

CHAPTER 2: KEY MESSAGES

- Market discipline is the process by which market participants—such as uninsured lenders, shareholders, and rating agencies—monitor the risks and financial positions of banks and take action to guide, limit, and price banks’ risk-taking.
- For market discipline to work effectively, market participants must have the information, the means, and, most important, the incentives to monitor and influence banks to limit excessive risk-taking.
- The global financial crisis led to unprecedented interventions by governments to stabilize their economic and financial systems. There has been significant expansion of deposit insurance (both in coverage and scope), with some countries offering blanket guarantees on deposits. There has also been additional government support in the form of capital and liquidity injections, guarantees on bank liabilities, and repurchases of impaired bank assets.
- These interventions have reinforced investors’ expectations of government support for large financial institutions, significantly reducing the long-term incentives to monitor and discipline these banks.
- In response, following policy goals set by the Basel Committee on Banking Supervision and the Financial Stability Board, some countries have introduced legislation and regulatory reforms to limit the economic damage posed by large financial institutions and to strengthen market discipline.
- The main regulatory reforms include:
 - Higher capital and liquidity requirements overall and additional surcharges for institutions deemed systemically important, both domestically and globally.
 - New resolution processes for bank holding companies and new requirements for systemically important banks to hold bail-in debt.
 - Enhanced supervision of risk management and risk reporting processes at banks, including periodic stress tests to determine whether banks have sufficient capital to absorb losses.
- Although these reforms have been widely adopted and have been successful, many issues remain. In particular, it is not clear whether bail-in funds will be enough to capitalize bridge banks during resolution in order for taxpayers’ funds to not be put at risk. It also remains uncertain how cross-border resolution will be implemented and how bail-in funds will be shared between host and home country supervisors. It is difficult to quantify the long-term effects of widespread bailouts and blanket guarantees on moral hazard and on market discipline.
- Finally, for developing countries, the principle of proportionality must be kept in mind when implementing policies designed to enhance market discipline in order to maximize social objectives, given capacity constraints.

2

Market Discipline

MARKET DISCIPLINE

The global financial crisis highlighted the weaknesses in regulatory regimes to supervise and resolve large financial institutions. These systemically important financial institutions (SIFIs) have been deemed as too big, too interconnected, and too complex to fail by domestic authorities.¹ Because their failure would significantly disrupt the financial system and economic activity, governments worldwide have made unprecedented interventions in the markets to rescue these large financial institutions using public resources. As a result of these measures, shareholders and borrowers have been able to shift bank losses to taxpayers.

These interventions rekindled the debate on the impact of government interventions on market discipline and on the incentives of owners, borrowers, and shareholders to monitor large financial institutions. The focus of the regulatory reform agenda has also been shifting from supervision to resolution. A strong resolution regime, in which bank creditors bear the brunt of losses, is considered to be important to reinforce market discipline.

Market discipline refers to the notion that market participants—such as uninsured lenders, shareholders, and rating agencies—can influence a financial institution's behavior through monitoring its risk profile and financial position. By making risk-taking costlier,

market discipline has been recognized by regulators as an important mechanism for curbing banks' incentives to take excessive risks. Market discipline was introduced as the third pillar of the Basel capital regulations as a way to complement and support official oversight of financial institutions through new public disclosure requirements.²

For market discipline to be effective, market participants should have not only the means to monitor the activities of financial institutions but also the ability to influence and impose discipline on these institutions. Bliss and Flannery (2002) identify two main components of market discipline: monitoring and influence. Monitoring is the process by which shareholders, depositors, and other market participants can systematically review the business activities, financial condition, and risk-taking behavior of banks. Influence can be both direct and indirect. Market participants, based on their monitoring, can take direct corrective action. This action can be in the form of refusing to roll over short-term debt, charging higher interest rates on new debt, or exercising covenants on debt contracts. Indirect influence occurs when a third party, responding to the information provided by market monitoring, engages in corrective action. For example, wholesale funding may be withheld based on external assessments by rating agencies, or, if the financial institution

has publicly traded securities, the market's risk assessments can be inferred from the observed security prices, and funding may be withheld based on security prices.

Effective market discipline requires two important conditions. First and most important, market participants must have incentives to monitor banks. Large depositors, shareholders, and other unsecured creditors naturally have incentives to monitor banks because they have money at stake. Empirical evidence indicates that the amount of uninsured and subordinated debt banks carry on their balance sheets is associated with greater market discipline (Flannery and Sorescu 1996; Sironi 2003). Moreover, because uninsured depositors can lose money when a bank fails, they will demand higher rates when a bank takes on more risk. Higher market prices are a valuable signal of greater risk-taking by banks, which can be used by regulators to discipline those banks.

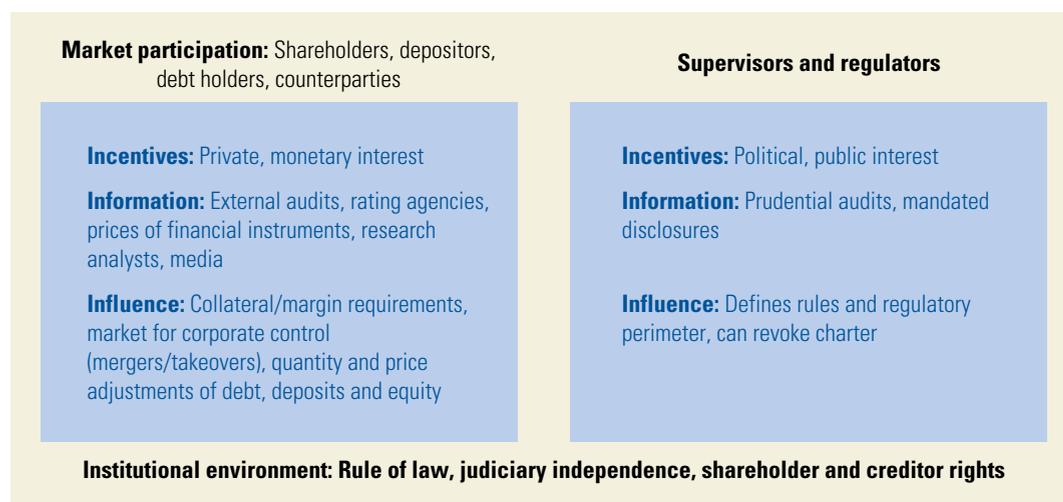
Second, market participants must have access to relevant and timely information. It is difficult for uninsured debtholders or shareholders to effectively monitor their investments unless they receive reliable financial information about the banks in which they are investing. Stringent disclosure rules, independent outside audits, and the availability of public and private credit ratings all increase transparency and allow for greater discipline by market participants. Anginer, Demirgüç-Kunt and Zhu (2014) show that information availability and information asymmetry in the banking sectors are important drivers of systemic risk. The importance of information in market discipline has also been recognized by the Basel Committee on Banking Supervision (BCBS).³

The growing complexity of the organizational structures and operations of large financial institutions make it difficult for market participants to process information. The rapid development of new financial instruments over the last two decades has increased the complexity and opacity of bank balance sheets. At the same time, financial institutions are now structured as intricate ownership hierarchies, involving hundreds or even thousands of legal

entities that span multiple sovereign nations. Their multiple business lines range from insurance to investment management, and they receive a substantial portion of their income from noninterest activities. Meanwhile, growing interconnections across large banks make it difficult to assess fault lines (Gai, Haldane, and Kapadia 2011). Since the global financial crisis, there has been a further increase in the organizational complexity of large banks—see Carmassi and Herring (2016) for large global banks and Goldberg and Meehl (2019) for large U.S. banks—making transparency and information even more valuable for the effectiveness of market discipline.

Implicit and explicit government guarantees distort the incentives of market participants to monitor and discipline financial institutions. In particular, government intervention in the markets to provide liquidity and funding to rescue large financial institutions and the expansion of deposit insurance schemes in scope and coverage have reduced incentives for market discipline (see the section below, titled “Implicit Government Guarantees Become Explicit”). Because insured depositors are protected when a bank fails, their incentives to monitor the financial condition of their bank is significantly reduced (see Anginer and Demirgüç-Kunt, forthcoming, for a review). Large financial institutions that are deemed too big to fail may also benefit from implicit government guarantees on the uninsured debt they carry on their balance sheets. Empirical evidence indicates that the risk is not fully priced in the cost of uninsured funding for large banks that are deemed systemically important by the market (Acharya, Anginer, and Warburton 2017). The expectation of support by the market results in moral hazard problems in the form of excessive and correlated risk-taking, which is similar to moral hazard problems associated with deposit insurance. Thus, larger banks may lack market discipline, regardless of whether an explicit insurance scheme protects depositors. Some aspects of the new regulatory reforms such as higher capital surcharges and requirements to hold bail-in debt and the implementation of procedures to resolve or

FIGURE 2.1 Elements of Market Discipline



liquidate large financial institutions in an orderly fashion can reinforce incentives for market discipline. Whether the recent reforms will dampen investor expectations of government support going forward is yet unknown.

Market discipline works within the larger institutional environment in conjunction with the discipline provided by regulators and supervisors (see figure 2.1). Bank regulators and supervisors have their own set of incentives. As discussed in chapter 1, governments face political and social demands to provide financial safety nets. Although the goal of regulators and supervisors is to maximize public welfare, political considerations can also play a role. Meanwhile, an interplay is at work between the discipline provided by the private market and that provided by regulators and supervisors, and at times they can complement or substitute for each other. For example, information is critical for effective public monitoring of banks. Regulators and supervisors generate information through prudential audits and mandated disclosures, which are also used by market participants to monitor and influence risk-taking by banks. Similarly, regulators and supervisors can use data on security prices and other information generated by the private market to monitor and discipline banks. The form of influence by regulators and supervisors tends to be more

direct—they define the rules and the regulatory perimeter and can impose extreme discipline in the form of shutting down banks and revoking bank charters. Specific regulations and, more important, the actions taken by supervisors can affect the incentives of private market participants and can enhance or hinder market discipline. For example, increasing the cost of bank failure by redesigning safety nets, credibly committing to not bailing out failing banks, or increasing the incentives for bank managers to respond to market signals can all affect the incentives of private market participants.

There must be institutions in place and mechanisms available for market participants to exercise market discipline. Information generation and provision of ancillary financial services, such as credit ratings, tend to have high fixed costs. These require a certain level of market development, which can be curtailed by the lack of scale and insufficient market depth—important hindrances in developing countries. Enabling a competitive environment that makes it easier for depositors and other investors to shift their investments between banks according to their assessments of relative risk is also important. Effective private monitoring also requires strong adherence to the rule of law. In particular, enforcing debt contracts and covenants, holding

directors and managers accountable for fraud, and protecting minority shareholders from self-dealing all require a strong, independent judiciary and laws protecting shareholder and creditor rights.

Significant cross-country differences in institutional environments imply that proportionality must be kept in mind in thinking about the rules and regulations meant to strengthen market discipline. Simplified prudential rules and requirements can be applied for small or noncomplex institutions in order to avoid excessive compliance costs. This possibility is especially important for smaller banks in developing countries, which may lack the economies of scale for the compliance function. Proportionality should apply not only to regulations but also to supervision. Smaller developing countries may lack informational and operational infrastructure and face steep scale curves in the supervision and enforcement functions. Proportionality must be kept in mind to use supervisors' scarce resources effectively, thereby maximizing the desired social objectives. This need may in some cases imply a lower degree of stringency and simplified enforcement processes for smaller and less complex institutions.

IMPACT OF THE GLOBAL FINANCIAL CRISIS ON INCENTIVES AND MORAL HAZARD

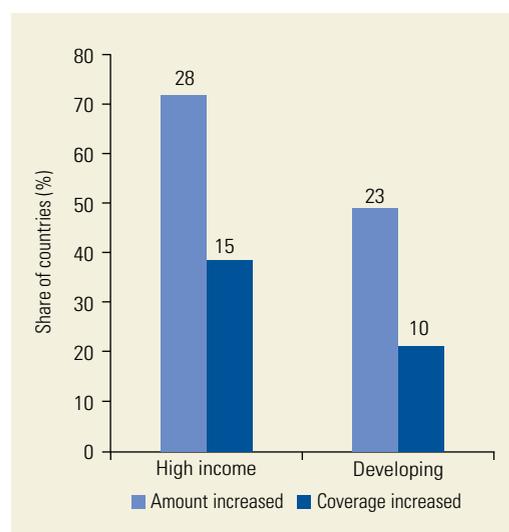
The global financial crisis led to unprecedented interventions by governments to stabilize their economic and financial systems. Deposit insurance was significantly expanded (in both coverage and scope) during the crisis, with a number of countries offering blanket guarantees on deposits. Government support was also extended in the form of capital and liquidity injections, guarantees on bank liabilities, and repurchases of impaired bank assets.

Expansion of Explicit Guarantees

During the global financial crisis, a number of countries introduced new deposit insurance

schemes or extended the scope and coverage of existing schemes to restore confidence in their banking systems and to avert runs. Several countries, such as Australia and Singapore, introduced explicit deposit insurance schemes for the first time. Many others, including the United States and Spain, substantially increased the limit on deposits covered by deposit insurance. Other countries increased the scope of securities and bank liabilities guaranteed under deposit insurance. Most notably, Ireland introduced a blanket guarantee for most liabilities of its banks. The deposit insurance in Ireland was expanded to cover bonds, subordinated debt, and interbank deposits. The increased coverage amounted to about 200 percent of Ireland's gross domestic product (GDP). Figure 2.2 shows the percentage and number of high-income and developing countries that implemented changes in their deposit insurance systems in response to the crisis. Most countries, especially those in the high-income group, significantly increased both the limit and the type of accounts covered under deposit insurance. Since the crisis,

FIGURE 2.2 Increase in Deposit Insurance Coverage in Response to the Global Financial Crisis



Source: Bank Regulation and Supervision Survey (BRSS), wave 5, <https://www.worldbank.org/en/research/brief/BRSS>.

Note: This figure shows the number and the percentage of countries implementing changes to their bank deposit systems as a result of the 2007–09 global financial crisis.

there has been further expansion of explicit insurance coverage. Currently, over 110 countries have some form of explicit deposit insurance, up from 93 in 2013, according to the most recent Bank Regulation and Supervision Survey (BRSS). Over 80 percent of countries in the high-income group have some form of explicit deposit insurance in place.

Expansions of deposit insurance coverage and scope have helped to restore confidence in banking sectors across the globe. Except for a few exceptions, there have been no contagious runs by retail depositors (Hasan et al. 2017). However, these expansions may come at a significant cost to market discipline. Although adequate funding of insurance schemes is crucial for deposit insurance to be credible, governments have ended up doing far more to avoid crises and restore stability. Limited commitment *ex ante* by governments is crucial in three important respects for deposit insurance schemes to work effectively. First, it limits risk-taking incentives by banks. Second, it limits the amount of taxpayer funds that could be at risk. And, third, it helps to

harmonize insurance schemes in common banking areas to limit regulatory arbitrage.

Expanding coverage beyond what was promised to depositors during the crisis may have reinforced market expectations of blanket government support, potentially distorting the incentives of both bank managers and depositors. A number of papers have shown that more generous deposit insurance coverage and scope lead to greater moral hazard (Honohan and Klingebiel 2000; Demirgüç-Kunt, and Detragiache 2002). Although deposit insurance can enhance depositor confidence and reduce the likelihood of contagious bank runs during crisis periods, it also increases incentives for banks to take on more risks in normal times. The net effect of deposit insurance on bank risk and stability depends on whether the benefits of deposit insurance outweigh its costs. Much of the empirical research suggests that the overall effect of deposit insurance on stability is negative (see box 2.1). It is not surprising, then, that expansions during the financial crisis may have reduced market discipline. Although

BOX 2.1 How Does Deposit Insurance Affect Stability?

Deposit insurance can increase moral hazard and make financial systems more vulnerable to crises during good times, but it can also enhance depositor confidence and reduce the likelihood of bank runs during crises. The net effect of deposit insurance on bank risk and stability depends on whether the benefits of deposit insurance outweigh its costs.

Anginer, Demirgüç-Kunt, and Zhu (2014) examine the effect of deposit insurance on banks' stand-alone and systemic risk before and after the global financial crisis. They find that more generous deposit insurance schemes increase bank risk and reduce systemic stability in noncrisis years. During the global financial crisis, bank risk was lower and systemic stability was greater in countries with more generous deposit insurance coverage. The authors also examine the level of risk across countries over the

full sample period. They find that the overall effect of deposit insurance over the full sample remains negative because the destabilizing effect during normal times is greater in magnitude than the stabilizing effect during global turbulence.

The study sample consists of 4,109 publicly traded banks in 96 countries, and the study period includes the crisis years 2007–09 and the three years, 2004–06, leading up to the crisis. The authors use the Z-score and stock return volatility to measure the stand-alone risk of an individual bank and the marginal expected shortfall (MES) of Acharya, Engle, and Richardson (2012) to measure systemic risk. The authors use two variables to measure the generosity of deposit insurance coverage. The first indicator—from Barth, Caprio, and Levine (2008)—is a dummy variable that takes on a value of 1 if a country has

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BOX 2.1 How Does Deposit Insurance Affect Stability? (continued)

TABLE B2.1.1 Stand-Alone and Systemic Risk before and after the Global Financial Crisis

	Risk variable	Has no deposit insurance	Has deposit insurance	Difference	p-value
Precrisis	Log (Z-score)	3.7611	2.4710	1.2901	0.0000
	Volatility	0.0184	0.0295	-0.0111	0.0000
	MES	-1.2617	-2.0150	0.7534	0.0001
Postcrisis	Log (Z-score)	3.3148	3.1170	0.1978	0.0218
	Volatility	0.0369	0.0303	0.0067	0.0020
	MES	-3.3644	-3.0699	-0.2945	0.0000

Note: This table reports univariate analyses of the impact of deposit insurance during crisis and noncrisis periods for the sample of 4,109 banks in 96 countries over the period 2004–09. MES = marginal expected shortfall (from Acharya, Engle, and Richardson 2012).

explicit deposit insurance and depositors were fully compensated the last time a bank failed. The second indicator—from Demirgüç-Kunt, Kane, and Laeven (2008)—takes on a value of 1 if a country offers full coverage of deposits.

Table B2.1.1 shows the key results of the study using the second deposit insurance measure. It presents averages for the risk measures, which are partitioned based on whether a country offers deposit insurance and whether the country is in a crisis period. In the noncrisis period, banks in countries without deposit insurance experience 0.7 percent lower daily volatility, 0.3 percent higher stock returns during a market decline, and half a standard deviation higher Z-score. During the crisis period, banks in countries with deposit insurance show more favorable figures. However, the net effect of deposit insurance on risk over the full sample period is still negative.

The authors also examine how the quality of regulation and supervision affects the impact of deposit insurance on stabilization and moral hazard. A bank supervisory quality index measures whether the

supervisory authorities have the power and authority to take specific preventive and corrective actions such as replacing the management team. They find that good bank regulation and supervision enhances the stabilization effects during crisis periods, while dampening the negative effects associated with moral hazard during normal times. These results are consistent with the literature, which shows that a well-designed deposit insurance scheme combined with effective regulation and supervision can provide stability while minimizing some of the distortions introduced by deposit insurance (Demirgüç-Kunt, Kane, and Laeven 2008). For example, limiting coverage and scope and implementing risk-based pricing can help alleviate moral hazard problems and help internalize banks' risk-taking. Similarly, better bank supervision may limit the extent to which banks can engage in correlated risk-taking activities in the presence of deposit insurance. Overall, the results highlight the importance of the underlying regulatory and institutional framework and support the view that the appropriate incentive framework is important for ensuring that deposit insurance works effectively.

these expansions have been temporary and were scaled back after the crisis, they reinforce investor expectations that the government will step in and expand coverage when a new crisis arises. In other words, temporary expansions do not temporarily reduce market discipline and can result in moral hazard with potentially long-lasting effects.

A limited commitment by governments also reduces the costs of providing insurance during times of distress. In most theoretical models, bank runs result from a self-fulfilling prophecy where a lack of confidence in the banking sector causes investors to withdraw funds from otherwise solvent banks, resulting in unnecessary economic loss—see,

for example, Diamond and Dybvig (1983). However, as Allen, Babus, and Carletti (2009) point out, bank runs often coincide with deteriorating economic conditions and declining asset values. Ex-post expansion of guarantees is therefore very costly for taxpayers. In some instances, as the Ireland example illustrates, guarantees can threaten the solvency of a country. Acharya et al. (2011) and Demirgüç-Kunt and Huizinga (2013) point out the increase in sovereign credit default swap (CDS) spreads after the announcement of government guarantees in the financial sector and the strong correlation in movement between bank and sovereign CDS spreads after bailouts. By limiting fiscal costs, a limited ex-ante commitment can also improve the reliability and credibility of deposit insurance schemes.

A limited commitment also ensures that deposit insurance schemes will be harmonized across countries. This approach levels the playing field and reduces regulatory arbitrage, whereby investors move funds to countries where they expect the local authorities to increase coverage during a crisis. With the growing globalization of financial systems and cross-border banking, the harmonization of deposit insurance schemes has become an important issue. The possibility that governments will intervene after a crisis to either increase coverage or provide other types of support can weaken harmonization. There can also be differences in how domestic and foreign banks are treated in home and host countries. According to Bertay, Demirgüç-Kunt, and Huizinga (2016), internationalized banks benefit less from home country financial safety nets than their domestic counterparts. The global financial crisis experience highlighted that countries may even decide to selectively honor their deposit insurance, possibly distinguishing domestic and foreign depositors or retail depositors and others.⁴ The 2014 European Union directive to require member countries to have the same coverage in terms of amounts and types of deposits is a step in the right direction to ensure a harmonized level of protection for depositors.

Finally, it is important for deposit insurance schemes to incorporate features to help internalize risk-taking by banks. The empirical evidence reveals that poorly designed schemes can increase the likelihood that a country will experience a banking crisis.⁵ Effective deposit insurance also requires monitoring by supervisors that have the incentives and legal authority to intervene quickly to resolve troubled institutions.⁶ Since the crisis, reforms have limited the amount of taxpayer funds to be put at risk, and new rules resolve insolvent financial institutions quickly with minimal damage to the country (see the section below, titled “Regulatory and Supervisory Remedies”). Nevertheless, because many countries provided blanket guarantees with full coverage during the crisis, the empirical evidence suggests that moral hazard problems associated with full blanket guarantees may remain for a long time.

Implicit Government Guarantees Become Explicit

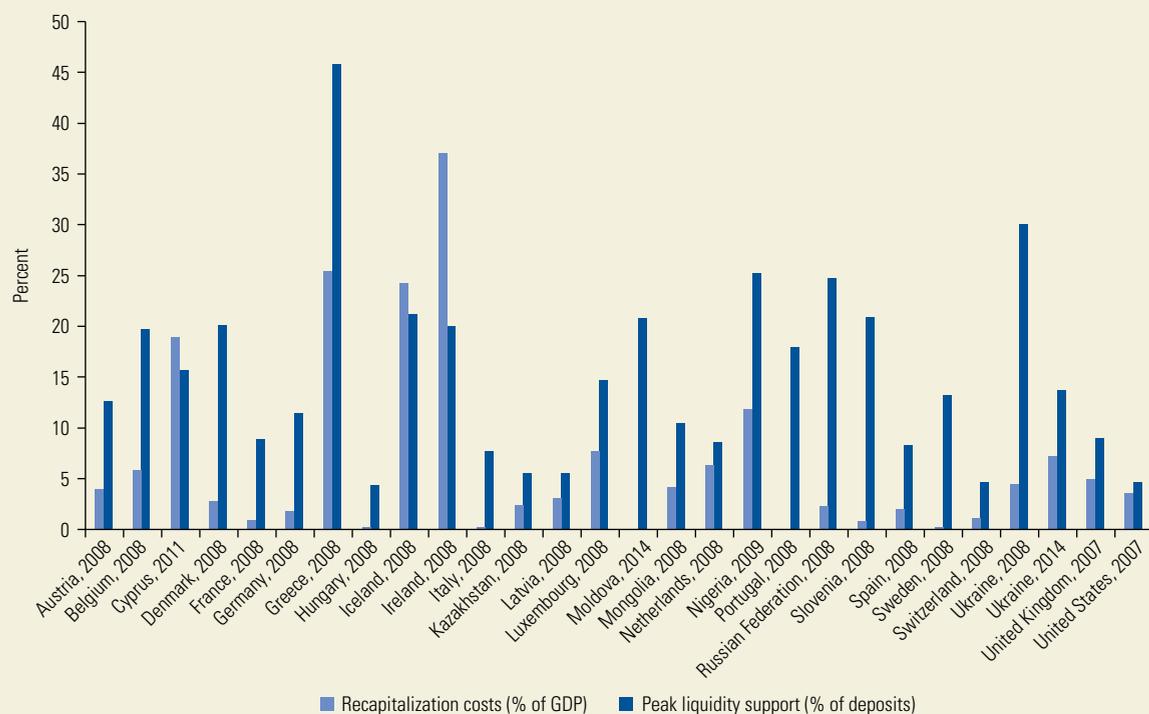
During the global financial crisis, policy responses went beyond the use of explicit guarantees. In many countries, losses by uninsured creditors were covered using taxpayer funds, confirming market expectations of implicit government guarantees. The financial sectors in high-income and developing countries received extended periods of liquidity, bank nationalizations, recapitalizations, and asset purchases, as well as state guarantees on bank liabilities (Laeven and Valencia 2018). For example, one of the largest Dutch banks, ABN Amro, was nationalized and subsequently merged with the already-bailed-out Dutch operations of the Belgian bank Fortis. Box 2.2 details the size of some of these policy measures and their impact on government finances during and after the global financial crisis. Although these measures were successful in reducing the severity of the recent banking crises (Rose and Wieladek 2012; Hryckiewicz 2014), along with expansions of deposit insurance, state interventions to rescue banks will have adverse effects in the long

BOX 2.2 Economic Costs of State Support during the Global Financial Crisis

Government interventions to support national banking systems were widespread during the global financial crisis. Before the crisis, systemic banking crises mostly occurred in developing countries, but the 2007–09 crisis represented a big change in this pattern. More than half of the 28 systemic banking crises documented by Laeven and Valencia (2018) since

2007 were in Europe, with only a few in developing countries. Figure B2.2.1 shows the cost of government interventions in terms of liquidity support and recapitalizations since 2008. The average peak liquidity support provided by the authorities reached 15 percent of deposits, and the average capital support provided to banks across countries was 7 percent of GDP.

FIGURE B2.2.1 Recapitalizations and Liquidity Support during Banking Crises, 2007–17



Source: Laeven and Valencia 2018.

Note: This figure shows the relative size of recapitalizations and peak liquidity support during the banking crises after 2006.

More than 100 European banks were bailed out between 2007 and 2013 through various liquidity, asset relief, and recapitalization interventions (Gerhardt and Vander Venet 2017). Contingent liabilities, such as government guarantees, to support financial institutions reached €1.34 trillion in 2009. By 2017, this amount remained above €150 billion, which is almost as large as the budget of the European Union in that year. Figure B2.2.2 shows the impact of these interventions on government budgets.

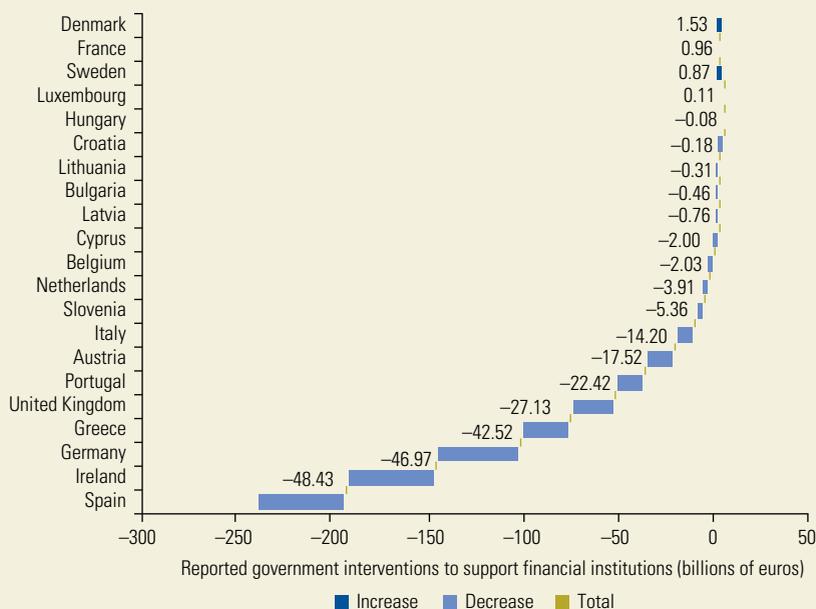
Between 2007 and 2017, EU-28 countries incurred net costs of around €241 billion. Ireland, Germany, and Spain each incurred net costs of more than €40 billion.

The literature suggests that such interventions may help the banking systems by reducing the possibility of contagious runs. The long-term adverse impact of government interventions on market discipline is more difficult to capture and may outweigh the short-term economic gains.^a

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BOX 2.2 Economic Costs of State Support during the Global Financial Crisis (continued)

FIGURE B2.2.2 Government Interventions in the European Union during Banking Crises, 2007–17



Source: Eurostat (database, European Union).

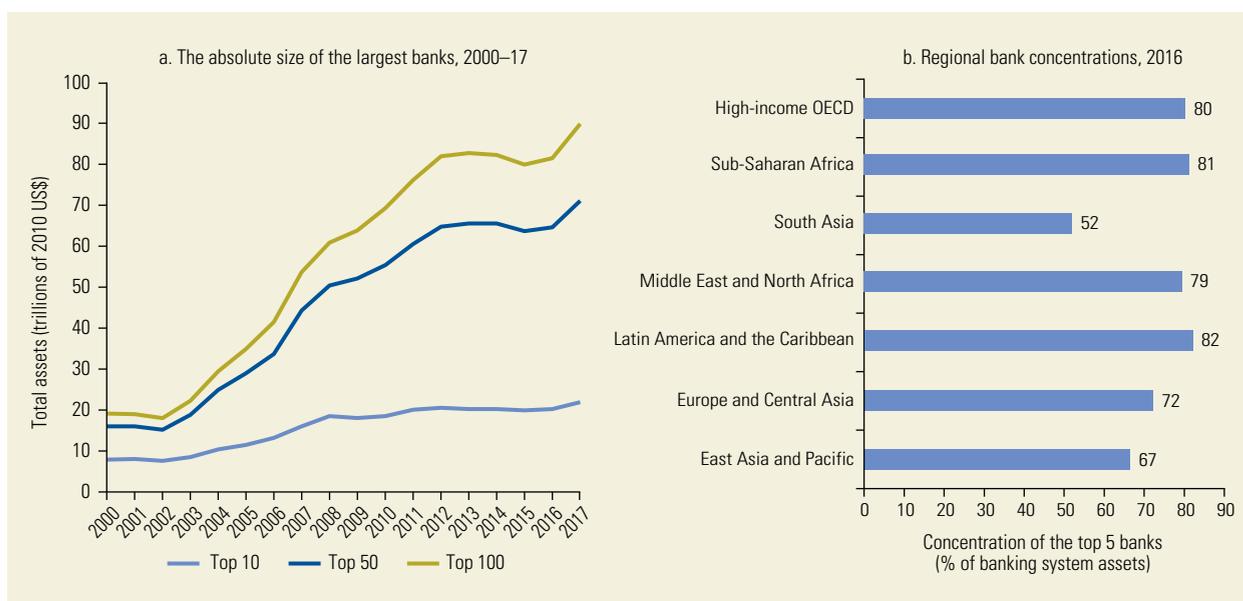
Note: This figure shows the net impact of government interventions to support financial institutions in the EU-28 countries on general government budgets.

- a. According to Berger, Roman, and Sedunov (forthcoming), the U.S. Troubled Asset Relief Program (TARP) reduced the systemic risk contributions of the banks benefiting from the program during the crisis years 2009 and 2010, but increased their systemic risk contributions after the crisis.

term. Arguably, the most serious negative effect on market discipline going forward will stem from the blanket guarantees put in place in many countries during the crisis.⁷

The real economic costs of government interventions to rescue financial institutions go beyond the direct costs of capital and liquidity injections and other forms of direct support. In accounting terms, most of the programs implemented during the financial crisis have been a success, with the outlays of most programs paid back in full with interest (Webel and Labonte 2018). However, this simple accounting calculation ignores the true economic value of guarantees: the potential but not realized costs to taxpayers. Economic

models that treat implicit guarantees within a contingent pricing framework come up with significantly larger estimates for the value of guarantees (Lucas 2018). An apt analogy for the economic cost of guarantees during a crisis would be the cost of providing fire insurance for a house that is on fire. More important, there are indirect economic costs that are difficult to quantify. These include distortions to incentives for risk-taking and monitoring financial institutions, distortions from ad hoc bailout policies (such as those for rescuing some institutions and not others), economic distortions resulting from regulatory responses, and the growing public distrust of financial institutions. These indirect economic

FIGURE 2.3 Bank Sizes Worldwide and Regional Bank Concentrations

Sources: 2000–12: archived data from Bankscope (Bureau van Dijk); 2013–17: Orbis Bank Focus (Bureau van Dijk); World Bank staff calculations.
 Note: This panel shows the total assets of the largest commercial banks, using unconsolidated statements on a rolling basis.

Sources: Global Finance Development Database (World Bank) and World Bank staff calculations.
 Note: This panel shows the share of countries' banking system assets held by the largest five banks, averaged at the regional level. OECD = Organisation for Economic Co-operation and Development.

costs are difficult to quantify, but they can have long-lasting effects.

Banks have grown large in size in the aftermath of the global financial crisis. Figure 2.3, panel a, shows the total assets of the largest banks worldwide between 2000 and 2017. As a result of mergers and acquisitions (some of which were forced or encouraged by supervisors), the largest banks have grown even larger in many countries, and the banking systems remain highly concentrated. There has also been a decline in the number of financial institutions. In Europe, the number of banks fell, from more than 10,000 in 2005 to around 7,000 in 2018 (European Central Bank SDW 2019). There has been a similar decline in the United States, where the number of commercial banks declined from around 7,500 in 2005 to around 4,700 in 2018 (FFIEC 2019). As seen in figure 2.3, panel b, the banking systems in most regions remain highly concentrated. The top five banks on average account for around 80 percent of total banking system assets in high-income countries and in regions

such as Sub-Saharan Africa, the Middle East and Northern Africa, and Latin America and the Caribbean.

Regulatory and Supervisory Remedies

The Financial Stability Board (FSB) was established by G-20 members to set up new macroprudential rules to govern bank behavior in the aftermath of the global financial crisis.⁸ Working with the Basel Committee on Banking Supervision (BCBS), one of the key objectives of the FSB is to protect the public from any economic damage caused by the failure of systemically important institutions. This objective reflects the concern that SIFIs may engage in excessive and correlated risk-taking behavior resulting from market perceptions that these institutions are too big to fail (TBTF). After the crisis, the FSB adopted a policy goal of ending moral hazard and ending TBTF. The main changes to the regulatory frameworks to deal with TBTF include: (1) higher capital and liquidity requirements

overall and additional surcharges for institutions deemed systemically important; (2) a new resolution process for bank holding companies and new requirements for systemically important banks to hold bail-in debt; and (3) governance reforms—specifically, enhanced supervision of risk management and risk-reporting processes at banks, including periodic stress tests.

Capital and Liquidity Requirements

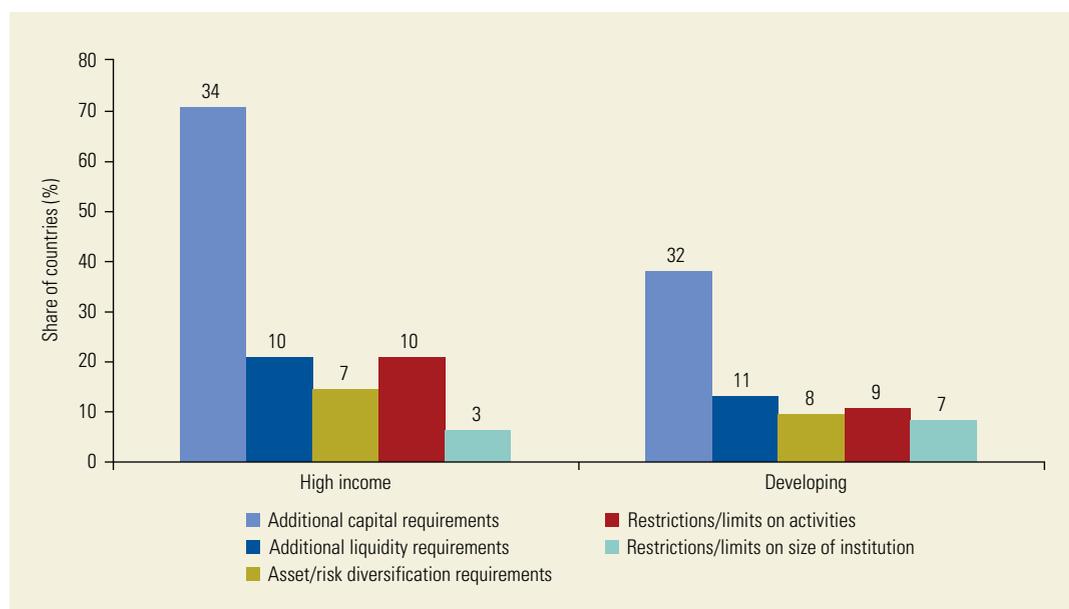
The BCBS set guidelines to identify both global and domestic systemically important banks. The assessment is based on the average of 12 indicators associated with five dimensions of systemic risk identified by the BCBS: size, interconnectedness, substitutability/financial institution infrastructure, complexity, and cross-jurisdictional activity (Barth et al. 2013; BCBS 2018a). These banks are required to hold additional common equity Tier 1 capital ranging from 1 percent to 3.5 percent, depending on their importance. Most countries have applied a range of capital surcharges to their domestic SIFIs, reflecting the

extent of their domestic systemic importance following the BCBS approach to global SIFIs.⁹ These banks are also required to hold additional bail-in debt that can be converted to equity. Figure 2.4 shows the percentage and number of countries by income group that have implemented additional capital and liquidity requirements and other restrictions on banks deemed systemically important by local supervisors.

These additional capital requirements are intended to provide a sufficient equity cushion to make these institutions more resilient and to internalize the social impact of their failure. The capital surcharges should make bailouts less likely by reducing the default probability of these banks. The surcharges also curb the incentives to grow too much because larger banks may face higher capital requirements. Critics argue that the surcharges are too low for these banks to survive a financial crisis similar to that of 2007–09 (Passmore and von Hafften 2017).

During the global financial crisis, the high reliance on wholesale short-term funding by financial institutions caused a series of

FIGURE 2.4 New Rules for Systemically Important Banks



Source: Bank Regulation and Supervision Survey (BRSS), wave 5, <https://www.worldbank.org/en/research/brief/BRSS>.

Note: This figure shows the number of countries (over the bars) as well as the percentage of countries (height of the bars) that have implemented new rules for systemically important banks.

liquidity problems. The dominance of short-term funding over longer-term, less volatile sources of funds (such as retail deposits or equity) also resulted in cross-border contagion (De Haas and Van Lelyveld 2014). The regulatory response, which was part of the Basel III reforms, was to introduce two new minimum liquidity standards: the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR). The LCR was designed to make banks more resilient to brief but severe liquidity shocks. The NSFR was designed to ensure that banks have sufficient stable funding sources to begin with in order to reduce the possibility of system-wide liquidity shortages. Although many theoretical banking models emphasize the complementarity between capital and liquidity (see, for example, Kashyap, Tsomocos, and Vardoulakis 2017), the introduction and application of new liquidity regulations have been more limited than that of capital regulations (figure 2.4).

Resolution Rules and Bail-In Debt Requirements

The bankruptcy in 2008 of the U.S. investment bank Lehman Brothers highlighted the many difficulties in resolving banks with global operations subject to regulatory oversight in different countries. In many countries, the resolution of failed smaller financial institutions is a straightforward process. For example, in the United States a small failed bank is typically taken into conservatorship by the Federal Deposit Insurance Corporation (FDIC), and then an agreement is negotiated with a healthy bank to assume the failed bank's assets and business operations. It is not uncommon for a failed bank to be shut down over a weekend and resume its business operations as a new bank the next week. Although this process is efficient and ensures confidence and stability in the system, it does not work well for large financial institutions and bank holding companies with multiple business lines and operations in dozens of countries subject to different types of regulatory oversight. It is also difficult to find healthy banks able to assume the operations

of a large financial institution in times of market distress.

An important component of new regulations aimed at improving systemic stability has therefore been to develop institutional rules and procedures to resolve large financial institutions without having a destabilizing effect on the financial system. In 2011 the FSB proposed 12 key attributes to serve as part of policy responses at the national level to resolve SIFIs (FSB 2014). The main goal has been to resolve these large financial institutions in an orderly manner without major disruptions of the financial system and the real economy, and without exposing taxpayers to a risk of loss. Most countries in which SIFIs are domiciled have introduced legislation to resolve these institutions consistent with FSB principles. Figure 2.5 shows the number and percentage of countries in each income group that have implemented new resolution schemes in response to the global financial crisis.

In the United States, the FDIC created a detailed plan to resolve SIFIs using a single point of entry (SPOE) approach. Under this scheme, the FDIC creates a bridge company and takes over a failed institution at the top bank holding company level, allowing different business lines such as insurance and investment banking arms, to continue their operations. The assets and some of the liabilities of the failed institutions are then transferred to the bridge company set up by the FDIC. The new company is capitalized by pre-issued bail-in debt. If more capital is needed and the new company is unable to raise funds in the market, then the FDIC would lend to the new company under its new powers under Title II of the Dodd-Frank Act.¹⁰

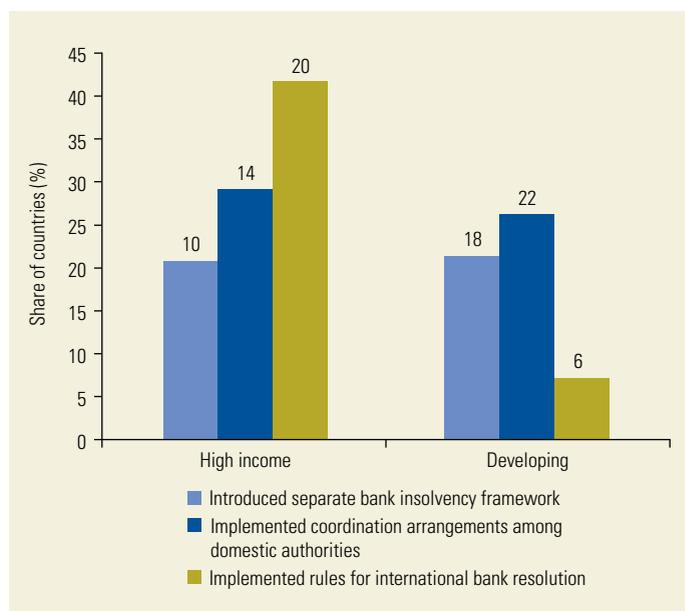
Under the SPOE scheme, supervisors can now assign losses to specific claimants of a failed institution, thereby significantly weakening market expectations of a bailout. Convincing bank creditors that their funds are truly at risk increases their incentives to monitor and discipline these institutions. As part of the Dodd-Frank Act, SIFIs are also required to submit resolution plans, so-called living wills, to the FDIC. These resolution plans

describe the institution's strategy for orderly resolution and liquidation in the event the institution fails. The reliability of these plans in a crisis, however, has not been tested.

The resolution framework implemented in the European Union (EU) and other countries is similar to the framework in the United States. The Bank Recovery and Resolution Directive (BRRD) was adopted in the spring of 2014 by the EU to provide plans to implement the core attributes outlined by the FSB and to create cooperation arrangements to tackle cross-border banking failures. Three main institutional differences characterize the FDIC and BRRD approaches. First, because there is no treasury in the EU's banking union, fiscal resources available at the time of resolution are limited. However, the Single Resolution Fund was set up in 2014 as part of the Single Resolution Mechanism to finance the resolution and restructuring of banks supervised by the European Central Bank (ECB).¹¹ The second difference is that in the EU, several different regulations and laws deal with resolution at the national level, making it difficult to have a unique resolution process. And, third, the FDIC relies on an SPOE at the holding company level, whereas BRRD is more flexible and allows for multiple points of entry at the subsidiary level.

Although most market participants agree that the new resolution policies have strengthened market discipline and reduced the likelihood of taxpayer funds being put at risk, some criticisms of the new resolution rules have emerged.¹² First, some argue that the regulatory authorities, by explicitly defining systemically important institutions, are reinforcing the expectations of large financial institutions that they will receive support when they get into trouble.¹³ Indeed, there is some evidence that the designation of institutions as SIFIs has produced positive stock price reactions (Bongini, Neri, and Pelagatti 2015; Dewenter and Riddick 2018). Institutions may be incentivized to become SIFIs or large enough banks to qualify under the new resolution rules because the market would provide them with cheaper funding (Skeel 2010). However, some firms have tried to avoid the

FIGURE 2.5 New Resolution Rules for Systemically Important Banks



Source: Bank Regulation and Supervision Survey (BRSS), wave 5, <https://www.worldbank.org/en/research/brief/BRSS>.

Note: This figure shows the number of countries (over the bars) as well as the percentage of countries (height of the bars) that have implemented new resolution schemes for systemically important institutions in the aftermath of the global financial crisis.

SIFI designation. MetLife, for example, successfully sued to avoid the SIFI classification, and General Electric reorganized to become smaller in order to avoid the new resolution rules. Violon, Durant, and Toader (2017) show that a SIFI designation by the FSB has resulted in these banks expanding their balance sheets more slowly and has led to improvements in their leverage ratios.

A second criticism is that the new resolution policies give too much discretion to regulatory authorities. In the United States, for example, the FDIC could take alternative action that would unsettle creditors and put taxpayers at risk. Similarly, the ECB has considerable discretion in determining whether a bank is failing or likely to fail and whether it will be subject to resolution under the Single Resolution Mechanism (see box 2.3 for how various bank resolutions and liquidations are handled in the EU). Critics argue that a strengthened or modified bankruptcy code may work better for large, complex financial institutions.

BOX 2.3 Bank Resolution Cases: One Law with Different Applications by European Union Countries

The Bank Recovery and Resolution Directive (BRRD) is the legal framework for bank resolution in the European Union (EU), including bail-in-related directions. Since its inception, however, the BRRD has been subject to different applications, even under a common law in the EU. Although cases differ and come with important lessons, they indicate that, even with the recent reforms in the EU, it will be challenging to resolve or liquidate banks by imposing losses on shareholders and unsecured liability holders, especially because of conflicts of interest with national and political interests.

Andelskassen (2015, Denmark). The resolution of Andelskassen was the first application of the BRRD outside the euro area. Because there was not enough capital and bail-in debt to absorb the losses, uninsured depositors incurred losses (World Bank 2016).

BPE (2017, Spain). Banco Popular Español (BPE) was the first bank deemed failing or likely to fail by the European Central Bank in its role as a banking supervisor and the first resolution case under the Single Resolution Mechanism (SRM). In the resolution process, equity and other junior debt instruments (such as additional Tier 1 notes and other hybrid capital instruments) were wiped out, and the bank was sold to another Spanish bank, Santander. The process was a success, but the resolution nevertheless raised important questions. In particular, BPE had passed regulatory stress tests even under adverse scenarios in 2016 (*New York Times* 2017).

ABLV (2018, Latvia). ABLV, the third-largest bank in Latvia, was hit by a money-laundering scandal

and was considered as failing or likely to fail under the BRRD (Politico 2018). Under SRM it was decided that the continued operation of the bank was not in the public interest, and that a resolution process should not be implemented. ABLV and its Luxembourg subsidiary instead went through a liquidation process. This case illustrated that the liquidation of banks remains a possibility under the SRM if the resolution and continued operations of a bank are not in the public interest.

CCB (2018, Cyprus). Cyprus Cooperative Bank (CCB) was bailed out in 2013 using taxpayer funds, and the government continued to inject capital over the years. The BRRD may choose not to resolve banks if state aid is provided. This was the case for the CCB. The good assets of the bank (its performing loan portfolio) were eventually sold, and the government took over the bad assets (its nonperforming portfolio).

Veneto Banca and Banca Popolare di Vicenza (2017, Italy). These banks were also deemed failing or likely to fail under the SRM, but the SRM authorities decided not to resolve these banks. Instead, the Italian authorities took over the resolution process (see ECB 2018, 49–51). Italian taxpayer funds were spent before bail-in options were fully utilized. The two banks were eventually liquidated. This episode— together with the earlier “precautionary recapitalization” of Monte dei Paschi and the recent decision to bail out another small, nonsystemic Italian bank, Banca Carige— casts doubt on whether bail-in mechanisms from the EU’s single rule book will work in every EU jurisdiction.

A third criticism is that the Dodd-Frank Act strips the Federal Reserve Bank of much of its last-resort lending powers, limiting the Fed from lending money in situations like those faced in 2008 without explicit political authorization. Although this aspect of the act is intended to reduce market expectations of support for SIFIs, it politicizes a crisis response and can lead to worse outcomes if the law’s resolution mechanisms are inadequate.

Finally, the process of cross-border resolution remains a thorny issue. There is no clear jurisdiction rule on the power allocation between home and host resolution authorities. The lack of such a rule could prove to be an obstacle to effective global resolution because cross-border cooperation could become difficult during crises due to political sensitivities. As bail-in decisions will have distributional consequences across business

units, strong disagreements are likely to arise as decisions are made to determine which subsidiary is bailed in and which is not. When the cross-jurisdictional transfer required for a successful SPOE resolution is too large, regulators may prefer to ring-fence assets in their own jurisdiction and prevent the required transfers. In that case, the planned SPOE resolution could break down, leading to a disorderly liquidation or a tax-funded bailout. Under SPOE, local authorities would need credible guarantees from the consolidating authorities about the resources that would be available to them in case of resolution (Bolton and Oehmke 2018). According to Faia and Weder di Mauro (2015), under multiple point of entry (MPOE) and SPOE with noncooperative authorities, the costs for bail-in-able debt holders are higher than under cooperative SPOE regimes and ring-fencing. The authors also show that banks under those regimes have incentives to reduce their exposure in foreign assets. Work is still needed to identify critical functions to be preserved in resolution via living wills, agreeing on triggers for entry into resolution, coordination on legal issues such as statutory stays on payments, and the total loss-absorbing capacity (TLAC) distribution across home and host jurisdictions.

In November 2015, the Financial Stability Board issued new international standards on the TLAC in the resolution of SIFIs. These new TLAC requirements were issued to increase market discipline and to reduce the possibility of taxpayer funds being used to rescue large financial institutions (FSB 2015). According to the new standards, the TLAC should be made up of securities that can be written down or converted into equity when an SIFI is in distress. These securities can be capital instruments or unsecured debt that can be converted into equity. Because of the tax advantages, in most countries TLAC securities have been in the form of convertible bail-in bonds. The TLAC standard is 16 percent of risk-weighted assets starting in 2019, and it will increase to 18 percent in 2022. SIFIs located in emerging markets have until 2025 and 2028 to meet the same standards.

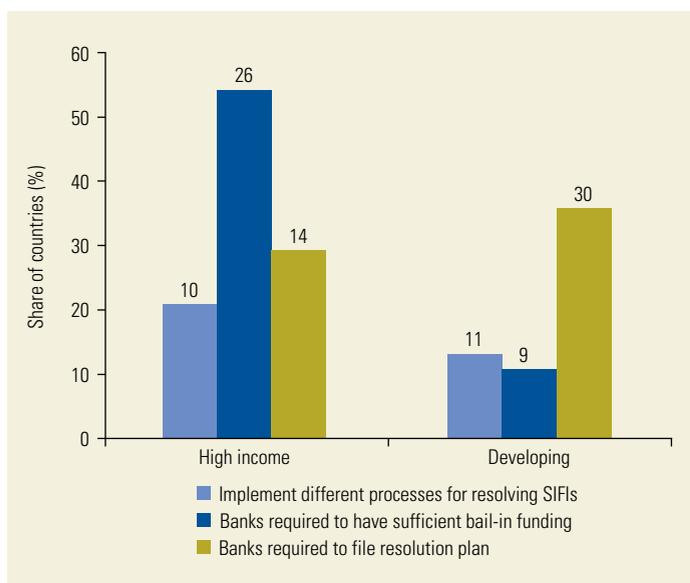
However, this period for emerging market SIFIs will shorten if over the next five years total corporate debt issuance exceeds 55 percent of a given country's GDP. The Single Resolution Board in the EU requires banks to meet a minimum requirement for own funds and eligible liabilities (MREL). This requirement increases the ability of banks to absorb losses and restore their capital position and continue to operate during the aftermath of a financial crisis.

The United States and the EU have statutory requirements that bail-in bondholders must absorb losses before any public money can be put into a troubled bank. If an SIFI were to fail, it would be recapitalized by its private sector long-term creditors using the bail-in bonds, with the idea that the orderly liquidation fund would be used only to provide liquidity support, not to inject capital. In the event of a default, the debt claims would be converted into equity in an automatic process resembling what would typically happen in a Chapter 11 bankruptcy in the United States. Figure 2.6 shows the percentage and number of countries that have implemented requirements for bail-in funding based on the BRSS survey.

The bail-in bonds address two shortcomings of the regulatory regime that was in place before the global financial crisis. First, bail-in bonds provide additional capital to absorb losses, reducing the likelihood that a bank will default and must be liquidated. Second, bail-in bonds reduce the likelihood of a run by uninsured short-term liability holders by increasing the tranche of claims junior to them.

It is possible that, by imposing long-term debt requirements on SIFIs, the new TLAC rules will prompt these banks to increase their leverage, which in turn would increase the probability that they will fail. Critics suggest that SIFIs should instead hold more capital. Although it is more important to avoid default in the first place, it is also important to consider resolution in the event of a default. TLAC requirements, by providing a tranche of equity when a default occurs, give resolution authorities flexibility in creating a new

FIGURE 2.6 Requirements Implemented for Resolving Systemically Important Financial Institutions



Source: Bank Regulation and Supervision Survey (BRSS), wave 5, <https://www.worldbank.org/en/research/brief/BRSS>.

Note: This figure shows the number of countries (over the bars) as well as the percentage of countries (height of the bars) that have implemented different resolution schemes for systemically important financial institutions (SIFIs).

entity with capital to continue the operations of a failed bank.

The TLAC system puts bail-in bonds at the forefront for absorbing losses when an SIFI fails. If orderly liquidation works as envisioned by the new regulations, bank losses should be concentrated in bail-in bonds. By implication, other claimants, including some very sophisticated short-term investors, would be more protected by these resolution policies. These reforms therefore have implications for market discipline.

The main effect of bail-in bonds will be to shift monitoring incentives away from short-term liabilities toward longer-term subordinated bonds. Although this shift will reduce runs, as noted earlier, it will also eliminate the disciplinary effects provided by the threat of bank runs. Studies have suggested that short-term debt can reduce potential agency conflicts by exposing managers to more frequent monitoring by the market. Because short-term debt comes up for frequent renewal, a bank and its managers can be scrutinized by lenders and rating agencies before the debt of the

bank is rolled over (Rajan and Winton 1995; Hart and Moore 1998).

By contrast, bail-in bondholders would be more exposed to bank losses in the new regulatory regime and would be incentivized to monitor and discipline banks. Although such an outcome would benefit market discipline, the direct corrective action that these bail-in bondholders can take would be limited. Bail-in bonds would account only for a small portion of total liabilities, and their effect on the total cost of funding for banks would be small. At the same time, prices can act as a valuable signal to other debtholders and regulators about the riskiness of banks' assets. The net effect of the TLAC requirement on market discipline thus remains ambiguous.

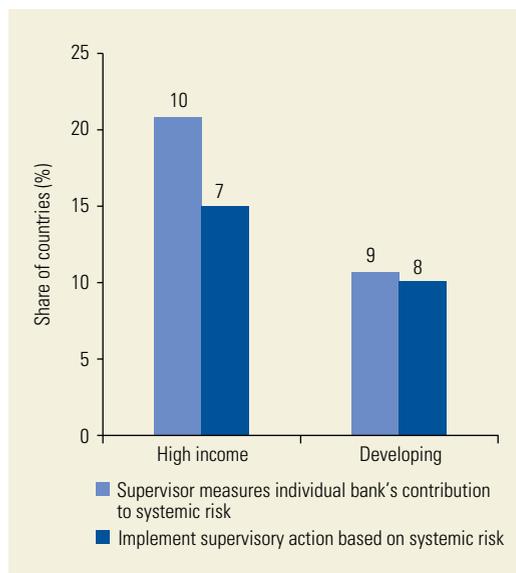
Finally, implementation of TLAC requirements in emerging markets that lack market depth can be challenging. China's four biggest banks (also the biggest in the world) would have to issue over US\$450 billion in bail-in bonds to meet the FSB's loss absorption buffer by 2025 (Bloomberg 2018). This amount is more than double the size of dollar bond issuance from all Chinese corporates last year.

Although some of the reforms just discussed (especially those targeting global systemically important financial institutions) may not apply locally in some developing countries, their implementation in other jurisdictions can have significant spillover effects.¹⁴ In particular, the implementation of reforms may result in a disproportionate tightening or reduction of international and cross-border financial activities in developing countries. A growing reliance on external credit ratings to calculate risk weights may also adversely affect firms in developing countries, which are less likely to be rated or have a verifiable credit history, thereby affecting the availability and cost of external long-term financing.

Macroprudential Rules and Governance Reforms

SIFIs are now subject to enhanced risk management and risk monitoring by supervisors. Figure 2.7 shows the percentage and number of countries in each income group where

FIGURE 2.7 Regulation of Systemic Risk in Systemically Important Financial Institutions



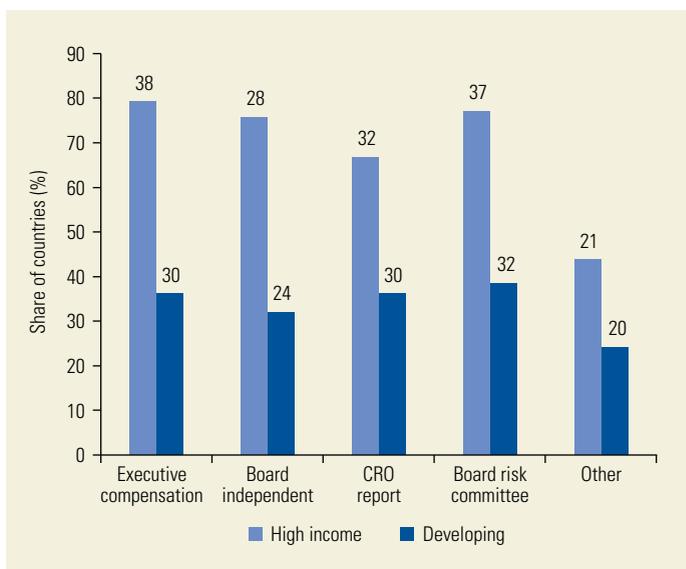
Source: Bank Regulation and Supervision Survey (BRSS), wave 5, <https://www.worldbank.org/en/research/brief/BRSS>.
 Note: This figure shows the number of countries (over the bars) as well as the percentage of countries (height of the bars) in each income group where supervisors explicitly measure and monitor an individual bank's contribution to systemic risk and whether they base supervisory actions on its contribution to systemic risk.

supervisors explicitly measure and monitor an individual bank's contribution to systemic risk. Although a significant percentage of countries take systemic risk into account, that translates into supervisory action for a smaller percentage of countries. As part of the enhanced supervision, most SIFIs are now required to conduct periodic stress tests. These stress tests examine an SIFI's financial response to hypothetical stress scenarios, such as macro shocks, deterioration of asset values, liquidity shortages, and credit defaults. The Federal Reserve under the Dodd-Frank Act in the United States and the European Banking Authority in the EU require SIFIs to engage in periodic stress tests. The stress tests are intended to identify weaknesses in SIFI funding and balance sheets so they can be corrected before problems become larger and spread to other banks. Many SIFIs are also required to establish risk committees to oversee a bank's risk management practices following guidelines set by the Basel Committee on Banking Supervision (BCBS 2015).

Ring-fencing of retail deposits and plain vanilla lending from riskier business lines are another form of SIFI regulation. In the United States, the so-called Volcker Rule limits deposit-taking banks from making risky investments.¹⁵ In the United Kingdom, the Vickers Rule states that financial institutions with deposits in excess of £25 billion are required to segregate those deposit-taking activities from affiliate risks and to restrict retail deposit-taking banks from transferring capital to affiliates.

The global financial crisis also prompted bank governance reforms. Figure 2.8 shows the number and percentage of countries in which the reforms of boards, executive compensation, and risk management processes have been implemented. Corporate governance has improved, but improving the corporate governance of banks—that benefit from a financial safety net when in distress—can backfire. The empirical work in this area suggests that better-governed banks will simply exploit the financial safety net, lowering their levels of capital and taking on more risk (see box 2.4).¹⁶

FIGURE 2.8 Governance Reforms in Banks



Source: Bank Regulation and Supervision Survey (BRSS), wave 5, <https://www.worldbank.org/en/research/brief/BRSS>.
 Note: This figure shows the number of countries (over the bars) as well as the percentage of countries (height of the bars) in each income group where supervisors implemented governance reforms after the global financial crisis. CRO = Chief Risk Officer.

BOX 2.4 Does Good Governance Lead to Financial Stability?

There was a reexamination of governance and compensation practices of banks after the global financial crisis. Some critics have argued that excessive short-term compensation and the failure of boards to monitor bank executives led directly to the crisis. Although this line of thinking seems intuitive, from a theoretical perspective it is not clear whether better governance would lead to higher risk-taking by executives at banks.

Shareholder-friendly governance better aligns the incentives of bank executives with those of their bank's shareholders. This alignment can lead to higher risk-taking, since the payoffs of shareholders are bounded at zero because of limited liability. Banks' shareholders also benefit from both implicit and explicit guarantees provided by the state. They thus have incentives to take on more risk and more correlated risk in order to exploit the financial safety net. Counterintuitively, it is the banks' executives who are less incentivized to take on excessive risk compared with shareholders. Unlike shareholders, who are likely to hold diversified stock portfolios, executives tend to have their jobs, reputations, and a substantial portion of their personal wealth tied to the performance and health of their firm.

In two papers, Anginer et al. (2016, 2018) examine how CEO compensation and corporate governance are related to the capital and risk-taking policies of financial institutions. They find that shareholder-friendly governance leads to lower capitalization levels and greater stand-alone and systemic risk-taking, especially for larger banks, which tend to benefit more from implicit government guarantees.

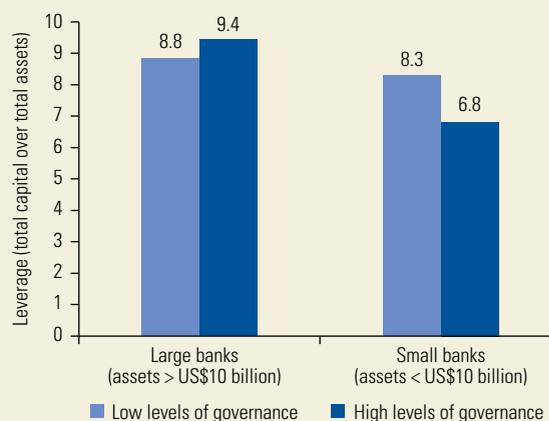
In their paper "Corporate Governance and Bank Capitalization Strategies," the authors show that, for an international sample of banks over the period 2003–11, shareholder-friendly corporate governance—in the form of separation of the CEO and chairman of the board roles, intermediate board size, and an absence of anti-takeover provisions—is associated with lower bank capitalization. The authors also examine the share issuance, repurchase, and dividend payout decisions of banks after they experience a negative income shock. Banks with shareholder-friendly corporate governance are more likely to continue to make payouts to bank share-

holders in the form of dividends and share repurchases after experiencing a major negative income shock. These payouts lead to even lower bank capitalization.

In their second paper, "Corporate Governance of Banks and Financial Stability," the authors examine the relationship between shareholder-friendly corporate governance and the risk-taking behavior of banks. The authors use both stand-alone and correlated risk-taking measures. They find that high levels of shareholder-friendly corporate governance are associated with greater stand-alone and systemic risks for financial institutions compared with that of nonfinancial firms. This finding is consistent with the notion that banks benefit more than nonfinancial firms from financial safety nets.

Anginer et al. (2018) also find that shareholder-friendly corporate governance is associated with greater risk-taking by large banks than small banks. They attribute this finding to market expectations of support for large financial institutions, with larger banks benefiting more from implicit too-big-to-fail guarantees. Figure B2.4.1 illustrates one of the

FIGURE B2.4.1 Corporate Governance of Banks and Leverage



Source: Institutional Shareholder Services and Compustat Global.

Note: Leverage is market leverage computed by dividing the sum of the market value of equity and the book value of liabilities by the market value of equity. Bank size is based on the book value of total assets. The governance measure is based on 44 individual governance attributes related to board size and composition, compensation and ownership, external auditing, and antitakeover measures, available from the Corporate Governance Quotient database assembled by Institutional Shareholder Services (see Anginer et al. 2018 for details). The sample includes international publicly traded banks over 2004–08.

(box continued next page)

BOX 2.4 Does Good Governance Lead to Financial Stability? *(continued)*

findings in the paper. For smaller banks with assets of less than US\$10 billion, high levels of corporate governance are associated with lower levels of leverage. For larger banks with assets greater than US\$10 billion, however, high levels of governance lead to higher leverage. This finding is consistent with the notion that larger banks benefit more from implicit state guarantees, and shareholder-friendly governance leads to greater risk-taking and shifting in the form of higher leverage.

Both papers have important policy implications. In a world with mispriced financial safety nets and too-big-to-fail policies, shareholder-friendly governance that better aligns managerial incentives with shareholder interests may exacerbate the excessive risk-taking resulting from bank shareholders' incentives to exploit implicit and explicit state guarantees. The authors argue that the first priority should be to address moral hazard issues that result from too-big-to-fail policies.

The macroprudential regulations that have been implemented are not without problems. Critics argue that most of the new regulations focus primarily on regulating banks and other systemically important financial institutions. This entity-focused approach may prove to be

too narrow, ignoring other critical elements of the system such as financial markets (Gorton 2009) and the growing importance of fintech and nonfinancial institutions (Buchak et al. 2018; Claessens et al. 2018) in the provision of financial services (see box 2.5). The

BOX 2.5 Shadow Banking in China

The growing importance of the shadow-banking system in China prompted authorities to respond with stricter regulations. Over the past several years, rules and regulations aimed at stabilizing credit growth and safeguarding the financial system have led to the creation of new types of assets around the regulatory perimeter, with commercial banks shifting lending to their investment books (through collaborations with insurance, trust, and securities companies) or off their balance sheets (through bankers' acceptances and entrusted loan arrangements). Although some of these new financial instruments were financed through proceeds from wealth management and trust products, they do not in practice shield financial intermediaries from credit risks. Though these practices can be seen as market-driven responses to credit shortages, they have been increasingly placed under regulatory scrutiny as less visible channels of risk transmission proliferated.

As figure B2.5.1 illustrates, during China's recent decade of rapid credit expansion, different types of

financial instruments experienced surges in their utilization, which were followed by periods of relative cooldown and substitution into other shadow financing vehicles as a result of tightening of regulations.

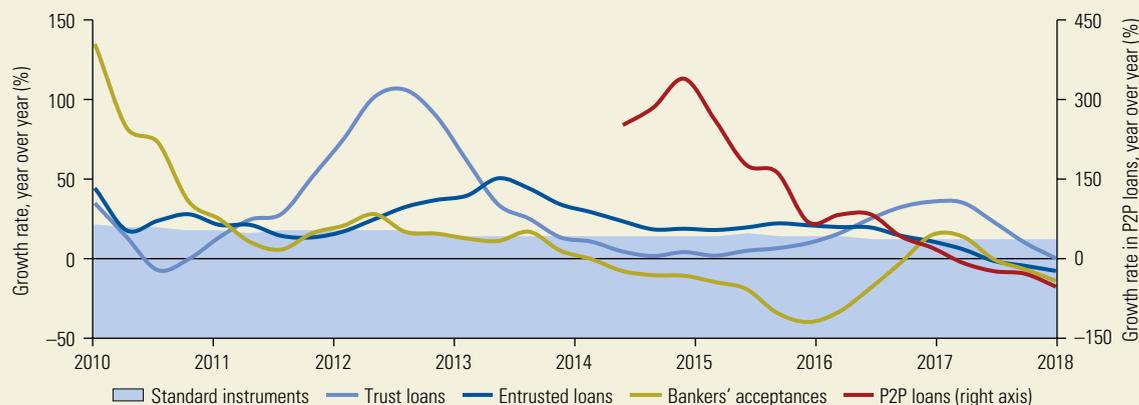
Bankers' acceptances were intended to be a short-term liquidity instrument for trading companies, but were frequently discounted in secondary markets before maturity. They were the most prominent type of nonstandard credit vehicles, although their importance seemed to wane after the China Banking Regulation Commission (CBRC) issued new standards on bank liquidity management in February 2010.

A growing amount of loans were then extended by the less-regulated trust companies, which received financing from commercial banks and insurance companies channeling funding from off-balance-sheet wealth management products (WMPs) as China prepared for the transition to the Basel II capital rules. In March 2013, CBRC announced new bank WMP rules, tightening practices for investment management and information disclosure. A separate

(box continued next page)

BOX 2.5 Shadow Banking in China (continued)

FIGURE B2.5.1 Substitution across Allocative Instruments in China



Source: World Bank staff calculations based on statistics from People's Bank of China and Wangdaizhijia, a peer-to-peer (P2P) aggregation portal.
 Note: The term "standard instruments" refers to borrowings by nonfinancial companies through bank loans and corporate bonds.

department was also formed within CBRC in July 2014 to specialize in the supervision of WMPs.

In the meantime, banks accelerated their off-balance-sheet custodial business of entrusted lending to serve corporate customers in search of better yields. Such loans benefited (as did WMPs) from a perception of an implicit guarantee, especially when they were intermediated by the larger state-owned banks, despite the fact that the originating trustors were the legal holders of the credit risks. In January 2015, CBRC formalized the rules on entrusted loans, preventing their proceeds from being invested in WMPs, bonds, and equities, and no longer allowing firms to lend on existing bank loans.

Peer-to-peer (P2P) lending and third-party payment platforms began their drastic expansion in 2014. Despite the small base volumes, such practices promised convenience and high returns, and they exposed a growing number of households and corporates to underregulated financial risks. Supervisory oversight in the area has tightened since July 2015, with an emphasis on strengthening financial management, information disclosure, cybersecurity, and the illicit financing safeguards associated with Internet finance.

These episodes seem to suggest two general lessons on the regulatory approach of shadow

banking. First, because shadow-banking activities often operate across the supervisory domains for banks, nonbank financial institutions, financial markets, and payment systems, interagency collaboration is often needed to formulate coherent strategies for containing systemic risks. In August 2013, the People's Bank of China was asked to organize coordination conferences on financial regulations by convening banking, insurance, and securities regulators. This arrangement influenced the development of the macroprudential assessment framework implemented in 2016 and was further elevated in July 2017 to become the Financial Stability and Development Committee for determining major plans for financial reforms.

Second, even though gaps and overlaps in regulatory policies can be identified and reduced, it is important to recognize that shadow banking may be driven by broader distortions in the main banking system. The gradual liberalization of lending and deposit interest rates from July 2013 to October 2015 promoted the market's role in determining prices for allocating financial resources. The lifting of a 75 percent cap on bank loan-to-deposit limits in June 2015 also reduced the pressure for credit to flow through nonstandard channels.

extensive and ever-growing regulations also place an undue burden on community banks, putting them at a competitive disadvantage and leading to regulatory arbitrage as non-bank entities enter the market.¹⁷

The reforms just described have been widely adopted and have succeeded, but many issues remain. SIFIs are better capitalized and financially sounder than they were

in 2007. On the bright side, the overall riskiness of the banking sector as measured by the Z-score has improved since the global financial crisis, especially in high-income countries (figure 2.9, panel a). De-leveraging and de-risking have resulted in lower liquidity creation, as evidenced by a decline in the loan-to-deposit ratio (figure 2.9, panel b). However, some balance sheet issues remain.

FIGURE 2.9 Bank Riskiness, Impaired Loans, and Provisions before and after the Global Financial Crisis, by Country Income Group



Sources: Global Finance Development Database (World Bank) and World Bank staff calculations.

Note: Bank Z-scores capture the probability of default of a country’s banking system. The Z-score compares the buffer of a country’s banking system (capitalization and returns) with the volatility of those returns. It is estimated as $(ROA + (equity/assets)) / sd(ROA)$, where $sd(ROA)$ is the standard deviation of return on assets (ROA).

Nonperforming loans remain at elevated levels (figure 2.9, panel c). The banks are also underprovisioned for nonperforming loans (figure 2.9, panel d), which puts them at significant risk should a new crisis occur.

POLICY RECOMMENDATIONS

Market discipline has been one of the three pillars of Basel capital regulations and has been recognized by policy makers as an important component of their regulatory frameworks. The global financial crisis exposed important limitations of market discipline and cast doubt on its effectiveness as a prudential tool to rein in excessive risk-taking by banks. Many critics have expressed skepticism at the ability of the private market to identify risks and monitor financial institutions.¹⁸ However, the reason market discipline has not succeeded in reining in risk is not because of private market failure but because of structural impediments such as the presence of implicit guarantees creating moral hazard and the informational asymmetries inherent in financial intermediation, which impeded bank creditors from effectively monitoring and influencing banks.

As emphasized throughout this chapter, incentives are the most important component of market discipline. Market participants must have “skin in the game” to effectively monitor and influence risk-taking. This requires insolvent banks to fail and to be liquidated in an orderly fashion and bank investors and depositors to share in the losses. Recent reforms requiring SIFIs to hold more capital and bail-in debt and new rules for resolution and orderly liquidation are steps in the right direction for putting in place the right set of incentives going forward. These reforms have been widely adopted and have succeeded, but some key policy issues remain. In particular, how cross-border resolution will be implemented and how bail-in funds will be shared between host and home country supervisors remain uncertain. It is also not clear whether bail-in funds will be enough to capitalize bridge banks during resolution to avoid placing taxpayer funds at risk. Finally, it is difficult to quantify the long-term effects of

widespread bailouts and blanket guarantees on moral hazard and market discipline.

For developing countries, the principle of proportionality must be kept in mind when implementing policies designed to enhance market discipline. Because developing countries tend to be in the earlier stages of economic and financial sector development, they may lack market depth and scale and may face institutional capacity constraints. For example, the ability of banks to issue bail-in debt depends on the availability of a liquid secondary market to support such issuance. Similarly, some of the recent macroprudential regulations discussed earlier were designed for a more sophisticated banking sector. Social objectives and capacity constraints must be kept in mind in order to avoid placing an undue burden on banks with simple balance sheets that engage in plain vanilla lending and financial intermediation.

Capital regulations are a very important part of getting the incentives right because having more resources at risk curtails excessive risk-taking by shareholders. There is also evidence that capital can substitute for supervision and regulation (Anginer, Demirgüç-Kunt, and Mare 2018), and higher capital requirements can prove to be a simpler and cheaper way of ensuring stability. Thus, chapter 3 covers issues surrounding bank capital regulation in greater depth.

NOTES

1. Although nonbank entities can be classified as SIFIs, this chapter will focus on banks. Later in the chapter, we distinguish between global systemically important banks (G-SIBs) and domestic systemically important banks (D-SIBs).
2. BCBS made a number of revisions to the Pillar 3 framework in the aftermath of the global financial crisis in order to enhance bank disclosure (<https://www.bis.org/bcbs/publ/d432.htm>).
3. BCBS (1998) reports the following: “Market discipline, however, can only work if market participants have access to timely and reliable information which enables them to assess a bank’s activities and the risks inherent in those activities. Proved public disclosure

- strengthens market participants' ability to encourage safe and sound banking practices.”
4. Icesave is a controversial example. In 2008, Icelandic authorities decided to honor deposit insurance only for domestic depositors, and not for the foreign depositors from whom Landsbanki, a bankrupt Icelandic bank, had collected deposits through its online branch, Icesave. Eventually, the losses of foreign depositors were covered by the British (fully) and Dutch governments (up to €100,000), which hold claims on Landsbanki receivership (Zeissler, Piontek, and Metrick 2014).
 5. See, for example, Demirgüç-Kunt and Detragiache (2002); Angkinand and Wihlborg (2008); and Cull, Senbet, and Sorge (2005), among others.
 6. Insolvent banks have incentives to take on excessive risks, which result in negative externalities and raise the economic costs of resolution later on (Pyle 1986; Lucas and McDonald 2006).
 7. Some of these guarantees were applied to specific financial institutions, such as specific guarantees provided to the later-nationalized Dexia by the Luxembourg and Belgian governments (Laeven and Valencia 2018).
 8. The FSB was established after the G-20 London summit in 2009. It is a successor to the Financial Stability Forum, but with an expanded membership and a broader mandate.
 9. Methodologies vary. For example, Mauritius adds exposure to large groups as a fifth dimension and uses equal weights (Bank of Mauritius 2016), whereas Pakistan focuses on bank size (exposure) by setting a 3 percent of GDP threshold and having higher weights for the size-related indicator.
 10. The Dodd–Frank Wall Street Reform and Consumer Protection Act was signed into law July 21, 2010.
 11. The Single Resolution Fund is built up over time with contributions from individual banks in EU member states participating in the banking union. The target size of the fund, however, is expected to be small or about 1 percent of the covered deposits of all banks in EU member states.
 12. Indeed, there is some recent empirical evidence showing the market perception of government support is reduced (see, for example, FSB 2018b). However, the estimate of government support tends to be countercyclical (low during good times, high during bad times), and it is very difficult to disentangle default probabilities from the likelihood of government intervention when the default probabilities are low; see Borio, Furfine, and Lowe (2001) and Siegert and Willison (2015).
 13. The implicit nature of the too-big-to-fail guarantees implies that the possibility of a bailout may exist in theory but not reliably in practice. The U.S. government had a long-standing policy of “constructive ambiguity” (Freixas 1999; Mishkin 1999) designed to encourage that uncertainty.
 14. Briault et al. (2018) report results from a survey of regulators in developing countries on the impacts of the FSB reforms discussed in this section on their banking sectors. Overall, the survey suggests that developing country regulators expect the reforms to be beneficial in the long term but also expect negative spillover costs in the short term.
 15. The Volcker Rule has undergone changes over the years and has been challenged in the courts (*Wall Street Journal* 2018).
 16. See, for example, Anginer et al. (2016 and 2018).
 17. There is also some empirical evidence that fintech firms' activities can also be used to circumvent macroprudential regulation; see, for example, Braggion, Manconi, and Zhu (2018) for the Chinese case.
 18. Although there have been some instances of market participants failing ahead of a crisis to sufficiently monitor or react to curb banks' risk-taking behavior because of procyclical and incomplete information, there have been also many cases in which shareholders have actively encouraged banks to take on greater risks in order to match or exceed the performance of their peers.