recall that financial stability is defined in this analysis as a low probability of experiencing a banking crisis, a tail event. Conceivably, there can be other aspects of financial stability for which other regulatory standards have a measurable effect.

²³ It would be ideal to test this hypothesis directly, by including interactions with regulatory variables in the growth regressions to assess whether the turning point does indeed shift to the left as regulatory quality improves. However, there is not sufficient time variation in the regulatory variables to be captured in a long-run growth regression.

CONCLUSION

43. The evidence presented in this paper shows that most EMs are still in the relatively safe and growth-enhancing region of financial development and have scope to develop further.

Most EMs can reap benefits from further financial development—that is, achieving higher growth and financial stability, and reducing macroeconomic volatility. However, it is important to emphasize that financial stability risks are still present at low levels of financial development and, therefore, policymakers need to ensure that sufficient buffers are maintained to reduce the risks of a financial crisis.

44. The analysis shows that financial development entails tradeoffs, but these can be offset by building strong institutions and a sound regulatory/supervisory environment.

The analysis uncovers evidence of “too much finance” in recent years—that is, beyond a certain level of financial development the benefits to growth begin to decline and costs in terms of economic and financial volatility begin to rise. Following the 2008 global financial crisis, sweeping changes to regulatory frameworks globally have been proposed and substantially implemented. These reforms aim to make financial systems safer and can potentially expand the frontiers of Regions I and II, maximizing the benefits from financial development while minimizing the risks. Indeed, one of the effects of the global regulatory reforms has been a deleveraging in advanced countries, implicitly confirming that there had been “too much finance.” A complete implementation of these regulatory reforms would augur well for the growth and stability prospects of all countries.

45. There are clear lessons for emerging markets from this study:

First, financial development is multi-faceted and should be measured by looking at many indicators. Second, financial development can be promoted by putting in place a strong business, regulatory, and supervisory environment. Of the 93 regulatory principles, the critical principles that matter for financial development and financial stability are essentially the same. This means that better—not more—regulation is what promotes financial stability and development. Third, since the weakening effect on growth at higher levels of financial development stems from financial deepening, raising access or efficiency at any level of financial development would be beneficial. Fourth, to mitigate economic and financial stability risks, as well as reduce the likelihood of a crisis, too fast a pace of financial development should be avoided. Finally, there is no “one-size-fits-all” in terms of sequencing the development of financial systems, but the relative benefits from institutions decline and those from markets increase over time.

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ANNEX I. CONSTRUCTION OF THE INDEX

1. Approach. This paper introduces a comprehensive index of financial development, using indicators of financial depth, access, and efficiency for financial institutions and markets. The broad approach to defining financial development follows the matrix of financial system characteristics developed by Čihák and others (2012).

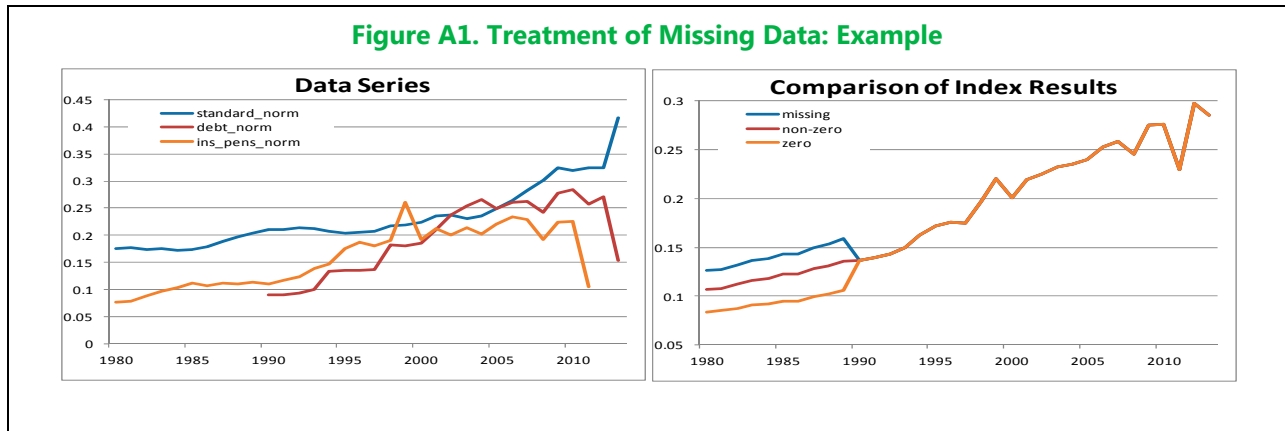
2. Data. The dataset contains annual data between 1980 and 2013 for 176 advanced, emerging, and low-income economies from the World Bank Global Financial Development Database and World Bank FinStats, IMF's Financial Access Survey, Dealogic corporate debt database, and Bank for International Settlement (BIS) debt securities database. The selected variables (Table A1) follow the general logic described in Čihák and others (2012) and take into account the objective of covering a wide range of countries over many years. For example, the Global Findex provides useful user-side data on access, but these are available only for 2011 and 2014. Similarly, a conceptually attractive measure of efficiency based on distance from a "production frontier" is available for a small set of AEs, but not for most EMs and LIDCs, so including it would shrink the representativeness of the estimates considerably. Instead, Table A1 relies on proxy variables that have limitations, but are all well established and available for the broad country sample. Robustness checks were performed with respect to the inclusion of individual variables, such as return on assets and return on equity, into the index.

Table A1. Construction of the Financial Development Index

	FINANCIAL INSTITUTIONS	FINANCIAL MARKETS
DEPTH	1. Private-sector credit (% of GDP) 2. Pension fund assets (% of GDP) 3. Mutual fund assets (% of GDP) 4. Insurance premiums, life and non-life (% of GDP)	1. Stock market capitalization to GDP 2. Stocks traded to GDP 3. International debt securities government (% of GDP) 4. Total debt securities of nonfinancial corporations (% of GDP) 5. Total debt securities of financial corporations (% of GDP)
ACCESS	1. Branches (commercial banks) per 100,000 adults 2. ATMs per 100,000 adults	1. Percent of market capitalization outside of top 10 largest companies 2. Total number of issuers of debt (domestic and external, nonfinancial corporations, and financial corporations)
EFFICIENCY	1. Net interest margin 2. Lending-deposits spread 3. Non-interest income to total income 4. Overhead costs to total assets 5. Return on assets 6. Return on equity	1. Stock market turnover ratio (stocks traded/capitalization)

3. Missing data. Cases of missing data can be treated in three main ways: (1) excluding the series from the final index average (line "missing" in Figure A1, right panel); (2) treating as zero (line "zero" in Figure A1, right panel); and (3) splicing (line "non-zero" in Figure A1, right panel). The treatment of missing data can affect the index of financial development. In splicing the data, the cross-country levels of financial development are determined from the most recently available data by taking a weighted average across performance on various indicators. When some data are unavailable for earlier years, the index is expanded backward using the average growth rates in the available series. This paper's approach is to use

as much of the available data as possible, and to make an informed judgment as to whether data are missing but markets exist (for example, there was a bond issuance but there are no data on it), or whether missing data indicate non-existent markets (that is, there was no bond market). When the relevant market existed in previous years even though data are not available, missing data are filled in retrospectively, starting from the first available observation and applying the average growth rate of other indicators with data available for previous years. If data are missing for the most recent years, then the values are set equal to the latest available observations.



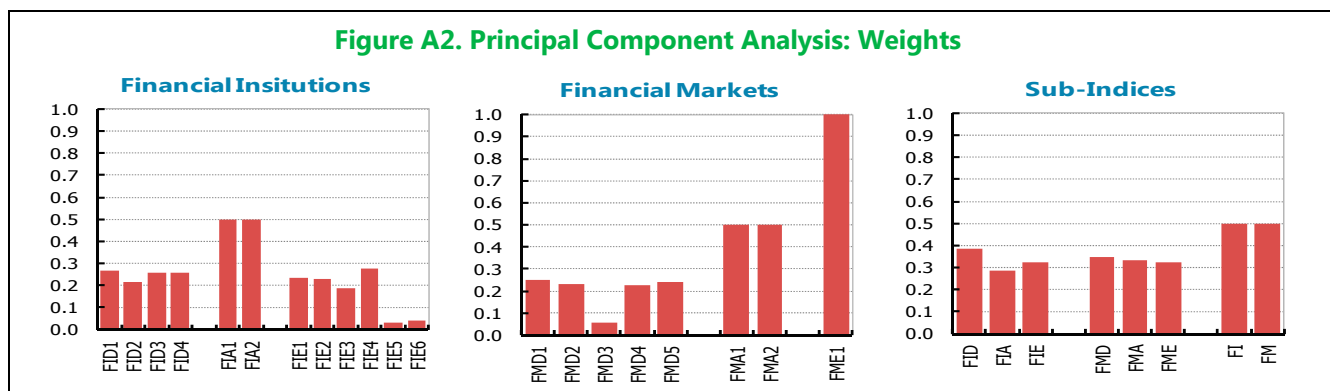
4. Compiling the index. The treatment for missing data is applied to actual data series before the ratings are created. The data are then winsorized at the 5th and the 95th percentiles to avoid extreme observations driving the best and worse scores. Each indicator in a subcategory is normalized between 0 and 1, using a global min-max procedure. The procedure relates country performance to global min and max across all countries and years. For some series—net interest margin, lending-deposits spread, non-interest income to total income, and overhead costs to total assets—a higher value indicates a worse performance on efficiency. For these cases, the ratings are rescaled according to the second formula below so that a higher value indicates greater financial development.

$$I_x = \frac{x - x_{min}}{x_{max} - x_{min}}$$

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

5. Weighting. Sub-indices are constructed as weighted averages of the underlying series, where the weights are squared factor loadings (such that their sum adds up to 1) from principal component analysis of the underlying series (Figure A2). The series that contributes more to the direction of common variation in the data gets a higher weight. Sub-indices are combined into higher indices using principal component analysis and the weights are those in Figure A2.

6. Final index. The result is a relative ranking of countries on depth, access, and efficiency of financial institutions and financial markets, on the development of financial institutions and markets, and on the overall level of financial development (Table A2).

Figure A2. Principal Component Analysis: Weights

Table A2. Summary Statistics of the Financial Development Index

Variable	Observations	Mean	Median	Standard Deviation	Minimum	Maximum
All Countries						
FID	5,984	0.20	0.11	0.23	0.00	1.00
FIA	5,984	0.15	0.00	0.24	0.00	1.00
FIE	5,984	0.49	0.55	0.27	0.00	1.00
FMD	5,984	0.14	0.02	0.23	0.00	1.00
FMA	5,984	0.12	0.00	0.23	0.00	1.00
FME	5,984	0.16	0.00	0.28	0.00	1.00
FI	5,984	0.32	0.31	0.22	0.00	1.00
FM	5,984	0.14	0.01	0.22	0.00	1.00
FD	5,984	0.23	0.17	0.21	0.00	1.00
Emerging Markets						
FID	2,890	0.19	0.14	0.19	0.00	1.00
FIA	2,890	0.15	0.00	0.24	0.00	1.00
FIE	2,890	0.47	0.56	0.29	0.00	0.98
FMD	2,890	0.13	0.04	0.19	0.00	0.90
FMA	2,890	0.12	0.00	0.23	0.00	1.00
FME	2,890	0.16	0.03	0.27	0.00	1.00
FI	2,890	0.31	0.33	0.20	0.00	0.86
FM	2,890	0.14	0.04	0.20	0.00	0.91
FD	2,890	0.23	0.19	0.18	0.00	0.85
Advanced Economies						
FID	850	0.58	0.61	0.23	0.08	1.00
FIA	850	0.30	0.21	0.29	0.00	1.00
FIE	850	0.70	0.75	0.17	0.01	0.98
FMD	850	0.46	0.42	0.30	0.00	1.00
FMA	850	0.42	0.45	0.29	0.00	1.00
FME	850	0.48	0.42	0.34	0.00	1.00
FI	850	0.62	0.62	0.19	0.04	1.00
FM	850	0.46	0.44	0.27	0.00	1.00
FD	850	0.55	0.55	0.21	0.04	1.00

Table A2. Summary Statistics of the Financial Development Index (continued)

Variable	Observations	Mean	Median	Standard Deviation	Minimum	Maximum
All Countries						
Low-Income and Developing Countries						
FID	2,244	0.08	0.05	0.08	0.00	0.50
FIA	2,244	0.08	0.00	0.18	0.00	1.00
FIE	2,244	0.42	0.47	0.25	0.01	1.00
FMD	2,244	0.02	0.00	0.05	0.00	0.50
FMA	2,244	0.00	0.00	0.01	0.00	0.16
FME	2,244	0.02	0.00	0.12	0.00	1.00
FI	2,244	0.22	0.23	0.14	0.00	0.76
FM	2,244	0.01	0.00	0.05	0.00	0.43
FD	2,244	0.12	0.12	0.08	0.00	0.43

Source: IMF staff calculations.

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

ANNEX II. ECONOMETRIC METHODOLOGY, ESTIMATION, AND RESULTS

The approach used was to begin with well-known specifications of the growth regression, substituting traditional measures of financial depth with the composite measure as well as its components. A dynamic system generalized method of moments (GMM) estimator, as in Beck and Levine (2004), was used with a standard set of controls: initial income per capita, education (secondary school enrollment), trade-to-GDP, consumer price index inflation, government consumption-to-GDP ratio,²⁴ and foreign direct investment-to-GDP ratio. A “banking crisis” dummy variable (Laeven and Valencia 2012) was also included to control for the increasing incidence of banking crises beginning in the 1990s, as suggested by Rousseau and Wachtel (2011).

The basic estimation equation is:

$$\dot{y}_{it} = \alpha + \beta_0 FD_{it} + \beta_1 FD_{it}^2 + \beta_2 (FD_{it} \cdot Interact_i) + \beta_3 X_{it}$$

Thus, in the regressions for economic growth (Table B1), per capita real GDP growth was regressed on the respective financial development indicator (FD or a subcomponent) and its square, possible additional interactions, and the set of controls X described above. The equation was estimated over non-overlapping five-year periods encompassing the 1980–2010 period, and for 128 countries.²⁵ The baseline regressions reported in Table B1 excluded outliers—the 5 percent highest and lowest observations of the financial development variable—to ensure that the results were not driven by these observations. Nonetheless, similar results were obtained when including the entire sample.

A quadratic functional form was chosen due to its performance in previous studies that had focused on traditional depth measures (Arcand, Berkes, and Panizza 2012; Eugster 2014).²⁶ While the quadratic form imposes curvature onto the estimated relationship, the quadratic term need not be significant. In fact, for many subcomponents of FD the quadratic term is not significant, and therefore the estimated finance-growth relationship is in fact linear.

Tables B2 and B3 show results for panel regressions that followed the same logic but instead of using economic growth as the dependent variable, they focused on economic volatility and financial stability, respectively. Economic volatility was measured by the rolling five-year standard deviation of growth (Table B2), and financial stability was approximated by distance to distress, defined as Capital to Assets + Return on Assets / Standard Deviation of Return on Assets (Table B3).

²⁴ Note that the government consumption-to-GDP ratio can be considered as a proxy for macroeconomic stance.

²⁵ These are the countries for which all data used in the empirical model could be found.

²⁶ In an additional exercise, Arcand, Berkes, and Panizza (2012) conduct an estimation in which no functional form is imposed a priori, and also obtain a “too much finance” phenomenon with a similar turning point.

Table B1. Finance and Growth: GMM Estimation, 1980–2010
(5-year averages)

Dependent variable: per capita real GDP growth. Additional controls: Initial GDP per capita, educational attainment, and government consumption/GDP.

FD = financial development index or subcomponent (as indicated), EM = emerging market dummy.

Explanatory variables	General Index - FD				Financial Institutions		Financial Markets	
	Full Sample		Excluding Offshore Financial Centers		FI - Full Sample		FMD - Full Sample	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FD	0.220*** (4.567)	0.055*** (2.732)	0.206*** (3.450)	0.051** (2.555)	0.223*** (4.397)	0.154*** (5.530)	0.076* (1.724)	0.031 (1.191)
Crisis x FD	-0.041** (-2.028)	-0.052*** (-3.238)	-0.032 (-1.589)	-0.050*** (-3.527)	-0.042** (-2.570)	-0.093*** (-2.818)	-0.066*** (-3.255)	-0.023 (-0.727)
FD ²	-0.226*** (-3.656)		-0.204*** (-2.881)		-0.206*** (-4.054)		-0.092 (-1.544)	
EM x FD		0.002 (0.141)		0.011 (0.886)		0.046** (2.277)		0.082*** (2.959)
Constant	0.080** (2.097)	0.081** (2.024)	0.094*** (2.833)	0.081*** (2.691)	0.065* (1.695)	0.002 (0.048)	0.067** (2.008)	0.067** (2.008)
Observations	575	575	497	497	573	467	440	340
Number of countries	128	128	111	111	128	126	118	101
AR2	0.790	0.717	0.401	0.277	0.817	0.735	0.0917	0.815
Hansen	0.287	0.152	0.102	0.193	0.149	0.304	0.105	0.365
Instruments	90	90	90	90	108	92	87	92

z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table B2. Finance and Growth Volatility: Panel Estimation, 1980–2013

Dependent variable: rolling standard deviation of growth (five-year period ending in current year).
 Controls: five-year lags of GDP per capita (PPP), trade and financial openness, energy exports (percent of GDP); volatility of foreign growth, gross capital inflows to the region excluding country in question, and terms of trade changes; Polity Index, transition and offshore financial center dummy, growth in GDP per capita, government balance.

FD = financial development index or subcomponent (as indicated)

	<i>General Index - FD</i>		<i>Financial Institutions - FI</i>		<i>Financial Markets - FM</i>	
<i>Explanatory variables</i>	(1)	(2)	(3)	(4)	(5)	(6)
<i>FD</i>	-1.18** (0.57)	-3.69*** (0.96)	-0.98** (0.46)	-2.77*** (0.84)	-0.51 (0.43)	-2.86*** (0.84)
<i>FD</i> ²		3.76*** (1.16)		2.82** (1.11)		3.21*** (0.99)
Constant	1.98*** (0.19)	2.37*** (0.23)	2.06*** (0.20)	2.38*** (0.24)	1.93*** (0.19)	2.13*** (0.20)
Observations	2,309	2,309	2,309	2,309	2,309	2,309
Number of Countries	103	103	103	103	103	103
<i>R</i> ²	0.15	0.16	0.15	0.15	0.15	0.16
z-statistics in parentheses						

Table B3. Finance and Financial Stability: Panel Estimation, 1980–2013

Dependent variable: Distance to distress defined as Capital to Assets + Return on Assets/ Standard Deviation (Return on Assets).

Controls: five-year lags of GDP per capita (PPP), trade and financial openness; volatility of foreign growth, gross capital inflows to the region excluding country in question, and terms of trade changes; Polity Index, transition and offshore financial center dummy, growth in GDP per capita, government balance, exchange rate regime.

FD = financial development index or subcomponent (as indicated)

<i>Explanatory variables</i>	<i>General Index - FD</i>		<i>Financial Institutions - FI</i>		<i>Financial Institutions Depth - FID</i>	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>FD</i>	-0.39 (3.10)	-27.25*** (6.90)	-4.58* (2.65)	-23.32*** (6.16)	-11.97*** (4.40)	9.07 (7.00)
<i>FD</i> ²		37.05*** (8.52)		25.44*** (7.57)		-34.31*** (8.92)
Constant	10.86*** (1.40)	14.96*** (1.67)	11.44*** (1.40)	15.60*** (1.86)	11.72*** (1.39)	10.19*** (1.43)
Observations	834	834	834	834	834	834
Number of Countries	64	64	64	64	64	64
<i>R</i> ²	0.04	0.06	0.04	0.05	0.05	0.06

z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1