World Economic and Financial Surveys

Global Financial Stability Report

Fostering Stability in a Low-Growth, Low-Rate Era

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Editor's Note (October 3, 2016)

This version of the GFSR has been updated to reflect the following changes to the print version:
- On page 11 (Figure 1.9, panel 1), the data and x-axis years have been corrected.
- On page 24 (first sentence of the last paragraph), "Chapter 2 of the October 2015 GFSR" has been corrected to "Chapter 3 of the April 2016 GFSR."
- On page 46 (last sentence of the last paragraph), "3.5 percent" has been corrected to "about 3 percent relative to the baseline."

ASSUMPTIONS AND CONVENTIONS

The following conventions are used throughout the *Global Financial Stability Report* (GFSR):

. . . to indicate that data are not available or not applicable;

— to indicate that the figure is zero or less than half the final digit shown or that the item does not exist;

– between years or months (for example, 2015–16 or January–June) to indicate the years or months covered, including the beginning and ending years or months;

/ between years or months (for example, 2015/16) to indicate a fiscal or financial year.

"Billion" means a thousand million.

"Trillion" means a thousand billion.

"Basis points" refers to hundredths of 1 percentage point (for example, 25 basis points are equivalent to ¼ of 1 percentage point).

If no source is listed on tables and figures, data are based on IMF staff estimates or calculations.

Minor discrepancies between sums of constituent figures and totals shown reflect rounding.

As used in this report, the terms "country" and "economy" do not in all cases refer to a territorial entity that is a state as understood by international law and practice. As used here, the term also covers some territorial entities that are not states but for which statistical data are maintained on a separate and independent basis.

FURTHER INFORMATION AND DATA

This version of the GFSR is available in full through the IMF eLibrary (www.elibrary.imf.org) and the IMF website (www.imf.org).

The data and analysis appearing in the GFSR are compiled by the IMF staff at the time of publication. Every effort is made to ensure, but not guarantee, their timeliness, accuracy, and completeness. When errors are discovered, there is a concerted effort to correct them as appropriate and feasible. Corrections and revisions made after publication are incorporated into the electronic editions available from the IMF eLibrary (www.elibrary.imf.org) and on the IMF website (www.imf.org). All substantive changes are listed in detail in the online tables of contents.

PREFACE

The *Global Financial Stability Report* (GFSR) assesses key risks facing the global financial system. In normal times, the report seeks to play a role in preventing crises by highlighting policies that may mitigate systemic risks, thereby contributing to global financial stability and the sustained economic growth of the IMF's member countries.

The current report finds that short-term risks to global financial stability have abated since April 2016. The rise of commodity prices from their lows, along with the ongoing adjustments in emerging markets, has supported a recovery in capital flows. In advanced economies, weaker growth has been mitigated by the prospect of further monetary accommodation. Despite this decrease in short-term risk, the report finds that medium-term risks continue to build. The political climate is unsettled in many countries, making it more difficult to tackle legacy problems. Financial institutions in advanced economies face a number of structural and cyclical challenges. Corporate leverage in many emerging market economies remains high and would fall only gradually under the report's baseline scenario. Policymakers need a more potent and balanced policy mix to deliver a stronger path for growth and financial stability. There is an urgent need to raise global growth, strengthen the foundations of the global financial system, and bolster confidence. The report also examines how the rise of nonbank financing has altered the impact of monetary policy and finds that the fears of a decline in the effectiveness of monetary policy are unfounded. It appears that the transmission of monetary policy is in fact stronger in economies with larger nonbank financial sectors. Finally, the report examines the link between corporate governance, investor protection, and financial stability in emerging market economies. It finds that the improvements over the past two decades have helped bolster the resilience of their financial systems. These benefits strengthen the case for further reform.

The analysis in this report has been coordinated by the Monetary and Capital Markets (MCM) Department under the general direction of Ratna Sahay, Acting Director. The project has been directed by Peter Dattels and Dong He, both Deputy Directors, as well as by Gaston Gelos and Matthew Jones, both Division Chiefs. It has benefited from comments and suggestions from the senior staff in the MCM Department.

Individual contributors to the report are Ali Al-Eyd, Adrian Alter, Nicolás Arregui, Mohamed Bakoush, Luis Brandão-Marques, John Caparusso, Stephen Cecchetti, Sally Chen, Yingyuan Chen, Fabio Cortes, Cristina Cuervo, Martin Edmonds, Selim Elekdag, Jennifer Elliott, Michaela Erbenova, Alan Xiaochen Feng, Caio Ferreira, Rohit Goel, Lucyna Gornicka, Xinhao Han, Thomas Harjes, Sanjay Hazarika, Geoffrey Heenan, Dyna Heng, Eija Holttinen, Henry Hoyle, Hibiki Ichiue, Viacheslav Ilin, Mustafa Jamal, Andy Jobst, David Jones, Oksana Khadarina, Tak Yan Daniel Law, Yang Li, Peter Lindner, Nicolás Magud, Sherheryar Malik, Rebecca McCaughrin, Naoko Miake, Win Monroe, Machiko Narita, Evan Papageorgiou, Vladimir Pillonca, Lev Ratnovski, Luca Sanfilippo, Dulani Senevirante, Juan Solé, Ilan Solot, Garence Staraci, Nobuyasu Sugimoto, Narayan Suryakumar, Shamir Tanna, Laura Valderrama, Francis Vitek, Dmitry Yakovlev, Jeffrey Williams, Nicholas Wood, and Rasool Zandvakil. Magally Bernal, Carol Franco, Lilit Makaryan, Juan Rigat, and Adriana Rota were responsible for word processing.

Gemma Diaz from the Communications Department led the editorial team and managed the report's production with support from Michael Harrup, Linda Kean, and Joe Procopio, and editorial assistance from Lorraine Coffey, Gregg Forte, Susan Graham, Lucy Scott Morales, Nancy Morrison, Annerose Wambui Waithaka, Katy Whipple, AGS (an RR Donnelley Company), and EEI Communications.

We are thankful to the Research Department at Keefe, Bruyette & Woods (KBW) for insightful discussions and data support relating to the sensitivity of bank earnings to changes in interest rates. This particular issue of the GFSR draws in part on a series of discussions with banks, securities firms, asset management companies, hedge funds, standard setters, financial consultants, pension funds, central banks, national treasuries, and academic researchers.

This GFSR reflects information available as of September 19, 2016. The report benefited from comments and suggestions from staff in other IMF departments, as well as from Executive Directors following their discussion of the GFSR on September 23, 2016. However, the analysis and policy considerations are those of the contributing staff and should not be attributed to the IMF, its Executive Directors, or their national authorities.

EXECUTIVE SUMMARY

Short-Term Risks Have Abated

Short-term risks to global financial stability have abated since the April 2016 *Global Financial Stability Report* (GFSR). Commodity prices have risen from their lows earlier in the year, and ongoing adjustments in emerging markets have supported a recovery in capital flows. Immediate concerns over a slowdown in China have eased on the back of policy measures to shore up growth.

In advanced economies, weaker growth was mitigated by the prospect of further monetary accommodation, which supported asset prices and spurred some recovery in risk appetites. The shock of Brexit—the June 2016 U.K. referendum result in favor of leaving the European Union—initially roiled markets. Markets have subsequently adjusted smoothly to concerns about downside risks to the U.K. economy and potential spillovers.

Medium-Term Risks Have Risen

Despite lower short-term risks, medium-term risks are building. The continued slowdown in global growth has prompted financial markets to expect an extended period of low inflation and low interest rates and an even longer delay in normalizing monetary policy. The political climate is unsettled in many countries. A lack of income growth and a rise in inequality have opened the door for populist, inward-looking policies. These developments make it even harder to tackle legacy problems, further expose economies and markets to shocks, and raise the risk of a gradual slide into economic and financial stagnation. In such a state, financial institutions struggle to sustain healthy balance sheets, which weakens economic growth and financial stability.

Financial institutions in advanced economies face a number of cyclical and structural challenges and need to adapt to this new era of low growth and low interest rates, as well as to an evolving market and regulatory environment. These are significant challenges that affect large parts of the financial system, and if unaddressed could undermine financial soundness.

- Weak profitability could erode banks' buffers over time and undermine their ability to support growth. This report finds that a cyclical recovery will not resolve the problem of low profitability. Over 25 percent of banks in advanced economies (about $11.7 trillion in assets) would remain weak and face significant structural challenges. More deep-rooted reforms and systemic management are needed, especially for European banks. Japanese banks also face significant business model challenges. These banks are expanding abroad to offset thin margins and weak domestic demand, but this exposes them to greater dollar funding risks. A disruption of dollar funding sources could force Japanese banks to curtail their offshore lending and investment.
- The solvency of many life insurance companies and pension funds is threatened by a prolonged period of low interest rates. Low interest rates add to the legacy challenges facing many insurance companies and pension funds, along with those from aging populations and low or volatile asset returns. Heightened concern over these important long-term-saving and investment institutions could encourage even greater saving, adding to financial and economic stagnation pressures.

Emerging markets are also adapting to an environment of lower global growth, lower commodity prices, and reduced global trade. The current favorable external environment, including low interest rates and the global search for investment opportunities, presents an opportunity for overly indebted firms to restructure their balance sheets. Corporate leverage in many of these markets may be peaking, since firms have slashed investment in the wake of commodity price declines and slowing demand.

The challenge for many emerging market economies is to achieve a smooth deleveraging of weakened corporate balance sheets. Approximately 11 percent of corporate debt (over $400 billion) is held by firms with weak repayment capacity. Indebtedness declines only gradually under our baseline scenario, as high

debt levels and excess capacity make it difficult to grow out of the problem, leaving them sensitive to downside external or domestic developments. A disorderly adjustment is still possible if global risk premiums rise and earnings fall. Such a scenario would exhaust bank capital buffers in some emerging markets.

Continued rapid credit growth in China and expanding shadow banking products pose mounting risks to financial stability. The rapidly growing financial system is becoming increasingly leveraged and interconnected, and a variety of innovative investment vehicles and products are adding to the complexity. As discussed in the April 2016 GFSR, corporate debt-at-risk remains high, and underlying risks from nonloan credit exposures add to these challenges.

More Potent and Coordinated Policies Needed to Foster Stability

Policymakers need a more potent and balanced policy mix to deliver a stronger path for growth and financial stability. Financial markets have benefited from renewed risk appetite in the wake of unprecedented central bank actions. Although monetary accommodation is still needed to support the recovery, a more comprehensive set of policies would ease mounting burdens on central banks. Some monetary policies, such as negative interest rates, are reaching the limits of their effectiveness, and the medium-term side effects of low rates are rising for banks and other financial institutions. There is an urgent need to implement fiscal and structural policies to bolster confidence and raise global growth, and deploy macroprudential policies to strengthen the foundations of the global financial system. This could help to avoid slipping into a state of financial and economic stagnation. A financial stagnation and protectionist scenario could result in a loss of world output by about 3 percent through 2021.

A number of pressing global challenges must be addressed to ensure that the global financial system can continue to support the recovery and sustain hard-won resilience. Progress on the following fronts—together with a more balanced set of macroeconomic policies outlined in the October 2016 issues of the *World Economic Outlook* and the *Fiscal Monitor*—would help promote a virtuous cycle between financial markets and the real economy. The resolution of debt overhangs in an era of low nominal growth is also likely to require growth-friendly fiscal policies to support economic activity and create incentives for restructuring private debt, while facilitating the repair of banks' balance sheets.

Banks must adjust to this new environment of low growth and low interest rates by reducing large stocks of legacy problem loans, and rationalizing balance sheets and industry structures. This will require adjusting dated business models in order to maintain profitability, and adapting to new business realities and regulatory standards. In some cases, weak banks will have to exit and banking systems will have to shrink. This is important to ensure that the remaining banks have sufficient credit demand to foster a vibrant and healthy banking system that can grow and sustain its strengthened capital and liquidity buffers. Policymakers can help reduce uncertainty by completing the regulatory reform agenda, without significantly increasing overall capital requirements, while preserving the integrity of the capital framework.

- In the euro area, excessive nonperforming loans and structural drags on profitability require urgent and comprehensive action. Reducing nonperforming loans and addressing capital deficiencies at weak banks is a priority. Reforms that speed up asset recovery and facilitate smoother insolvency procedures would bring large benefits. For the euro area as a whole, the net capital impact from the sale of nonperforming loans would swing from a loss of about €80 billion to a gain of about €60 billion with such reforms. Enhancing operational efficiency through rationalizing branch networks, together with an improved funding mix and cost, could improve banks' overall expenses by about $40 billion.
- In Japan, intensified supervision is needed to ensure that banks maintain adequate profitability and healthy funding profiles to meet the demands of changing global regulatory standards.
- Regulatory uncertainty needs to be reduced and procyclical outcomes avoided. The Basel III capital adequacy framework was a key plank of the postcrisis reform agenda and has led to enhanced resilience of banking systems following its phased-in implementation. The Regulatory Consistency Assessment Program, launched to monitor consistent implementation across countries, revealed excessive risk weight variability across banks using internal models. Addressing this material variabil-

ity to ensure the credibility of the risk-weighted framework and comparability of its outcomes is an integral part of the reform agenda. It is better to obtain agreement on a robust risk-weighted capital framework, even if the agreement takes more time, than to see the framework diluted or withdrawn to meet the challenging constraints of no further significant increase in overall capital requirements and the end-2016 deadline. Implementation may also have to be phased in over a longer period to avoid potentially procyclical consequences under the current circumstances.

- Shoring up life insurers and pension funds remains critical. Sustained low growth and low interest rates raise significant challenges for long-term investment and savings institutions such as life insurers and pension funds. Regulators and supervisors should act promptly to sustain the strength of insurance and pension fund balance sheets, including identifying medium-term insolvency risks and funding gaps, while enhancing the reform agenda to strengthen standards for internal models and capital frameworks and improve transparency.

Emerging market economies should take advantage of supportive external conditions to proactively monitor and address corporate vulnerabilities, particularly those arising from excess leverage and foreign exchange exposures. Actions are needed on three fronts: (1) managing the impact of corporate distress, through swift and transparent recognition of nonperforming loans and strengthening insolvency frameworks; (2) boosting oversight and response capacity through reforms to macroprudential and supervisory frameworks; and (3) ensuring continued access to international financial services, including through strengthened regulatory and supervisory regimes that help lower risk perceptions, including those supporting correspondent banking activity.

The Chinese authorities' latest reform efforts have led to more balanced growth and a greater role for market forces, improving the resilience of the Chinese economy and financial system. Nonetheless, China's corporate debt overhang and other growing financial sector vulnerabilities must be addressed promptly through a comprehensive approach to facilitate deleveraging and upgrade the supervisory framework. Curbing excessive credit growth, including in the form of riskier shadow credit products, and ensuring sound interbank funding structures would reduce the potential for system stress and spillovers.

Global institutions have a role to play in promoting inclusive growth and encouraging an open dialogue on globalization. Most countries would reap macroeconomic growth benefits from greater access by firms and individuals to banking services. Closing gender gaps in account usage and promoting diversity in the depositor base can have broader economic benefits while creating opportunities for the disadvantaged.

Monetary Policy Impact Changing, but Not Weakened by Growth in Nonbank Financing

A notable change in global financial markets in the past decade has been the rise of nonbank financial intermediaries such as asset managers, insurance companies, and pension funds. Although concerns have been voiced about a decline in the effectiveness of monetary policy given the growing role of nonbank financing, these fears appear to be unfounded. Indeed, Chapter 2 finds that, on average, monetary policy transmission seems to be stronger in economies with larger nonbank financial sectors. Nonbanks tend to contract their balance sheets even more than banks when monetary policy tightens—a behavior partly explained by the effect of monetary policy on risk taking.

Low interest rates have probably created the conditions for more risk taking by both bank and nonbank financial intermediaries. However, the conjunction of weak bank balance sheets and stronger bank regulation could mean that nonbanks now play a more important role in the transmission of monetary policy because the risk-taking channel of monetary policy has gained importance and asset managers have assumed a greater role in financial intermediation. As a result, the effects of monetary policy changes on the real economy may become more rapid and marked. This suggests the need for greater vigilance by prudential and regulatory authorities and for central banks to continuously recalibrate the dosage and timing of monetary policy actions as their impact and the speed of their transmission change—particularly in an environment characterized by new challenges to financial stability.

Given the growth of the nonbank financial sector, the information contained in the balance sheets of nonbanks is potentially at least as useful as traditional measures of monetary aggregates. In this context, improving data collection on nonbanks is essential.

Further Corporate Governance Reform in Emerging Market Economies Would Help Enhance Resilience to Shocks

Has institutional progress in emerging market economies—including corporate governance and investor protection—kept pace with their international financial integration in building their resilience to external shocks? Chapter 3 finds that corporate governance and investor protection have generally improved in emerging market economies over the past two decades. These improvements are visible both at the firm level and at the country level. Even so, there are important differences across emerging market economies, and there is room for further improvement.

The analysis shows that stronger corporate governance and investor protection frameworks enhance the resilience of emerging market economies to global financial shocks—an issue of particular importance in the new phase the global financial system is entering. For example, equity price declines in the wake of Brexit were relatively larger in emerging market economies with lower corporate governance standards. Corporate governance improvements enhance stock market efficiency and foster deeper and more liquid capital markets, allowing them to absorb shocks better. Emerging market economies with better corporate governance generally also have more resilient corporate balance sheets.

Policies to further bolster the rights of outside investors, especially minority shareholders; bring disclosure requirements fully in line with international best practice; and promote greater board independence are likely to yield financial stability benefits.

IMF EXECUTIVE BOARD DISCUSSION SUMMARY

The following remarks were made by the Chair at the conclusion of the Executive Board's discussion of the Fiscal Monitor, Global Financial Stability Report, *and* World Economic Outlook *on September 23, 2016.*

Executive Directors broadly shared the assessment of global economic prospects and risks. They observed that global growth is likely to remain modest this year, world trade growth is declining, and low inflation persists in many advanced economies. On the upside, commodity prices have firmed up, and financial market volatility following the U.K. vote to leave the European Union has generally been contained. Directors noted that, while global growth is expected to pick up somewhat next year, downside risks and uncertainty are elevated. The potential for another setback cannot be ruled out. Directors urged policymakers to employ all policy levers—individually and collectively—and enhance global cooperation, to avoid further growth disappointments, strengthen the foundations of the recovery, revive global trade, and ensure that the benefits of globalization are shared more broadly.

Directors noted that growth in advanced economies is projected to weaken this year and edge up slightly next year. Nevertheless, the overall outlook continues to be weighed down by remaining crisis legacy issues, persistently low inflation, weak demand, continued large external imbalances in some countries, low labor productivity growth, and population aging. At the same time, the full macroeconomic implications of the U.K. vote have yet to unfold. In emerging market and developing countries, growth is expected to strengthen gradually, on the back of improved external financing conditions, rising commodity prices, and a gradual stabilization in key economies currently in recession. Many countries have made steady progress in strengthening policy frameworks and resilience to shocks, and market sentiment has recently improved. Notwithstanding these positive developments, emerging market and developing economies remain exposed to spillovers from subdued growth in advanced economies, developments in China during its transition toward more sustainable growth, and volatility in capital flows and exchange rates, while domestic challenges remain to be addressed. Globally, concerns are growing about political discontent, income inequality, and populist policies, threatening to derail globalization.

Directors observed that, while financial markets have shown resilience to a number of shocks in the past six months, medium-term risks are rising. In advanced economies where weak growth calls for continued accommodative monetary policy, a prolonged period of low growth and low interest rates could add to banks' structural profitability challenges and put at risk the solvency of many life insurance companies and pension funds. These risks and challenges could, in turn, further weaken economic activity and financial stability more broadly. In many emerging market economies, high corporate leverage and the growing complexity of financial products continue to pose challenges.

Against this backdrop, Directors emphasized the urgent need for comprehensive, clearly articulated strategies—combining structural, macroeconomic, and financial policies—to lift actual and potential output, manage vulnerabilities, and enhance resilience. They recognized that the optimal policy mix will vary according to country contexts and the particular priorities. Directors also stressed that intensified multilateral cooperation is crucial to sustain global growth and improvements in living standards. Specifically, concerted efforts are needed to promote strong, sustainable, balanced, and inclusive growth; facilitate cross-border trade and investment flows; implement effective banking resolution frameworks; reduce policy uncertainty, including through clear communication; and sustain progress on global rebalancing. Strong global safety nets are also vital to deal with shocks, including those stemming from refugee flows, climate events, and domestic strife.

Directors broadly concurred that, in most advanced economies, policy action will need to continue to support demand in the short term and boost productivity

and potential output in the medium term. Continued monetary accommodation remains appropriate to lift inflation expectations, while being mindful of negative side effects, but monetary policy alone would not be sufficient for closing output gaps and achieving balanced and sustainable growth. Growth-friendly fiscal policy is therefore essential, calibrated to the amount of space available in each country while ensuring long-term debt sustainability, anchored in a credible medium-term framework. Sustained efforts to repair bank and corporate balance sheets would help improve the transmission of monetary policy to real activity, and proactive use of macroprudential policies would safeguard financial stability. Structural reforms need to be prioritized depending on country circumstances, with a focus on raising labor force participation rates, enhancing the efficiency of the labor market, reducing barriers to entry, and encouraging research and development. In the corporate sector, reforms should focus on eliminating debt overhangs, facilitating restructuring, and further improving governance.

Directors acknowledged that circumstances and challenges in emerging market and developing countries vary depending on their level of development and cyclical position. To achieve the common objective of converging to higher levels of income, structural reforms should focus on facilitating technology diffusion and job creation, and enhancing human capital. Directors encouraged taking advantage of the current relatively benign external financial conditions to press ahead with needed corporate deleveraging, through a comprehensive approach, where warranted. This should be complemented by continued efforts to strengthen financial sector oversight, upgrade regulatory and supervisory frameworks, and improve corporate governance practices. Directors stressed that a smooth adjustment in China's corporate and financial sectors is crucial for sustaining growth and stability in China and elsewhere.

Directors stressed the need for financial institutions, particularly in advanced economies, to adapt their business models to new realities and evolving regulatory standards. Greater vigilance by regulators and improved data collection on nonbank financial institutions are essential to preserve their financial health and monitor their role in monetary policy transmission. Policymakers can help reduce uncertainty by completing the regulatory reform agenda, without significantly increasing overall capital requirements, while preserving the integrity of a robust capital framework. Directors broadly agreed that, in countries facing a private sector debt overhang or where the financial system is seriously impaired but fiscal space is available, well-targeted fiscal measures—with the support of strong insolvency and bankruptcy procedures and safeguards to limit moral hazard—could help facilitate private debt restructuring. Many emerging market countries should continue to enhance resilience, including by curbing excessive private debt build-up and strengthening the government balance sheet in upturns.

Directors underscored that policy priorities in low-income countries are to address near-term macroeconomic challenges and make progress toward their Sustainable Development Goals. In commodity-dependent economies, building fiscal buffers will require increasing the contribution of the non-commodity sector to tax revenue, together with spending rationalization. For countries less dependent on commodities, countercyclical macroeconomic policies should be adopted where growth remains robust, and debt management practices strengthened to lower the impact of potential shifts in capital flows. More broadly, achieving robust, sustainable, and inclusive growth requires sustained efforts to diversify the economy, broaden the revenue base, improve the efficiency of government spending, and enhance financial deepening.

CHAPTER 1

FINANCIAL STABILITY CHALLENGES IN A LOW-GROWTH, LOW-RATE ERA

Financial Stability Overview

Short-term risks have moderated in the past six months as markets have shown resilience to a number of shocks. Pressures on emerging market assets have eased, helped by firmer commodity prices, reduced uncertainty about China's near-term prospects, and expectations of lower interest rates in advanced economies. But medium-term risks are rising in a new environment of increased political and policy uncertainty. Expectations for monetary normalization in advanced economies have shifted even further into the future, and weak growth and low interest rates are increasing the challenges for banks, insurers, and pension funds. Although most advanced economy bank balance sheets are robust, sustainable profitability is weak, reflecting unresolved legacy problems and bank business model challenges. Corporate leverage in many emerging market firms has peaked at high levels, and debt servicing capacity remains weak. These developments have complicated the outlook for attaining a more balanced and potent policy mix, and could lead to a prolonged era of economic and financial stagnation. Policymakers must take a more comprehensive and collaborative approach to protect and advance financial stability and inclusion and revitalize the global economy.

Short-Term Risks Are Abating

Short-term risks to global financial stability have moderated in the past six months (Figures 1.1 and 1.2). As noted in the October 2016 *World Economic Outlook* (WEO), the macroeconomic outlook has weakened modestly in advanced economies, leaving *macroeconomic risks* largely unchanged. Central banks have provided additional monetary stimulus in response to the subdued outlook for growth and inflation, which has eased *monetary and financial conditions*. Easier financial conditions have supported the recovery in *risk appetite* from the turmoil earlier in the year and the unexpected outcome of Brexit, the June 2016 U.K. referendum result in favor of leaving the European Union.

Emerging market risks have declined, led by a modest recovery in commodity prices and improved external financial conditions, fueling a pickup in capital flows. The economic outlook has improved for the recession-hit economies of Brazil and Russia, while supportive external conditions are providing an opportunity for a smooth deleveraging of firms in many emerging market economies. *Market and liquidity risks* are still elevated in an environment of extended positioning across major asset classes.

A key driver of short-term risks in the past six months was the Brexit vote (see Box 1.1), which caught investors by surprise and initially roiled global markets. The global financial system has been strengthened since the crisis, and the political shock was absorbed by markets:

- Despite the large adjustment in prices, markets managed high volumes well, without significant disruption, and no major disorderly events surfaced, other than a sharp sell-off in some U.K.-based real estate funds. Contingency plans and central bank communications helped underpin confidence in market functioning.
- New firewalls in the euro area, including the European Central Bank's asset purchase programs and other backstops, supported smooth market adjustment and prevented contagion.
- In contrast with past episodes of global turbulence, flows into emerging markets were resilient and have, in fact, increased since the referendum.

In the aftermath of the Brexit vote, markets quickly rebounded (Figure 1.3, panel 1). Equity markets in the United States rose to record levels, and the volatility of major asset classes dropped to levels below where they

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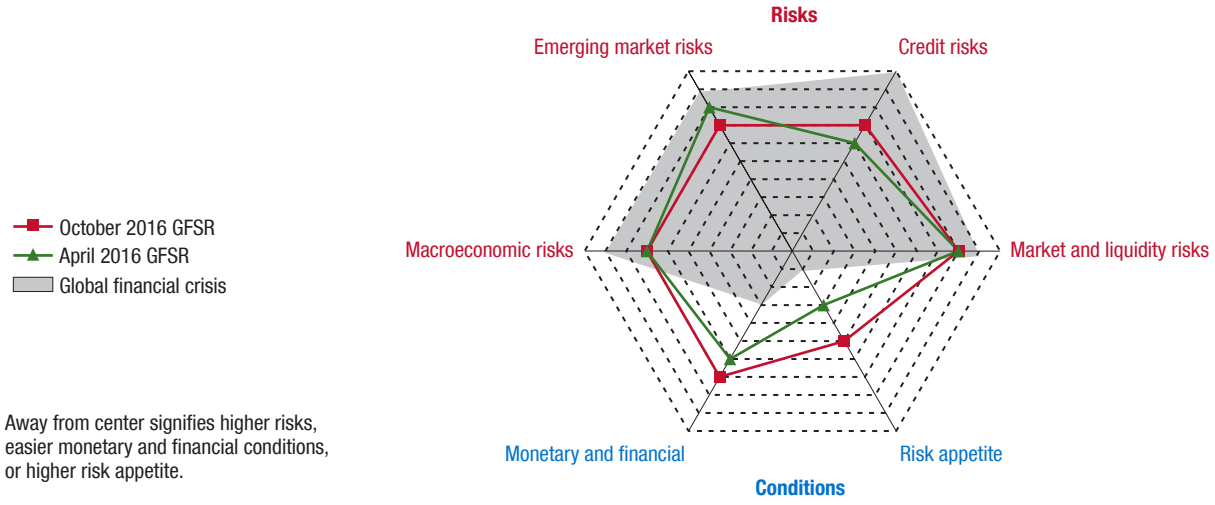
Figure 1.1. Global Financial Stability Map: Risks and Conditions



Source: IMF staff estimates.
Note: The shaded region shows the global financial crisis as reflected in the stability map of the April 2009 *Global Financial Stability Report* (GFSR).

were at the beginning of the year as markets passed this severe stress test.

Medium-Term Risks Are Rising

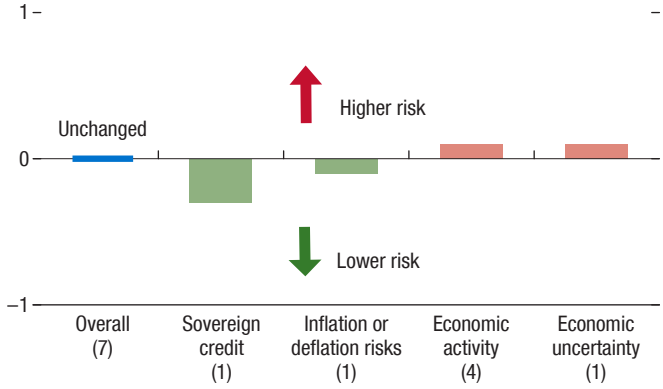
Despite lower short-term risks, medium-term risks are rising as policymakers grapple with a wide range of pre-existing vulnerabilities and new challenges. *Credit risks* are increasing as banks and insurance companies struggle to remain profitable in the low-growth, low-interest-rate environment. Challenges include rising side effects of prolonged monetary accommodation in advanced economies, still-elevated corporate leverage in many emerging market economies, and rising political risks.

- In advanced economies, the prolonged slowdown in global growth has prompted financial markets to expect an extended period of low inflation and low interest rates, with normalization of monetary policy delayed even further into the future. Although monetary accommodation has helped boost demand by encouraging consumption and investment, prolonged low interest rates may undermine financial resilience in the medium term. Banks and other financial institutions face greater structural challenges in maintaining and improving their capital and solvency ratios in this new era of very low interest rates. Indeed, bank equities continue to remain under pressure this year, reflecting investor concerns about their medium-term profitability (Figure 1.3, panel 2) in the wake of declining growth and interest rates.
- Furthermore, the transmission of monetary policy through asset prices and onto the real economy may be weakening, limiting monetary effectiveness. In the period following the global financial crisis in 2008, monetary accommodation helped boost global equity prices in roughly equal parts through strengthening expected corporate earnings, lowering equity risk premiums, and reducing interest rates on government bonds. More recently, however, global equity valuations appear increasingly supported by low yields as the earnings outlook has weakened and equity risk premiums have increased in a more uncertain environment (Figure 1.4).
- In emerging market economies, the challenge is to achieve a smooth deleveraging of weakened corporate balance sheets in a new environment of lower commodity prices, slower credit growth, and weaker external demand.
- Policy uncertainties are increasing, as the political climate is undergoing a sea change in many countries. Growing discontent about anemic income growth and rising inequality has opened the door for more populist, inward-looking policies. Economic policy uncertainty has spiked to its highest levels since 2011 in the United States and the European Union (Figure 1.5, panel 1). Reflecting increased concerns over a widening range of possible policy outcomes, the sensitivity of markets to policy uncertainty has risen to its highest level since 2009 (Figure 1.5, panel 2).

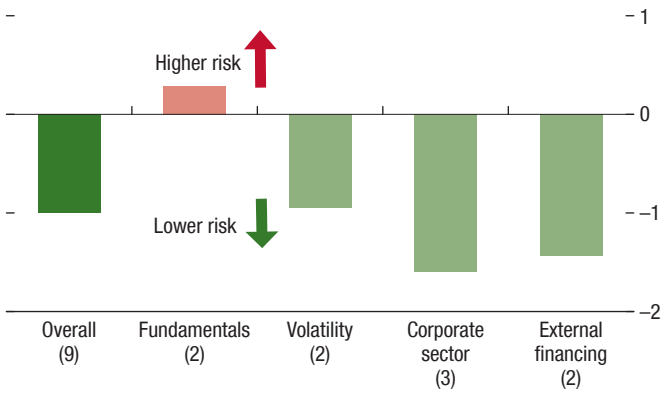
Figure 1.2. Global Financial Stability Map: Assessment of Risks and Conditions

(Notch changes since the April 2016 Global Financial Stability Report*)*

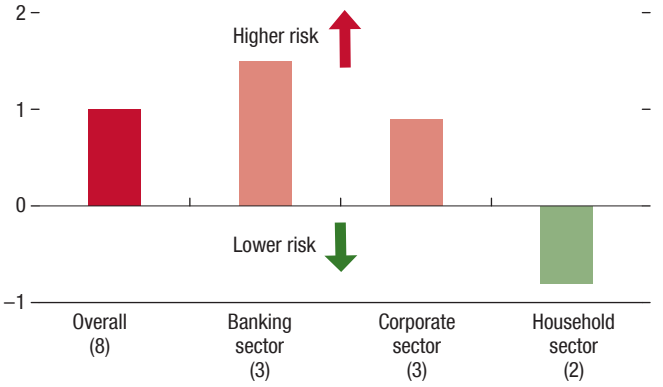
1. Macroeconomic risks are unchanged, as growth remains low but stable.



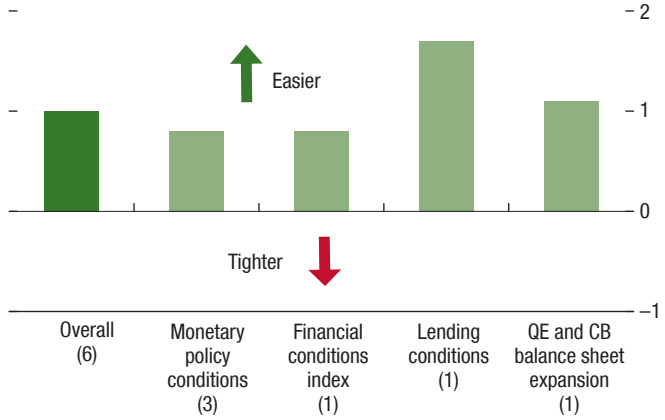
2. Emerging market risks are lower, reflecting benign market conditions and improving external imbalances.



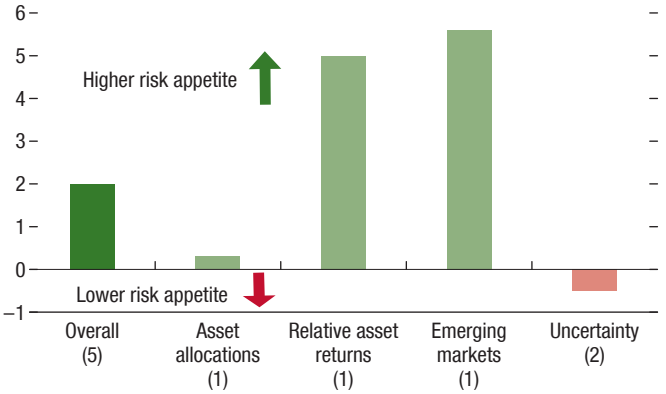
3. Credit risks are higher, driven by banking and corporate sector risks.



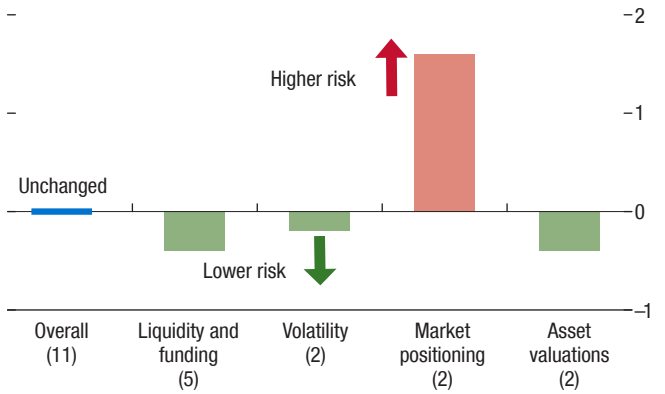
4. Monetary and financial conditions have improved as monetary policies and lending conditions became easier.



5. Risk appetite is higher as demand for risk assets increases.



6. Market and liquidity risks remain elevated, against the backdrop of extended positioning.



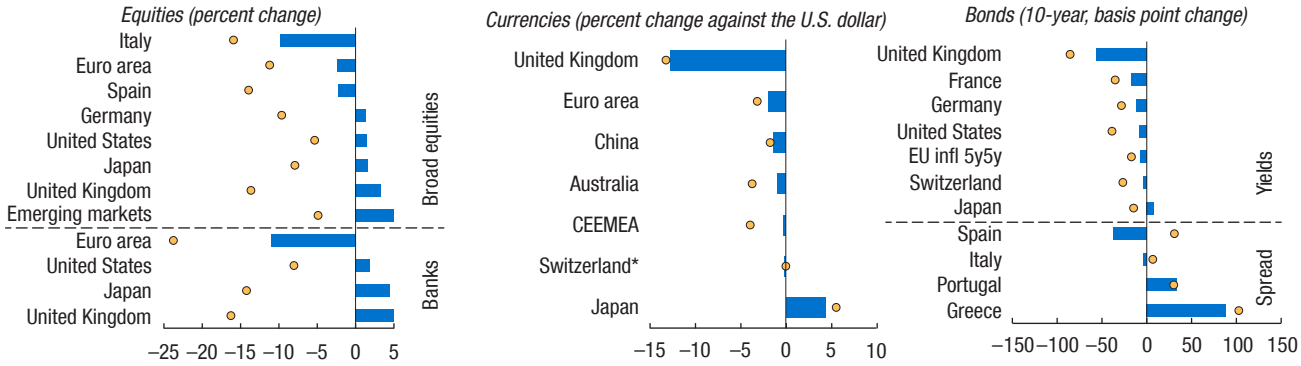
Source: IMF staff estimates.

Note: Changes in risks and conditions are based on a range of indicators, complemented with IMF staff judgment (see Annex 1.1 in the April 2010 *Global Financial Stability Report* and Dattels and others 2010 for a description of the methodology underlying the Global Financial Stability Map). Overall notch changes are the simple average of notch changes in individual indicators. The number in parentheses next to each category on the *x*-axis indicates the number of individual indicators within each subcategory of risks and conditions. For lending standards, positive values represent a slower pace of tightening or faster easing. CB = central bank; QE = quantitative easing.

Figure 1.3. Brexit's Impact on Financial Markets

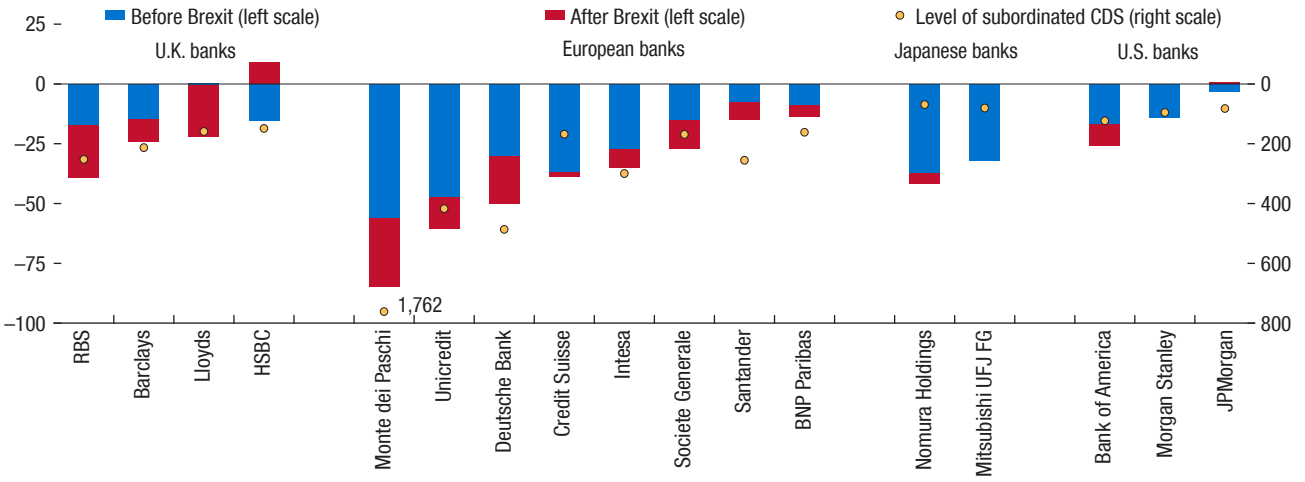
Global risk markets absorb Brexit shock and rebound.

1. Asset Market Performance after Brexit
(Bar indicates asset performance after Brexit; dot indicates largest move since Jun. 23, 2016 = Brexit)



Bank equities remain under pressure, especially in the euro area, extending year-to-date losses, reflecting underlying vulnerabilities, and weakening medium-term prospects.

2. Bank Equities and CDS Spreads
(Year-to-date changes; basis points)



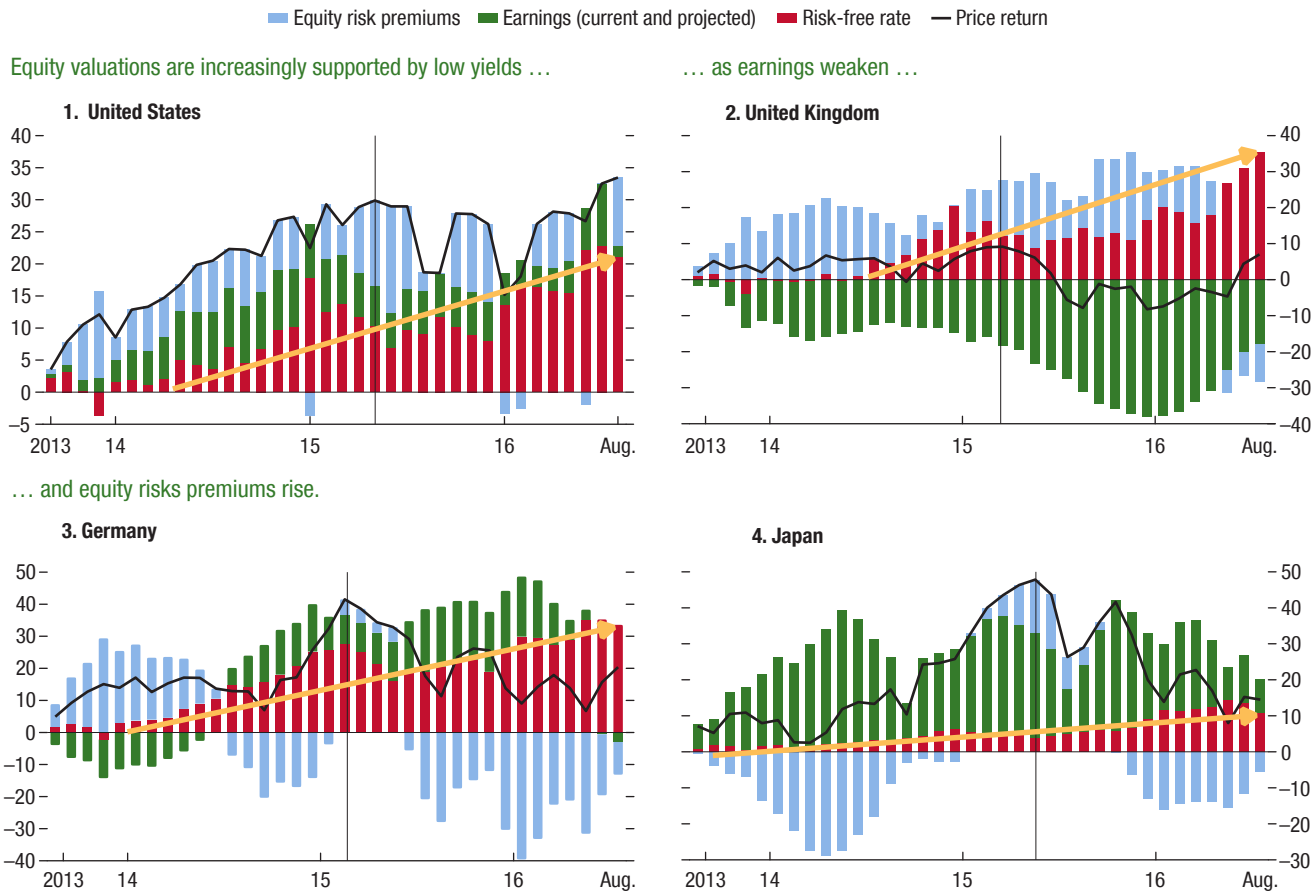
Sources: Bloomberg L.P.; Federal Reserve; Haver Analytics; and IMF staff estimates.
Note: In Panel 2, the positive values are below the zero line for the right scale. Brexit = June 2016 U.K. referendum result in favor of leaving the European Union; CDS = credit default swap; CEEMEA = central and eastern Europe, Middle East, and Africa; EU infl 5y5y = euro area inflation-linked bond, five year, five year forward.
* Against the euro.

These developments make tackling legacy problems even harder, further expose economies and markets to shocks, and present new challenges to financial stability.

Financial Institutions Face Strong Cyclical and Structural Challenges

Most banks in advanced economies now have stronger balance sheets, but they are struggling to show sustainable profitability. A combination of disinflationary pressures, flatter yield curves, legacy problems, regulatory uncertainty, and structural challenges to their business models have squeezed bank valuations, even as broad markets have recovered. Since the start of the year, the market capitalization of advanced economy banks has fallen by almost $430 billion, increasing the challenge of addressing banking system vulnerabilities, particularly for weaker European banks. Japanese banks also face significant business model challenges; with thin margins and little domestic demand, they are

Figure 1.4. Decomposition of Equity Market Performance
(Percent contribution to cumulative return since September 2013)



Sources: Deutsche Bundesbank; European Central Bank; Haver Analytics; Thomson Reuters I/B/E/S; and IMF staff calculations.
Note: Based on a standard three-stage dividend discount model.

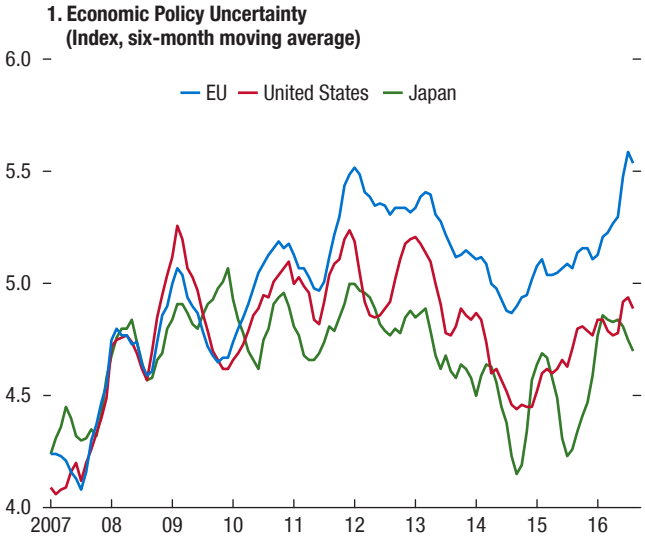
expanding abroad, but their dollar funding risks have increased as a result. Lower yields present significant challenges to insurers and pension funds that provide guaranteed returns and benefits. Together, these challenges could impair support from the financial system to the economic recovery, raising concern that financial stagnation could add to economic stagnation. These issues are examined in the section "Medium-Term Risks Rising."

The Favorable External Environment Supports Corporate Deleveraging in Emerging Markets

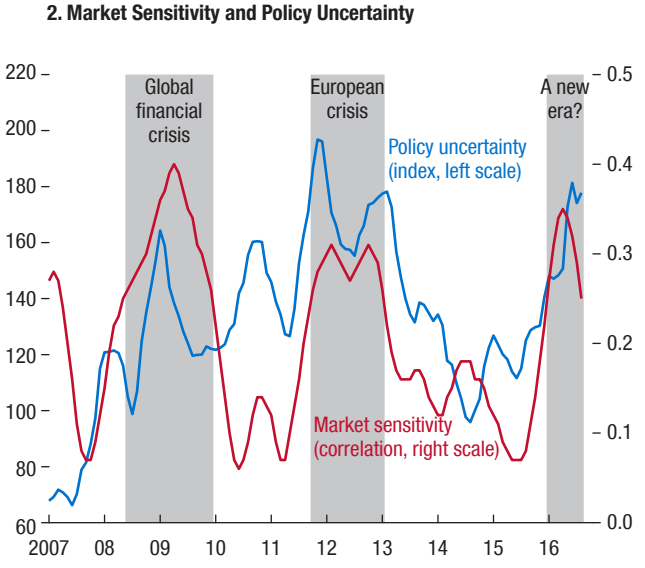
As flagged in previous issues of the *Global Financial Stability Report* (GFSR), corporate leverage (for example, debt-to-equity ratio) is high in some countries, and debt-servicing capacity has deteriorated in many emerging market economies. However, despite expectations of weak earnings for many emerging market companies, corporate bond yields have fallen sharply recently. This has been driven by lower bond yields in advanced economies and a recovery in risk appetite. These favorable external developments have improved prospects for smooth deleveraging of the corporate sector (where firms take advantage of supportive conditions to gradually reduce their debt) and have helped reduce short-term risks for emerging market economies. This GFSR explores good and disorderly scenarios for the corporate sectors in emerging market economies and some of the challenges that China faces in dealing with high credit growth in an increasingly complex financial system. These topics are discussed in the "Emerging Market Economies: A Smooth Deleveraging?" section of this report.

Figure 1.5. Policy Uncertainty

Policy uncertainty remains elevated ...



... while market sensitivity to policy uncertainty is also at the highest level since 2009.



Sources: Baker, Bloom, and Davis 2015; Bloomberg L.P.; and IMF staff estimates.
Note: Policy uncertainty is the six-month moving average of policy uncertainty measures for the European Union, Japan, and the United States. Market sensitivity is the six-month moving average correlation of policy uncertainty levels and the Chicago Board Options Exchange Volatility Index (VIX) in the United States and the Financial Times Stock Exchange (FTSE) 100 Index volatility in the United Kingdom.

Is the Global Financial System Moving Closer to Financial and Economic Stagnation?

The current environment of weak growth and low interest rates, elevated policy and political uncertainty, and growing structural impediments for banks is ushering in a new era of challenges and risks for the global financial system. Global financial markets have been dominated by political events since the April 2016 GFSR. The economic and financial fallout associated with the United Kingdom's eventual exit from the European Union and unpredictable political events in Europe, the United States, and some key emerging markets are adding to fears about these risks. More broadly, dissatisfaction resulting from economic hardships, stagnant growth, income and wealth inequality, and legacy burdens is further reducing political cohesion and policy consensus. More extreme political outcomes could lead to increased isolationism and a retreat from trade expansion, with repercussions for growth and financial stability. These prospects are explored in a downside scenario of *financial stagnation and protectionism*, in which financial institutions struggle to sustain healthy balance sheets, crippling economic growth and financial stability. This report concludes that policymakers must take a more comprehensive and collaborative stance to protect financial stability, advance financial inclusion, and revitalize the global economy to provide for a shared and secure future.

Medium-Term Risks Rising

Financial institutions face a number of cyclical and structural challenges as they adapt to a new environment of low growth, low interest rates, and a changed market and regulatory environment. These are significant challenges that affect large parts of the financial system, and if unaddressed, could undermine financial soundness. This calls for new policies to ensure the soundness of financial institutions as they evolve in this new environment, so that they can continue to support the smooth transmission of monetary policy and contribute to the economic recovery.

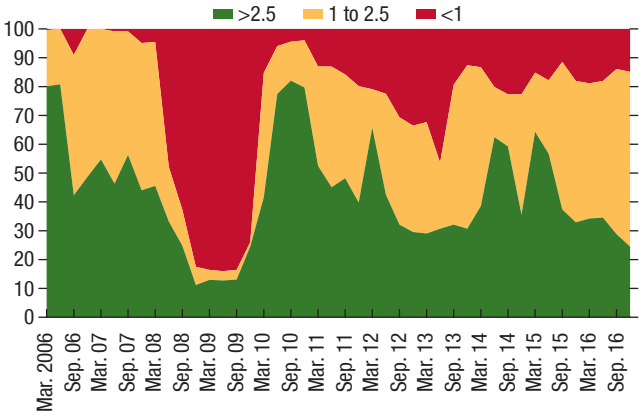
Low for Long and Implications for Financial Stability

The prolonged slowdown in global growth since 2010 (Figure 1.6, panel 1), persistent low inflation (Figure 1.6, panel 2), and increased uncertainty about the medium term portend low policy rates far into the future. In the euro area and Japan, markets expect pol-

Figure 1.6. Global Growth Momentum and Interest Rates

Much of the world economy has mediocre or falling growth ...

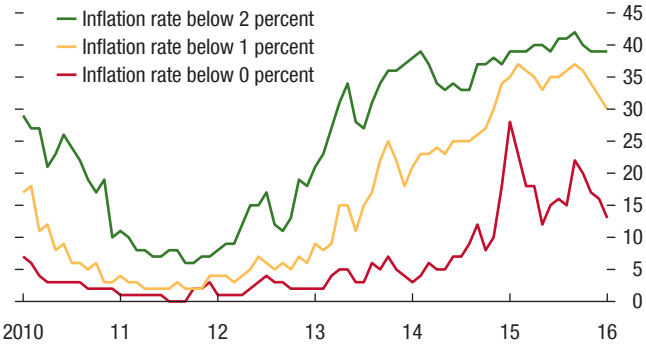
1. Distribution of Level of Real GDP Growth (Growth rate over previous four quarters, share of total GDP in each growth bracket; percent)



Sources: Bloomberg L.P.; and IMF staff estimates.

... persistent deflationary pressures ...

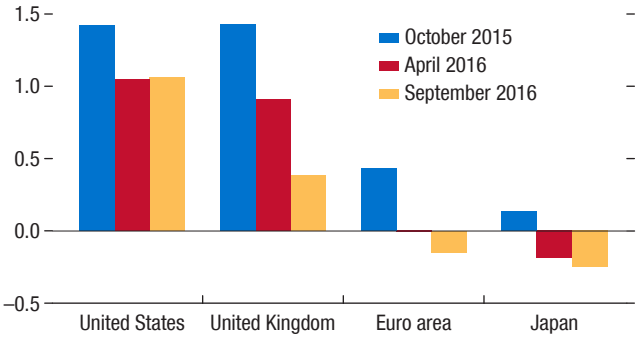
2. Headline Consumer Price Index Inflation: Number of Countries with Low Inflation Rates



Sources: Haver Analytics; and IMF staff estimates.

... and ever lower expected terminal rates ...

3. Expected Policy Rate, End-2020 (Percent)



Sources: Bloomberg L.P.; and IMF staff estimates.

... as the real global bond yield falls.

4. Global Real Rates (First principal component of inflation-linked securities, percent)

Sources: Barclays; and IMF staff estimates.
Note: The principal component analysis is based on the yield of inflation-linked securities from 16 developed and emerging market economies. The first principal component is transformed to have the same mean and variance as the sample.

icy rates to remain in negative territory even five years from now (Figure 1.6, panel 3). Interest rates on long-term bonds have continued their steady march lower through much of 2016, while global real long-term interest rates continue to decline (Figure 1.6, panel 4), reflecting a lack of confidence in sustained long-term growth and inflation rates converging back to central banks' targets in the near future.

These developments suggest that, at best, the normalization of monetary policy has been put on hold until well into the future. Accommodative monetary policies, including quantitative easing, continue to be crucial to address the weak macroeconomic outlook in many countries. Banks and other financial institutions benefit from ongoing monetary accommodation, because of its support for their credit portfolios through improved growth and price stability and from capital gains on their bond holdings. But low interest rates also raise the present value of existing long-term liabilities, steadily eroding capital and solvency buffers

the longer the low-rate environment persists. Remaining profitable in an environment marked by lower growth, lower interest rates, and tighter regulation will also require a significant transition in business models, because many existing balance sheets and business practices are not currently structured in a way that can earn a sustainable return.

Why Have Global Bond Yields Fallen?

The decline in short-term interest rate expectations explains an important part of the decline of sovereign bond yields (Figure 1.7, panel 1), but it only explains part of it. Bond yields can be considered as the sum of two parts: (1) short-term interest rate expectations (over the maturity of the bond); and (2) a term premium component,[1] which is simply a measure of risk compensation for investors. Decomposing the fall in yields over the past three years reveals that it was largely driven by the progressive erosion of term premiums, which turned negative in Germany, Japan, the United Kingdom, and the United States, for the first time in history (Figure 1.7). The erosion of term premiums reflects several factors that characterize the new era we are in:

- *First, central banks' sizable bond purchases* have flattened yield curves (Figure 1.8) and pushed term premiums further into unprecedented negative territory. Anticipated future demand from central banks has also caused additional compression of term premiums, as investors know that a reliable buyer will prevent sharp increases in bond yields.
- *Second, demand has increased for long duration assets from other investors, such as pension funds and insurance companies.* This increase in demand for long-duration assets may also reflect population aging and demographic shifts that result in higher demand for safe assets.
- *Third, political and policy uncertainty are higher.* Despite low and negative bond yields, their value in a portfolio for insurance against medium-term risks and economic uncertainty remains high.
- *Fourth, there are concerns over secular stagnation*, which has been accompanied by a lack of corporate investment and productivity growth and persistently low inflation.

[1]The term premium is not directly observable, but can be estimated. Here, estimations are based on Wright's (2011) model.

Another striking trend in long-term bond yields has been the high and rising degree of comovement across major global bond markets. This has occurred despite diverging monetary policies and forward guidance (and hence interest rate expectations) across Japan, the United Kingdom, the United States, and the euro area. This rising comovement is shown in Figure 1.8, panel 4, where a large share of the comovement in bond yields is driven by a single common factor for term premiums. In contrast, the heterogeneous stance of monetary policies is captured by the declining comovement in interest rate expectations. Term premiums have become increasingly driven by a single common factor as they have compressed in unison, pushing up correlations across global bond markets.

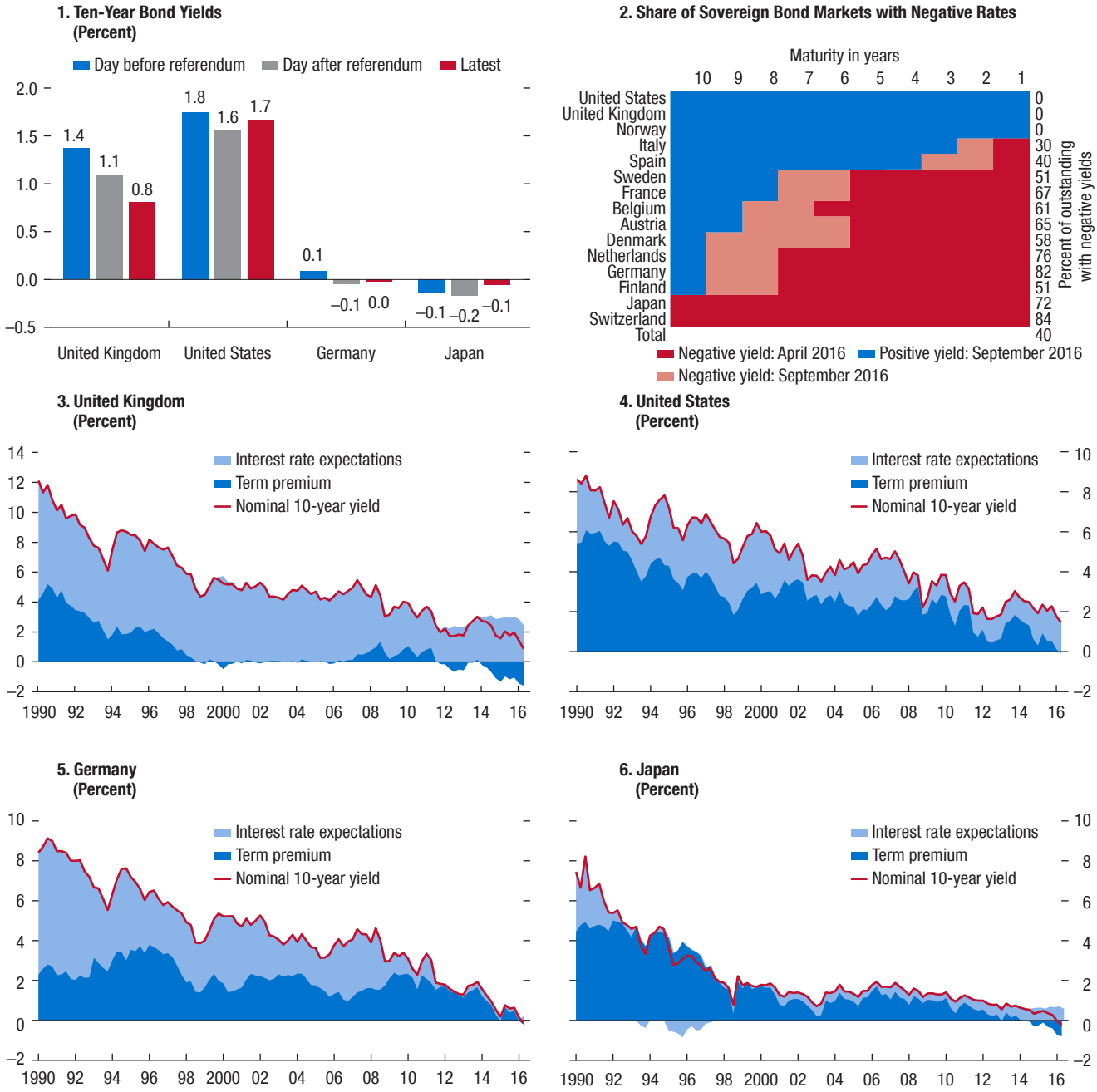
How Are Lending Conditions Impacted?

Cyclical pressures and weak growth have hurt the outlook for banks by flattening yield curves and weakening credit. A protracted period of low and negative policy rates and flat yields could undermine financial resilience in the medium term, but the risks of increased headwinds may materialize more immediately. For instance, the decline in bank equity prices seen in 2016 is likely to put pressure on banks to curtail lending as investors question whether banks can deliver sustainable profitability and dividends.

Our analysis suggests that the most recent sharp dive in bank equity prices could curb lending until early 2018 (Figure 1.9, panel 1). To get a sense of how credit growth in the euro area is affected by a range of shocks, a simple (autoregressive)[2] model is used to capture the (dynamic) interactions between euro area credit growth, euro area bank equity prices, the EU economic policy uncertainty index, the business cycle, real lending rates, and the slope of the yield curve. The first set of simulations (Figure 1.9, panel 2) shows that a one-off 20 percent fall in bank equity prices results in a prolonged

[2]A suite of simple unconstrained vector autoregressions (VARs) is estimated with no (exclusion) restrictions imposed on how equity prices affect credit and the other variables in the system (Sims 1981). The VARs comprise six equations, one for each endogenous variable, with four lags. The estimation from 2000 allows nearly 200 monthly observations. The business cycle is proxied by (log) changes in euro area industrial production, euro area lending rates to nonfinancial firms, and log changes of euro area credit growth, excluding the effect of securitization (European Central Bank), and the log level of the EU Economic Policy Uncertainty Index. The last two variables are the slope of the (GDP-weighted) yield curve and the cost of borrowing to nonfinancial firms (adjusted according to the consumer price index).

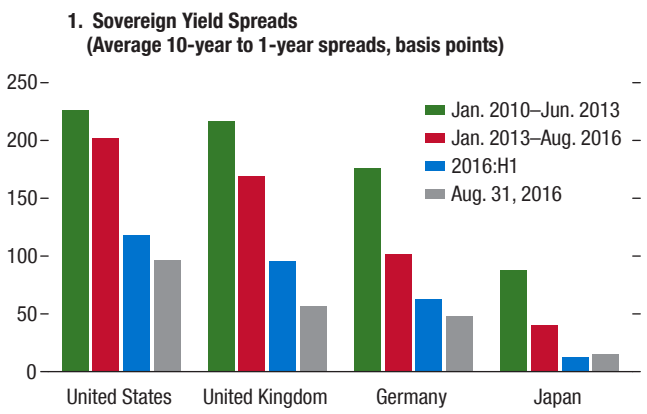
Figure 1.7. Sovereign Bond Yields and Term Premiums in Advanced Economies



Sources: Bloomberg L.P.; Consensus Economics; Deutsche Bundesbank; Haver Analytics; Organisation for Economic Co-operation and Development; and IMF staff estimates.
Note: Term premiums are based on Wright 2011. Referendum refers to the June 2016 U.K. referendum on leaving the European Union.

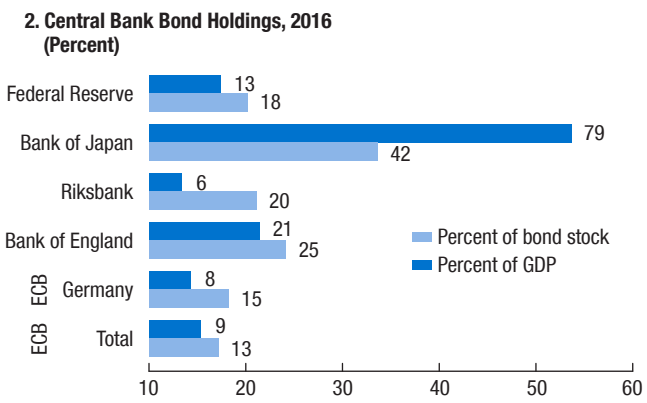
Figure 1.8. Drivers of Government Bond Yields

Flatter yield curves reflect the compression of term premiums ...



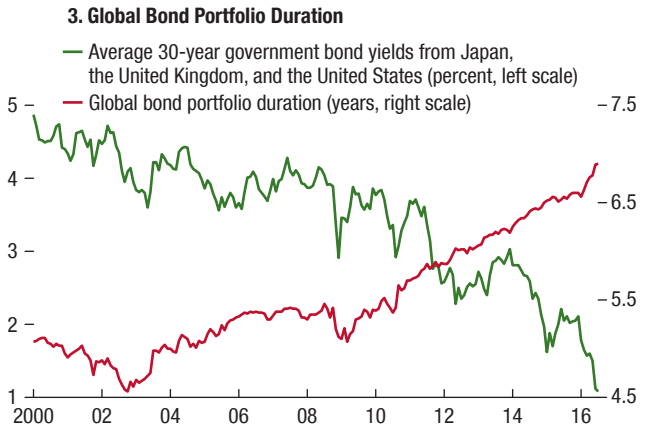
Sources: Bloomberg L.P.; and IMF staff calculations.

... increased demand for duration from central banks ...



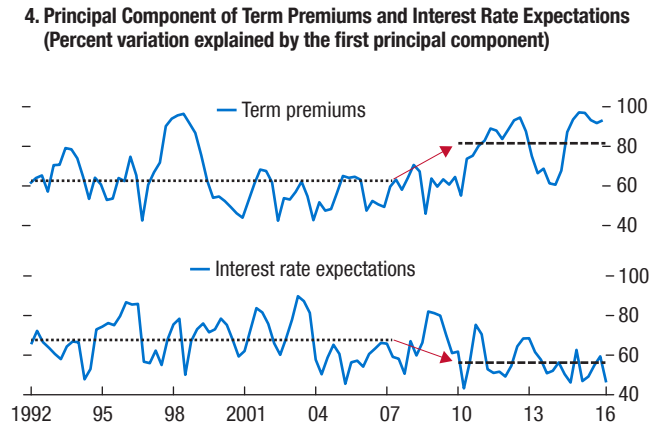
Source: Citibank.
Note: ECB = European Central Bank.

... and private sector investors ...



Sources: Barclays Capital; and Bloomberg L.P.

… driving down term premiums across global bond markets, even as policy rates diverge.



Sources: Bloomberg L.P.; and IMF staff calculations.

period of negative credit growth. The impact on credit growth peaks within 18 months, after which the effect starts to ebb away. A 20 percent one-off fall in equity prices, when translated into *levels* of credit, results in credit being 4 percent lower three years after the shock.

Advanced Economy Banks: The Profitability Problem

Banks in advanced economies face a number of cyclical and structural challenges. Weak profitability, particularly in Europe and Japan, could undermine their ability to support growth and could erode bank buffers over time. Even under a "cyclical recovery" scenario of rising rates, lower provisions, and rising fee income generation, almost a third of the European banking system remains weak. This suggests the need for fundamental changes in both bank business models and system structure to ensure a vibrant and healthy banking system that can grow and sustain its rebuilt capital and liquidity buffers. In some cases, weak banks will have to exit and banking systems will have to shrink.

Bank Balance Sheets Are Stronger, but Weak Profitability Is a Looming Stability Challenge

Bank balance sheets in aggregate are substantially stronger and more resilient than they were before the

global financial crisis, with higher and better-quality capital levels and more robust funding and liquidity profiles (Figure 1.10, panels 1 and 2). Banks in advanced economies now have more deposits relative to wholesale funding, longer-term liabilities, and much higher buffers of high-quality liquid assets.

Nonetheless, weak bank profitability has emerged as a looming financial stability challenge for many advanced economy banks. Banks need to generate profits to sustain capital levels through adverse economic cycles (when higher provisioning charges can eat into capital buffers), support future expansion of their balance sheets, meet future increases in regulatory requirements, and pay dividends to shareholders. Banks' returns on assets have only partially recovered since the crisis, with euro area institutions earning less than half their 2004–06 average profits (Figure 1.12). The return on equity of most banks is unlikely to return to precrisis levels. This is the intended result of the postcrisis regulatory reforms, which were designed to make banks better capitalized, more liquid, and safer.

The market's current assessment of the ability of banks to meet these challenges is not optimistic, as valuations are well below the balance sheet value of banks, especially in Europe and Japan where they have dipped to levels in line with the worst points of the crisis (Figure 1.11, panel 1). Many banks earn less than the (persistently high) cost of equity capital (in the range of 8–10 percent).[3] If banks consistently earn less than their cost of equity, they will face considerable challenges in raising private capital and could again become undercapitalized after an unexpected loss or during a broader downturn in their business. Thus, ensuring that banks are able to earn an adequate rate of return on equity is important for maintaining a vibrant and healthy banking system that is able to provide credit and financial services to support the economy.

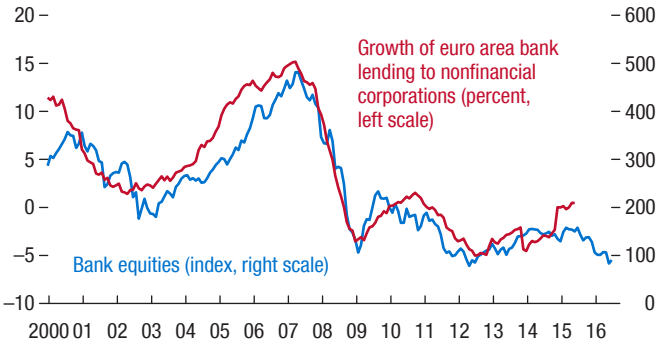
Rebuilding sustainable levels of bank profitability faces several cyclical, structural, and regulatory challenges:

[3]According to a survey in the European Banking Authority's December 2015 risk assessment report, 49 percent of respondents estimated a cost of equity between 8 and 10 percent, 27 percent in the range of 10 to 12 percent, and 14 percent above 12 percent. On a blended basis, the average cost of equity is above 9 percent, based on banking authority estimates. For U.S. banks, the asset-weighted cost of equity is about 10 percent (Bloomberg estimates and IMF staff calculations).

Figure 1.9. Effects on Credit Growth of Shocks to Equity Prices

A fall in bank equity prices could curb lending …

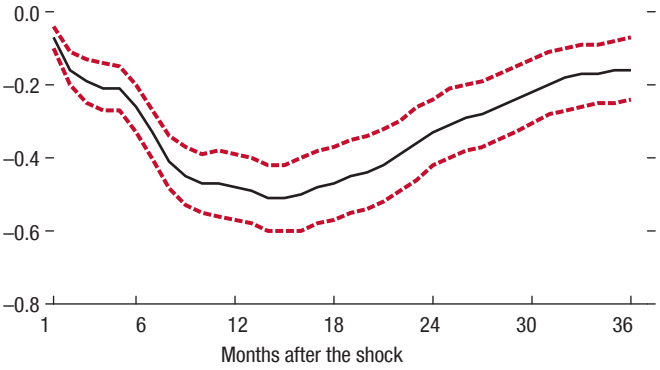
1. Euro Area Bank Equities and Lending to Nonfinancial Corporations



Sources: Bloomberg L.P.; Haver Analytics; and IMF staff estimates.
Note: The series for lending has been shifted forward 12 months (e.g., the year 2000 reflects lending for 2001).

… for a prolonged period of time.

2. Corporate Credit Growth—Impulse Response to Negative Equity Shock
(20 percent negative shock; percent)

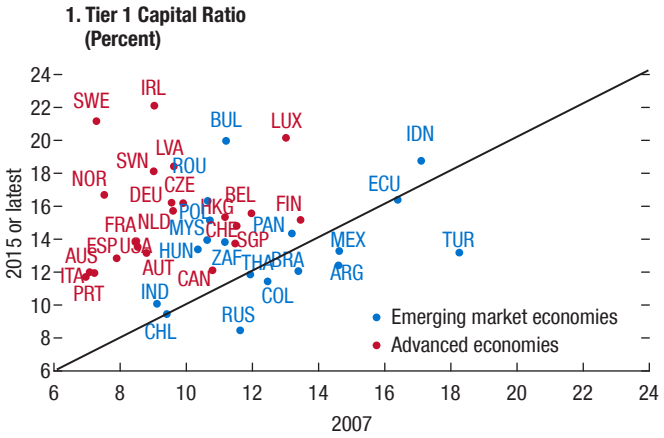


Sources: Baker, Bloom, and Davis 2015; Bloomberg L.P.; Haver Analytics; and IMF staff estimates.
Note: The impulse responses are generalized (Pesaran and Shin 1997) so they do not depend on a specific ordering of the variables, and orthogonalization is not required. The responses are fully order invariant. The dashed lines show the 90 percent error bands.

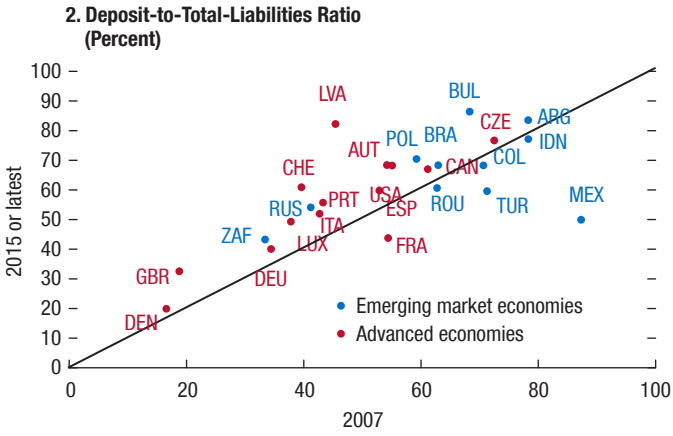
- Some loss in income generation may be attributable to the challenging interest rate and growth environment. Low rates and flattened yield curves reduce the ability to earn income from maturity transformation (borrowing short term and lending long term), while weak demand for credit also reduces income (Figure 1.12, panel 2). Some central banks have mitigated the impact of low or negative rates by providing longer-term funding at low (or no)

Figure 1.10. Developed and Emerging Market Economy Banks: Capital and Liquidity Indicators

Advanced economy banks have higher levels of capital compared with the precrisis period ...



... and have increased deposits as a share of their total liabilities.



Sources: Federal Reserve; and IMF, International Financial Statistics database.
Note: Data labels in the figure use International Organization for Standardization (ISO) country codes.

cost—for example, the European Central Bank's targeted longer-term refinancing operations and the Bank of England's funding for lending schemes.

- Regulatory measures to increase safety may limit the scope for risky activities, including by ensuring more stable funding and requiring banks to hold more liquid assets. This is especially the case in capital market businesses. Revenue generation from activities such as market making and derivatives trading has fallen significantly, reducing banks' fee, commission, and trading income as a percentage of assets (Figure 1.12, panel 4). In Europe and the United States, these income streams appear to have stabilized at a level roughly one-third lower than during the precrisis period.
- Loan-loss provisioning charges stemming from large stocks of legacy problem loans are an important component of lower profitability in some banks in euro area countries still recovering from the crisis (Figure 1.12, panel 3). By contrast, U.S. banks wrote off larger portions of their bad loans and assets earlier in the crisis, enabling them to return to growth more quickly.
- Looking ahead, competitive pressures from nonbanks and disruptive technology threaten to leave banks with substantial fixed costs, as new entrants face substantially reduced operating costs.

Banks have responded to declining revenue with deep cost cuts and by exiting noncore businesses. Institutions in the United States and northern Europe have reduced their operating expenses to assets by 30–35 percent relative to the precrisis average, suggesting some ability to adapt to the shrinking revenue base (see Figure 1.12, panel 5).

Weak underlying profitability has been an important contributing factor to the fall in return on equity, particularly in Europe. Increases in regulatory capital also contributed, but by less in the case of Europe. Figure 1.11 highlights that from 2006–07 to 2012–15, the overall return on equity fell by 11.4 and 3.0 percentage points for large European and U.S. banks, respectively. Higher equity levels accounted for only about 15 percent of this decline at European banks and for about two-thirds of the reduced return on equity at U.S. banks.

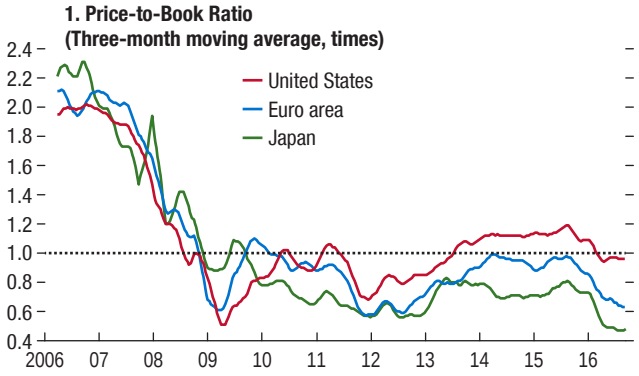
A Cyclical Recovery Would Be Insufficient to Restore Sustainable Profitability

A critical issue is whether current low levels of profitability are more of a cyclical problem, which will remedy itself as the economy recovers and monetary policy normalizes, or a structural problem that calls for more deep-rooted reforms and systemic management. To answer this question, this report outlines two scenarios—a "cyclical recovery" scenario during which rates rise and provisions fall to determine the impact on profitability and a bold "structural reform" scenario to quantify changes in business models that could increase efficiencies and profitability.

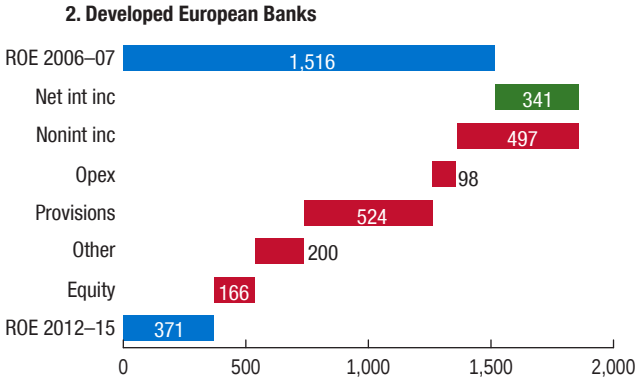
The cyclical recovery scenario consists of improvements along three dimensions. First, net interest income improves with monetary policy normalization,

Figure 1.11. Price-to-Book and Return on Equity Decomposition, 2006–15
(Basis points, relative to average equity)

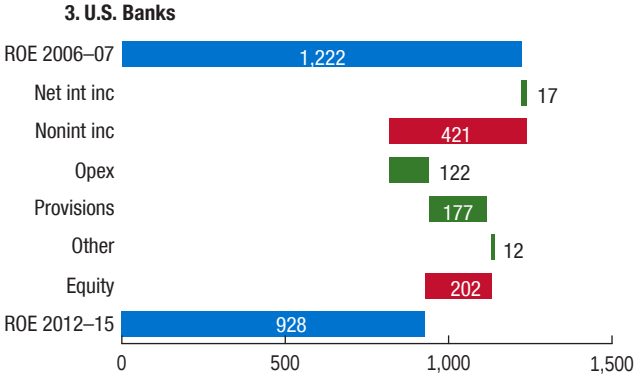
Valuations remain below the balance sheet values of banks, signaling market concerns about bank business models.



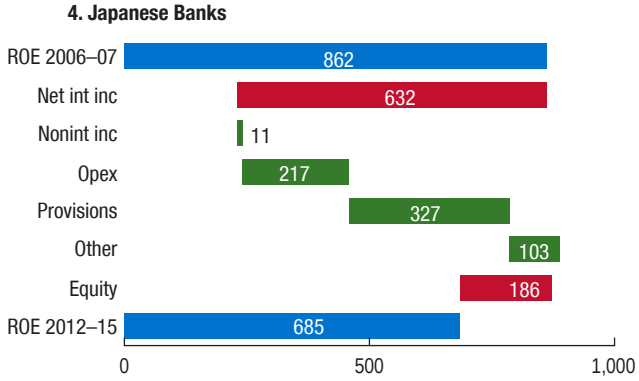
European bank profitability has deteriorated, driven by falling noninterest income and rising provisions.



U.S. banks' cost flexibility and lower provisioning compensated for falling noninterest income.



Japanese banks have offset net interest income compression with lower provisioning and operating costs.



Sources: Federal Reserve call reports; Fitch Ratings; SNL Financial; and IMF staff estimates.
Note: Price-to-book ratio is based on the KBW index for the U.S., Stoxx Europe 600 bank index for the euro area and TOPIX bank index for Japan. Int inc = interest income; Opex = operating expenses; ROE = return on equity; Other = taxes + nonoperating income. Blue = ROE levels; red = negative contribution to ROE; green = positive contribution to ROE.

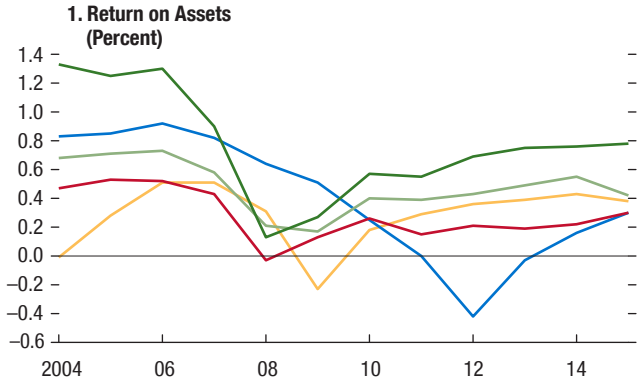
as the benchmark short-term interest rate rises by 50 basis points. Second, provision expenses decline as economic recovery improves borrower credit quality. Third, economic recovery supports stronger fee-generating activity levels and market trading conditions, boosting non-interest income.[4] Return on assets is converted back to return on equity using the higher of current equity levels or equity corresponding to the minimum fully phased-in end-point 2019 capital level required based on the 2015 balance sheet.

In a cyclical recovery scenario, European bank profitability rises by over 40 percent in terms of return on assets (Figure 1.13, panel 1), recovering about two-thirds of the decline from precrisis levels. Nevertheless, 30 percent or about $8.5 trillion of system assets still remain weak, falling short of meeting a cost of equity of 8 percent, suggesting that structural shortcomings will not be adequately addressed by a recovery in rates and business conditions (Figure 1.13, panel 2). U.S. banks benefit less from a cyclical recovery because of their stronger starting point, leaving a quarter of system assets weak (generally

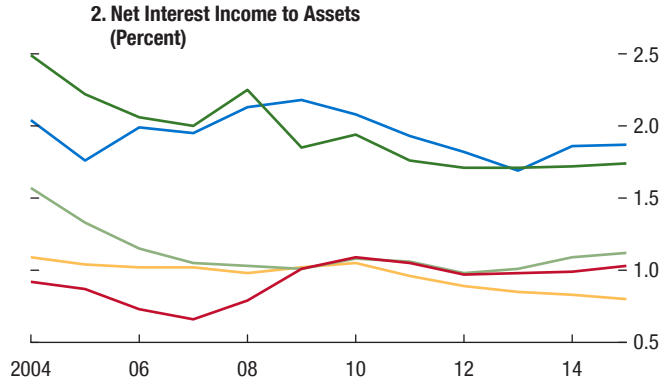
[4]The scenario incorporates the following parameters for each bank: (1) *net interest income:* sensitivity to a 50 basis point change in the benchmark three-month interbank rate is calibrated using the most recent rate hike cycle (2005–08); (2) *fee income:* recovers to the median of 2006–15; (3) *other income (mainly trading gains):* recovers to the midpoint between the median and the peak over 2006–15, with a cap at 20 percent above the 2015 level; and (d) *loan-loss provisions:* declines to the midpoint between the median and the trough over the period 2006–15 (with exceptions for countries with extraordinary nonperforming loan write-backs).

Figure 1.12. Advanced Economies: Trends in Bank Profitability

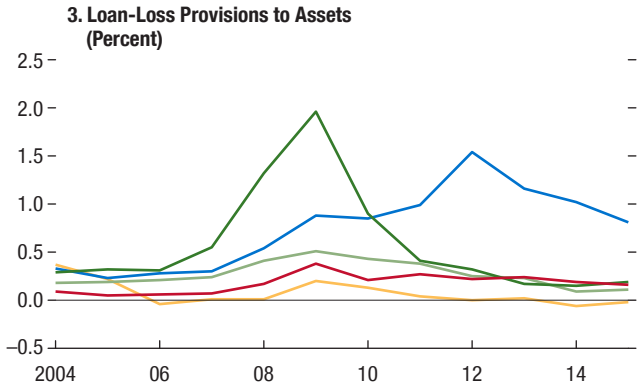
Banks' returns on assets have plateaued below precrisis levels after rising since 2008.



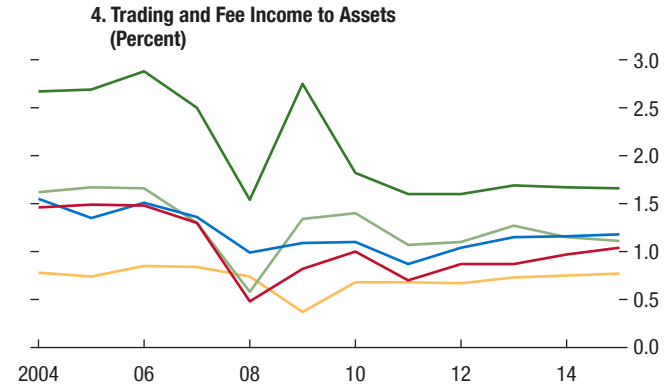
Declining net interest income has been a factor in the United States, Japan, and certain euro area countries.



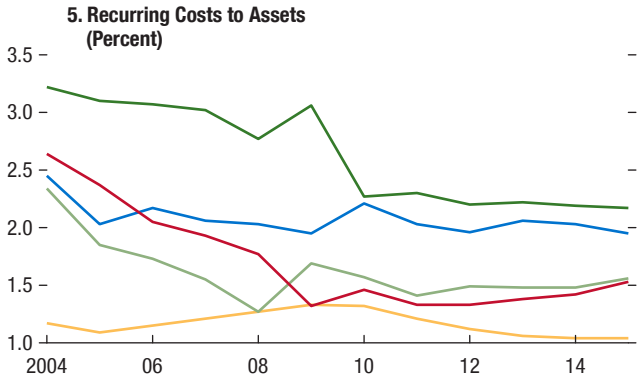
Provision costs have largely normalized outside of euro area countries highly affected by the crisis.



Noninterest income generation has fallen in Europe and particularly in the United States.



Costs have declined in keeping with revenues, although less so in hard-hit euro area regions.



Sources: Bloomberg L.P.; and IMF staff estimates.
Note: Data depicted are asset-weighted percentages of average tangible assets.
[1]Asset totals adjusted to include netted trading derivatives.
[2]Core euro area = Austria, Belgium, France, Germany, Netherlands.
[3]Selected euro area = Greece, Ireland, Italy, Portugal, Spain.
[4]Other Europe = Czech Republic, Denmark, Norway, Sweden, Switzerland, United Kingdom.

less than 8 percent return on equity) or about $3.2 trillion. While the share of weak banks is broadly similar between the United States and Europe, the United States has a much larger core of healthy banks (shown by the green bars in Figure 1.13, panels 3 and 4).

A Bold "Structural Reform" Program Is Needed to Boost Medium-Term Financial Stability

Many European banks continue to struggle with still-high levels of impaired assets and low profitability. Even under a cyclical recovery, Europe retains a higher share of weak and challenged banks. To address this challenge, policymakers and banks must implement a bold structural reform program, which should include three broad elements:

- Address legacy issues of high nonperforming loans, corporate insolvency frameworks, and the weak tail of European banks.
- Enhance operational efficiencies and strengthen business models.
- Reform the system through consolidation and reduced excess capacity to support sustainable revenue and efficient allocation of credit.

Reducing Nonperforming Loans and Addressing Capital Deficiencies at Weak Banks

The European banking system faces challenges in reducing its large stock of nonperforming loans, particularly in some countries. European and country authorities are taking a number of steps to address those loans and the resulting capital deficiencies. These measures could help reduce the cost of removing nonperforming loans from bank balance sheets. In addition, reforms that speed up asset recovery in insolvency and otherwise reduce the risk of investing in bad loans could potentially boost the price that third-party investors would be willing to pay for them by about 20 percent on average, according to standard distressed investor pricing models.[5] In a simple sensitivity analysis that incorporates these reforms and current levels of bad-loan provisioning, the net impact across the euro area of selling nonperforming loans could change from a loss of €85 billion in regulatory capital to an increase of €64 billion (Figure 1.14).[6]

Cleaning up nonperforming loans will be challenging without accompanying efforts to structurally boost bank profitability to sustainable levels. Without a clear improvement in weak banks' ability to generate sufficient internal capital, investors are likely to be hesitant to fund injections of new capital to offset losses related to nonperforming loans.

The Italian authorities have adopted a multipronged strategy to strengthen Italy's banking system. This includes measures aimed at improving the efficiency and speed of judicial and extrajudicial insolvency procedures; a public guarantee on senior tranches of securitized bad loans; the Atlante funds, politically supported by the government, financed and managed by the private sector; and reform of the tax treatment of loan losses. Nonetheless, government efforts to facilitate the credit enhancement and purchase of bad loans may not be sufficient to reduce them as much or as fast as needed to strengthen the banking system. Moreover, the authorities should promptly assess the asset quality for smaller banks not subject to the European Central Bank's 2014 comprehensive assessment, and monitor the ambitious bank-by-bank targets set for medium-term nonperforming loan reduction to ensure they are achieved. Insolvency reforms should be extended to existing bad loans as well as to new ones.

Addressing capital deficiencies at weak banks is needed to ensure system stability and support for the broader economy. For example, the EU-wide stress test in July identified significant weaknesses at Monte dei Paschi di Siena (MPS). The bank immediately announced a fully private plan to move €27.7 billion in gross nonperforming loans, or more than €10 billion in net nonperforming loans, off its balance sheet, which would notably reduce its balance sheet weakness. MPS is also planning to raise €5 billion in capital through a rights issue. Addressing the challenges of weak banks is important to reduce pressure on the Italian banking sector more broadly.

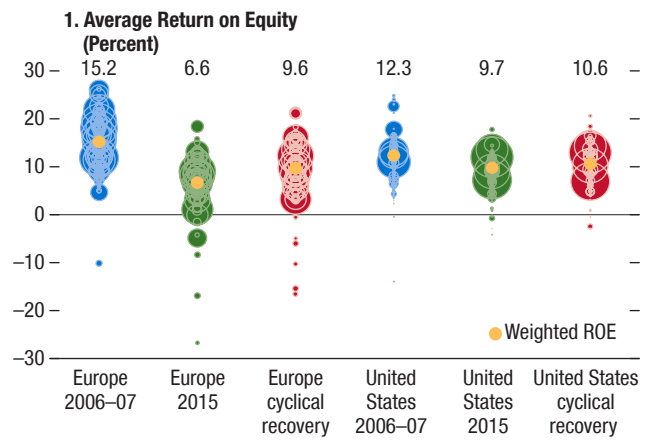
Portuguese banks face a similar series of challenges related to weak capital and earnings, with even greater potential spillback to the sovereign. As of the first quarter of 2016, Portuguese banks had the lowest

[5]The price increase of 20 percent reflects the impact of reducing the period of time for asset recovery in euro area countries by up to two years and reducing a potential third-party buyer's required internal rate of return on its bad loan investment from 15 percent to 6 percent.

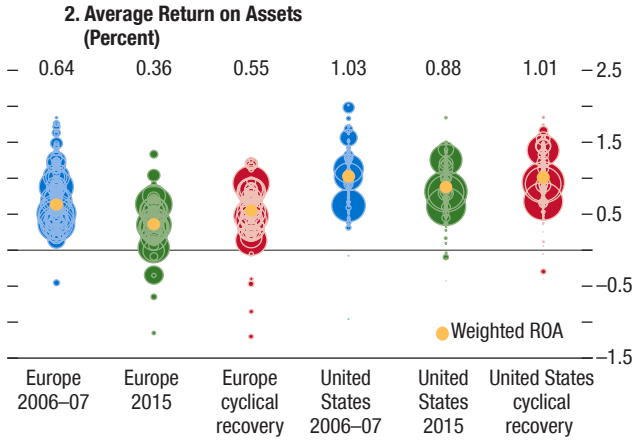
[6]The changes in capital are relative to regulatory capital requirements and reflect the impact of nonperforming loan reduction on lowering total risk-weighted assets, which would reduce the minimum capital required by regulation by approximately €47 billion in both cases. On the other hand, capital requirements on the whole stock of performing loans at IRB banks could significantly increase as a consequence of the NPL disposal. Therefore, the estimated impact calculated in the exercise may be an upper bound of the possible improvement in the capital requirement.

Figure 1.13. Bank Performance in a "Cyclical Recovery" Scenario, by Region

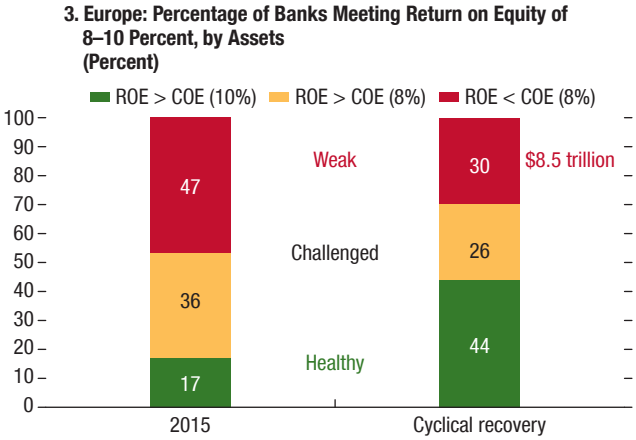
Profitability improves but does not return to precrisis levels ...



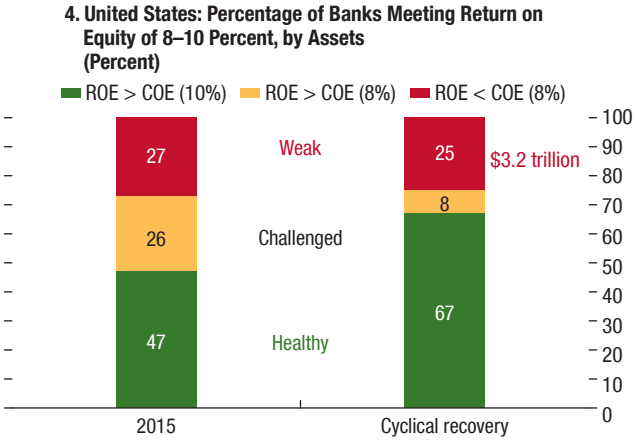
... and is not enough to fix Europe's large tail of weak banks.



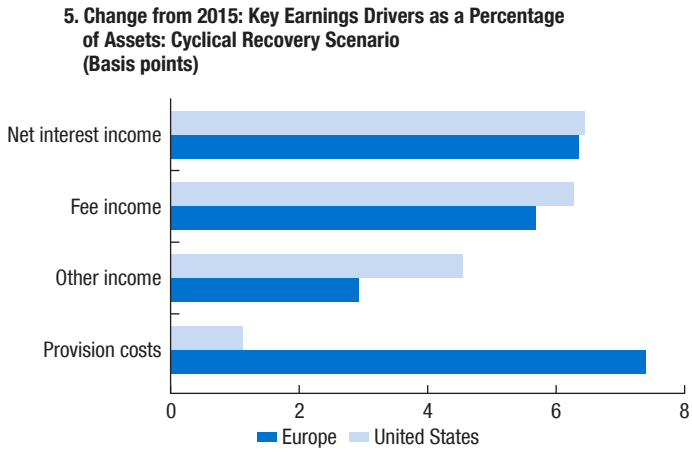
Following a cyclical recovery, 30 percent of European banks remain weak ...



... as do one-quarter of U.S. banks.



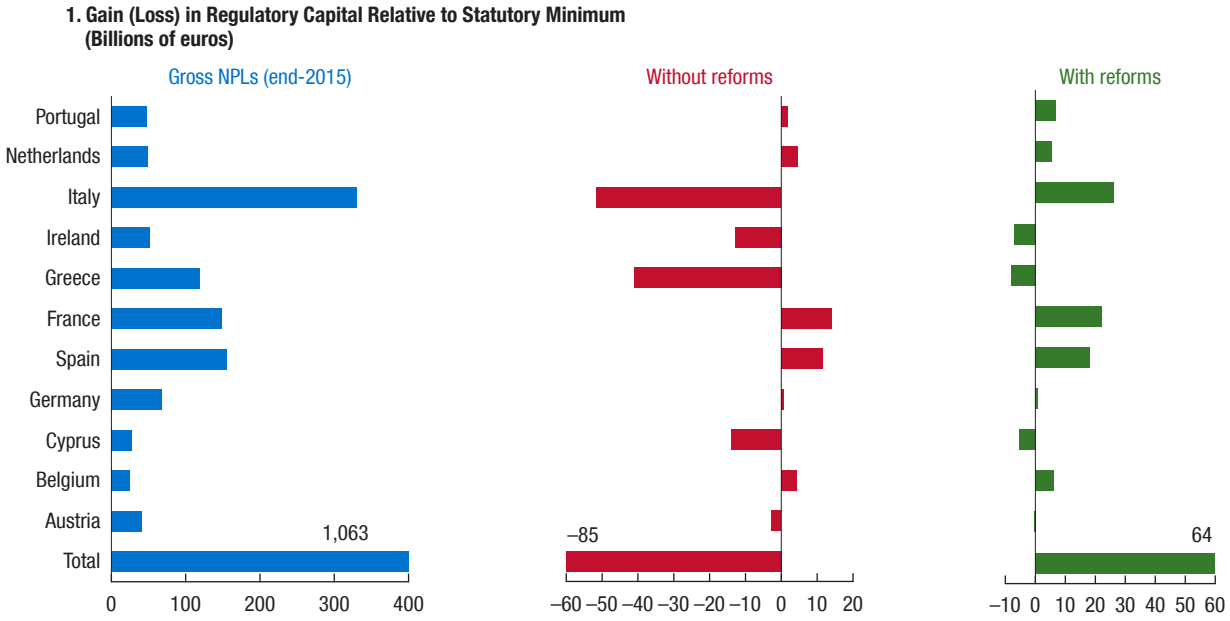
Europe benefits more from falling provisions.



Sources: Bank financial statements; Bloomberg L.P.; CreditSights; Federal Reserve call reports; Fitch Ratings; Hypostat; SNL Financial; and IMF staff estimates and analysis.
Note: Balls represent individual banks, with size of balls proportional to bank assets. The scenario includes 61 European banks (covering 60 percent of system assets) and 215 U.S. banks (covering 80 percent of system assets). The model treats earnings as instantaneous, not phased in over time and does not consider balance sheet evolution. COE = cost of equity; ROA = return on assets; ROE = return on equity.

Figure 1.14. Stylized Net Capital Impact of Nonperforming Loan Disposal at Euro Area Banks

Faster bankruptcy processes and lower investor return requirements could support balance sheet cleanup.



Sources: Bankscope; European Banking Authority (EBA); European Central Bank (ECB); Haver Analytics; SNL Financial; World Bank, Doing Business project; and IMF staff calculations.
Note: The "Without reforms" scenario assumes nonperforming loans (NPLs) are sold at the price implied by a distressed loan valuation model using current country-specific asset recovery times and an internal rate of return of 15 percent, whereas the "With reforms" scenario uses the price implied by an improvement in asset recovery time by up to two years (for countries where current asset recovery time exceeds two years, i.e., Cyprus, Greece, Ireland, and Italy) and an internal rate of return of 6 percent. In both cases, losses on the sale of NPLs are offset by a reduction in the minimum level of required capital associated with lower risk-weighted assets and the potential increase in capital requirements related to higher loss-given-defaults for banks using internal models. The net capital impact shown does not consider other potentially important factors, such as deferred tax assets/credits and hidden reserves that could reduce potential losses. Calculations are based on bank-level risk-weighted assets and provisioning data from the EBA Transparency Exercise 2015 and ECB-reported, country-level data for NPLs, with NPLs assumed to be sold down to restore the country-level NPL ratio as of end-June 2009. The specified regulatory minimum is a ratio of 16 percent total regulatory capital to risk-weighted assets. Asset recovery times are based on World Bank statistics. For further details, please see Jobst and Weber 2016.

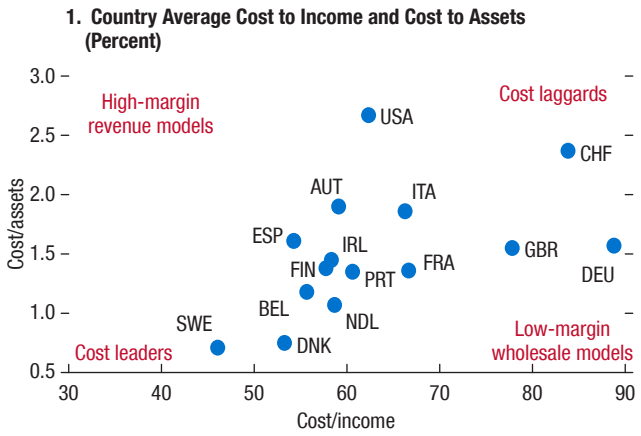
common equity Tier 1 capital ratio in the European Union, along with Italian banks at 11.4 percent. Nonperforming exposures were among the highest in the European Union, at 15.7 percent. Return on assets and equity were the lowest in the European Union, at –0.2 and –2.5 percent, respectively. Contingent liabilities to the government arising from banking sector support could have a significant impact on the country's fiscal position, raising the risk of an adverse feedback loop between banks and the sovereign.

Enhancing Operational Efficiency

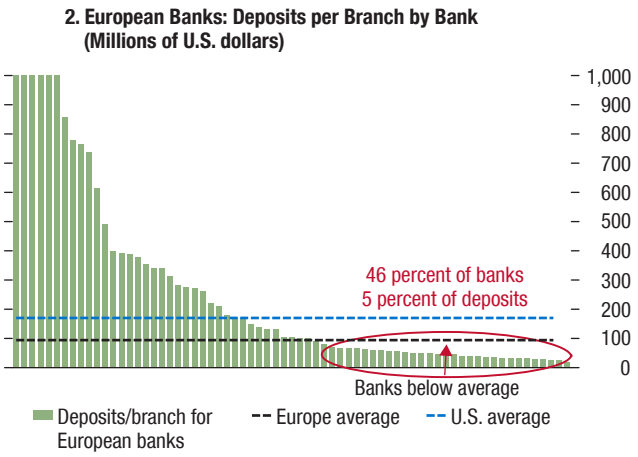
Some European banks and systems have considerable room to improve operational efficiency, in particular through branch rationalization. Overall, banks' cost structures differ between more costly but high-value customer-oriented services, on the one hand, and lower-margin wholesale models on the other (Figure 1.15, panel 1). Nonetheless, wide variation in the efficiency of deposit-gathering branch networks is evident among European banks. Since branches are intended primarily to service deposit customers, deposits per branch provides a reasonable metric to compare efficiency across business models and service levels. Using this metric, European branch efficiency varies widely (Figure 1.15, panel 2), implying potentially large savings from rationalizing branch networks by banks with low deposits per branch, through closing enough branches to reach the European average (Figure 1.15, panel 3). If rationalizing bank branches were to occur, this could result in the closure of up to one-third of bank branches. This would reduce aggregate bank operating expenses of $454 billion by about $18 billion, assuming that branch costs are 25 percent of total operating

Figure 1.15. European and U.S. Banks—Operating Efficiency and Cost Rationalization

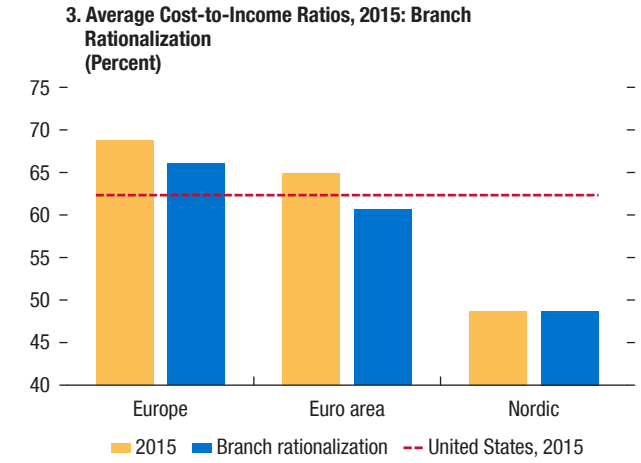
Appropriate cost structures vary by business model.



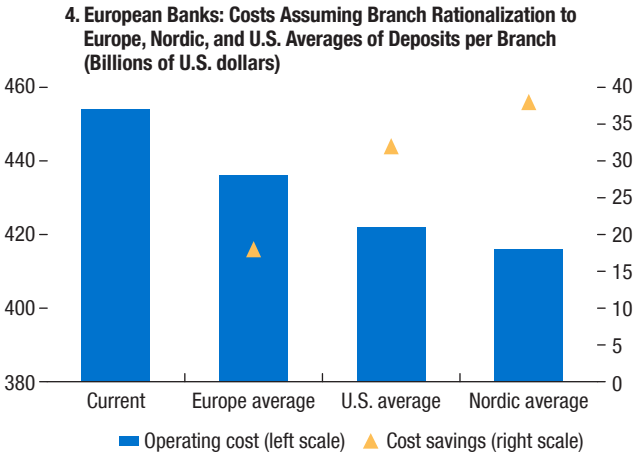
A long tail of inefficient branch networks ...



... keeps cost high relative to income ...



... providing scope for cost savings.



Sources: European Central Bank; Fitch Ratings; SNL Financial; and IMF staff estimates and analysis.
Note: Data labels in the figure use International Organization of Standardization (ISO) country codes. Nordic = Denmark, Finland, Norway, Sweden.

expenses.[7] This cost savings is equivalent to a 5 basis point increase in after-tax return on assets across the European banks considered here. If European bank branch networks were to consolidate branches to the average level of deposits per branch of Nordic banks, the cost reduction would more than double (to about $38 billion), with aggregate operating costs falling to close to $416 billion (Figure 1.15, panel 4).

It is important to note that applying such a metric is only indicative because it ignores differences in system structures across countries, heterogeneity of banks' business models, and potential costs associated with closures, which would need to be addressed. Nevertheless, it is instructive in identifying potential operating efficiencies that could form part of a bold structural reform agenda. Other cost elements are important and potentially susceptible to efficiency improvements, but are difficult to model quantitatively. This analysis is therefore intended to represent one possible source of structural cost improvement.

[7]Disclosures from 12 global systemically important banks (G-SIBs) indicate that, on average, 44 percent of operating expense is associated with retail banking, with branch expense a subset of that total. Estimates are few and vary, but technology and operations consultants (Diebold, Forrester) suggest branch costs constitute 47 to 60 percent of retail banking costs. We assume that revenue potential is fixed, so that reduction of bank branches does not result in a decrease in revenues.

Improved Funding Models

European banks' net interest income generation has historically been constrained by a high cost of funding relative to U.S. and Japanese peers, pointing to the potential for improving financial performance (Figure 1.16, panel 1). While the differential in their respective costs of funding reflects European banks' high degree of dependence on long-term wholesale funding, it is also driven by higher interest rates on deposits, as measured by the spread relative to the interbank rate (Figure 1.16, panel 2). Even though deposit rates are falling in the euro area, deposit rates persistently above interbank rates suggest strong competition for customer deposits, which is surprising in an environment of falling benchmark rates, minimal credit growth, and ample funding liquidity. The unfavorable deposit economics may be a reflection of still-large balance sheets and efforts of some banks to improve their funding mix through deposits. It is also notable that euro area banking systems where deposits have grown the most since 2012 have also seen the slowest downward adjustment in their deposit costs (Figure 1.16, panel 3).

Deposit costs could also benefit from policy efforts to encourage shifts in industry deposit-taking practices. In France, for example, nearly 50 percent of household deposits are in the form of government-regulated deposit products carrying above-market interest rates, which drive some of the highest overall interest rates in the euro area. In other markets, regulators could explore excess competition for high-cost deposits, developing a better understanding of pricing practices for time deposits with maturities in excess of two years, which represent 18 percent of system deposits and have seen relatively less downward adjustment in pricing since the crisis (Figure 1.16, panel 3).

To estimate the potential earnings boost from funding cost rationalization, structural improvements in both deposit mix and in pricing are assumed. Specifically, banks with a relatively low proportion of transaction deposits relative to higher-cost time and savings deposits improve their deposit mix to equal the average of their country peers. Banks with a low proportion of deposits (as a portion of their interest-bearing liabilities) improve their balance sheet mix to the average of their country peers. Each bank whose deposit spread exceeds its national average is assumed to lower its deposit pricing sufficiently to redress the excess deposit spread over the average. Implementing these improvements generates 16 basis points of improvement to average net interest margins across our sample of European banks, which boosts post-tax return on assets by 11 basis points on average, and adds $30 billion to profitability.

Rationalizing Banking System Balance Sheets and Industry Structures

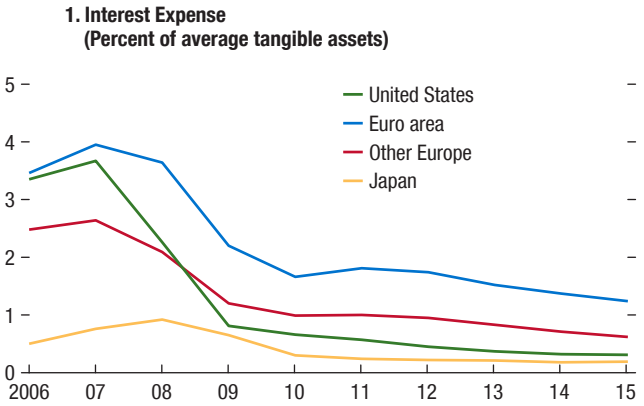
Sector consolidation and the exit of weak banks would likely further enhance revenue opportunities for sound banks while improving allocation efficiency. At the same time, consolidation would entail costs and investments in the short term, while the resolution of weak banks could pose risks stemming from the enforcement of burden sharing. Countries have and are taking various approaches, depending in part on the structure and needs of their individual banking systems. For instance, the savings bank sector in Spain underwent a substantial consolidation from 2009 to 2012 (IMF 2012), along with governance reforms. As outlined in the 2016 Germany Financial Stability Assessment Report, the German savings bank sector has deleveraged as banks refocused on core businesses, reduced noncore assets and participations, closed foreign offices, and sold a number of subsidiaries, although more restructuring and downsizing is needed. Foreign currency activities and refinancing risks were cut back, while dependence on wholesale market financing declined. Reforms to the cooperative sector under way in Italy aim to improve their access to capital markets and their efficiency, while strengthening the governance of cooperative lenders and their credit assessment standards. These efforts are welcome, but further structural measures are called for to support bank sustainability.

The Impact of Structural Reform on Bank Sustainability

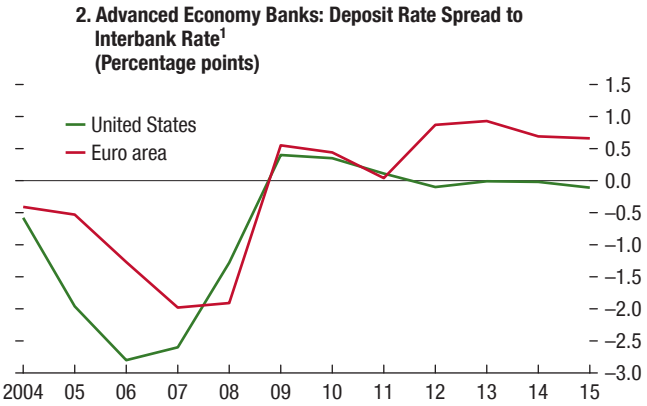
The cyclical recovery scenario would on average add 19 basis points to post-tax return on assets across the banks in this study, but that would still leave about 30 percent of bank assets in Europe in weak banks generating returns on equity below 8 percent. Thus, a cyclical recovery is insufficient to deliver sustainable profitability, without structural changes to bank business models supported by structural system-wide reforms. The structural reform scenario would improve average return on assets by 15 basis points, adding $43 billion to profits. An outcome that combines the impact of a cyclical rebound in interest margins

Figure 1.16. European Banks' Elevated Cost of Funding

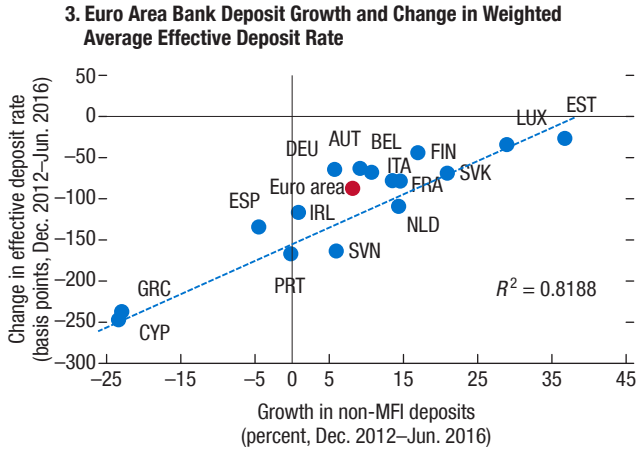
European banks face structurally higher funding costs ...



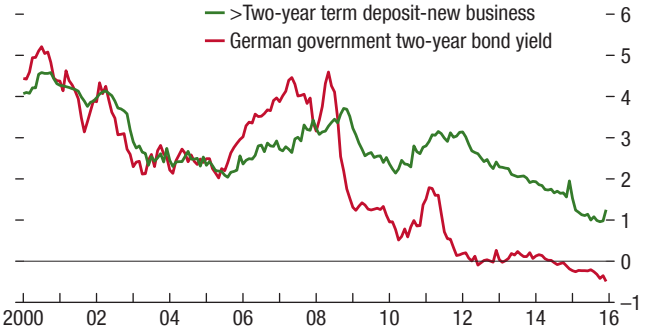
... reflecting higher deposit rates.



Bank deposit rates have fallen slowly in countries with higher deposit growth.



Yields on long-term deposits have been slow to adjust.



Sources: European Central Bank; Federal Deposit Insurance Corporation; Fitch Ratings; SNL Financial; and IMF staff estimates and analysis.
Note: Data labels in the figure use International Organization for Standardization (ISO) country codes. MFI = monetary financial institution.
[1]Spread shown is the banking system weighted average deposit rate minus the average annual three-month interbank rate.

and moderation in provision charges with structural improvement in funding and operating costs would nearly double European banks' return on assets (Figure 1.17); over 80 percent of European bank assets would generate clearly sustainable returns. Furthermore, structural reforms combined with a cyclical recovery would increase the share of healthy banks to over 70 percent of system assets.

Japanese Banks Are Expanding Overseas but Face New Challenges

Since the global financial crisis, overseas expansion by Japanese banks has helped offset the pullback of European banks from international banking. Although total foreign claims of Bank for International Settlements reporting banks were nearly unchanged between 2010 and 2016, the share of Japanese banks rose from 9.1 to 14.4 percent (Figure 1.18, panel 1). The overseas expansion of Japanese banks has been driven by weak domestic growth and low interest rates, which have constrained domestic lending and compressed net interest margins. In response, Japanese banks have dedicated more of their balance sheets to higher-yielding overseas borrowers, increasing the foreign asset share from 12 percent of their total assets in 2010 to 16.7 percent in 2015.

So far, major banks have taken a cautious approach with the credit and foreign exchange risks of their overseas expansion. Foreign currency positions are almost fully hedged, with limited exposure to lower-rated issuers. This has helped contain the risk weights and regulatory capital requirements on foreign assets. However, the recent rise in hedging and foreign currency funding costs (Figure 1.18, panel 2) means that Japanese investors are no longer able to make positive returns on securities holdings net of hedging costs on AA- and A-rated U.S. corporate paper (Figure 1.18, panel 3). As a result, going forward Japanese financial institutions would have to take on additional credit and duration risk to generate positive net returns on their investment portfolios. Given the larger incremental capital requirements associated with these higher risks, this may curtail the ability of Japanese financial institutions to continue expanding overseas investment.

Japanese Banks May Face Increased Risks from External Funding, if Severe and Persistent Money Market Disruptions Occur

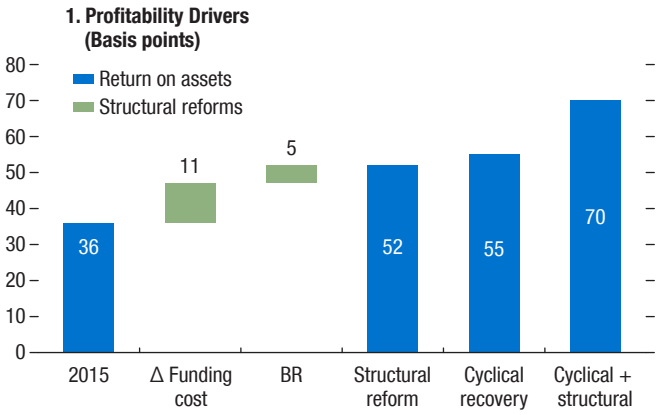
The overseas expansion has left Japanese banks more reliant on wholesale funding to finance their foreign assets, even though the largest three banks have been able to increase their access to foreign currency customer deposits through overseas acquisitions.[8] However, major banks have still had to increase their reliance on wholesale dollar funding markets to fund the growth of their overseas balance sheets (Figure 1.18, panel 1). As demand for currency hedging climbed, reliance on cross-currency swap markets grew from about $600 billion in 2010 to more than $1 trillion as of 2015. Most of this increase was due to regional banks and institutional investors, which, unlike the major banks, have little access to foreign currency interbank funding and deposits. The cost of hedging via swaps has increased recently, not only because of greater demand from Japanese investors, but also because of reduced supply stemming from impending U.S. money market fund reform. This has put upward pressure on three-month U.S. dollar London interbank offered rates.

If broad dollar funding markets from deposits to bond issuance were to become disrupted, Japan's large foreign currency reserves and access to central bank swap lines could be a critical backstop. In July, the Bank of Japan doubled available dollar lending of maturity up to four years to finance offshore lending against pooled collateral to $24 billion and doubled the per counterparty loan limit to $2 billion. In addition, banks will be able to borrow Japanese government bonds from the Bank of Japan through

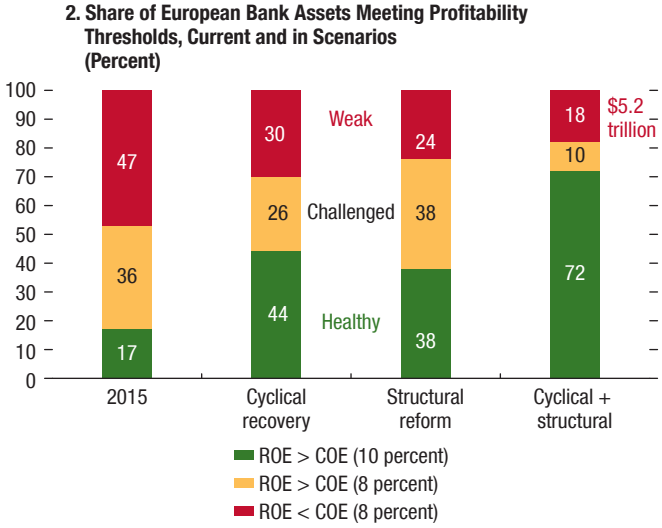
[8]The term "major banks" references the Bank of Japan classification. See Bank of Japan 2016.

Figure 1.17. European Bank Profitability in a "Structural Reform" Scenario

Cyclical recovery and structural reform combined would raise European banks' return on assets by 34 basis points …



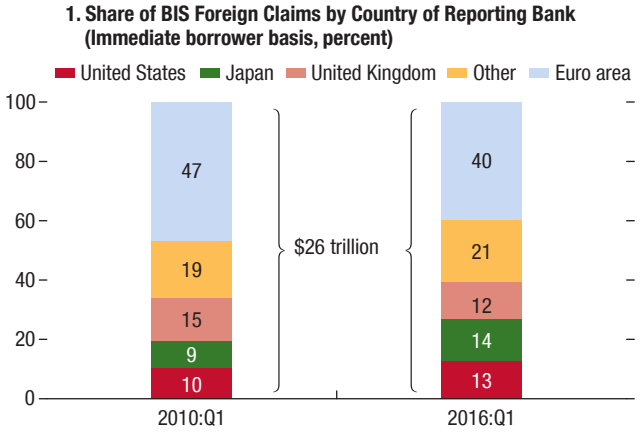
… and allow over 80 percent of sector assets to satisfy an 8 percent cost of equity.



Sources: Bank financial statements; Bloomberg L.P.; Credit Sights; European Central Bank; Fitch Ratings; SNL Financial; and IMF staff estimates and analysis.
Note: "Cyclical + structural" values do not add up because of rounding. The structural reform scenario is considered for European banks. The scenarios considered are different from the stress tests, and aim to focus on the profitability and sustainability distribution under the defined variables. BR = branch rationalization; COE = cost of equity; ROE = return on equity.

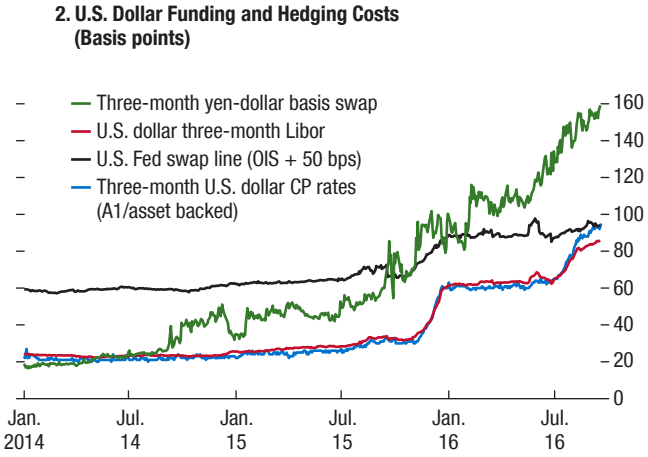
Figure 1.18. Japanese Banks and Foreign Exchange Funding

Japanese banks are expanding overseas ...



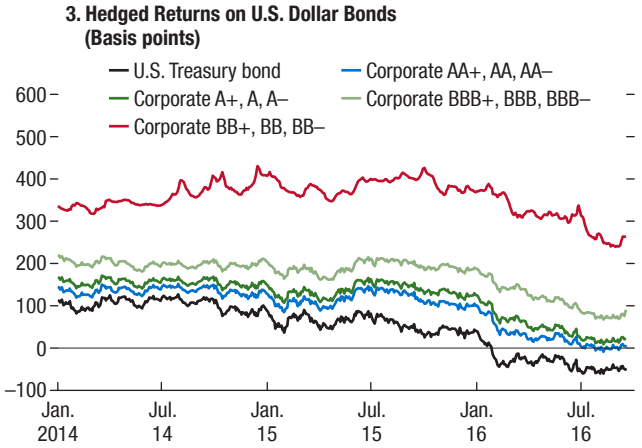
Source: Bank for International Settlements (BIS), Consolidated Banking Statistics.

... but dollar funding and hedging costs have risen ...



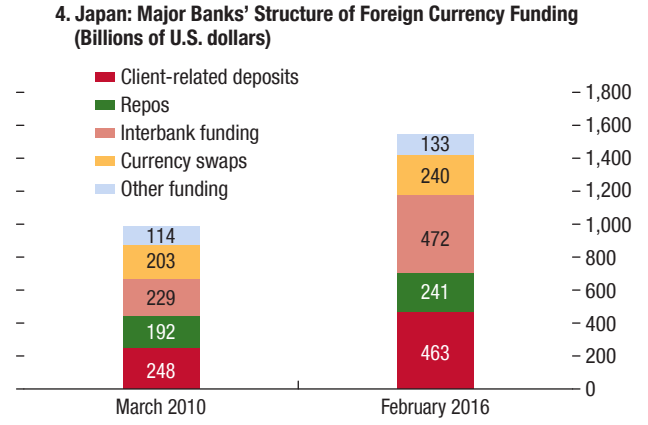
Sources: Bloomberg L.P.; and IMF staff calculations.
Note: Bps = basis points; CP = commercial paper; Libor = London interbank offered rate; OIS = overnight indexed swap.

... forcing investors into riskier bonds to maintain positive yields.



Sources: Bloomberg L.P.; and IMF staff calculations.

Japanese banks are more reliant on wholesale funding than deposits.



Source: Bank of Japan.
Note: Repo = repurchase agreement.

repurchase agreements, which can then be pledged as collateral to access U.S. dollar funding (using existing swap agreements with other central banks). These foreign currency facilities would help buffer banks from temporary dollar funding disruptions. Major banks are not facing funding difficulties currently, as other sources of dollar funding, including bond issuance and customer deposits, have been relatively stable. Major banks have about $400 billion in liquid foreign currency assets that also serve as a buffer. Nevertheless, these funding sources might become more restricted and expensive if broad and severe money market disruptions persisted. The conditions in dollar money markets and their implications for external funding conditions of Japanese banks need to be monitored closely.

A Retrenchment by Japanese Banks and Financial Institutions Would Affect Global Financial Markets

The sizable reliance by Japanese banks and other Japanese financial institutions on wholesale funding and swap markets to finance their foreign investments

means that any disruption to these funding sources could force Japanese banks to curtail their offshore investment and limit the growth of their offshore balance sheets. This could negatively affect cross-border capital flows and global financial market conditions.

In addition, Japanese banks face a number of challenges to their business models:

- *Further declines in domestic interest rates*—The gradual erosion of profits from falling domestic net interest margins will likely accelerate if rates move lower, reducing their ability to generate capital. Likewise, lower profits reduce the ability to pay dividends, which could further depress share prices and hurt the ability of banks to strengthen their capital levels through secondary offerings. If capital levels start declining, this could be a catalyst for a spiral of rating downgrades and higher funding costs.
- *Higher capital charges*—Although Japanese global systemically important banks (G-SIBs) are well capitalized relative to regulatory minimums (in part due to lower total loss-absorbing capacity add-ons than most other G-SIBs), capital buffers could be reduced by upcoming regulatory changes and the introduction of IFRS 9.[9] For example, if all the current proposals before the Basel Committee were to be adopted (such as the recalibration of the standardized approach for credit risk), analysts suggest that required capital amounts of Japanese G-SIBs could rise significantly.
- *Market risks*—Higher U.S. rates would immediately raise the cost of Japanese banks' short-term wholesale funding and reduce demand from foreign investors for hedged Japanese government bond holdings. According to the Bank of Japan, a 100 basis point increase in both domestic and foreign bond yields would result in losses by major banks of about ¥3.5 trillion, or 12 percent of common equity Tier 1 capital. Regional banks could be impacted even more, as they are more exposed to duration risks. Banks are also exposed to a reversal in equity prices; unrealized gains on stockholdings by major banks amount to another ¥3.8 trillion (13 percent of common equity Tier 1 capital ratio).

[9]IFRS 9 is an international financial reporting standard (IFRS) promulgated by the International Accounting Standards Board that addresses the accounting framework for financial instruments.

Policies to Address Challenges in Advanced Economies

In many European countries, a more complete solution to address legacy bank problems can no longer be postponed. Specifically, both the high level of nonperforming loans and rising strains on profitability require urgent and comprehensive action.

- *Accelerating resolution of nonperforming loans*—A comprehensive strategy to reduce problem assets should implement the recently strengthened supervisory guidance for banks to resolve these loans more quickly (including through more conservative loan-loss provisioning and collateral valuation, capital surcharges, and time limits on disposal), strengthen and harmonize corporate insolvency and foreclosure frameworks, and promote active markets in distressed assets (including through asset management companies) (IMF 2016e).
- *Restoring bank profitability*—Excess capacity in the European banking system must be addressed steadily over time, including by assessing the viability of unprofitable banks and, where necessary, consolidating and liquidating nonviable entities to allow sufficient credit demand for remaining banks to increase their profits and capital positions. This would also motivate banks with high operating costs to reduce them, providing additional efficiency gains, including through branch rationalization and reducing funding costs and risks.
- *Fully utilizing the Bank Recovery and Resolution Directive (BRRD)*—Where financial stability risks arise, the flexibility allowed under the directive in resolution actions—such as excluding some creditors from bail-in—should be exercised as needed, taking due account of the principle that creditors should not be worse off than they would be under liquidation. To enhance the BRRD's effectiveness and avoid surprises in bail-in, differences in creditor hierarchies across countries should be clearly communicated to investors and a common hierarchy established. To ensure that the BRRD functions smoothly in a crisis, supervisors and resolution authorities should test how bail-in and cross-border coordination would work for large and complex banks. An assessment of the degree of flexibility afforded under the BRRD and its effectiveness should be undertaken as part of the next review of implementation of the directive, which is expected by June 2018.

- *Empowering the European Stability Mechanism*—Consideration should be given to reducing the thresholds for the direct recapitalization of viable European banks under the mechanism. To further safeguard financial stability in times of systemic stress, the mechanism could be empowered to deploy the direct recapitalization instrument on a precautionary basis, subject to appropriate conditions.

In Japan, intensified supervision is needed to ensure that banks maintain adequate profitability and healthy funding profiles, and are prepared to meet the demands of changing global regulatory standards, such as the implementation of total loss-absorbing capacity requirements. Large global banks are well capitalized compared with national regulatory minimums and have ample domestic liquidity. But the sustained low-profitability environment and increased exposure to foreign assets and funding markets leave them vulnerable to an economic slowdown, rising credit risks domestically or abroad, and higher U.S. dollar funding costs. Profitability strains for regional banks are more pressing. Supervisors should carefully monitor profitability stresses on both these and larger banks, as well as risks to larger banks from overseas commitments, which could intensify sharply should weaker domestic conditions lead to ratings downgrade pressure.

Challenges for Life Insurance Companies and Pension Funds in a Low-Rate Environment

Sustained low interest rates are eroding the viability of business models for many life insurance companies and pension funds, threatening solvency over the medium term.

Life Insurers' Solvency Is Eroded by Prolonged Low Rates

The outlook for many insurance companies has continued to deteriorate in 2016 as expectations for an extended period of low interest rates have deepened. Like those of their bank counterparts, equity prices for many insurance companies have been declining in 2016 (Figure 1.19, panel 1) even as general equity prices have recovered from bouts of volatility. At the same time, credit default swap spreads have increased, suggesting that markets are pricing in greater solvency risks as the interest rate environment becomes more challenging (Figure 1.19, panel 2).

Insurance companies in Germany and Japan are particularly sensitive to further falls in interest rates because of the nature of their business models. The extensive use of insurance policies offering guaranteed returns by many German and Japanese firms can lead to an eroded asset-liability management gap as policies continue to pay out a return higher than current rates.[10] The recent IMF Financial System Stability Assessment Report for Germany (IMF 2016d) highlighted German life insurers' challenges as a result of their traditional business model, which is based on longer and higher guarantees. The significant deterioration of the embedded value disclosed by Japanese life insurers suggests that they face similar pressures from a prolonged period of low interest rates. Other insurers, such as some in the United Kingdom and the United States, face increasing longevity risk: low rates are straining their ability to control longevity risk (resulting from increased life expectancy of policyholders) because of the higher cost of hedging. This in turn could place negative pressures on their solvency under the Solvency II Directive, barring transitional measures.[11] Solvency concerns were flagged in stress tests of European insurers in 2014 (see the April 2015 GFSR), but the interest rate in the current environment is even lower than in the adverse scenario in those tests, with market expectations even more pessimistic (Figure 1.19, panel 4).

The insurance sector is an important participant in global financial markets, and as noted in Chapter 3 of the April 2016 GFSR, this sector's systemic risk and potential for contagion to the rest of the financial sector are rising. In particular, a double-hit scenario (characterized by low interest rates and additional market shocks) could materially impact insurance companies, thus damaging market confidence and possibly triggering contagion to the broader financial sector. A solvency threat to insurers could also pose stability concerns, given the interconnectedness of insurers, banks, and asset managers.

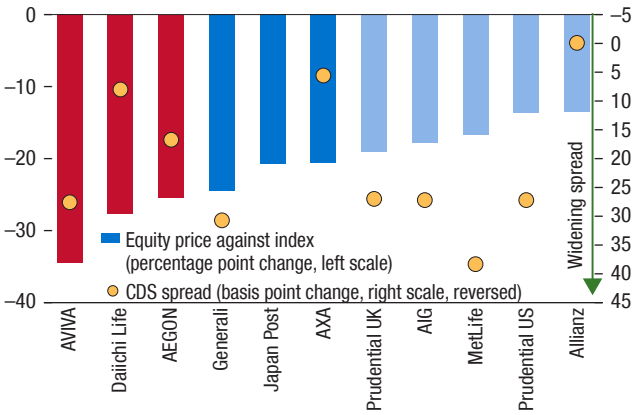
[10]Policyholders of existing policies with higher guarantees are more likely to keep their current contract, which increases the duration of the liability under lower and negative interest rates.

[11]The Solvency II Directive is a directive in EU law that codifies and harmonizes the EU insurance regulation. The Bank of England (2016) estimates that a 50 basis point interest rate change will affect the risk margin (which is part of the insurance liability) by 20 percent, leading to excessive volatility in solvency positions. While there is no explicit capital charge under U.S. risk-based capital, U.S. state regulators are currently working to incorporate risk sensitivity into the capital requirements.

Figure 1.19. Low Interest Rates and Insurance Companies

Equity prices and CDS spreads show insurers under pressure ...

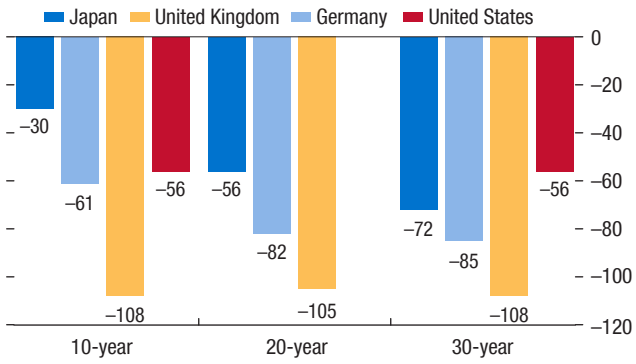
1. Equity Price Declines and CDS Spreads, 2016



Source: Bloomberg L.P.
Note: Insurers are those designated global systemically important insurers (G-SIIs) by the Financial Stability Board in 2014 or 2015 plus two large Japanese insurers. Colors denote severity of the shortfall in equity prices. Red = decline of more than 25 percent; dark blue = decline of between 20 and 25 percent; light blue = decline up to 20 percent. The relative declines are calculated by comparing the decline in equity prices of an individual insurer with the indices of the Standard and Poor's 500, Euro Stoxx 50, and Nikkei 225. CDS = credit default swap.

... as long-term rates continue to plummet.

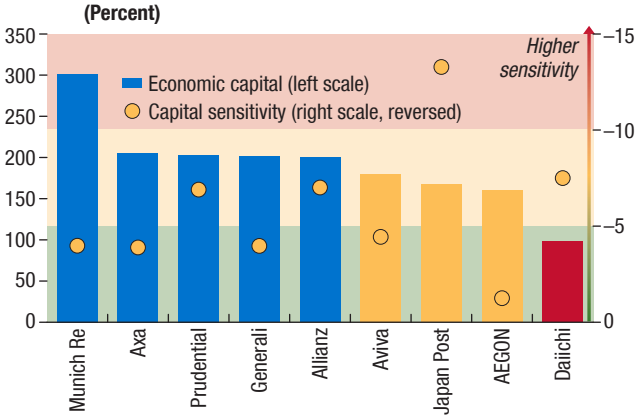
2. Changes in Long-Term Rates, 2016 (Basis points)



Source: Bloomberg L.P.

Lower rates are taking a toll on the solvency of insurers ...

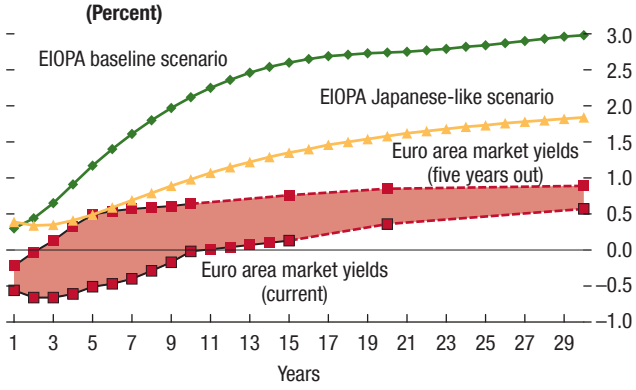
3. Impact of Rate Decline on Economic Capital Position of Selected Insurers (Percent)



Sources: Company disclosures; and IMF staff estimates.
Note: Bars show the level of economic capital of selected groups; the Solvency II SCR coverage ratio is used for European groups and the Economic Solvency Ratio is used for Japanese groups. The color of the bars indicates the level of the solvency ratio: red, below 100 percent; yellow, below 200 percent; and blue, 200 percent and over. Dots show the sensitivity of economic capital under a risk-free rate that is 50 basis points lower; the Solvency II coverage ratio is used for European groups, and the Embedded Value is used for Japanese groups. For the companies that disclose a sensitivity of either a 100 basis point or 25 basis point change, the sensitivity has been adjusted by dividing or multiplying by 2, respectively. Light yellow and pink zones indicate that the sensitivity is higher than 5 and 10 percent, respectively. Data are as of December 2015 for European insurers and March 2016 for Japanese insurers.

... with the outlook far more negative than previously thought.

4. EIOPA Stress Test Results for European Insurers (2014) and Evolution in Yield Curve (Percent)



Source: Bloomberg L.P.; and the European Insurance and Occupational Pension Authority (EIOPA).

Figure 1.20. U.S. Pension Fund Discount Rate
(Percent)

The U.S. pension fund discount rate has plummeted in the low-interest-rate environment.

Source: Bank of America Merrill Lynch.

Low Rates Exacerbate Funding Gaps for Pension Funds

The steady decline in interest rates adds to challenges facing many private pension funds, along with those from aging populations and low or volatile asset returns. Many pension funds face funding gaps, where the present value of future liabilities exceeds the market value of their assets. Funding gaps may widen due to low interest rates because of the lower associated discount rate applied to pension liabilities, which increases the present value of future obligations. Defined benefit pensions of U.S. and European companies have seen their funding gaps worsen since the onset of the crisis. This reflects a combination of low asset returns (especially on safe assets, such as sovereign bonds) and falling interest rates.

Although most equity prices have recently recovered, boosting pension funds' investment returns, the impact of declining interest rates and narrowing credit spreads has been substantial because it lowers the market-based discount rate applied to pension liabilities. Estimates of the U.S. discount rate point to a decline from about 6.5 percent in 2008 to about 3.5 percent in 2016 (Figure 1.20), raising pension funds' projected benefit obligations and offsetting gains from rising equity prices. Similar effects are evident in the United Kingdom. Indeed, the average funding gap for U.S. and U.K. pension funds is about 30 percent, or aggregate shortfalls of $520 billion and $530 billion (£408 billion), respectively (Figure 1.21).[12]

Funding Gaps Could Impact Market Dynamics

The low-interest-rate environment is also triggering adverse dynamics in many pension plans, which have the potential to drive interest rates even lower in a vicious self-fulfilling cycle. Pension funds, notably in the United States, have increasingly shifted their investment mix toward fixed income products (including high-quality long-term corporate debt) and away from equities, pursuing a so-called liability-driven-investing (LDI) strategy. LDI reduces the volatility of the funding gap of pension funds by better matching the interest rate sensitivity of their liabilities and assets through the purchase of more long-duration assets. Having similar interest sensitivity for assets and liabilities insulates the balance sheet from changes in interest rates. According to private estimates, just over 40 percent of U.S. pension funds currently use LDI, with another 40 percent considering this strategy. Applying this current ratio to the largest 100 pension funds of firms in the Standard and Poor's 500 stock index suggests that nearly $700 billion in assets are managed under LDI strategies.

Many pension funds face funding gaps, as more firms are shifting to LDI strategies. This could substantially increase demand for duration in riskier assets, such as corporate debt and emerging market economy debt, as well as in safe haven sovereign bonds, particularly U.S. Treasuries. The more firms that shift their asset allocations toward such assets, the more the yields on these assets decline, reinforcing funding gaps and thus generating additional demand for bonds in a potentially negative spiral. The funding gaps of pension funds may put pressure on the supply of suitable investments, such as high-quality corporate bonds, favored by long-term investors because of their higher yield and relative safety over other investments. Outstanding high-quality, long-term U.S. corporate debt (10-year or longer maturity, rated AA– to AAA) amounts to about $300 billion. This

[12]Respective funding shortfall estimates for the United States and the United Kingdom are from Bank of America Merrill Lynch and the U.K. Pension Protection Fund.

suggests that a meaningful rise in demand by pension funds could consume the current outstanding supply, driving corporate spreads much lower and boosting demand for duration in riskier markets. While lower corporate spreads may support investment and the broader economy, rising exposure to risky assets would increase the vulnerability of portfolios to shocks and higher volatility.

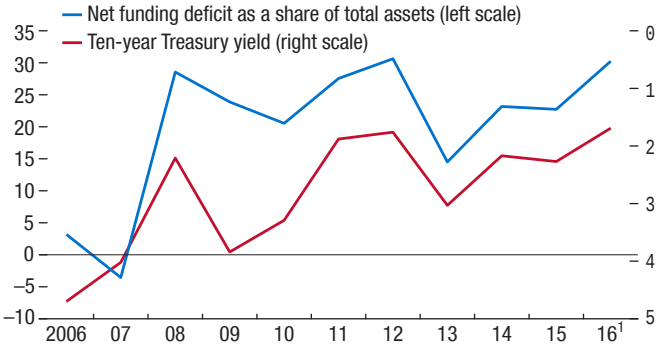
The interconnection of pension and insurance companies and their financial systems means that strains in large or medium-size entities could quickly spread, underscoring the need for prompt regulatory enhancements to ensure their health.

- *Life insurers*—The International Association of Insurance Supervisors' reform agenda should be enhanced across a number of avenues. Regulators and supervisors should act promptly to ensure the ongoing strength of insurance company balance sheets. The association should accelerate development of a sound insurance capital standard, which would ensure better asset and liability management. The development of high and robust standards surrounding the use of internal models is another priority. Macroprudential stress tests should also be employed to identify other challenges, such as a sudden increase in interest rates or more volatile capital markets. Regulatory uncertainty should be reduced by more clearly communicating transitional arrangements toward full implementation of final standards (for example, by establishing clear supervisory expectations and clarity on transitional arrangements). At the same time, consensus on an international capital standard appears to be further threatened by the possible exit of the United Kingdom from the European Union (and its approach to insurer solvency) and by indications from the U.S. Federal Reserve that it will not adopt international standards for the time being.
- *Pension funds*—In Europe, regulations should be strengthened to ensure a common framework for risk assessment and enhanced transparency. This means valuing assets and liabilities on a market-consistent basis to facilitate standardized reporting and risk analyses, such as stress testing. Greater consistency would boost transparency, including by ensuring regular public disclosure of balance sheet metrics and risk analyses.

Figure 1.21. Pension Funding Shortfalls in the United States and the United Kingdom

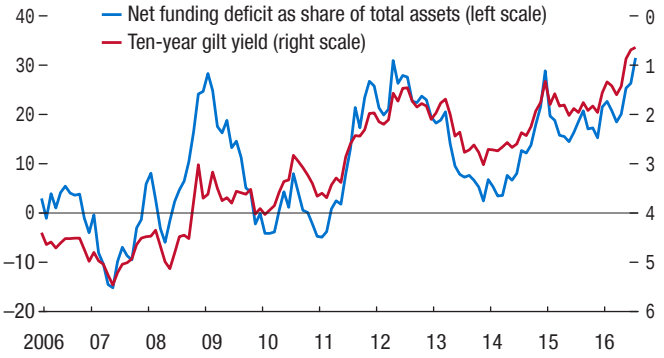
The funding gaps of the U.S. and the U.K. pension funds have risen, reflecting the impact of lower interest rates on future pension obligations.

1. United States: Funding Deficit of Defined Benefit Pension Funds and the 10-Year Treasury Yield
(Percent)



Sources: Bloomberg L.P.; Bank of America Merrill Lynch; and IMF staff calculations.
Note: Top 100 firms in the Standard & Poor's 500. The positive values are below the zero line for the right scale.
[1]Bank of America Merrill Lynch estimate.

2. United Kingdom: Funding Deficit of Pension Funds and the 10-Year Gilt
(Percent)



Sources: Bloomberg L.P.; Pension Protection Fund; and IMF staff calculations.
Note: The positive values are below the zero line for the right scale.

Emerging Market Economies: A Smooth Deleveraging?

Leverage of many emerging market firms appears to have peaked as lower commodity prices have reduced the need for more capital investment. Nevertheless, corporate leverage remains high in many countries, and balance sheet fundamentals are generally weak as growth has slowed, posing risks to emerging market banking systems. Therefore, a smooth path of deleveraging is crucial to preserve financial stability. Financial conditions have eased and economic activity has stabilized somewhat

in 2016 in many economies, but under the baseline scenario the pace of deleveraging over the next five years remains slow. Under an adverse deleveraging scenario, the increase in debt-at-risk (debt belonging to firms with limited ability to repay) is substantial for some major emerging market economies, with strong spillovers into banks that could overwhelm their buffers. Policymakers should use the improvement in near-term conditions to promote smooth deleveraging and to rebuild bank buffers where they are insufficient.

Near-Term Risks Are Down, but Challenges Remain

Short-term risks for emerging market economies have declined in recent months with commodity prices stabilizing and external conditions improving. The growing share of advanced economy sovereign bonds trading in negative territory, along with expectations for further easing by major central banks, have rekindled the global search for yield. The stabilization of capital outflows from China, and reduced uncertainty about China's near-term growth outlook, have supported broader positive sentiment toward emerging market currencies. Currency volatility has declined steadily after spiking earlier this year, lending support for local-currency-denominated assets. As a result, portfolio flows to emerging markets rebounded in March after three-quarters of retrenchment. Total emerging market portfolio inflows have strengthened further since the Brexit referendum in June. Domestic factors have also contributed to attracting portfolio flows. Signs of stabilization in economic activity have emerged in some countries, with business cycle indicators such as purchasing managers' indices recovering. The decline in borrowing costs and stability of currencies resulted in an improvement in financial conditions since the second quarter of 2016, which allowed firms to roll over their maturing debt (Figure 1.22).

Corporate Leverage in Many Emerging Markets May Have Peaked, but Medium-Term Challenges Remain

As highlighted in previous GFSRs, nonfinancial corporate credit in emerging market economies rose substantially following the global financial crisis (Figure 1.23). Firms, particularly in commodity-related sectors, ramped up investment spending to increase production amid rising commodity prices. Many firms increased balance sheet leverage substantially, aided by low rates and easy financial conditions. The subsequent downturn in commodity prices in 2012, and especially the plunge in oil prices since the second quarter of 2014, notably reduced the profitability of commodity firms and their suppliers. This forced many to undo or reduce capital investment plans in an effort to cut expenses and reorganize business strategies. Early indications suggest that corporate leverage is poised to fall for the first time in seven years. In many Latin American countries, leverage is high, but corporate debt is very concentrated, with the top 10 companies in most economies accounting for a majority of the debt stock.

The decline in global commodity prices spurred an initial phase of capital-expenditure-related deleveraging. However, additional efforts are needed to place balance sheets on a healthy footing for a number of reasons: growth is slowing because of cyclical and structural factors, thus suppressing earnings, and high leverage and reduced debt repayment capacity have added to potential corporate and banking system strains.

Some firms have already taken steps to address refinancing challenges by prefinancing upcoming maturities. Net bond financing (bonds issued after netting amortizations, interest payments, and debt buybacks) is expected to turn slightly negative this year and may move further into negative territory. Overall, however, emerging market corporate leverage is elevated as measured by the share of debt to equity (75 percent in 2015), while debt repayment capacity is challenged amid decelerating growth. As discussed in previous GFSRs, corporate debt service capacity is increasingly strained, particularly in emerging Asia. The amount of debt-at-risk (debt of firms with earnings[13] below their interest expenses) across emerging market economies is estimated at $430 billion, or 11 percent of total corporate debt, and remains elevated compared with earlier years. Commodity firms, dominated by state-owned enterprises in many countries, are among the most vulnerable, elevating risks directly to sovereign balance sheets (the *corporate-sovereign nexus*). This can be cause for fiscal concern and can have second-order effects on other firms via the supply chain.

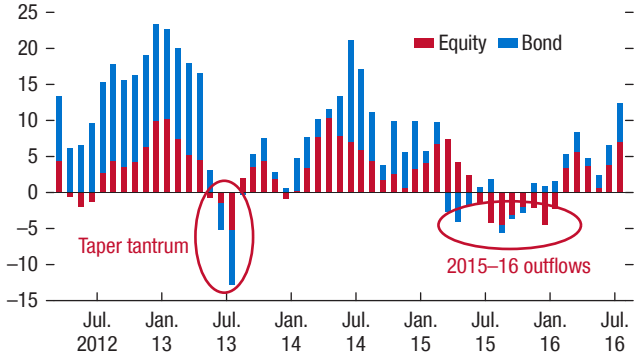
Excess corporate debt also increases risks to banks. The majority of the stock of emerging market corporate debt, some $19.6 trillion out of $25 trillion, resides on the balance sheets of domestic banks. Aggregate capital buffers of banks appear adequate for

[13]That is, firms whose earnings before interest, taxes, depreciation, and amortization are less than their interest expenses.

Figure 1.22. Portfolio Flows to Emerging Market Economies and Asset Prices

Portfolio flows to emerging market economies have rebounded since March ...

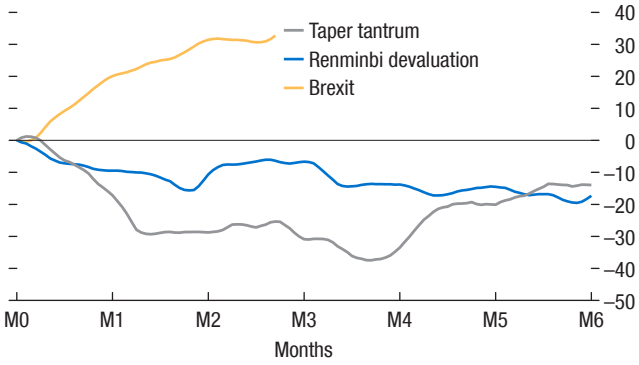
1. Nonresident Portfolio Inflows to Emerging Market Economies (Billions of U.S. dollars)



Sources: Bloomberg L.P.; and IMF staff calculations.
Note: Bond flows include India, Indonesia, Mexico, Russia, South Africa, Thailand, and Turkey. Equity flows include Brazil, India, Indonesia, the Philippines, South Africa, Thailand, and Turkey.

... and have so far proven more resilient to external shocks, such as Brexit, than before.

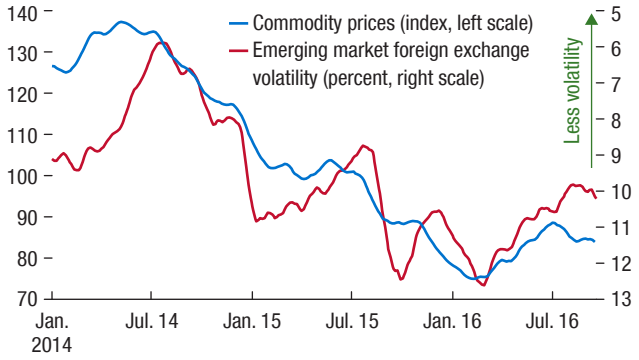
2. Nonresident Portfolio Inflows to Emerging Market Economies (Billions of U.S. dollars, cumulative since each event)



Sources: Bloomberg L.P.; and IMF staff calculations.
Note: Bond flows include India, Indonesia, Mexico, South Africa, and Thailand. Equity flows include Brazil, India, Indonesia, the Philippines, South Africa, Taiwan Province of China, and Thailand.

Stability in commodity prices and low currency volatility, along with ...

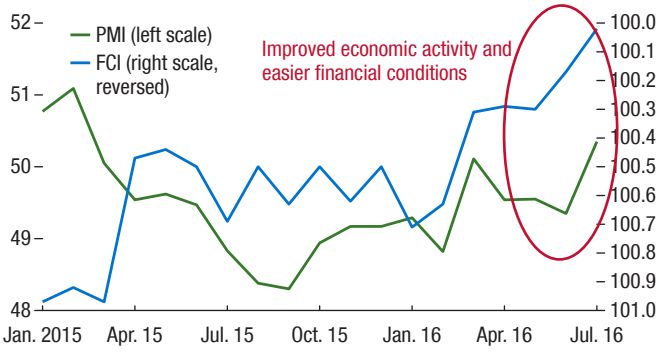
3. Commodity Prices and Emerging Market Foreign Exchange Volatility (Twenty-day moving average)



Source: Bloomberg L.P.

... economy-specific factors are supporting favorable sentiment in many emerging market economies ...

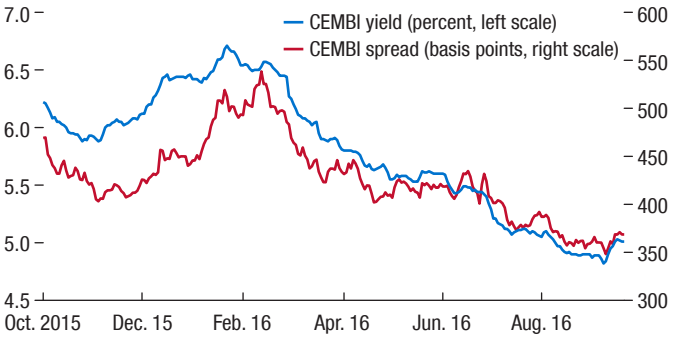
4. Markit PMI and Goldman Sachs EM Financial Condition Index



Sources: Goldman Sachs; and Markit.
Note: EM = emerging market; FCI = Financial conditions index; PMI = purchasing managers' index.

... and the low return of advanced economy assets has boosted the attractiveness of emerging market economy assets.

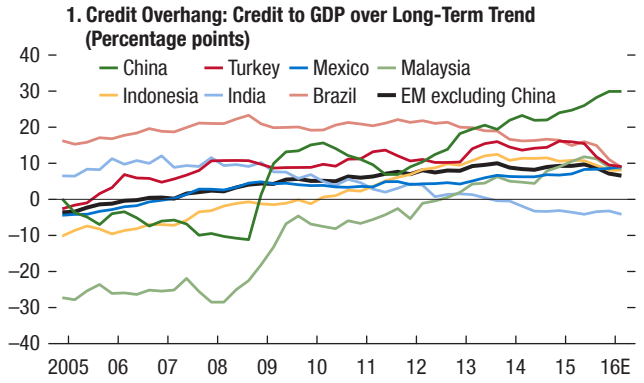
5. Emerging Market Corporate U.S. Dollar Bond



Sources: Bloomberg L.P.; JPMorgan & Chase Co; and IMF staff calculations.
Note: CEMBI = Corporate Emerging Markets Bond Index.

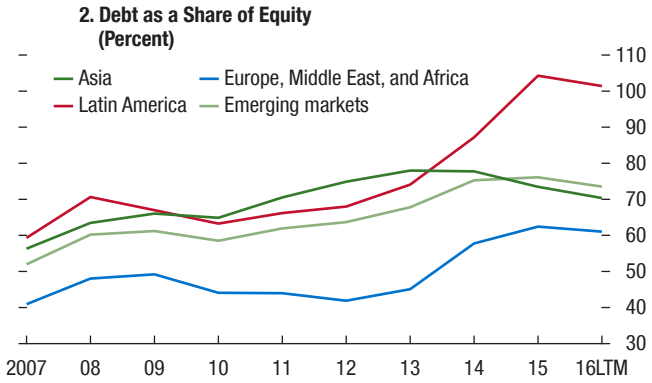
Figure 1.23. Corporate Borrowing: Stabilized, but at a High Level

Excess credit increased substantially in most emerging market economies, and it is now falling ...



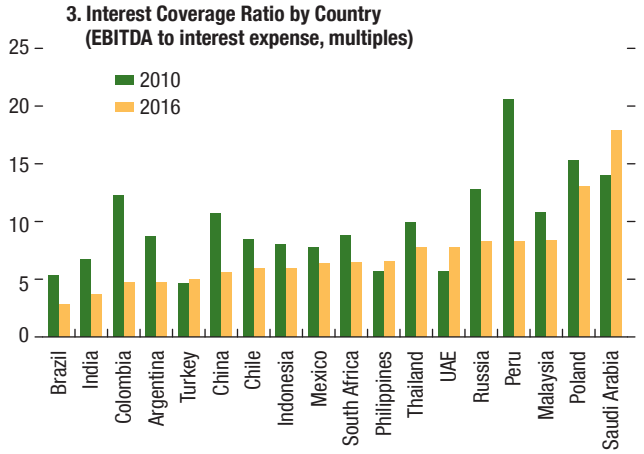
Sources: Bank for International Settlements; Haver Analytics; national authorities; and IMF staff calculations.
Note: Based on a one-sided Hodrick-Prescott filter with a smoothing parameter of 400,000. Data for 2016 are estimates. EM = emerging market.

... led by financing of capital investment.



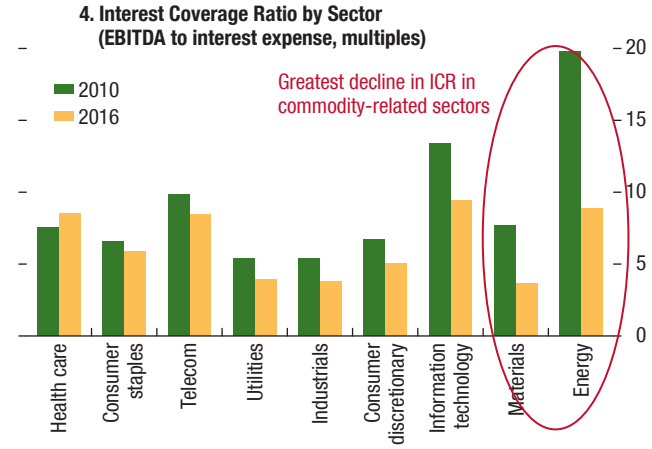
Sources: S&P Capital IQ; and IMF staff calculations.
Note: LTM = last 12 months.

Lower earnings impaired firms' ability to repay ...



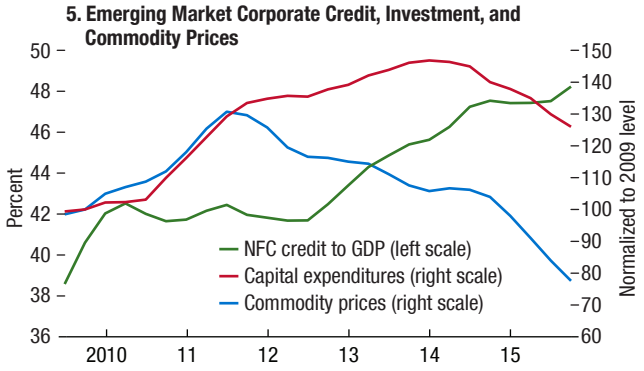
Sources: S&P Capital IQ; and IMF staff calculations.
Note: EBITDA = earnings before interest, taxes, depreciation, and amortization. UAE = United Arab Emirates.

... led by commodity-related sectors.



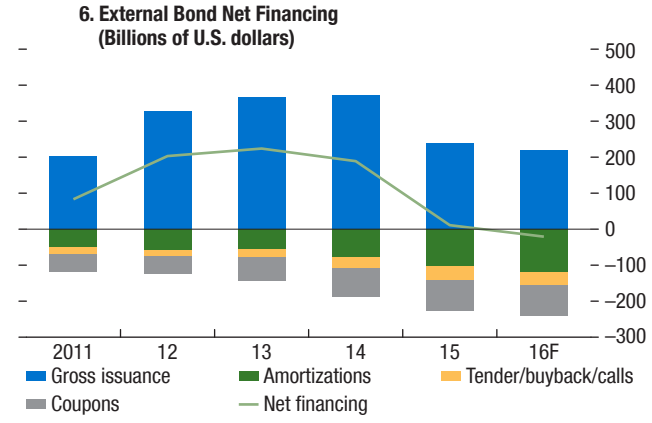
Sources: S&P Capital IQ; and IMF staff calculations.
Note: EBITDA = earnings, before interest, taxes, depreciation, and amortization; ICR = interest coverage ratio.

Low commodity prices have curbed investment, leading to ...



Sources: S&P Capital IQ; and IMF staff calculations.
Note: NFC = nonfinancial corporation.

... dollar corporate net financing turning negative this year.



Source: JPMorgan Chase & Co.
Note: Data for 2016 are forecast.

most systems (see the October 2015 and April 2016 GFSRs). However, banking systems are vulnerable to further declines in growth or profits, particularly in countries at later stages of the credit cycle (such as India), where slowing credit growth and risks from elevated levels of nonperforming loans are most acute (see the October 2015 GFSR).

Medium-term macroeconomic challenges also remain. Growth expectations for 2017 have been revised slightly higher in India, and for some Commonwealth of Independent States economies, compared with the July 2016 WEO forecasts (and for Brazil compared with the April 2016 WEO), but emerging Europe and sub-Saharan Africa are expected to decelerate further. External conditions may turn less supportive if U.S. dollar strength resumes, perhaps as a result of renewed expectations for higher rates in the United States, which could test the resilience of emerging market economies again.

The Path of Deleveraging Is Important for Financial Stability

The challenge for emerging market firms is to deleverage in a smooth manner, taking advantage of supportive external conditions and policy measures to improve balance sheet fundamentals. In this regard, reducing borrowing in order to shrink the size of their overall debt burden, and refinancing existing debt at current favorable interest rates, would lessen balance sheet vulnerabilities and decrease the overall amount of corporate debt-at-risk. Banks, in turn, would benefit from healthier borrowers, particularly as provisioning needs would decline.

Our baseline deleveraging scenario assumes that economic and financial conditions continue to be benign and supportive, corporate earnings stop declining and instead normalize to a slightly improved level. Individual firm earnings are modeled over the next five years by increasing their earnings before interest, taxes, depreciation, and amortization (EBITDA) by a half standard deviation of their five-year earnings history, which is consistent with a small resumption in growth and economic activity. Firms are assumed to be able to service and roll over their debt stock over the next five years at interest rate and spread levels on par with the improvement in corporate bond yields since January 2016, or 40–50 basis points lower (on average) than their most recent borrowing costs.

Leverage falls under the baseline scenario, but only gradually, reaching 2014 levels by 2021 in most regions. Some economies, such as Brazil, Colombia, and Malaysia, achieve faster deleveraging—partly as they unwind the increase in leverage caused by the prior years' currency depreciation with the improvement in earnings and reduction in borrowing costs—but the pace of improvement for most other emerging market economies is subdued (Figure 1.24).

The slow pace of deleveraging reflects a new era that emerging market economies find themselves in: low growth in advanced economies keeping commodity prices well below levels seen in 2010–14, lower trade, and higher debt levels and excess capacity. In these circumstances, deleveraging is gradual and not fast enough to simply grow out of the problem, leaving them sensitive to downside external or domestic developments.

Firms in Latin America have been tested since 2014 with sharp earnings growth deceleration and substantial currency depreciation in most economies, which may explain the sharp rise in default rates in 2016 (Figure 1.24, panel 6). Nevertheless, so far the region has not had widespread corporate distress. While leverage may have peaked for some firms, the default rate may continue to rise, notwithstanding factors such as (1) ongoing debt restructuring, (2) government support to big and systemically important firms such as national champions and state-owned enterprises, and (3) evergreening by banks.

Bank Buffers Would Be Stressed Under Disorderly Deleveraging

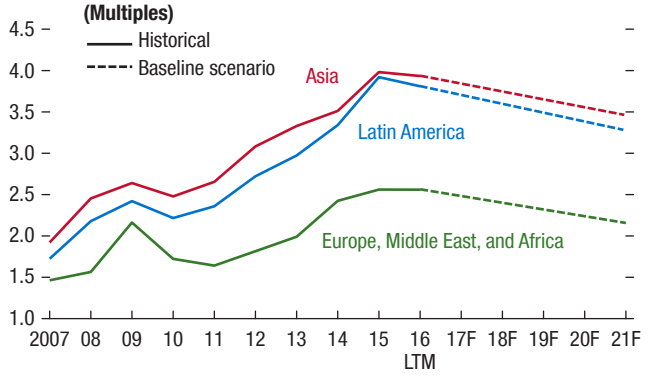
Emerging market economies remain vulnerable to shifts in investor sentiment and changes in policies of major central banks. Given only modest improvements in emerging market economy growth prospects, the recent rebound in capital flows appears to be driven more by external developments than by better economic fundamentals. As a result, a shock or sudden shift in market sentiment could quickly reverse these benign conditions and capital flows.

In an adverse deleveraging scenario, higher funding costs and lower corporate earnings could result in significantly higher debt-at-risk for nonfinancial firms (Figure 1.24, panel 3). A shock to earnings growth consistent with the continuation of subpar performance as in the most recent two years (modeled as a firm-by-firm half standard deviation

Figure 1.24. Scenarios for Deleveraging in Emerging Market Firms and Default Rates

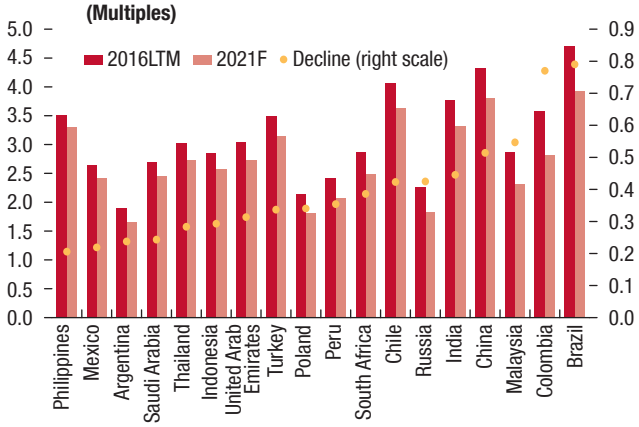
Leverage is expected to continue coming down in the baseline scenario ...

1. Debt to EBITDA by Region and Forecast (Multiples)



... but slowly for most economies.

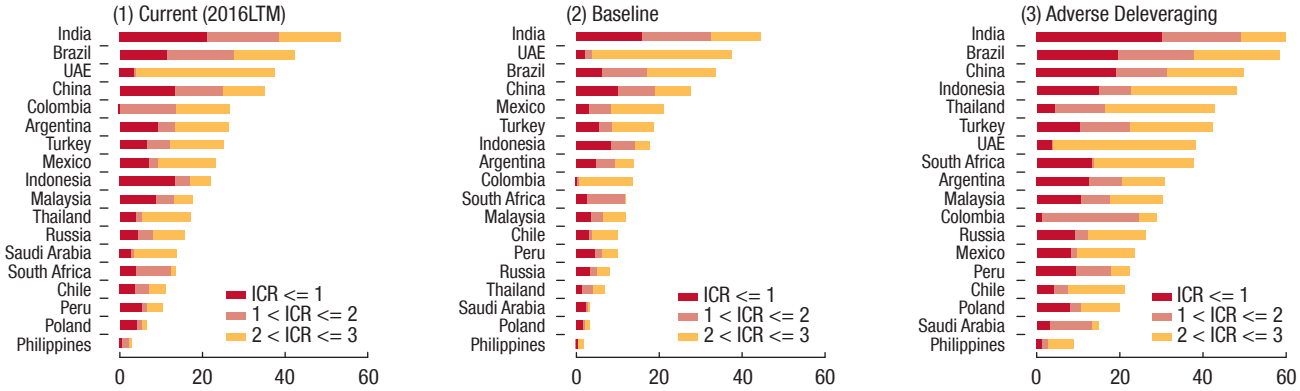
2. Debt to EBITDA in Selected Major Emerging Market Economies (Multiples)



Sources: S&P Capital IQ; and IMF staff calculations.
Note: EBITDA = earnings before interest, taxes, depreciation, and amortization; F = forecast; LTM = last 12 months.

Debt-at-risk threatens to rise significantly, in an adverse deleveraging scenario.

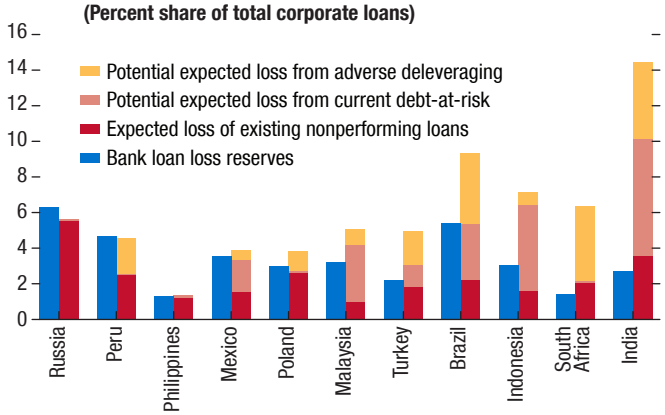
3. Share of Corporate Debt by Interest Coverage Ratio Bucket (Percent)



Sources: S&P Capital IQ; and IMF staff calculations.
Note: ICR = interest coverage ratio; LTM = last 12 months; UAE = United Arab Emirates.

Additional nonperforming loans from debt-at-risk could overwhelm bank buffers in some emerging market economies.

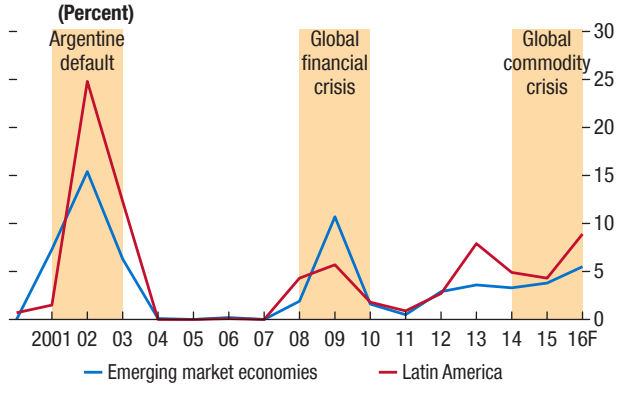
4. Additional Nonperforming Market Loans from Debt-at-Risk (Percent share of total corporate loans)



Sources: Fitch; IMF, Financial Soundness Indicators database; national sources; S&P Capital IQ; and IMF staff calculations.

The increase in emerging market corporate default rates is led by firms in Latin America.

5. Dollar Bond Default Rate (Percent)



Source: JPMorgan Chase & Co.
Note: Default rate calculated on the stock of high-yield debt. F = forecast.

decline of EBITDA over the next five years), and a permanent increase in debt risk premiums (by a half standard deviation of the interest expense) over the next five years, increases the debt-at-risk substantially for many economies, including Brazil, China, India, and Indonesia.[14]

Bank loan-loss reserves fall short of the expected loss on nonperforming loans under the current (2016) debt-at-risk in India (Figure 1.24, panel 4).[15] The additional potential losses from an adverse deleveraging scenario shown in Figure 1.24, panel 4, would require additional provisions for many banking systems.[16] Pressure is more acute where loan-loss reserves are low relative to potential losses, such as in India, Indonesia, and South Africa.[17]

Financial Market Implications of Political Risks

Recent events have highlighted the importance of political stability and policy certainty to preserve macro-financial stability. The past year has seen major political events trigger increased uncertainty about the direction of policies and the prospects for reform. Brazil was downgraded by Fitch in May 2016, Turkey was downgraded by Standard & Poor's in July 2016 and put on review for a downgrade by Moody's and Fitch, and South Africa was downgraded by Fitch in December 2015 and barely avoided a downgrade to below investment grade status by Standard & Poor's and Moody's in June 2016. In all these cases, political uncertainty was cited as a major factor. In some cases, these developments have had an immediate impact on sovereign ratings or have triggered bouts of market volatility (Figure 1.25, panel 1). On a positive note, recent elections in Peru and policy measures in Argentina have been received favorably by investors, reflecting prospects for further reforms and political stability in the region, while India continues to benefit from a stable political environment.

Increased financial linkages between emerging market and advanced economies have increased the risk of spillovers between the two (Figure 1.25, panel 2) and have left some countries particularly exposed to political risks from abroad. Notably, investor concerns about potential ramifications of the U.S. presidential election results on trade relations with Mexico continue to mount. Given the relatively large investment and trade linkages between the two countries, Mexico looks vulnerable to a deterioration in investor sentiment and a sharp drop in portfolio and foreign direct investment flows from the United States.

Heightened policy uncertainty could worsen the investment climate for many emerging market economies, with an impact on medium-term growth potential. There is also elevated event risk that large emerging markets could lose their investment grade ratings, potentially triggering forced selling of hard-currency debt by foreign investors (Figure 1.25, panels 3 and 4).

Policies Need to Aim at Ensuring Smooth Deleveraging and Enhancing Resilience

Continued subdued growth prospects and lingering vulnerabilities in many countries underscore the need for more progress along a number of fronts. Although many countries wisely deployed macroeconomic policy buffers and allowed currency flexibility to cushion the impact of slower growth and lower commodity prices, some may be running out of room to maneuver. The turn of the credit cycle and weaker corporate balance sheets will continue to raise pressure on banks despite adequate levels of profitability and capitalization across most systems. Therefore, emerging markets should take advantage of supportive external conditions to enhance their resilience by addressing corporate and banking sector weaknesses.

- *Managing the impact of corporate distress*—Slower growth and corporate strains will erode banks' asset quality. Policymakers should proactively monitor and address corporate vulnerabilities, particularly those arising from excess leverage. Swift and transparent recognition of nonperforming assets is central to ensuring future banking system health. Some, such as India, are taking steps to reduce nonperforming loans, but additional and more timely action is needed. Corporate insolvency frameworks

[14]Discrepancies between country bilateral reports and the GFSR may arise due to different databases and time periods covered.

[15]Loan-loss reserve data for Malaysia are calculated as 100 percent of individual impairment provisions plus 70 percent of collective impairment provisions as per Bank Negara Malaysia methodology.

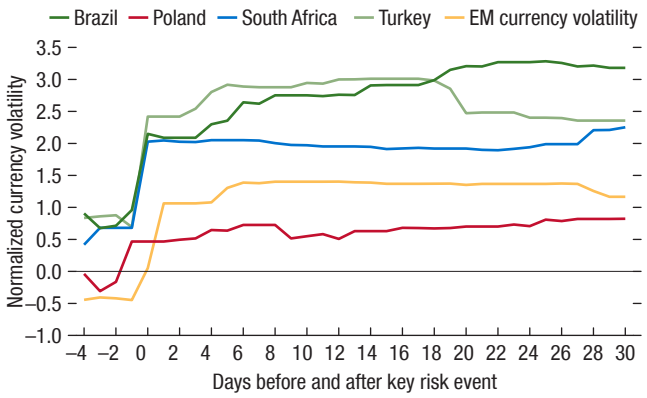
[16]Excess bank capital over minimum regulatory requirements would also cover some of these potential losses.

[17]To overcome the lack of loan-level information from the financial statements of individual banks, the analysis scales the debt-at-risk proportions for the sample of firms to the system level using national data and compares it to the stock of nonperforming loans and loan-loss reserves that banks have set aside to cover bad loans. The expected loss assumption on the loans-at-risk is 60 percent, and the nonperforming loan default probability is 0.8.

Figure 1.25. Sensitivity of Emerging Market Economy Assets to Global Policy Uncertainty

Market volatility is higher after political events across emerging market economies ...

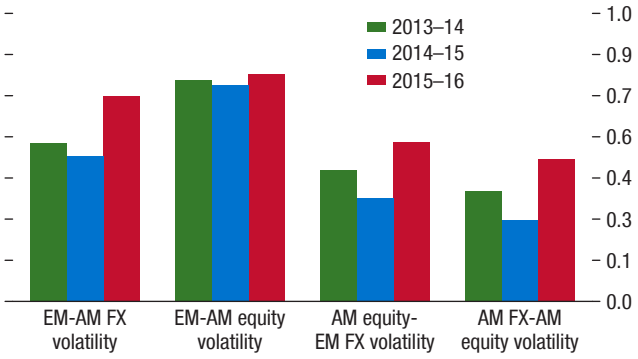
1. Emerging Market Economy Currency Volatility after Risk Events



Sources: Bloomberg L.P.; and IMF staff calculations.
Note: Events over the past 12 months. Brazil: Congressional vote (Sep. 23, 2015); Turkey: failed coup attempt (Jul. 15, 2016); South Africa: Fitch rating downgrade (Dec. 4, 2015); Poland: S&P rating downgrade (Jan. 15, 2016); EM = emerging market: Brexit vote (June 23, 2016).

... with tighter financial linkages between emerging market economies and advanced economies potentially transmitting shocks across countries.

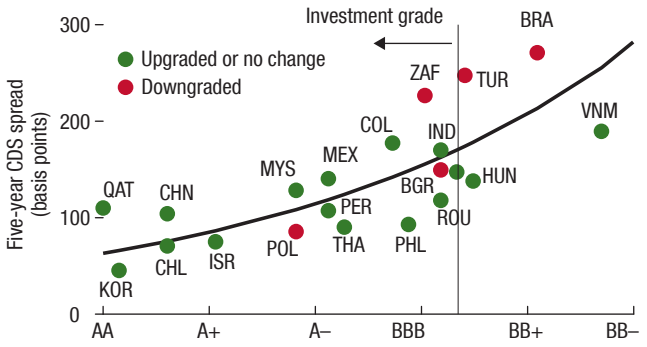
2. Correlation between Emerging Market Economy and Advanced Economy Volatilities



Sources: Bloomberg L.P.; and IMF staff calculations.
Note: AM = advanced markets; EM = emerging market economies; FX = foreign exchange.

Sovereigns face growing risk of rating downgrades due to political uncertainty ...

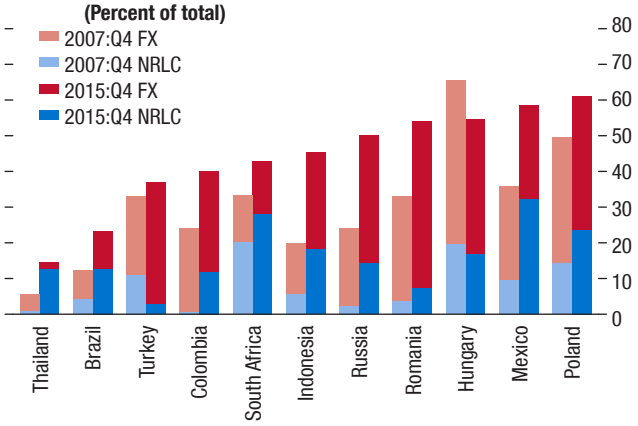
3. Sovereign Credit Spreads versus Ratings, August 2016



Sources: Bloomberg L.P.; and IMF staff calculations.
Note: Data labels in the figure use International Organization for Standardization (ISO) country codes. Line corresponds to the best fit of the logarithm of CDS spreads against ratings. CDS = credit default swap.

... and downgrades could trigger forced selling of dollar and local currency sovereign debt by nonresidents.

4. Government Debt Breakdown in Foreign Currency and Nonresident Holdings of Local Currency (Percent of total)



Sources: Bank for International Settlements; Haver Analytics; national authorities; and IMF staff calculations.
Note: FX = foreign exchange; NRLC = nonresident holdings of local currency.

should be upgraded (including by facilitating out-of-court settlement and debt-for-equity swaps, with well-defined and transparent rules) and contingency plans to manage corporate distress put in place. This should include a timely, market-based restructuring framework that minimizes moral hazard while providing for limited state support if necessary (see also the October 2016 *Fiscal Monitor* for a broader exposition of targeted fiscal interventions). Where available, banks should draw on their capital reserves to cushion losses. But where these reserves are insufficient, policymakers will have to balance necessary prudential tightening against the risk of being excessively procyclical.

- *Boosting capacity*—Reforms to macroprudential and supervisory frameworks should be accelerated to ensure timely and effective responses to these challenges. Enhanced supervision of banks will be needed, requiring better coordination among institutions and central banks in some countries.
- *Ensuring continued access to international financial services*—Strengthened regulatory and supervisory regimes, including by ensuring effective implementation of standards to combat money laundering and the financing of terrorism, would enhance capacity and transparency and help lower risk perceptions in some emerging market and developing economies. Such actions would also help moderate impact from global banks' reduced financial services (derisking)—in correspondent banking activity, for example—and promote greater financial inclusion for these economies.[18]

China: Growing Credit and Complexities

China continues its transition to a slower and safer pace of growth and a more market-based financial system. Reforms are progressing on multiple fronts, driving economic rebalancing. Measures to boost productivity in the past have delivered strong wage and income growth and a resilient labor market, lifting the share of consumption and services in GDP, while manufacturing activity and investment have become less prevalent sources of growth. Additional plans to reduce capacity in some sectors, such as coal and steel, should support further rebalancing of China's economy and a more efficient allocation of credit. The move toward more market-based mechanisms for interest rates and the exchange rate has strengthened the monetary policy framework and increased the flexibility of the renminbi against the U.S. dollar. Capital outflow pressures and expectations of further renminbi depreciation have eased, stabilizing international reserves, while equity market volatility has diminished, further boosting market sentiment. The combination of reforms and policy measures has supported near-term growth and bolstered the resilience of the economy, helping Chinese financial markets stabilize after recent bouts of global financial market turmoil.

Nevertheless, as discussed in the recent IMF consultation for China (IMF 2016f), uneven reform progress—especially in key areas such as strengthening governance and imposing hard budget constraints on state-owned enterprises, tackling excessive corporate debt, and opening up state-dominated service sectors to private firms—has led to rising vulnerabilities.

- Credit and financial sector leverage continue to rise faster than GDP, and state-owned enterprises in sectors with excess capacity and real estate continue to absorb a major share of credit flow. The deviation of credit growth from its long-term trend, the so-called credit overhang—a key cross-country indicator of potential crisis—is estimated somewhere in the range of 22–27 percent of GDP (Figure 1.26, panel 1), which is very high by international comparison.
- The surge in shadow credit products adds to underlying credit risks. They could be another source of bank losses, especially for a number of smaller banks with relatively large exposure, and could add to potentially significant loan losses in the face of weakened corporate balance sheets, as discussed in the April 2016 GFSR.
- The rapidly growing financial system is increasingly leveraged and interconnected, further increasing banks' vulnerability. This reflects a complex network of credit and funding linkages between banks and nonbank financial institutions, facilitated by a recently developed variety of innovative investment products and vehicles.

Proliferation of Shadow Credit Assets Adds to Financial Sector Risks

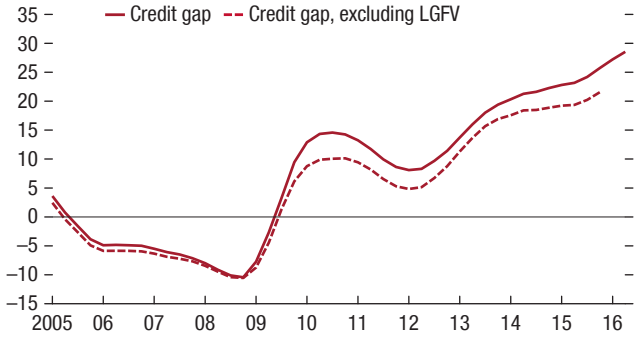
Bank balance sheets expanded at a rapid pace in 2015 (by about 16 percentage points to 286 percent of GDP), driven in part by surging exposure to shadow credit products and claims on other financial insti-

[18]Sahay and others (2015) show that strengthened supervision and reputation enhance the benefits of financial inclusion.

Figure 1.26. China: Credit Overhang and Shadow Credit

China's credit overhang is rising ...

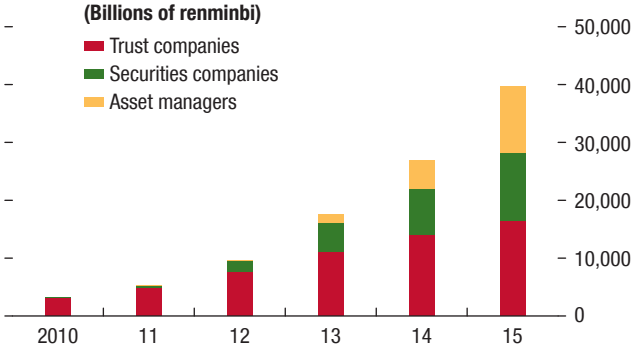
1. China: Credit Overhang to GDP over Long-Term Trend (Percentage points)



Sources: Bank for International Settlements; Haver Analytics; IMF, World Economic Outlook database; and IMF staff estimates.
Note: Based on a one-sided Hodrick-Prescott filter with a smoothing parameter of 400,000. LGFV = local government financing vehicle.

... as the proliferation of shadow credit products adds to financial sector vulnerabilities.

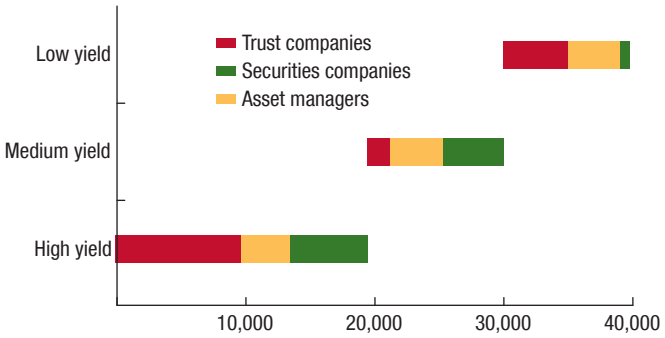
2. China: Shadow Credit Products, by Category of Structuring Entity (Billions of renminbi)



Source: CEIC.

About half of outstanding shadow credit products carry a relatively high yield ...

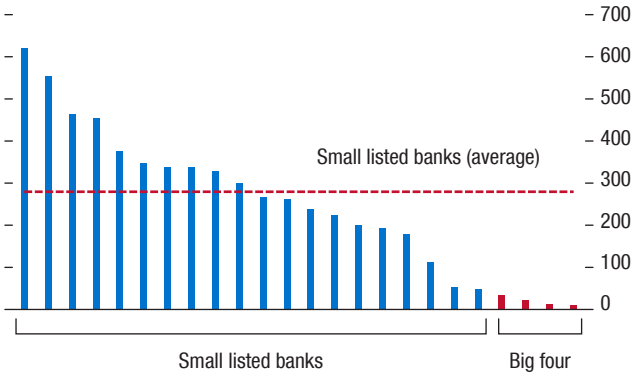
3. China: Shadow Credit Products, by Yield Category (Billions of renminbi)



Sources: ChinaBond; China Trustee Association; Morgan Stanley; WIND; and IMF staff estimates.

... while small banks are heavily exposed to shadow credit as a share of capital buffers.

4. China: Shadow Assets as a Share of Capital Buffers (Percent)



Sources: Bank financial statements; and IMF staff estimates and analysis.
Note: Big four = Agricultural Bank of China, China Construction Bank, China Development Bank, and Industrial and Commercial Bank of China.

tutions. Although bank loans continue to dominate credit to the private sector, corporate bonds and other credit products are rapidly increasing. Notably, shadow products—credit products composed of trust and other structured products—surged by almost 50 percent to ¥40 trillion last year (Figure 1.26, panel 2). By comparison, over the same period, loans grew 13 percent and bonds 20 percent.

Often, shadow credits' underlying assets are nonstandard credit assets—untradeable debt, typically repackaged loans that used to carry lower capital charges than standard loans. A large number of these products come with a high yield, suggesting higher risk than standard bank loans (Figure 1.26, panel 3). A sample of 24 banks (virtually all listed banks, accounting for over 60 percent of total bank assets) reveals that risks are not distributed evenly across banks. At the end of 2015, the "big four" banks had relatively modest exposures (between 1 and 2 percent of total assets), or 10–15 percent of loss-absorbing buffers (equity plus loan-loss reserves; Figure 1.26, panel 4). However, shadow product exposure of smaller banks

averaged 280 percent of total buffers, and reached nearly 600 percent.

Growing Linkages Increase Potential for Spillovers

The rapid growth of bank assets, including rising exposure to shadow credit, increased banks' reliance on wholesale funding as deposit growth slowed. Wholesale funding surged by 5 percentage points relative to a year ago and reached over 30 percent of total funding at the end of 2015 (Figure 1.27, panel 1). Reliance on wholesale funding was the highest among small banks; this dependence is rising fast. Notably, this growing reliance on the interbank and repo markets has been dominated by overnight and weekly repurchase agreements, which account for more than 90 percent of transaction volume. Banks and other financial institutions are net borrowers from the interbank market; money market investment vehicles that are typically regarded as yield-enhancing deposit substitutes—wealth management products, trust plans, money market funds—are net liquidity providers. This growing interconnectedness of banks, other financial institutions, and investment products through the interbank and repo markets raises the potential for spillovers in the event of increased turbulence.

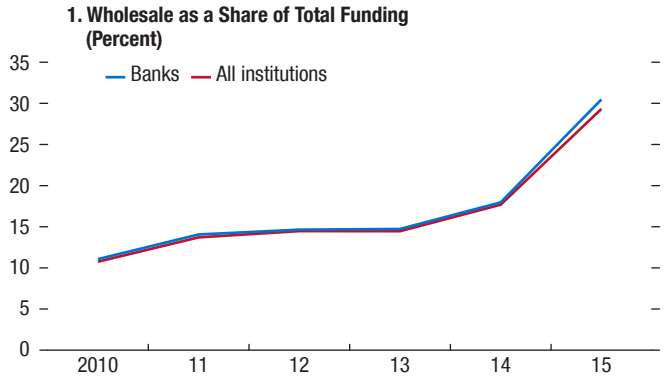
Although most of the underlying collateral for products that invest in the interbank market consists of government paper and bonds issued by financial institutions, corporate bonds and other tradable credit products are used as well. A deterioration in credit quality and repricing of credit risk for the latter could quickly damage investor confidence with repercussions for banks' funding. Moreover, funds invested by trusts and asset and wealth management product managers in the interbank market tend to have short maturities. For example, in 2015, 61 percent of total wealth management product assets had terms of less than three months, and 13 percent had maturities shorter than one month. The short maturity of these assets that fund interbank lending exacerbates liquidity risks facing banks and financial institutions.

Three risks stand out from increased reliance on wholesale funding, especially for the smaller banks:

- First, the very short-term nature of China's repurchase agreement funding implies that borrowers must roll over their liabilities on average almost daily, whereas funded credit products have mostly longer maturities. This maturity mismatch makes borrowers highly vulnerable to a sudden liquidity crunch.
- Second, a significant portion of wholesale and repo funding is provided by nonbank investors and third-party funds tied to products that are potentially prone to flight in the event of a negative credit shock.
- Third, the growing interconnection between borrowers—banks and financial institutions—and lenders—money market investment vehicles—through the interbank market and increasingly complex products creates an opaque system in which vulnerabilities are difficult to locate and targeted support may be more difficult to deliver.

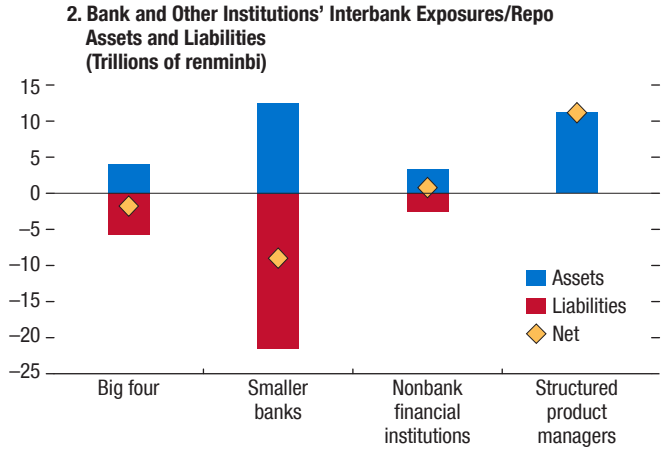
Figure 1.27. China: Bank Linkages to the Structured Investment Complex

Wholesale funding has increased ...



Sources: Bank financial statements; and IMF staff estimates and analysis.

... and small banks are more reliant on it.



Sources: Bloomberg L.P.; CEIC; WIND; and IMF staff estimates and analysis.
Note: Big four = Agricultural Bank of China, China Construction Bank, China Development Bank, Industrial and Commercial Bank of China; repo = repurchase agreement.

Smoothing the Rebalancing Process in China

The Chinese authorities' latest reform efforts have led to more balanced growth and a greater role for market forces, improving the resilience of the Chinese economy and financial system. While growth is slowing to a healthier pace, economic activity remains robust and China continues to contribute significantly to global growth. Nonetheless, China's corporate debt overhang and other emerging financial sector vulnerabilities must be addressed promptly through a comprehensive approach to facilitate deleveraging and upgrade the supervisory and macroprudential framework. Specifically (IMF 2016f):

- *Deleveraging firms*—As discussed in previous GFSRs, high corporate leverage and debt-at-risk call for a proactive recognition of losses shared among relevant parties, including the government if necessary. Overindebted but viable firms can be restructured, but nonviable firms should be closed on the basis of a sound legal and institutional framework for facilitating bankruptcy and debt workout processes. Faster debt write-offs should be accompanied by a strengthening of banks' capital positions and better governance, together with hardened budget constraints, especially for state-owned enterprises, including through the elimination of implicit guarantees. The authorities' proposed debt-equity swap could be a useful part of this overall agenda, aimed at reducing nonperforming loans. But it should be done on a limited basis with transparent and well-defined rules, including strong eligibility criteria both for borrowers (such as ensuring business solvency and good governance) and for banks (such as limitations on the scope and time of ownership).
- *Upgrading the supervisory framework*—Risks emerging in the financial sector point to several regulatory challenges: the growth of shadow products reflects regulatory arbitrage and the interconnection and complexity of the financial system underscore the absence of harmonized regulatory treatment of similar institutions and products. Against this backdrop, regulatory oversight should standardize and coordinate oversight of parties involved in the interbank market and install common standards across products to limit regulatory arbitrage. Closer monitoring of the link between banks and nonbank financial institutions and timely reporting of underlying system leverage are needed to reduce vulnerabilities. Solvency, liquidity, and other norms should be standardized or coordinated to limit vulnerabilities and the potential for risk propagation. These initiatives require regulatory upgrades and a more effective coordination and information sharing among regulatory bodies. In addition, efforts should be made to gradually reduce moral hazard and implicit guarantees to foster better credit risk pricing while limiting default risk flowing back to banks via bailouts. Finally, contingency plans are needed to deal with a sudden stop in wholesale funding from nonbank financial institutions.

The Chinese authorities have made significant progress in building supervisory capacity and strengthening the macroprudential framework. They have also taken steps to contain the growth of shadow credit products and reduce risks. The stakes are high: the risks remain manageable but they need to be managed promptly to ensure that financial stability risks do not undermine China's progress toward balanced and sustainable growth.

Global Stability Challenges in the New Era

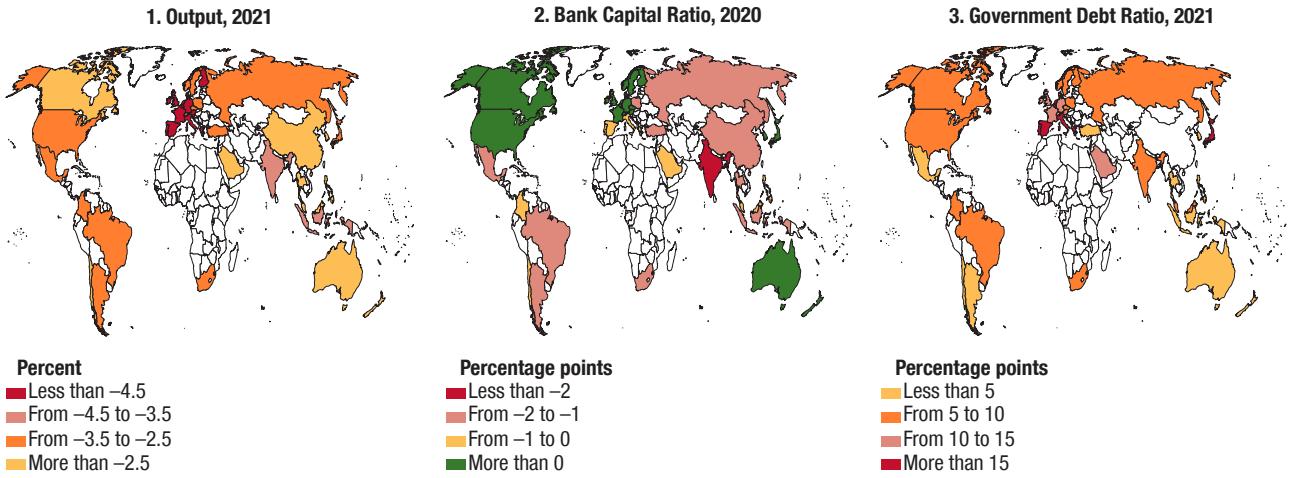
Policymakers need a more potent and balanced policy mix to deliver a stronger path for inclusive growth and financial stability and ward off risks of sliding into a state of economic and financial stagnation.

The Challenges

Financial markets have benefited from renewed risk appetite in the wake of unprecedented central bank actions. But there is an urgent need to raise global growth, strengthen the foundation of the global financial system, and bolster confidence to avoid slipping into a state of economic and financial stagnation.

The weak economic environment has driven rising discontent over income growth and inequality, unearthing protectionist and populist sentiment and making consensus on growth-enhancing reforms and additional supportive policies more difficult to achieve. This underscores the potential for political developments to pose a major challenge to financial stability going forward. In particular, tail risk political outcomes (those that are severe but not very likely) could increase isolationist policies (see Scenario Box 1 on tariff scenarios in the October 2016 *World Economic Outlook*) and prevent needed reforms. Such outcomes would carry negative economic consequences

Figure 1.28. Financial Stagnation and Protectionism Scenario: Simulated Peak Effects



Source: IMF staff estimates.

and could tip the global financial system into a state of financial stagnation: financial institutions would struggle to sustain healthy balance sheets, which would jeopardize economic growth and financial stability.

If such a scenario of *financial stagnation and protectionism* were to materialize, it would likely lead to a marked shift into safer assets in financial markets. Confidence losses could cause firms and households to postpone spending, reducing private investment and consumption. Banking systems would come under increased profitability stress and experience widening funding spreads. This could hasten derisking by global banks, with implications for correspondent banking activities in emerging market and developing economies. Moreover, capital flows would steer toward safer assets, undercutting the supportive external environment that is benefiting emerging markets. Tighter global financial conditions and high corporate leverage would exacerbate credit cycle downturns in emerging market economies. Implementing such a scenario using the Global Macro-financial Model suggests that in aggregate, world output would fall by around 3 percent by 2021. Scenario details are found in Annex 1.1 and are summarized in Figure 1.28.

A number of pressing global challenges must be addressed to ensure that the global financial system can continue to support the recovery and sustain hard-won resilience. Although monetary accommodation is still needed to support recovery, a more comprehensive set of policies would ease mounting burdens on central banks. Some monetary policies, such as negative interest rates, are reaching the limits of their effectiveness, and the medium-term side effects of low interest rates are rising for banks and other financial institutions. Progress on the following fronts—together with a more balanced set of macroeconomic policies outlined in the *World Economic Outlook* and the *Fiscal Monitor*—together with enhanced macroprudential policies would help promote a virtuous cycle between financial markets and the real economy. The resolution of debt overhangs in an era of low nominal growth is also likely to require growth-friendly fiscal policies to support economic activity and create incentives for restructuring private debt while facilitating the repair of banks' balance sheets.

Financial policy details are discussed in each specific section and are summarized below:

- Remaining profitable in an environment marked by lower growth, lower interest rates, and tighter regulation will also require a significant shift in business models, because many existing balance sheets and business practices are not currently structured in a way that can earn a sustainable return. Rationalizing banking system balance sheets and industry structures is an urgent challenge. Banks must adjust to this low-interest-rate environment by reducing large stocks of legacy problem loans. They must adjust dated business models in order to maintain profitability and adapt to new business realities and regulatory standards.

- Sustained low growth and low interest rates also raise significant challenges for long-term investment and savings institutions, such as life insurers and pension funds. Regulators and supervisors should act promptly to sustain ongoing strength of insurance and pension fund balance sheets, including identifying and addressing medium-term insolvency risks and funding gaps.
- Policymakers can help reduce uncertainty by completing the regulatory reform agenda, without significantly increasing overall capital requirements, while preserving the integrity of the capital framework (Box 1.2). Regulators and supervisors need to also enhance the reform agenda for insurers and pension funds by strengthening standards for internal models and capital frameworks and improve transparency.
- Emerging market economies should take advantage of supportive external conditions to achieve a smooth path of deleveraging to enhance resilience and preserve financial stability. They should proactively monitor and address corporate vulnerabilities, particularly those arising from excess leverage and foreign exchange exposures. Actions are needed on three fronts: (1) managing the impact of corporate distress, through swift and transparent recognition of nonperforming loans and strengthening insolvency frameworks; (2) boosting oversight and response capacity through reforms to macroprudential and supervisory frameworks; and (3) ensuring continued access to international financial services, including by strengthened regulatory and supervisory regimes that help lower risk perceptions, including those supporting correspondent banking activity.
- The Chinese authorities' latest reform efforts have led to more balanced growth and a greater role for market forces, improving the resilience of the Chinese economy and financial system. Nonetheless, China's corporate debt overhang and other emerging financial sector vulnerabilities must be addressed promptly through a comprehensive approach to facilitate deleveraging and upgrade the supervisory framework. Curbing excessive credit growth, including in the form of riskier shadow credit products and ensuring sound interbank funding structures, would reduce the potential for system stress and spillovers.
- Global institutions have a role to play in upholding political cohesion by promoting inclusive growth and enhancing an open dialogue on globalization. Research (Sahay and others 2015) shows that most countries would reap macroeconomic growth benefits from greater access of firms and individuals to banking services. Moreover, sectors dependent on external finance tend to grow more rapidly in countries with greater financial inclusion. When financial sector supervision keeps up, greater financial inclusion can reduce output volatility without hurting financial stability. Closing gender gaps in account usage and promoting depositor diversity can have broader economic benefits while creating opportunities for the disadvantaged.

Progress in addressing these challenges would help promote a virtuous cycle between financial markets and the real economy, lifting growth and inflation, and would ease the rising burdens and risks from an environment of sustained low interest rates.

Box 1.1. Impact of Brexit

The unexpected decision by U.K. voters to leave the European Union (EU) in June 2016 (Brexit) caught investors by surprise and initially roiled global markets. The post-referendum bout of market volatility faded after central banks responded promptly; no major disorderly market events surfaced, other than a sharp sell-off in some U.K.-based real estate funds.

Yet the biggest challenges remain ahead. The shape of future trade arrangements and the uncertain impact of Brexit on the United Kingdom's large and globally integrated financial system have created uncertainty over the longer-term financial prospects of the United Kingdom.[1] As noted in recent IMF publications,[2] there is a high degree of uncertainty surrounding future arrangements and the implications for the U.K. financial sector. Table 1.1.1 highlights the relative importance of different financial activities carried out in London, and how decisions on future relations with the EU may impact the provision of financial services in the United Kingdom. The impact on the financial sector and economy could work through three different channels:

- *Bank operating costs.* Unless passporting for banking services is preserved under future trade arrangements, banks could incur additional expenses associated with moving operations out of London or duplicating functions in the United Kingdom and EU. They may also have to bear the cost of setting up and maintaining subsidiaries rather than branches, including additional capital, liquidity, and total loss-absorbing requirements for new subsidiaries. EU banks, which have €1–€1.5 trillion in assets (excluding derivatives) in U.K. branches, could also incur some of these same costs.
- *Changes in the financial services "rulebook."* The financial sector more broadly could be subject to change depending on the outcome of negotiations. Some 60 percent of the current financial services "rulebook" is estimated to be composed of EU rules.[3] Even if only modestly revised, these revisions would require legal, compliance, operational, and information technology changes.
- *Macroeconomic impact.* Protracted negotiations could weigh on confidence, not only postponing consumption and investment decisions, and thus reducing short-term growth, but also leading to permanently lower foreign investment and physical and human capital flows into the United Kingdom. The U.K. economy's longer-term prospects could be affected. Sustained declines in portfolio inflows could create more challenging financing conditions for firms.

Heightened concerns about the financial and macroeconomic impact of Brexit have contributed to a sharp drop in market participants' expectations of the (median) growth of U.K. GDP, especially for 2017, and the perceived risk of recession in 2017 remains elevated (Figure 1.1.1, panel 1). This reflects major uncertainties about negotiations of several trade, financial, and regulatory arrangements not just with the EU, but also with the rest of the world. Further, the post-Brexit upward shift in investors' inflation expectations did not ease back in August (Figure 1.1.1, panel 2), reflecting the continued anticipation of a weaker exchange rate in lifting domestic inflation. Finally, investors' forecasts of U.K. 10-year government bond yields became even more widely dispersed in August (Figure 1.1.1, panel 3), signaling elevated uncertainty and a prolonged period of low interest rates, reflecting persistent economic and financial risks.

Commercial Real Estate and Housing

Expectations that Brexit would trigger investor outflows from the real estate market prompted especially pronounced market volatility for financial assets exposed to this sector, and broader concern over the funding of the external current account, given the sizable participation of foreign investors in these sectors. As shown in Figure 1.1.2, commercial real estate transactions fell sharply in anticipation of the referendum. The exit of the United Kingdom from the European Union is expected to result in further significant declines in foreign investment in U.K. commercial real estate. These concerns triggered an abrupt wave of redemptions in U.K. property funds following the decision to leave the European Union.

This box was prepared by Jennifer Elliott, Vladimir Pillonca, and Luca Sanfilippo.

[1]See IMF 2016c. This paper discusses the potential macroeconomic impacts and ramifications in detail.

[2]See IMF 2016a and 2016b.

[3]Morel and others 2016.

Box 1.1 *(continued)*

Table 1.1.1. Brexit Implications for the U.K. Financial Sector

Market Function	Importance	What Could Happen?[1]
Banking		
Cross-Border Lending	20 percent of global total	Unless passporting is maintained, both the U.K. and EU are likely to require branch operations to become subsidiaries. The extent of the relocation or duplication of operations would vary according to the agreement with the host country.
Investment Banking	20 percent of global investment banking revenue	
Wholesale Banking	$7 trillion in assets	
Interest Rate Trading	50 percent of global total	If banks relocate some operations, as above, some euro rates trading could relocate.
European Equity Trading	70 percent of EU bank trading conducted through London	If banks relocate some operations, as above, some equities trading could relocate.
Foreign Exchange Trading	40 percent of global total 51 percent of U.S. dollars 54 percent of euros	Foreign exchange trading is not directly impacted by a change in the EU/U.K. relationship.
Market Infrastructure		
OTC Derivatives Clearing (global leader)	Clear 50 percent of interest rate swaps globally, total of $384 trillion annually	U.K. clearing of OTC derivatives meets EU standards but the use of U.K. clearing by EU banks will be subject to negotiation, and if not fully recognized by the EU, some relocation of clearing activities is likely.
Insurance		
Reinsurance	24 percent of global total	U.K. reinsurance meets EU standards but the use of reinsurance provided by U.K. entities will be subject to negotiation, and if not fully recognized by the EU, some relocation of reinsurance business is likely.
Marine Insurance	30 percent of global total	Unaffected.
Asset Management		
Investment Funds	Total £6.8 trillion under management; £2.5 trillion for foreign investors; UCITS are 12.5 percent of total market share of UCITS in EU; 17 percent of global funds	Unless passporting is retained, a negotiated arrangement will be required; UCITS will need to be domiciled in the EU and some relocation of operations may be required.
Hedge Funds	13 percent of global hedge fund assets managed in U.K.	Many clients are not EU based and funds may be unaffected even if passporting is not retained.

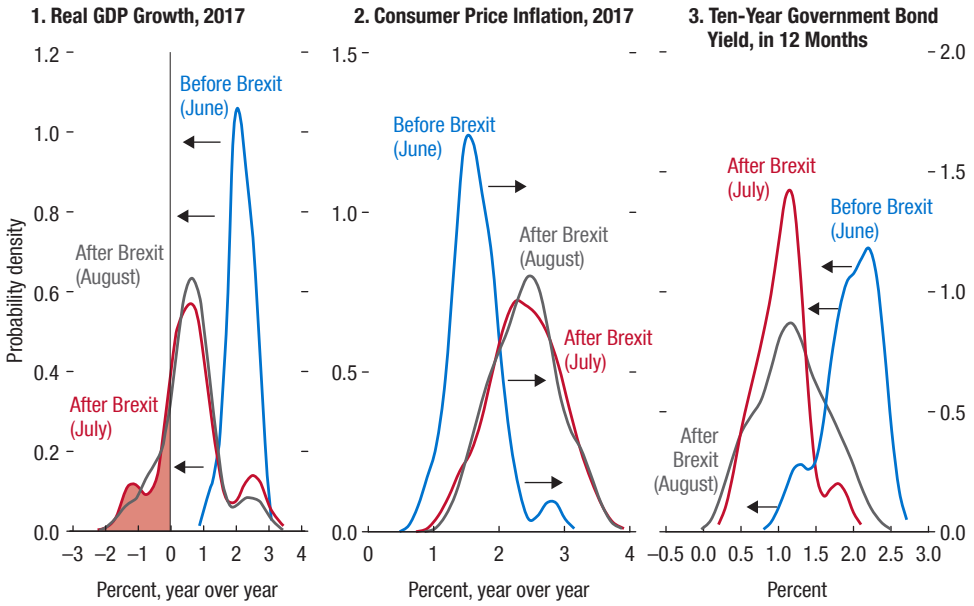
Sources: Autonomous Research LLP; Bank for International Settlements; Boston Consulting Group; Financial Conduct Authority 2015; TheCityUK 2016; and IMF Staff estimates.

Note: OTC = over the counter; UCITS = Undertakings for Collective Investment in Transferable Securities.

[1] Reflects a combination of estimates from Autonomous Research LLP, Boston Consulting Group, and IMF staff.

Box 1.1 *(continued)*

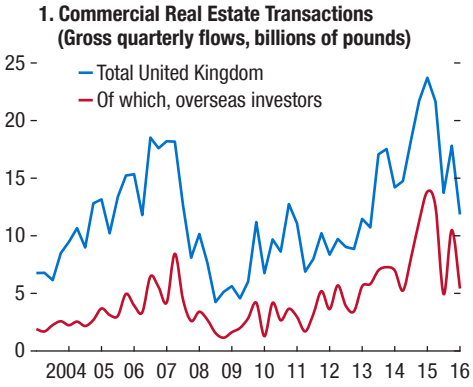
Figure 1.1.1. Brexit Implications for the United Kingdom



Source: IMF staff calculations, based on Consensus Economics data.
Note: The probability distributions of market participants' forecasts were estimated using a Kernel density estimation approach—a nonparametric algorithm to estimate probability density functions of random variables. Data before and after Brexit were obtained from the June 13, 2016, July 11, 2016, and August 8, 2016 surveys, respectively. Brexit = June 2016 U.K. referendum result in favor of leaving the European Union.

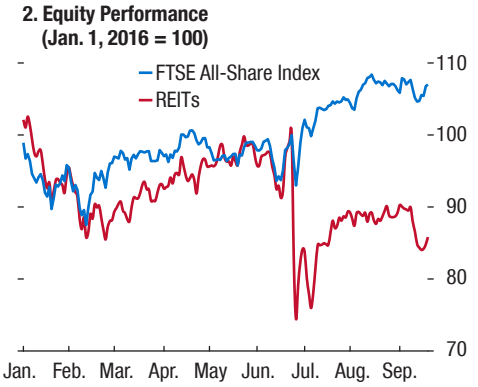
Figure 1.1.2. Brexit Impact on the U.K. Commercial Real Estate Markets

Foreign commercial real estate transactions fell sharply in anticipation of the U.K. referendum …



Sources: Bank of England; and Property Archive.

… and assets exposed to this market sold off sharply after the U.K. vote to leave.



Sources: Bloomberg L.P.; and IMF staff calculations.
Note: Brexit = June 2016 U.K. referendum result in favor of leaving the European Union. FTSE = Financial Times Stock Exchange; REITs = real estate investment trusts.

Box 1.2. The Basel Committee Agenda: Achieving Certainty without Compromising Integrity

The international agreement on the Basel III capital adequacy and liquidity framework in 2010–11 was a key plank of the postcrisis reform agenda. It has led to enhanced resilience of banking systems following its phased-in implementation. At the time of its introduction, some elements, such as the leverage ratio, the countercyclical capital buffer, and capital for banks' exposures to central counterparties, were still a work in progress and were calibrated and refined in the years that followed. Work also continued in parallel to address other remaining issues that had implications for bank capital. For example, consultations were launched on the global systemically important bank designation process and fundamental review of the trading book to replace the value-at-risk-based methodology, which significantly underestimated losses in tail events.

The Regulatory Consistency Assessment Program was also launched in 2012 to monitor consistent implementation of Basel III across countries. The results of these exercises are revealing: there is excessive risk-weight variability across banks using internal models that cannot be explained even after taking into account national and institutional differences in practices. Addressing this material variability to ensure the credibility of the risk-weighted framework and comparability of its outcomes has since become central to the Basel agenda. Fresh consultations were launched in 2014 to revise the standardized approaches to credit, market, operational, and counterparty credit risks with the objective of developing an improved "complement and alternative approach to internal models." These proposals seek to constrain the use of internal models, including, for example, by reaffirming the Basel framework's existing "output floor," which limits the regulatory capital benefit a bank can achieve through the use of its internal models compared to the revised standardized approach. Such a floor would help ensure credible and comparable outcomes.

The Basel Committee's final round of postcrisis regulatory reforms has led to consternation in the industry which is still struggling to reorient its business models to restore sustainable profitability. Industry associations, banks, and other interested parties have balked at the prospects of higher regulatory capital requirements for outlier institutions. They argue that this would further affect their ability to lend in this low-growth environment. Others are resigned to the changes but have called for finalization to achieve greater certainty that will facilitate capital planning. Still others believe that the resilience that comes from implementing a robust and comprehensive framework would only support sustainable profitability and intermediation. In 2016 the Basel Committee consulted on its final round of proposed reforms and, in parallel, conducted a comprehensive, cumulative quantitative study to assess the overall impact of its proposals. With the exception of the standardized approach for market risk, which was finalized in early 2016, the Basel Committee's proposed reforms are subject to change based on its analysis of comments and the results of its quantitative impact assessments.

In January 2016, the governing body of the Basel Committee weighed in on the discussions and announced that it would review the design and calibration of these measures of constraints and floors by the end of the year. It also cautioned the committee against "further significantly increasing the overall capital requirements," a call that has been reiterated by the G20 leaders. While this phrase has been interpreted variously by different interest groups, it was intended to convey the view that the amount of regulatory capital relief some outlier banks receive through the use of their internal models versus the standardized approach is not prudent. The challenge is to finalize the remaining reforms in the few months left while following the due process of impact assessment, consultation, and review without compromising the robustness and integrity of the capital framework.

These reforms are an integral part of the reform agenda and will contribute further to the long-term resilience of banks and the financial system. It is better to obtain agreement on a robust risk-weighted capital framework, even if the agreement takes more time, than to risk dilution or withdrawal to meet the challenging constraints of "no further capital increase" and the end-2016 deadline. The implementation of the framework may also have to be phased in over a longer period to prevent potentially procyclical consequences under the current circumstances. The more robust the design of regulation, the less likely it is that quick fixes will be needed again very soon in the future.

Annex 1.1. Financial Stagnation and Protectionism Scenario[19]

This annex analyzes the effects of a *financial stagnation and protectionism scenario*. This scenario is simulated using the Global Macro-financial Model, a structural macroeconometric model of the world economy, disaggregated into 40 national economies, documented in Vitek 2015 (see Annex Table 1.1.1 for assumptions). This estimated panel dynamic stochastic general equilibrium model features a range of nominal and real rigidities, extensive macro-financial linkages with both bank- and capital-market-based financial intermediation, and diverse spillover transmission channels.

The *financial stagnation and protectionism scenario* is triggered by risk-off reactions in financial markets to protectionist initiatives driven by political developments in Europe and the United States. These initiatives limit or reverse international trade and financial integration, generating a sell-off in stock markets on profitability concerns and reduced risk appetite, with the real equity price falling by 20 percent in the euro area, the United Kingdom, and the United States over two years.

Banking systems come under increased profitability stress and experience a widening of funding spreads, by 100 basis points in high-spread euro area economies and the United Kingdom, and by 50 basis points in low-spread euro area economies and the United States (Annex Figure 1.1.1). This banking sector stress induces sovereign stress in high-spread euro area economies, where long-term government bond yields rise by 100 basis points. In the rest of the world, flight to quality reduces long-term government bond yields by 25 basis points in low-spread euro area economies, the United Kingdom, and the United States, but raises them by 50 basis points in exposed emerging market economies.

Heightened uncertainty regarding the nature of future international trade and financial arrangements induces firms and households to postpone their expenditures, reducing private investment and consumption by a further 2.0 percent and 0.5 percent in the United Kingdom, versus 1.0 percent in the euro area and 0.25 percent in the United States, over three years.

Financing conditions tighten further as regulatory pressure to build bank capital buffers in high-spread euro area economies exacerbates credit cycle downturns, with the bank capital ratio requirement rising by 2.0 percentage points. Furthermore, market pressure to build bank capital buffers in other advanced economies in response to regulatory uncertainty, represented by an increase in the bank capital ratio requirement of 1.0 percentage point, also constrains credit supply in these countries.

High corporate leverage in emerging market economies exacerbates their credit cycle downturns, with the default rate on bank loans to nonfinancial firms rising by an additional 1.0 percentage point on average, with economy-specific increases proportional to estimated corporate debt-at-risk shares.

Protectionist measures in Europe and the United States ultimately generate secular stagnation, given constrained macroeconomic policy responses. These protectionist measures undermine the efficiency gains from specialization and exchange, inducing persistent weakness in aggregate demand and supply while disproportionately reducing trade flows. In particular, confidence losses concentrated in Europe and the United States induce firms and households to postpone their expenditures, reducing private investment and consumption by a further 6.0 and 2.0 percent there, and by 3.0 and 1.0 percent, respectively, in the rest of the world over five years. In addition, higher trade barriers concentrated in Europe and the United States contribute to reductions in exports and imports by a further 20.0 percent and by 10.0 percent in the rest of the world. Finally, less efficient resource allocation concentrated in Europe and the United States reduces productivity by 1.0 percent and by 0.5 percent in the rest of the world. This layer of the *financial stagnation and protectionism scenario* is broadly aligned with the *global tariff scenario* in the October 2016 *World Economic Outlook*.

Conventional monetary policy remains at or returns to the effective lower bound in the systemic advanced economies, while the calibration of global financial market adjustments is interpreted as net of the effects of unconventional monetary policy responses where warranted, in particular in the euro area and Japan. Automatic fiscal stabilizers are allowed to operate fully, but there are no discretionary fiscal stimulus measures worldwide.

This scenario hits banking sector capitalization in some emerging market economies and government debt sustainability in some advanced economies hard (see Figure 1.28). Largely reflecting lower economic and financial risk taking, output falls by 1.6 to 6.8 percent relative to the baseline across economies by 2021.

[19]This annex was prepared by Francis Vitek.

Annex Table 1.1.1. Financial Stagnation and Protectionism Scenario, Assumptions

Layer 1: Risk-off reactions in Europe and United States, 2017:Q1–18:Q4	
Real equity price; equity risk premium shocks	
Euro area, United Kingdom, United States	–20 percent
Money market interest rate spread; credit risk premium shocks	
High-spread euro area, United Kingdom	+100 basis points
Low-spread euro area, United States	+50 basis points
Long-term government bond yield; duration risk premium shocks	
High-spread euro area	+100 basis points
Exposed emerging markets	+50 basis points
Low-spread euro area, United Kingdom, United States	–25 basis points
Layer 2: Heightened uncertainty in Europe and United States, 2017:Q1–19:Q4	
Private investment; investment demand shocks	
United Kingdom	–2.0 percent
Euro area, United States	–1.0 percent
Private consumption; consumption demand shocks	
United Kingdom	–0.50 percent
Euro area, United States	–0.25 percent
Layer 3: Balance sheet vulnerabilities in euro area and emerging markets, 2017:Q1–19:Q4	
Bank capital ratio requirement; capital requirement shocks	
High-spread euro area	+2.0 percentage points
Other advanced economies	+1.0 percentage points
Loan default rate; loan default shocks	
Emerging markets	+0.0 to +3.2 percentage points
Layer 4: Protectionism in Europe and United States, 2017:Q1–21:Q4	
Private investment; investment demand shocks	
Euro area, United Kingdom, United States	–6.0 percent
Rest of world	–3.0 percent
Private consumption; consumption demand shocks	
Euro area, United Kingdom, United States	–2.0 percent
Rest of world	–1.0 percent
Exports and imports; export and import demand shocks	
Euro area, United Kingdom, United States	–20.0 percent
Rest of world	–10.0 percent
Productivity; productivity shocks	
Euro area, United Kingdom, United States	–1.0 percent
Rest of world	–0.5 percent

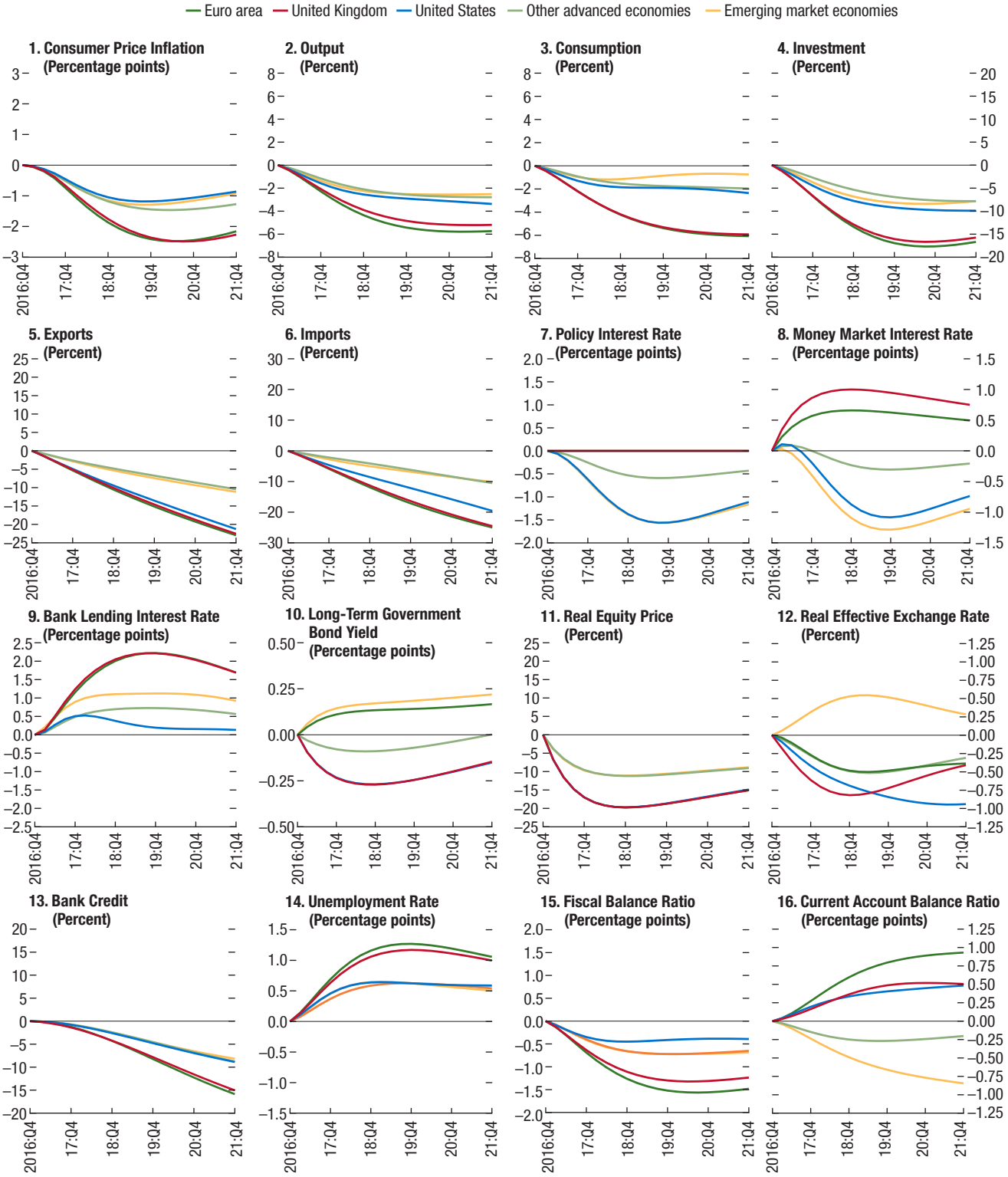
Source: IMF staff calcuations.
Note: All scenario assumptions are expressed as deviations from the October 2016 WEO baseline. Endogenous variable adjustments peak in 2018:Q4 or 2019:Q4 where indicated and one-quarter dissipate by 2021:Q4. The high-spread euro area economies are Greece, Italy, Portugal, and Spain. The low-spread euro area economies are Austria, Belgium, Finland, France, Germany, Ireland, and the Netherlands. The exposed emerging markets are Argentina, Brazil, Colombia, Indonesia, Mexico, the Philippines, Poland, Russia, South Africa, Thailand, and Turkey.

Given this secular stagnation, consumer price inflation declines by 0.8 to 2.9 percentage points by 2019, and the unemployment rate rises by 0.4 to 1.7 percentage points across countries.

These disinflationary macroeconomic contractions induce policy interest rate cuts of up to 2.3 percentage points by 2019. The banking sector accommodates and contributes to reductions in private investment with 5.2 to 17.1 percent decreases in bank credit by 2021. Bank capital ratios fall by 0.3 to 3.1 percentage points across emerging market economies by 2020, where credit loss rates generally increase more, compared with at most 0.2 percentage point across advanced economies, given regulatory or market pressure to build bank capital buffers.

Largely reflecting lower nominal output, government debt ratios rise, ranging from 2.1 to 28.2 percentage points across advanced economies by 2021, where initial government debt ratios are generally higher, compared with 1.6 to 11.9 percentage points across emerging market economies. In aggregate, world output falls by about 3 percent relative to the baseline by 2021, while energy and nonenergy commodity prices fall by 34.9 and 19.0 percent, respectively.

Annex Figure 1.1.1. Financial Stagnation and Protectionism Scenario, Aggregated Simulated Paths



Source: IMF staff estimates.
Note: Depicts variable paths expressed as output weighted average deviations from baseline. Real effective exchange rate increases represent currency depreciations in real effective terms.

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CHAPTER 2

MONETARY POLICY AND THE RISE OF NONBANK FINANCE

Summary

The structure of financial markets has been changing considerably. Ongoing financial innovation, weakened bank balance sheets following the financial crisis, changes in business models, and strengthened bank regulation have all supported a strong shift from bank lending to bond issuance. This has allowed a larger role for nonbanks, such as insurance companies, pension funds, and asset managers. Nonbanks are very important for financial intermediation in the United States and have become significantly more important in Europe and some emerging market economies.

Has the rise of nonbank financing rendered monetary policy less powerful? Some have argued that the impact of monetary policy action on economic activity has lessened because one of the traditionally key transmission channels—bank lending—has become less important. In theory, nonbanks can either dampen or amplify the transmission of monetary policy. On the one hand, nonbanks may be able to step in to lend in lieu of banks if their funding cost is not as strongly affected as that of banks by changes in monetary policy, or if they are not subject to the same regulatory constraints, potentially dampening the transmission of monetary policy. On the other hand, nonbanks may amplify the transmission of monetary policy if their risk appetite is more sensitive to changes in monetary policy. This chapter explores this important but relatively uncharted territory, first laying out a conceptual framework, and then examining the empirical evidence with novel analyses.

The chapter finds that the increasing importance of nonbanks for financial intermediation has, if anything, strengthened monetary policy transmission over the past 15 years. The potency of monetary policy appears to have risen in various countries and seems to be, on average, stronger in countries with larger nonbank financial sectors. Like banks, nonbanks contract their balance sheets when monetary policy tightens, and, in general, nonbank financial intermediaries contract them more than banks. This behavior is in part explained by the effect of monetary policy on risk taking, particularly in the asset management sector. As a result, bond yields and risk premiums move, affecting the cost of borrowing and real activity. Thus, the composition of the nonbank financial sector matters for the transmission of monetary policy.

The growing role of nonbanks implies that the conduct of monetary policy will need to continue to adapt to changes in the transmission mechanism. The dosage and timing of monetary policy actions must be continuously recalibrated as their impact and the speed of their effect change. For example, as the relative importance of the risk-taking channel grows, the effects of monetary policy changes on the real economy may become more rapid and marked. Although not a focus of this chapter, changes in the regulatory framework are likely to affect the strength of monetary policy transmission because some of the differences in banks' and nonbanks' responses to monetary shocks reflect differences in their regulatory regimes.

The effects of monetary policy on financial stability are becoming more important. For instance, monetary policy actions are likely to have stronger consequences for the financial soundness of banks and nonbank financial institutions because the risk-taking channel seems to be an increasingly important mechanism in driving the responses of financial intermediaries. This suggests the need for greater vigilance by prudential and regulatory authorities.

Monetary policy needs to take into account the size and composition of balance sheets of key financial intermediaries to better gauge changes in financial institutions' risk appetite. Given the growth of the nonbank financial sector, the information contained in the balance sheets of nonbanks is potentially at least as useful as traditional measures of monetary aggregates. For instance, the leverage and changes in leverage of broker-dealers and total assets managed by bond funds can be informative for monetary policy. In this context, closing data gaps on nonbanks is essential.

Introduction

The structure of financial markets has changed considerably since the 1980s. Fast-paced financial innovation and, as a consequence of the financial crisis, weak bank balance sheets, changes in business models, and strengthened bank regulation have driven a strong shift from bank lending to bond issuance (Figure 2.1), which has permitted a larger role for nonbank financial intermediaries (henceforth nonbanks).[1] Nonbanks have recently grown, especially in Europe and some emerging market economies.[2] As banks retrench from certain activities, the role of asset managers has become more dominant (Chapter 3 of the April 2015 *Global Financial Stability Report* [GFSR]). At the same time, with interest rates at historically low levels in many countries, insurance companies have sought to increase returns on assets by intensifying their lending activities (Chapter 3 of the April 2016 GFSR).

Some have speculated that the rise in nonbank financing has weakened the transmission mechanism of monetary policy.[3] Traditionally, banks have played a key role in transmitting monetary impulses to the real economy, and it has been argued that other financial intermediaries may react very differently to monetary policy (Nelson, Pinter, and Theodoridis 2015). Similarly, in the past, leverage (borrowing) in the financial system has played an important role in amplifying the effects of monetary policy. As the role of asset managers with little leverage grows, is monetary policy still able to influence economic activity by affecting risk premiums—the required return on a risky asset relative to a safe asset—and longer-term rates?[4]

In theory, nonbanks can either dampen or amplify the effects of monetary policy. On the one hand, nonbanks may be able to step in to lend in lieu of banks if their funding cost is less strongly affected by monetary policy, if they are not subject to the same regulatory constraints, or if their risk-taking incentives are different. For example, increases in the regulatory gap between banks and nonbanks or in the ability of banks to securitize some of their loan portfolio may dampen the transmission mechanism.[5] On the other hand, nonbanks may amplify the transmission of monetary policy if their risk appetite is more sensitive to changes in monetary policy. Although it is of key policy relevance, so far, the literature on this topic is very scarce.

This chapter uses novel analyses to better understand the influence of nonbanks on the effectiveness of monetary policy by providing a cross-country perspective on the following questions:[6]

- Conceptually, given that banks and different types of nonbanks have different business models and face different constraints, how can the composition of the financial system affect the transmission of monetary policy?
- Empirically, does the presence of nonbanks affect the transmission of monetary policy? Specifically, how does lending by different types of financial institutions respond to monetary policy and what explains the differences?

The chapter lays out a conceptual framework to discuss potential differences in the monetary transmission brought about by a larger nonbank sector. It then conducts empirical analyses at both the aggregate and the microeconomic level.

The chapter finds that the increasing importance of nonbanks for financial intermediation has not weakened the transmission of monetary policy and, if anything, it

Prepared by Luis Brandão-Marques (team leader), Nicolás Arregui, Lucyna Gornicka, Hibiki Ichiue, Nicolás Magud, Win Monroe, Machiko Narita, and Garence Staraci, with contributions from Simon Gilchrist (consultant), Stephen G. Cecchetti, and Lev Ratnovski, and research support from Oksana Khadarina, under the overall guidance of Gaston Gelos and Dong He. Carol Franco and Adriana Rota provided editorial assistance.

[1]Although both banks and nonbanks are engaged in financial intermediation, a bank issues deposits that must be converted upon demand into cash (central bank money) or deposits in other banks at par. In contrast, nonbanks fund themselves mostly with liabilities at market prices. In this chapter, nonbanks include insurance companies; pension funds; and other financial intermediaries such as asset managers (hedge funds, mutual funds, and other investment funds), finance companies, investment banks (broker-dealers), and securitizers.

[2]Nonbanks are significantly more important in the United States because the process of bank disintermediation started much earlier, in the 1980s.

[3]For example, see Bini Smaghi 2010.

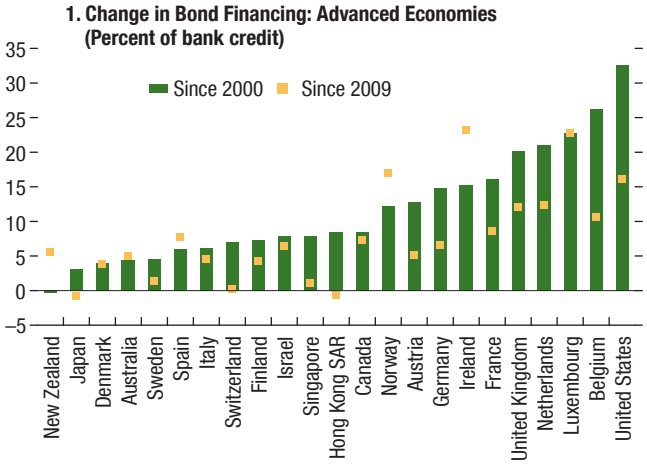
[4]Leverage measures a firm's total borrowing relative to the value of its equity or assets. In a financial sector dominated by asset managers, monetary policy can have large consequences for asset prices even if financial sector leverage is low.

[5]Changes in financial regulation since the crisis have likely tempered the risk appetite of banks and increased the role of nonbanks, dampening the transmission of monetary policy. On the other hand, the growth in securitization since the early 2000s may have lessened the effect of interest rates on credit origination by banks (Loutskina 2011).

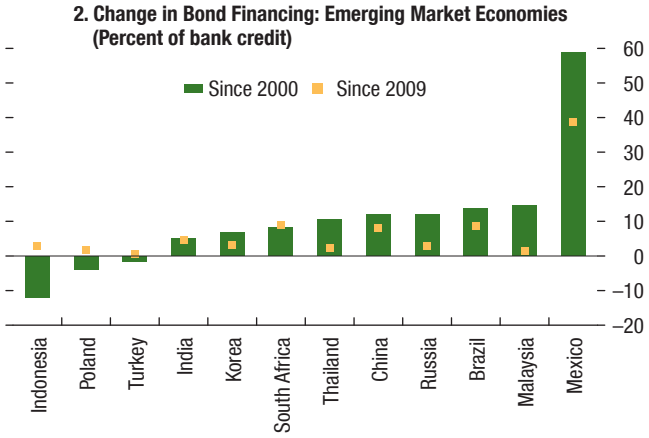
[6]Existing studies mainly examine parts of the financial system and rely mostly on data from the United States (Den Haan and Sterk 2011).

Figure 2.1. The Relative Importance of Nonbank Financial Intermediaries

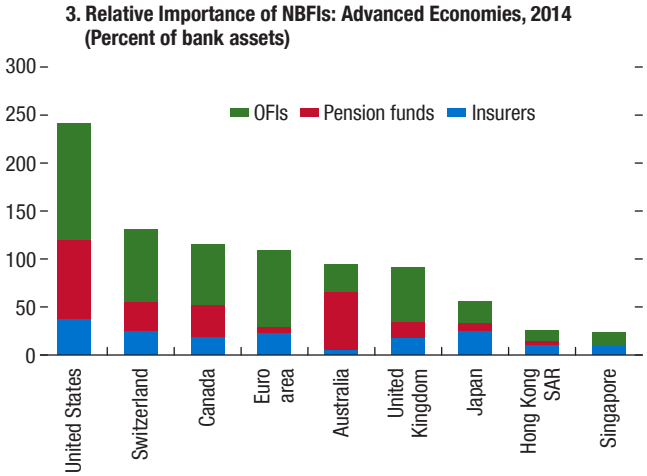
Since the 2007–09 crisis, bond financing has grown relative to bank loans in many advanced economies.



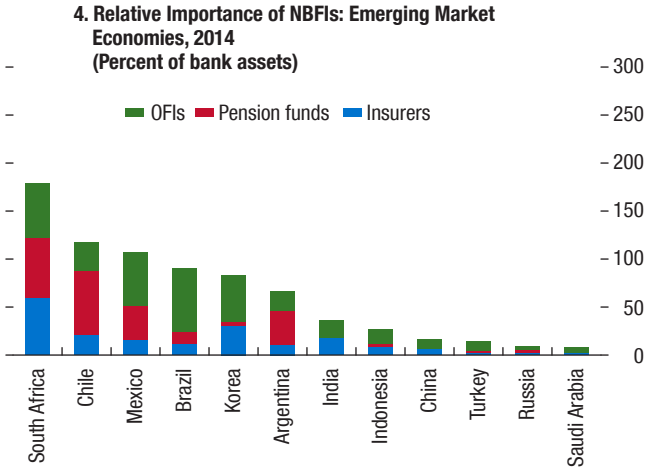
In emerging market economies, bond financing is becoming more prevalent.



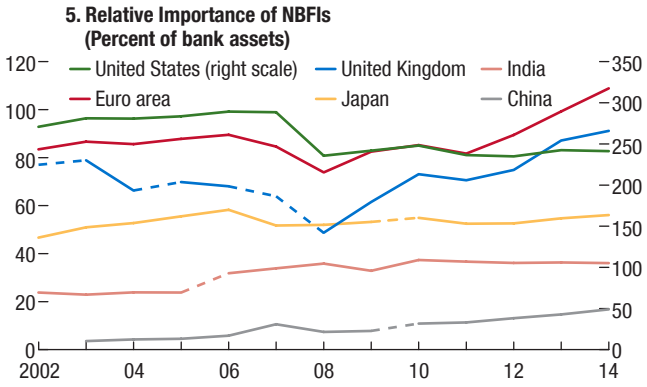
Among advanced economies, nonbanks are relatively less important in Asia.



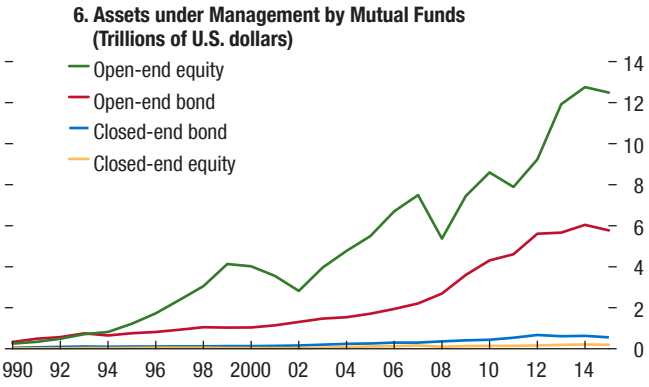
Among emerging market economies, South Africa has the largest nonbank sector relative to bank assets.



In Europe and China, nonbanks have grown in importance since the financial crisis.



Bond funds have become more important since the financial crisis.



Sources: Bank for International Settlements; Dealogic; Financial Stability Board; Organisation for Economic Co-operation and Development; and IMF staff calculations.
Note: Panels 1 and 2 show the change in the ratio of outstanding bonds issued by nonfinancial firms (by parent nationality) to outstanding bank credit to the private nonfinancial sector. The figures may overestimate (underestimate) borrowing in countries that are sources (recipients) of foreign direct investment. Nonbank financial intermediaries (NBFIs) include insurance companies, pension funds, and other financial intermediaries (OFIs). In panels 3 to 5, the relative importance of NBFIs is measured as the ratio of NBFI total assets to bank total assets. Dashed lines in panel 5 signify breaks in the underlying series.

has strengthened it. In particular, the chapter presents the following main findings:

- The transmission of monetary policy seems to have strengthened in many countries and appears to be slightly stronger in countries with larger nonbank financial sectors.[7]
- Banks and most nonbanks contract their balance sheets when monetary policy tightens.
- In general, nonbank financial intermediaries contract or expand their balance sheets more than do banks in response to a monetary tightening or loosening and do not dampen the transmission of monetary policy.
- The risk-taking channel operating through changes in asset allocations seems to play an important role, particularly in the asset management sector.[8] The induced changes in risk premiums also affect banks' ability to lend because they affect their cost of funding.
- Changes in the supply of bank credit induced by monetary policy affect total credit and real activity because nonfinancial corporations find it difficult to substitute market financing (bonds) for bank financing (loans), even in economies with deep financial markets.

The growing role of nonbanks implies that the conduct of monetary policy will need to continue to adapt to changes in the transmission mechanism. The dosage and timing of monetary policy actions will have to be recalibrated continuously, as the impact of monetary actions and the time lags involved change. For example, as the relative importance of the risk-taking channel grows, the effects of monetary policy changes on the real economy may become more rapid and marked. At the same time, changes in the regulatory framework for nonbanks are likely to affect the strength of monetary policy transmission.

Monetary policy needs to take into account the size and composition of balance sheets of key financial intermediaries to better gauge changes in the risk appetite of financial institutions. Given the growth in the nonbank financial sector, the information contained in the balance sheets of nonbanks can be at least as useful as more traditional measures of monetary aggregates. For instance, the leverage and changes in leverage of broker-dealers and total assets managed by investment funds can be informative for monetary policy. In this context, it is important to continue to close data gaps in the nonbank sector.

Policymakers need to be mindful of the changing financial stability implications of monetary policy in light of the growing importance of nonbank lenders. Given that the risk-taking channel seems to be an increasingly important mechanism in driving the responses of financial intermediaries, monetary policy actions are likely to have stronger consequences for the financial soundness of banks and nonbank financial intermediaries. This does not, per se, imply a case for monetary policy to pursue financial stability objectives (IMF 2015), but suggests the need for greater vigilance by prudential and regulatory authorities.

Trends in the Transmission of Monetary Policy

Before embarking in further analysis, this section first takes a look at the evolution of monetary transmission. Has the impact of monetary policy diminished?

Evidence from a sample of 12 countries suggests that, on average, the transmission of monetary policy strengthened after 2000 (Figure 2.2). Compared with the period 1980–99, since 2000, the response of real GDP to changes in the monetary policy rate has increased in Korea, South Africa, Spain, Sweden, and the United States, but has declined in Norway.[9] For other countries, the responses are in general stronger after the year 2000, but not significantly different between the two periods.[10]

[7]The finding that the transmission of monetary policy has strengthened is based on a medium-term analysis; the chapter does not attempt to ascertain the strength of monetary policy at the current juncture in specific countries.

[8]The risk-taking channel of monetary policy describes how central banks can affect the risk-bearing capacity of financial institutions, namely by influencing short-term interest rates (Adrian and Shin 2011).

[9]Other studies for the United States have found a weakening of the transmission (Baumeister, Liu, and Mumtaz 2010; Boivin and Giannoni 2006; Boivin, Kiley, and Mishkin 2011), or no change (Primiceri 2005). However, these studies typically compare the magnitude of the transmission until the late 1970s and thereafter, and do not include recent years. The results shown in Figure 2.2 are broadly in line with the literature, although country studies using different methods have reached different estimates of the response of GDP to a monetary policy change. In the case of Japan, the standard specification seems to have failed to identify monetary policy shocks such that the response after 2000 has the wrong sign. Still, the analysis presented in Figure 2.2 is robust to alternative specifications and different measures of monetary policy. The findings for inflation (not shown) are also supportive of a strengthened transmission. See Annex 2.1.

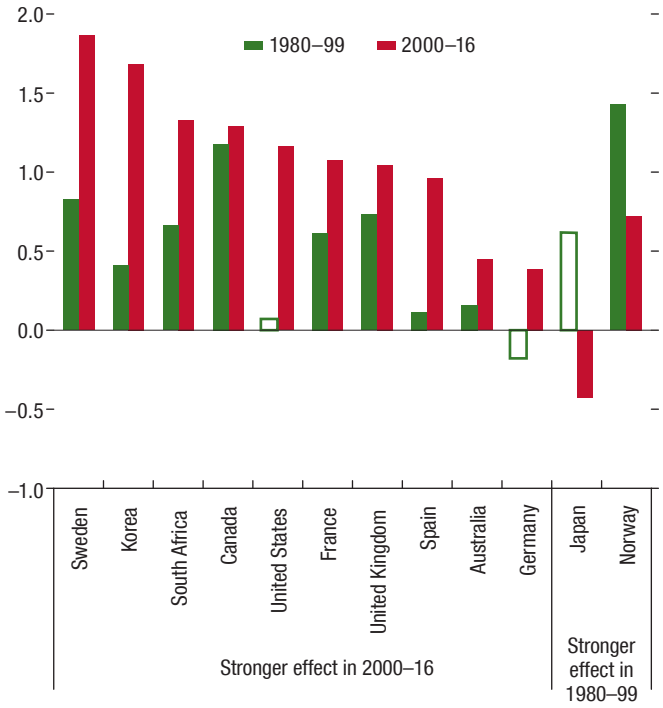
[10]In Figure 2.2, statistical significance is inferred based on one sigma, or 68 percent confidence intervals. In the vector autoregres-

Changes in the strength of monetary transmission and in the time frame of the response can likely be ascribed both to structural changes in the economy and to changes in the practice of monetary policy. Although the reasons behind such changes are multiple and difficult to determine, the literature has discussed three main possible reasons:

- *Changes in the conduct of monetary policy and in the way economic agents form expectations*—Since the early 1980s, the conduct of monetary policy has gradually shifted to better control of expectations and the buildup of credibility.[11] Better anchored expectations may have dampened the transmission of monetary policy (Boivin and Giannoni 2006).[12] However, these developments are consistent with a general weakening of transmission in 1980–99 compared with earlier years (not shown), but do not necessarily help explain developments since 2000.
- *Increased economic and financial integration*—In theory, greater economic openness and denser cross-border financial links should increase the chance for leakage and weaken the domestic transmission of monetary policy. However, the existing empirical evidence is not generally supportive of this mechanism, and it is possible that currency fluctuations induced by interest rate changes amplify the transmission of monetary policy through valuation effects of net long foreign exchange positions (Georgiadis and Mehl 2015). Nevertheless, there is mounting evidence that monetary policy shocks emanating from the United States are transmitted to other countries (especially those with large financial systems) via the global financial system (Rey 2016).[13]
- *Changes in the way financial markets work*—Changes in the regulation of banks and nonbanks, the rise of securitization, improved access to bank and nonbank credit by households and nonfinancial firms, and the ascendance of the asset management industry have transformed financial markets. The possible effects on the transmission of monetary policy of some of these trends are discussed next.

Figure 2.2. Trends in the Transmission of Monetary Policy
(Percent)

In most countries, the strength of the transmission of monetary policy has increased since 2000, especially in Korea, South Africa, Spain, Sweden, and the United States.



Sources: Federal Reserve System; Haver Analytics; IMF, International Financial Statistics database; Organisation for Economic Co-operation and Development; and IMF staff estimates.
Note: The figure shows the peak response of real GDP to a 1 percentage point decrease in the monetary policy rate. The response is estimated from a vector autoregression (VAR) of log real GDP, the log GDP deflator, the log of the nominal effective exchange rate, and the nominal interest rate (shadow policy rates for countries using unconventional monetary policy) using four lags (and a reunification dummy for Germany). The responses are identified using a Cholesky decomposition in which the interest rate is ordered last. Solid bars mean that the response is statistically significant using 68 percent confidence intervals. See Annex 2.1 for details.

Channels of Monetary Policy Transmission

This section discusses how the transmission of monetary policy may be affected by financial institutions. The focus of the discussion is on two main types of mechanisms:

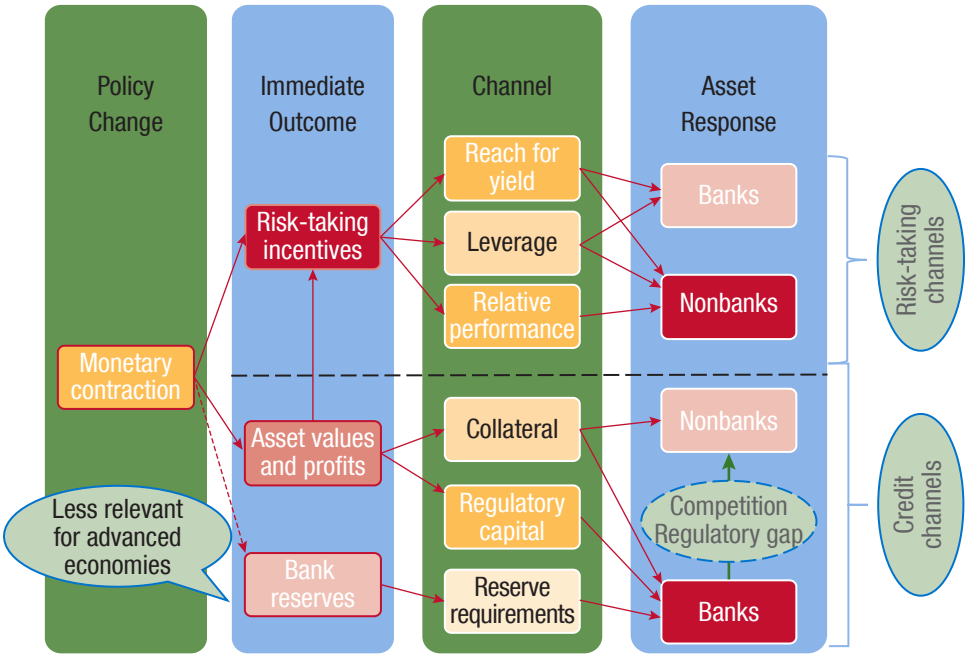
sion literature, which the analysis follows, it is common to infer significance from 68 percent confidence intervals. See Sims and Zha 1999 for a justification.

[11]This process has culminated in many countries with the adoption of inflation-targeting regimes, whereby the conduct of monetary policy is geared toward the management of inflation expectations and implies systematic and aggressive responses to output gaps and deviations from target inflation.

[12]When the central bank responds strongly to deviations of GDP from potential output and to deviations of inflation from its target, expectations for future income and inflation become more stable. Anchored expectations, in turn, cause actual spending to be more stable and to react less to monetary policy shocks (Boivin, Kiley, and Mishkin 2011).

[13]The increase in financial integration and associated monetary policy spillovers across countries complicates the identification of the effects of monetary policy on economic activity, especially after the year 2000.

Figure 2.3. Transmission of Monetary Policy through the Reaction of Financial Intermediaries



Source: IMF staff.
Note: A darker shade signifies a larger response. Red shades or arrows signify an adverse effect or response. A green arrow means that an adverse response from one sector may trigger a positive response from the other. A dashed red arrow means the effect of monetary policy through this channel is disputed.

those that affect the supply of credit by intermediaries and the risk-taking channel of monetary policy (Figure 2.3). In theory, both mechanisms help explain why the transmission of monetary policy may be different when nonbanks are more important.

Transmission through Effects on Aggregate Demand and Borrowers' Balance Sheets

The traditional discussion of monetary policy transmission emphasizes how changes in interest rates affect investment and consumption decisions. These channels operate through changes in the user cost of capital, intertemporal substitution effects, and wealth effects.[14] Similarly, changes in interest rates can induce exchange rate changes and therefore influence net exports. Although important, these channels for the transmission of monetary policy do not assign a particular role to financial intermediaries and, to a large extent, do not affect banks and nonbanks differently.

Monetary policy also affects the supply of loans through the balance sheets of borrowers. Banks and nonbanks lend to nonfinancial firms and households based on the ability of borrowers to post collateral—that is, on the basis of their net worth. By altering the net worth of borrowers and thereby their access to external finance, the effect of interest rate changes can be magnified through the balance sheet channel.[15] The

[14]Interest rates operate through these mechanisms as follows: First, they are an important component of the cost of using one unit of capital for one period (that is, the user cost of capital). Second, they drive the decision to forgo present consumption in order to achieve consumption in the future (that is, intertemporal substitution or saving). Third, they affect the value of households' wealth, changing their incentives to spend. However, the strength of these traditional monetary transmission channels may have changed over time. For instance, increased access to credit by households and firms from both bank and nonbank financial intermediaries may have increased the sensitivity of consumer spending and residential and business investment to asset prices and monetary policy rates via balance sheet effects (Iacoviello 2005).

[15]For instance, a cut in interest rates increases the expected future profits of a borrowing firm and, as a consequence, raises the value of the firm's equity or net worth. A higher value of the firm's equity, in turn, provides positive information to potential lenders about its

balance sheet channel is likely to be more important for nonbank finance because banks try to insulate lending from interest rate fluctuations in order to preserve the long-term relationships they have with their client base (Bolton and others 2016).

Imperfections in the Funding Markets of Financial Intermediaries that Affect Credit Supply

If monetary policy significantly affects the cost of funding for banks and nonbanks, their supply of credit will respond. Regulatory requirements for banks, in particular those regarding capital, may cause them to react differently than nonbanks.

Balance Sheets and the Supply of Credit by Banks and Nonbanks

Monetary policy affects the supply of loans through the balance sheets of financial intermediaries. An increase in short-term interest rates lowers the net worth of banks and nonbanks—because their assets typically have longer maturities than their liabilities—and thereby raises their funding costs (Bernanke 2007). Traditionally, this mechanism has played an important role in monetary policy transmission through banks. The reason is that changes in interest rates induce larger balance sheet changes for institutions with high levels of debt (that is, high leverage), such as banks, because the relative change in net worth is magnified.[16] At the same time, financial institutions with weaker access to capital markets will not be able to borrow when their net worth falls as a result of an interest rate hike. Consequently, their balance sheets will shrink more in response to a monetary policy contraction. The inability to switch to alternative sources of funding is reinforced by uncertainty about the value of financial institutions' assets (Stein 1998). Therefore, financial intermediaries that are smaller, are privately owned, have weaker capital ratios, have less-diversified funding structures, or do not have access to international capital markets will probably respond more to contractionary monetary policy actions.[17,18]

Market-consistent valuation strengthens these balance sheet effects on the supply of loans. Financial institutions that are required to mark to market a significant portion of their assets—that is, record and report the value of their assets at market prices or fair values—are likely to be more responsive to changes in the stance of monetary policy, since their reported asset values move more in tandem with the interest rate. Although banks are also required, in many jurisdictions, to mark to market some of their portfolios, for most, the share of fair-value assets is small and the impact on regulatory capital is slight (Figure 2.4; Badertscher, Burks, and Easton 2011). Thus, the more widespread use of mark-to-market accounting standards among nonbanks in itself will likely contribute to a strengthening of monetary policy transmission as the sector grows (Borio and Zhu 2012).

Bank Capital, Bank Regulation, and the Transmission of Monetary Policy

Monetary policy affects bank lending through its effect on bank capital and profits—the bank capital channel. Following monetary loosening, banks with low capital levels relative to regulatory requirements need to issue equity if they are to increase lending.[19] Raising equity, however, can be costly or even impossible for many banks. Thus, the ability of banks to expand credit is curtailed. Yet, over time, lower interest rates will likely relax the capital constraint for many banks, and the credit response will increase. When

credit risk and the value of available collateral, increasing their willingness to lend at a lower cost. This effect is known as the "financial accelerator" (Bernanke, Gertler, and Gilchrist 1996).

[16]For example, a 1 percent increase in the value of assets increases the net worth of a financial firm by 5 percent when the capital-to-assets ratio is 20 percent and by 10 percent when the capital-to-assets ratio is 10 percent.

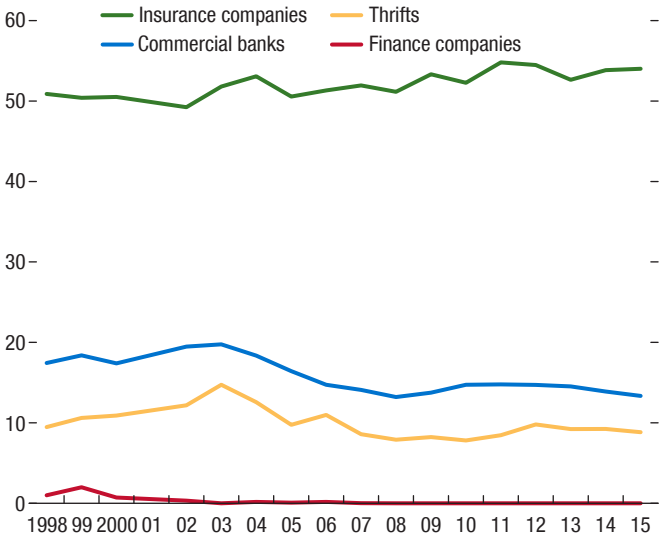
[17]Typically, smaller and unlisted intermediaries find it harder to issue securities because they do not have a track record in accessing bond and commercial paper markets, and are more opaque. Financial firms with lower net worth (that is, a lower market value of equity) will have to pay higher premiums in order to get wholesale funding and will cut lending more. In both cases, asymmetric information about the value of the firm's assets plays a major role (Van den Heuvel 2002).

[18]Imperfect competition in bank markets is an alternative market failure that can affect the transmission of monetary policy, but the effects discussed in the literature are ambiguous. On the one hand, a policy rate hike may increase banks' market power in the market for bank deposits and cause them to further restrict the supply of deposits (Drechsler, Savov, and Schnabl 2016). On the other hand, banks that have market power in the mortgage lending business seem to be less responsive to monetary policy because they dampen the response of lending rates by adjusting markups (Scharfstein and Sunderam 2014).

[19]To keep the same capital ratio, banks need to fund new loans with the same capital-to-debt ratio—hence the need to raise equity to expand lending.

Figure 2.4. Marked-to-Market Assets by Sector
(Percent)

Marked-to-market assets have fallen in banks and remain high for insurers.



Sources: SNL Financial; and IMF staff calculations.
Note: The figure shows the median value of assets recorded at fair value as a percentage of total assets, by sector, using a sample of financial institutions from various countries. Fair-value assets are trading account securities and securities available for sale and are marked to market.

many banks are facing binding capital constraints, the effect of monetary policy through banks can be small in the short term but large in the medium term (Van den Heuvel 2002).[20,21]

[20]Even if banks have enough capital to meet regulatory requirements, bank capital will still affect the transmission of monetary policy. As long as a monetary policy tightening reduces bank profits—either through the maturity gap or through a reduction in the demand for credit—it will make banks more likely to breach the capital requirement in the future. Hence, to reduce the likelihood of having to issue new equity, banks will prefer to shed assets, forgo new lending opportunities, or even contract lending (Van den Heuvel 2007). In theory, this effect will be larger for banks that are more engaged in maturity transformation (that is, retail banks), those that have a positive duration gap (for instance, mortgage banks), and those that rely less on financial derivatives to hedge interest rate risk (such as smaller banks; see Flannery 1981).

[21]According to the academic literature, monetary policy also influences bank reserves and thus their ability to lend—the bank lending channel. A monetary policy contraction through an outright sale of securities reduces the amount of reserves available to the banking system, and, hence, the amount of bank core deposits. If banks cannot substitute core deposits with some other source of funding, they may need to sell or liquidate some of their assets. However, as reserve requirements have become less prevalent and wholesale funding markets have developed, the relevance of this channel has diminished (Bernanke 2007). In fact, many central banks change interbank rates through signaling effects (that is, merely by announcing their target rates) without actually changing bank reserves (Disyatat 2011).

The impact of changes in bank loan supply on real economic activity depends on the degree to which borrowers can substitute bonds for loans (Bernanke and Blinder 1992). As capital markets develop, borrowers should find it easier to issue bonds. However, in many economies, even large firms are still heavily dependent on bank financing. Certain types of nonbanks can provide alternatives to bank financing following a tightening of monetary conditions. For instance, large institutional investors, such as insurance companies and pension funds, are often willing to buy newly issued private debt securities. In addition, investment banks that specialize in the underwriting and marketing of bond issues can facilitate alternatives to bank financing.

If the regulatory gap between banks and nonbanks increases, the significance of monetary policy transmission via bank lending may decline. The growth of nonbank financial intermediation has been fostered by tighter bank regulation (Chapter 2 of the October 2014 GFSR). At the same time, important sections of the nonbank financial sector remain lightly regulated.

Monetary Policy and Risk Taking by Financial Institutions

Expansionary monetary policy, such as an interest rate cut, can increase the risk-bearing capacity of financial institutions, thus increasing lending. In addition, incentives related to performance measurement and risk management can further enhance the risk-taking channel and suggest that even financial institutions without significant leverage can amplify the transmission of monetary policy.

Accommodative monetary policy—namely through interest rate cuts—can encourage financial intermediaries to take more risk and thus reduce the cost of borrowing. Through this mechanism, changes in short-term policy rates can have a large effect on long-term rates by reducing term premiums and thereby boosting economic activity, even if expectations about future short-term rates are unchanged.[22] This can happen in several ways.

[22]The macroeconomic response to central bank actions depends a great deal on whether a change in the short-term interest rate is transmitted to long-term rates (which are more relevant for aggregate demand). Under the expectations channel of monetary policy, central banks can affect long-term interest rates—and thereby

First, lower interest rates can encourage risk taking by financial institutions through greater leverage.[23] Since many financial institutions are engaged in maturity transformation, their profits tend to increase when monetary policy rates decline, at least in the short term.[24] This effect, in theory, should be more significant for financial intermediaries that rely more heavily on short-term wholesale funding (such as investment banks) than for those with more stable funding sources (such as commercial banks or thrifts). Higher profits, in turn, enhance their risk-bearing capacity—that is, their ability to take on more debt and expand their balance sheets (Adrian and Shin 2011).[25] Increased lending or asset purchases by these institutions will raise asset prices and reduce the price of risk, thus enhancing the transmission of monetary policy.

Second, accommodative monetary policy can also encourage risk taking by financial intermediaries that promise fixed nominal yields. Lower interest rates may induce financial intermediaries to buy higher-yield but riskier assets (reach for yield), which can drive up the price of risky assets and reduce the cost of borrowing. For instance, publicly traded commercial banks that do not mark to market most of their assets, and that are subject to regulatory capital constraints based on book values, have a strong incentive to boost reported earnings by replacing low-yielding with high-yielding assets (Hanson and Stein 2015). Similarly, insurance companies typically also have an incentive to reach for yield when funding conditions are loose (Becker and Ivashina 2015).[26]

Third, a large asset management industry largely driven by concerns about relative performance can also amplify the transmission of monetary policy. The growth of asset managers since the financial crisis has been remarkable (Chapter 3 of the April 2015 GFSR). Typically, funds are rewarded based on how their performance compares with that of their peers (Chevalier and Ellison 1997). This compensation structure, in turn, leads asset managers to be especially sensitive to changes in short-term rates and to the behavior of other asset managers, thus triggering significant asset price movements (Morris and Shin 2015).[27] In addition, investors may perceive a first-mover advantage when responding to changes in fund performance arising from a change in interest rates; they do not want to be the last to redeem if the fund sells its most liquid assets first (Feroli and others 2014; April 2015 GFSR). When both effects (relative performance concerns of fund managers and quick redemptions by ultimate investors) combine, the magnitude of the effect of monetary contractions on asset prices is further amplified. Thus, as the size of the asset management industry grows, an increase is likely in the effect of monetary policy on asset prices—as well as an increase in the resulting effect on credit and economic activity via the balance sheet channel.[28]

Finally, the risk-taking channel of monetary policy can operate through risk-management models used by financial institutions. A reduction in interest rates boosts asset valuations. One of the expected consequences of rising valuations is a drop in asset price volatility. This, in turn, can encourage risk taking by both banks and nonbanks by relaxing internal risk models based on value at risk (VaR). Thus, a more

aggregate demand—by signaling a path for future short-term interest rates (Woodford 2005). Alternatively, under the risk-taking channel, monetary policy affects long-term interest rates chiefly through its effect on risk premiums.

[23]Evidence in Cecchetti, Mancini-Griffoli, and Narita (forthcoming) suggests that borrowing (or leverage) by banks and insurance companies increases with the length of the period of monetary easing. There is also substantial empirical evidence showing that banks lower their lending standards with more accommodative monetary policy (Dell'Ariccia, Laeven, and Suarez 2016; Jiménez and others 2014).

[24]Alessandri and Nelson (2015) and Busch and Memmel (2015) show that higher interest rates dampen bank profits in the short term but have the opposite effect over the long term.

[25]The difference between this mechanism and the balance sheet effects previously discussed is that the latter relate to the ability to provide more credit because collateral constraints of borrowers are less binding, while the former considers the effect of monetary policy on institutions' willingness to take on risk via leverage targets or monetary policy's effect on target rates of return on investment (see Dell'Ariccia, Laeven, and Marquez 2014).

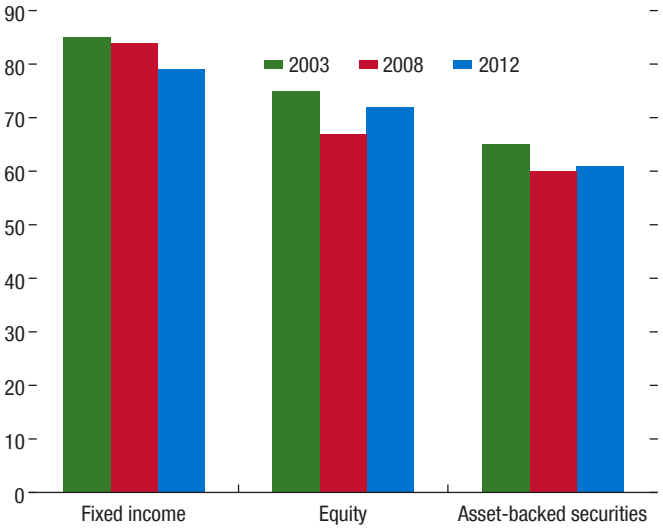
[26]For instance, by taking on poorly assessed tail risks or by buying assets based only on coarse credit rating categories in order to comply with capital requirements.

[27]The strategic interactions, in addition to the ones coming from first-mover advantages and relative performance concerns, can also result from implicit or explicit guarantees provided to asset managers by other institutions (Parlatore 2016). In addition, the presence of leverage among these asset managers will likely enhance the risk-taking channel.

[28]The empirical literature on the effect of monetary policy on asset prices and asset allocation has found that an expansionary monetary policy is associated with higher stock market valuations (Thorbecke 1997) and causes a shift in mutual funds' portfolios away from fixed income and into equity (Hau and Lai 2016).

Figure 2.5. Value at Risk in Risk Management by Asset Class and Year
(Percent)

Value at risk (VaR) has become slightly less popular but is still widely used by financial firms.



Source: Global Risk Management Survey (Deloitte 2004, 2009, 2013).
Note: The figure shows the percentage of surveyed financial firms that report using VaR to assess and manage market risk for fixed income, equity, and asset-backed securities.

pervasive use of such models by nonbank financial intermediaries will likely magnify the transmission of monetary policy. The evidence, however, suggests that these models, although still popular, have become less widespread since the 2007–09 financial crisis (Figure 2.5).

Empirical Evidence on the Transmission of Monetary Policy

This section examines the effect of monetary policy changes on credit provided or total assets owned by banks and nonbanks.

Most of the existing empirical literature on the role of nonbanks in monetary transmission either applies only to the United States or takes a narrow view of the nonbank financial sector. These studies suggest that nonbanks have similar, but more muted, responses to monetary policy relative to banks or may even respond in the opposite direction. For instance, in the United States, securities broker-dealers seem to be less responsive to monetary policy than banks but only money market funds show contrarian responses (Igan and others 2013). Other studies examining U.S. flow-of-funds data find that monetary tightening actually increases asset holdings of nonbank financial institutions (Den Haan and Sterk 2011).

A first look at cross-country evidence suggests that the aggregate macroeconomic response to monetary policy changes is stronger in countries with larger nonbank sectors. This result is based on the analysis of a panel of developed and emerging market economies, controlling for the level of financial market development (Figure 2.6).[29] However, there are important differences across countries in the composition of financial systems and in the characteristics of nonbanks, which cloud the analysis. Therefore, the remainder of this section examines detailed evidence across countries and different types of financial intermediaries.

To identify the effects of monetary policy, the empirical analysis to follow largely relies on two complementary strategies. First, it quantifies the aggregate effect of monetary policy on different types of financial intermediaries by looking at the responses of total real assets—adjusted for valuation changes and excluding equity and government securities—held by banks, insurance companies and pension funds, and other financial intermediaries.[30] Second, it uses microeconomic data to improve the identification of the effect of monetary policy on the supply of credit by different types of financial intermediaries.[31] Last, to gauge the potential for substitution between bank and nonbank financial intermediation, it estimates the ability of nonfinancial borrowers to use bond financing instead of bank loans after a monetary policy contraction.

[29]The results for banks and nonbanks are not necessarily different from a statistical point of view because the responses are not very precisely estimated (see Annex 2.1). Furthermore, the use of the same simple specification for all countries, as is usual in the literature, may mean that monetary policy is not adequately identified for every country.

[30]The results are based on vector autoregression (VAR) analyses. The main problem with the identification of monetary transmission is that the direction of causality between monetary policy and the provision of credit by financial intermediaries is difficult to establish.

[31]The aggregate data analysis can provide a sense of the overall magnitude of the effects, but compared with the firm-level analysis, it offers limited insight into the underlying mechanisms, is less able to deal with endogeneity, and is less robust to changes in the composition of the financial sector.

Analysis Based on Aggregate Data

This section estimates how bank and nonbank subsectors react to monetary policy changes in terms of total credit. The analysis helps to infer how the magnitude of monetary policy transmission is affected by the composition of the financial sector.

For the most part, other financial intermediaries respond more strongly to monetary policy than do banks, insurance companies, and pension funds.[32] Bank assets decline with a considerable lag after a monetary contraction, but the response of the nonbank financial sector varies across countries. In general, the analysis does not corroborate previous empirical studies showing a more muted or even opposite response of nonbanks relative to banks.[33] The results, by country (Figure 2.7), suggest that the difference in responses of other financial intermediaries to monetary policy derives from country-specific characteristics, including different compositions of these nonbank financial sectors. For instance, in the United Kingdom, other financial intermediaries include mostly mutual and hedge funds, which are most likely affected by monetary policy through the risk-taking channel. In the United States, they are composed of investment funds, government-sponsored enterprises, broker-dealers, issuers of asset-backed securities, and finance companies, which respond to monetary policy in different ways.[34]

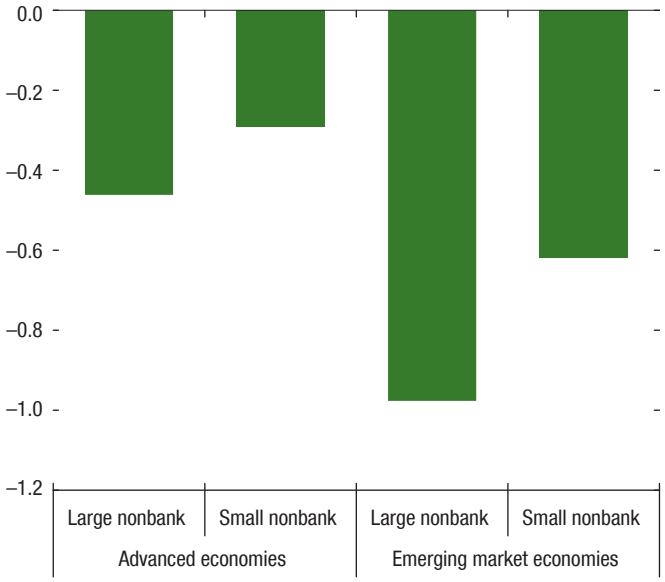
[32]The analysis uses a VAR with six variables: the natural logarithms of real GDP, of the GDP deflator, and of real total assets (adjusted for valuation effects) of banks, of insurance companies and pension funds, and of other financial intermediaries, and the nominal monetary policy rate. Total assets, which approximate lending by banks and nonbanks, are deflated and adjusted for valuation changes and do not include equity and government securities. The analysis considers data from Australia, Canada, Korea, South Africa, the United Kingdom, and the United States. It extends work by Den Haan and Sterk (2011); Nelson, Pinter, and Theodoridis (2015); and Herman, Igan, and Solé (2015), and is robust to various possible sources of misspecification. See Annex 2.1.

[33]The contrarian reaction of U.S. nonbank credit reported in Den Haan and Sterk 2011 seems to be driven by the narrow definition of credit used in that study—consumer and mortgage credit—as well as the time period, which ends in early 2008. In this chapter's analysis, the responses of other financial intermediaries and banks in the United States are not statistically different.

[34]In Australia, other financial intermediaries mostly comprise securitizers and investment funds; in Canada, the main other financial intermediaries are issuers of asset-backed securities, mutual funds, and other private financial institutions including holding companies; in Korea, other financial intermediaries mostly include finance companies such as credit card and leasing companies, and investment trusts; and in South Africa, other financial intermediaries are represented by investment trusts.

Figure 2.6. Transmission of Monetary Policy and Size of Nonbank Financial Sector
(Percent)

The transmission of monetary policy is slightly stronger in economies with large nonbank financial sectors.



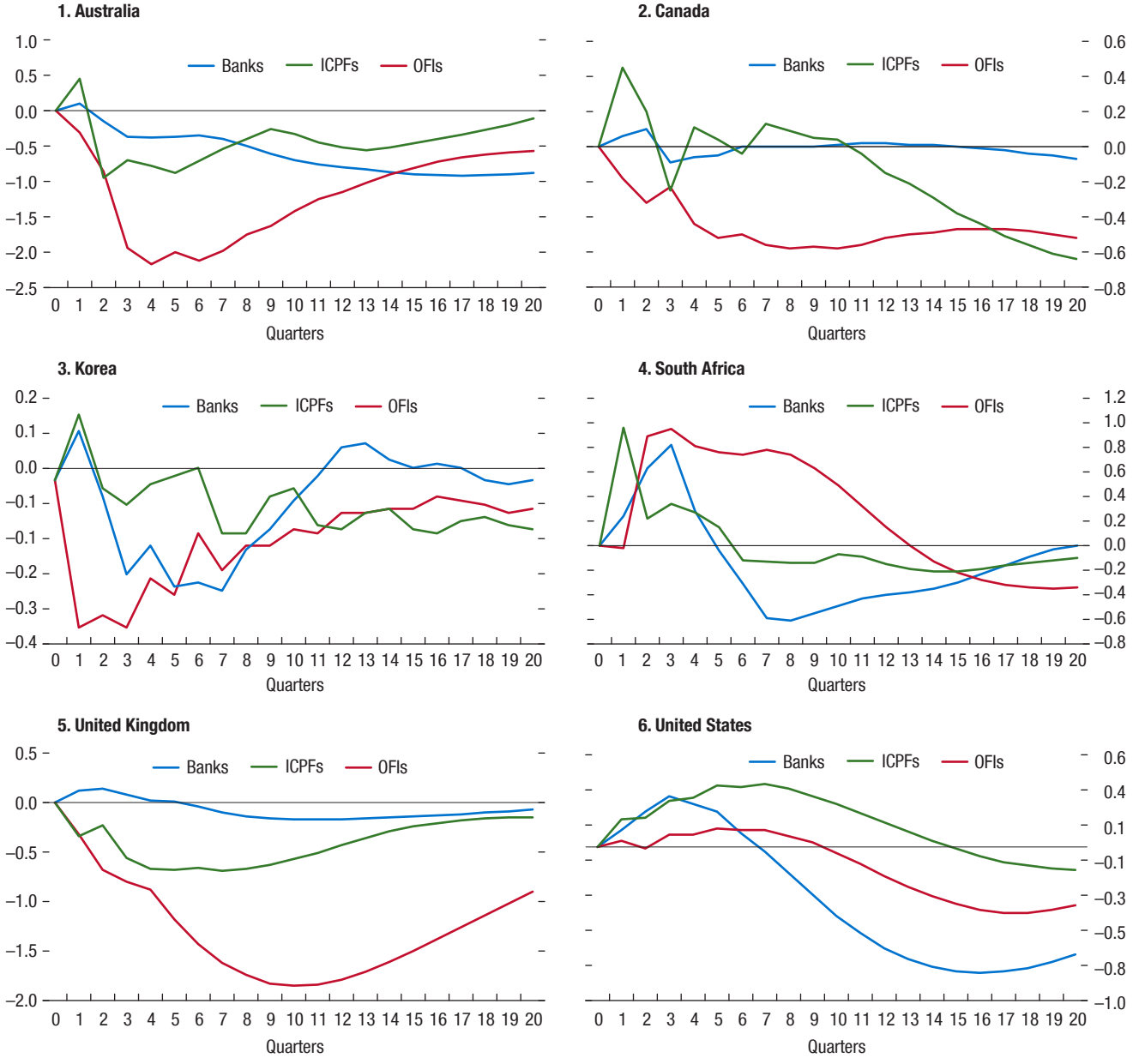
Sources: IMF, International Financial Statistics database; Organisation for Economic Co-operation and Development; World Bank; and IMF staff estimates.
Note: The figure shows the estimated peak response of GDP to a 1 percentage point increase in the nominal interest rate. The responses are estimated using a vector autoregression of log real GDP, log GDP deflator, the log of the nominal effective exchange rate, and the monetary policy interest rate (shadow policy rate for countries using unconventional monetary policy). The responses are identified using a Cholesky decomposition in which the interest rate is ordered last. See Annex 2.1.

Mutual funds, in particular, display responses to monetary policy consistent with the risk-taking channel. A closer look at other financial intermediaries shows that, after an increase in the monetary policy rate, total assets (in real terms) under management by equity funds consistently decline, whereas those of bond funds first decline and then increase (Figure 2.8, panel 1). This result suggests that, with some delay, investors switch from riskier assets (equity) to safer assets (bonds). On the other hand, money market mutual fund assets rise sharply following the monetary policy contraction, which is consistent with both a flight-to-quality effect and the bank-lending channel. Because many mutual funds invest internationally, the observed shifts in asset patterns likely represent an important mechanism for monetary spillovers.

Figure 2.7. Response to a Monetary Policy Contraction

(Percent)

Bank assets decline after a monetary contraction, but with a considerable lag. The response of insurance companies and pension funds (ICPFs) and other financial intermediaries (OFIs) varies across countries.

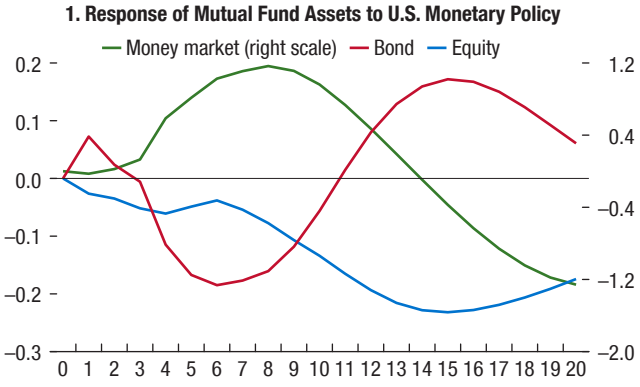


Sources: Bank of Canada; Bank of England; Bank of Korea; Federal Reserve System; Haver Analytics; Organisation for Economic Co-operation and Development; Reserve Bank of Australia; Reserve Bank of South Africa; and IMF staff estimates.
Note: The figure shows the response of total assets by sector to a 1 percent increase in the monetary policy rate. Banks' assets in the United Kingdom include those of the Bank of England. Monetary policy is measured with a shadow policy rate for countries using unconventional monetary policy. The responses are identified using a Cholesky decomposition in which the interest rate is ordered last. The results are robust to many possible sources of misspecification. ICPFs = insurance companies and pension funds; OFIs = other financial intermediaries. See Annex 2.1 for details.

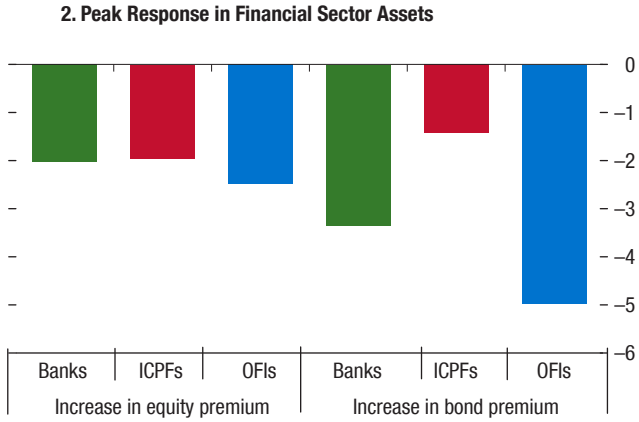
Figure 2.8. Risk Taking and Monetary Policy in the United States

(Percent)

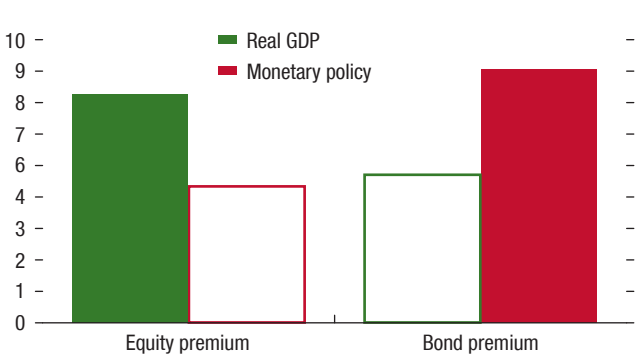
U.S. mutual funds display behavior consistent with the risk-taking channel of monetary policy.



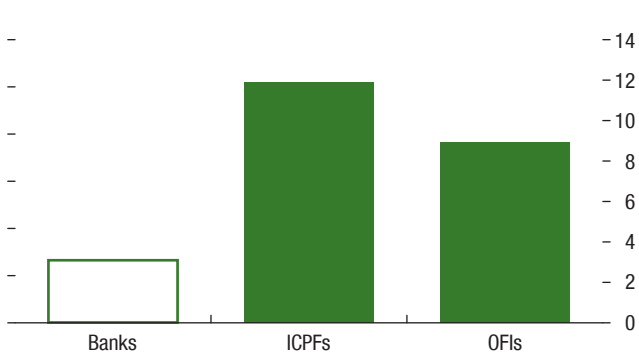
All financial intermediaries are affected by changes in risk premiums in the United States.



U.S. monetary policy seems to matter more for risk appetite in fixed income markets.



Nonbanks contribute more to the behavior of the excess bond premium in the United States.



Sources: Federal Reserve System; Haver Analytics; Organisation for Economic Co-Operation and Development; and Thomson Reuters Datastream.
Note: Panel 1 shows the response of total assets net of valuation by type of mutual fund to an orthogonal monetary policy innovation. The response is estimated with a vector autoregression (VAR), which also includes real GDP, the GDP deflator, shadow rate, total assets for the banking, and insurance and pension sectors, and a trend with a break in the postcrisis period. Panel 2 shows the peak response of each variable on the *x*-axis to orthogonal shocks to the equity and bond premiums. The VAR, in this case, includes real GDP, the GDP deflator, total assets for each financial subsector, the U.S. shadow policy rate from Ichiue and Ueno 2016 to take into account the use of unconventional monetary policy, the Gilchrist and Zakrajšek 2012 excess bond premium, and the equity risk premium from Absolute Strategy Research. Panel 3 shows the contribution of real GDP and monetary policy to the behavior of risk premiums, using a 16-quarter-ahead forecast-error variance decomposition based on the preceding VAR (solid bars are statistically significant at the 68 percent level). Panel 4 shows the contribution of each financial subsector to the behavior of the excess bond premium, using the same method as in panel 3. ICPFs = insurance companies and pension funds; OFIs = other financial intermediaries. See Annex 2.1 for details.

At least for the United States, the risk-taking channel of monetary policy seems to operate mostly through nonbank financial intermediaries. An extension to the aggregate analysis discussed earlier shows that a drop in the risk appetite in credit markets—measured by a rise in the return that investors require to hold bonds in excess of the risk-free rate of return, that is, a rise in the bond risk premium[35]—is followed by a large decline in total assets owned by other financial intermediaries, in the United States (Figure 2.8, panel 2).[36] This sug-

[35]The bond risk premium is captured by Gilchrist and Zakrajšek's (2012) excess bond premium.

[36]However, the responses to increases in the equity risk premium—the return that investors require to hold equity in excess of the risk-free rate of return—are more muted.

gests that nonbanks are very responsive to changes in risk appetite. The bond risk premium, in turn, is significantly affected by monetary policy (Figure 2.8, panel 3) and by nonbanks (Figure 2.8, panel 4). An open question is whether the risk-taking channel of monetary policy will remain significant as monetary policy normalizes and interest rates increase.

Digging Deeper: Micro Data on Bank and Nonbanks

To better understand the differences behind the behavior of heterogeneous nonbank sectors and to better identify some of the mechanisms discussed earlier, this section estimates the response of bank and nonbank financial intermediaries to policy shocks, exploiting firm-level characteristics.

With the exception of finance companies, both banks and nonbanks reduce their balance sheets three years after an interest rate increase (Figure 2.9, panel 1). In particular, peak responses tend to occur 12 quarters after the monetary policy shock and are statistically significant for all types of financial intermediaries.[37] Investment banks and insurance companies react in the same direction as banks, and appear to respond more strongly.[38] The reaction is different for finance companies, supporting the view that they act as substitutes for banks and dampen the monetary transmission mechanism. However, the substitution between banks and finance companies is unlikely to be relevant for the aggregate economy because the latter usually represent a relatively small share of financial sector assets. Furthermore, evidence based on stock returns confirms that banks' and nonbanks' reactions to unconventional monetary policies are not substantially different overall (Box 2.1).

The response of banks and nonbanks to monetary policy depends on their leverage, size, and access to wholesale funding. First, smaller banks are more responsive to monetary policy (Figure 2.9, panel 3), but there is no consistent relationship with size for nonbanks (whose different sizes may in fact represent very different business models). Second, a higher reliance on wholesale funding by banks and life insurance companies seems to dampen the response to monetary policy (Figure 2.9, panel 4).[39] Since financial institutions that are able to access wholesale markets easily are the least financially constrained, these findings are broadly in line with the channels of monetary policy that emphasize the presence of imperfections in the market for debt and equity issued by financial intermediaries. However, just as in Xie 2016, this study finds no consistent relationship between the percentage of assets marked to market and the response of total assets to monetary policy.

The substitution between banks and finance companies is stronger in countries with stricter bank regulation. In countries with stricter bank capital regulation, in response to monetary tightening, banks reduce their total assets more than banks subject to less-strict regulation. In line with greater substitution between bank and nonbank credit, finance companies increase their assets more when bank capital regulation is stricter (Figure 2.10).

The behavior of mutual funds in response to monetary policy changes is consistent with the risk-taking channel. Fund-level data on portfolio allocations by equity and bond mutual funds in the United States show that fund managers tilt their allocations toward riskier assets after an expansionary monetary policy change (Figure 2.11).[40] In particular, in response to monetary policy loosening, bond funds significantly increase their allocations to high-yield and long-term bonds in their portfolios. In addition, U.S. bond funds and, to a smaller extent, U.S. equity funds increase their investments in countries with speculative-grade sovereign credit ratings.

How Easily Do Borrowers Substitute Market Financing for Bank Financing?

This section examines how nonfinancial firms' reliance on bank and nonbank financing changes in response to monetary policy actions. If this substitution is seamless, the impact of monetary policy on real activity through its effect on the relative supply of credit by banks (as opposed to nonbanks) is likely to be unimportant.

[37]Although the average response of banks is not significant at the 90 percent confidence level, those of investment banks, finance companies, and small banks are significant (Figure 2.9, panel 3). The analysis found no robust evidence of asymmetric responses to monetary policy contractions and expansions.

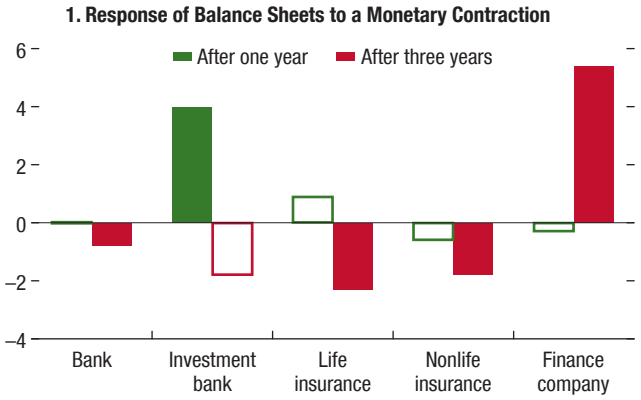
[38]The estimates are not precise enough to be unequivocal.

[39]The finding that greater access to wholesale finance dampens the response of banks and life insurers remains significant at a 90 percent significance level. However, the relationship between capital and monetary policy is no longer significant (Figure 2.9, panel 2). Furthermore, there is no consistent relation between the change in assets following monetary policy changes and the proportion of liquid assets.

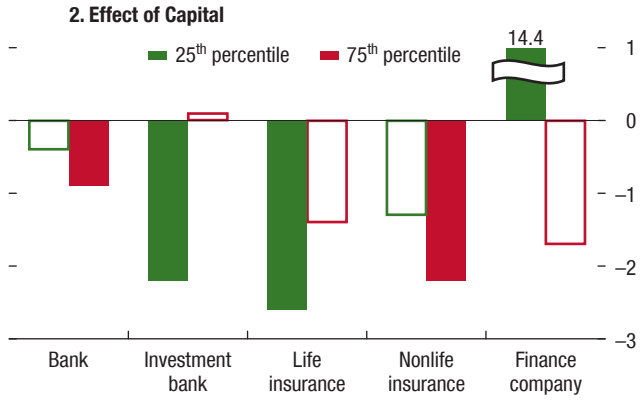
[40]Hau and Lai (2016) report similar findings for European mutual funds.

Figure 2.9. Monetary Policy and Total Assets Owned by Financial Intermediaries
(Percent)

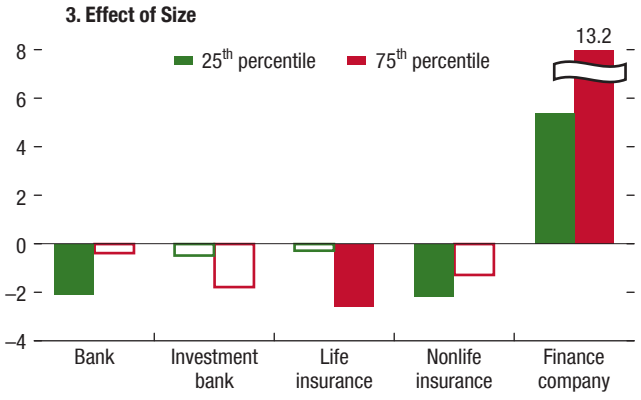
Banks', investment banks', and insurers' balance sheets shrink following a monetary contraction while finance companies show the opposite reaction.



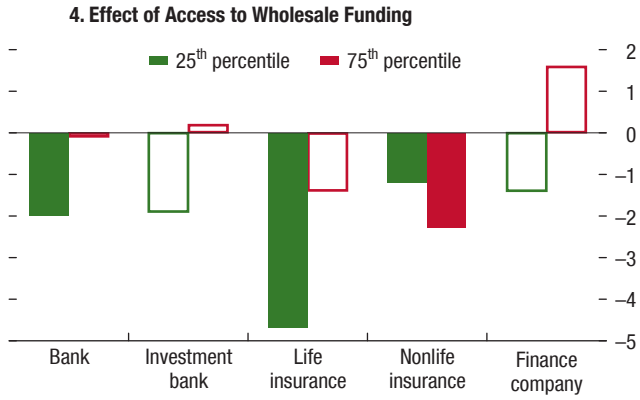
More highly capitalized banks contract lending more in response to a monetary contraction while more leveraged finance companies expand more.



Smaller banks are more responsive but the opposite holds true for finance companies.



More wholesale funding dampens the response to monetary policy.



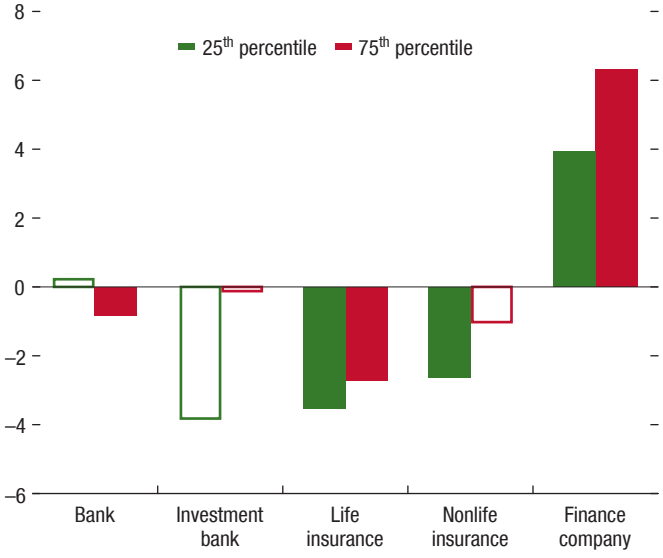
Sources: SNL Financial; Thomson Reuters Datastream; and IMF staff estimates.
Note: Panel 1 shows the estimated response of total real assets of financial institutions to a one percentage point monetary policy change. Panels 2 to 4 show the impulse responses after three years at the 25th and 75th percentiles of the interaction variable (that is, the equity to asset ratio, balance sheet size, and wholesale funding ratio, respectively). The responses are drawn from impulse responses based on a firm-level panel vector autoregression (VAR). The monetary policy measure is the orthogonal innovation to the monetary policy rate from a VAR analysis that also includes real GDP and the real GDP deflator. The VAR uses the shadow policy rate for countries using unconventional monetary policies. The sample covers listed financial institutions from advanced economies from 1998 to 2015, at quarterly frequency. Solid bars mean the responses are significant using a 68 percent confidence interval. See Annex 2.2 for details.

In general, the extent to which firms use bond financing depends on the overall level of financial market development.[41] A number of factors affect firms' choices between bank loans and bonds. First, issuing bonds entails substantial issuance costs, including a large fixed component. Second, bonds may be more difficult to renegotiate in times of stress. Third, banks may be better suited than the public or even institutional investors to obtain information about firms. The data show that the reliance on loan versus bond financing varies significantly across countries. Bond financing is favored in countries with deeper financial markets and by larger firms (Figure 2.12). In addition, firms in countries that have experienced large increases in the relative size of the nonbank financial intermediation sector since 2010—

[41]This section focuses on corporate borrowing because nonfinancial firms have more access to market financing than do households and because of data availability.

Figure 2.10. Bank Regulation, Monetary Policy, and Total Assets Owned by Financial Institutions
(Percent)

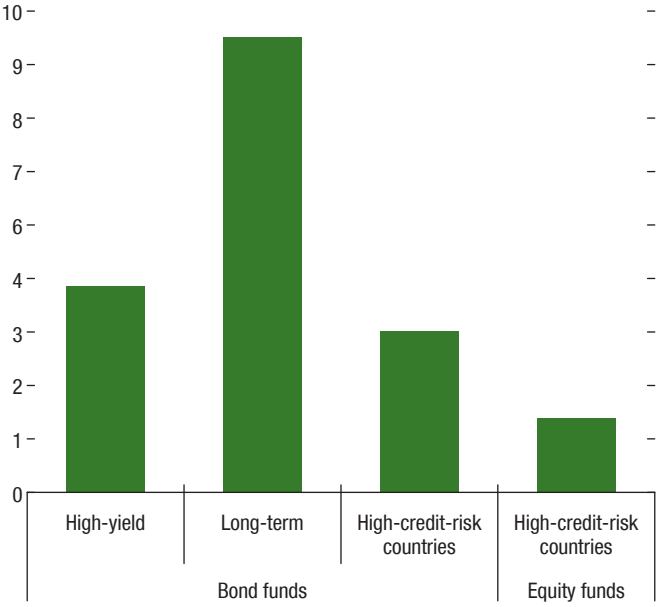
Bank regulation may induce the substitution between bank and nonbank credit.



Sources: Barth, Caprio, and Levine 2013; Thomson Reuters Datastream; and IMF staff estimates.
Note: The figure shows the impulse responses after three years at the 25th and 75th percentiles of the interaction variable (Barth, Caprio, and Levine 2013 index of stringency of bank capital regulations), as in Figure 2.9. Solid bars indicate that the estimate is significant using a 68 percent confidence interval.

Figure 2.11. Risk Taking by Mutual Funds and Monetary Policy
(Percent of total assets)

Mutual funds in the United States increase the riskiness of their portfolios after an accommodative monetary policy change.



Sources: EPFR Global; Lipper Global Mutual Fund Holdings; and IMF staff estimates.
Note: The figure shows the estimated change in the allocations of mutual funds' portfolios into each asset class, after a 1 percentage point decrease in Wu and Xia's (2016) shadow policy rate. The shadow policy rate takes into account the use of unconventional monetary policies. All estimates are significant at least at the 10 percent significance level. See Annex 2.2 for details.

such as Brazil, Canada, Germany, and the United Kingdom—on average reduced their reliance on bank financing significantly more than those in countries where the nonbank sector has not increased (Japan, United States).

Overall, borrowing companies show a limited ability to substitute between market and bank financing following a monetary policy change. An analysis using data for nonfinancial firms in Europe, Japan, and the United States for 1993–2015 finds that the choice between the issuance of bonds and syndicated loans is affected by monetary policy—but the effect is small. On average, an increase in the monetary policy rate of roughly 2 percentage points reduces firms' probability of bank financing in favor of bond issuance by only 3 percentage points (Figure 2.13, panel 1). The evidence of limited substitutability between bond and bank financing is especially significant given that the firms in the sample are very large listed companies that should have relatively easy access to bond markets.[42] The limited substitution between bank and market financing suggests that shocks to the supply of bank loans caused by monetary policy changes can have significant effects on total credit and economic activity.

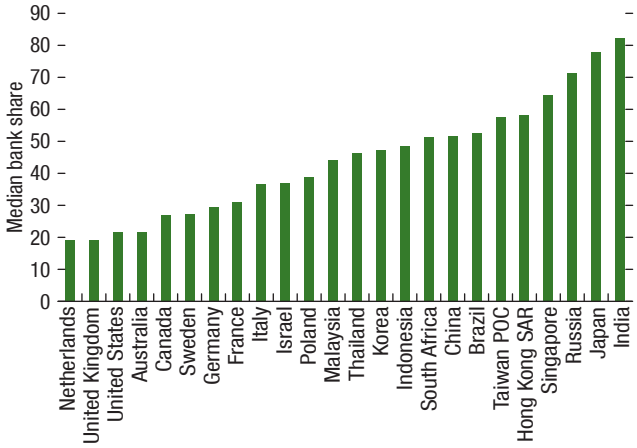
Nonfinancial firms with more tangible assets can more easily switch to market financing after a monetary contraction. Although firm size does not seem to significantly influence the way monetary policy affects firms' financing choices, the amount of tangible assets does (Figure 2.13, panel 2), probably because tangible

[42]The lack of substitution between bond and bank financing reflects difficulty in accessing bond markets even for large firms and borrowing conditions in bond markets that closely mirror those for bank loans. That is, the lack of substitution may reflect either that firms cannot substitute or that they can but do not have an incentive to do so. Unfortunately, empirically it is difficult to distinguish unambiguously between the two possible explanations. However, the fact that firms do not appreciably substitute bonds for loans when banks' lending standards tighten suggests that they cannot easily substitute bank loans.

Figure 2.12. Bond Finance around the World

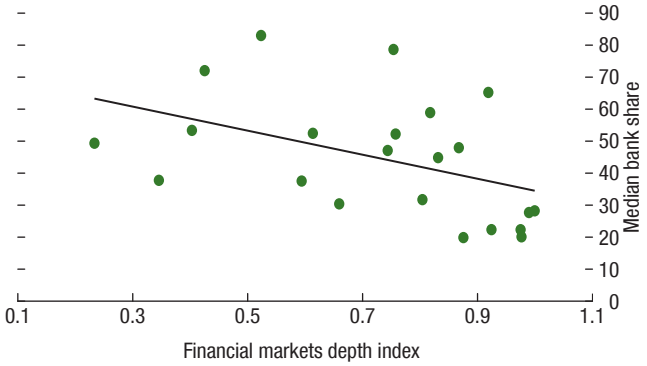
The reliance of listed companies on loan versus bond financing varies significantly across countries.

1. Loan versus Bond Financing, 2014
(Percent)



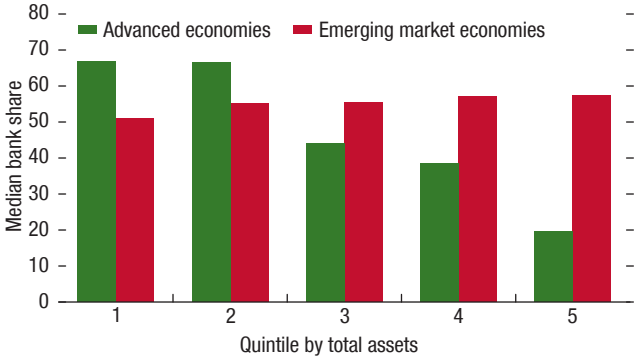
Bond financing is favored in deeper financial markets.

2. Bank Financing and Financial Development, 2014
(Percent)



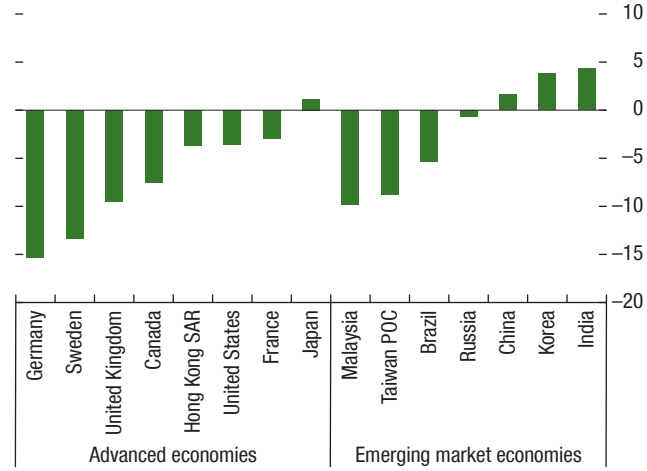
Larger firms rely more on bond financing in advanced economies.

3. Bank Financing by Firm Size, 2014
(Percent)



Bond financing increased in most countries after the crisis.

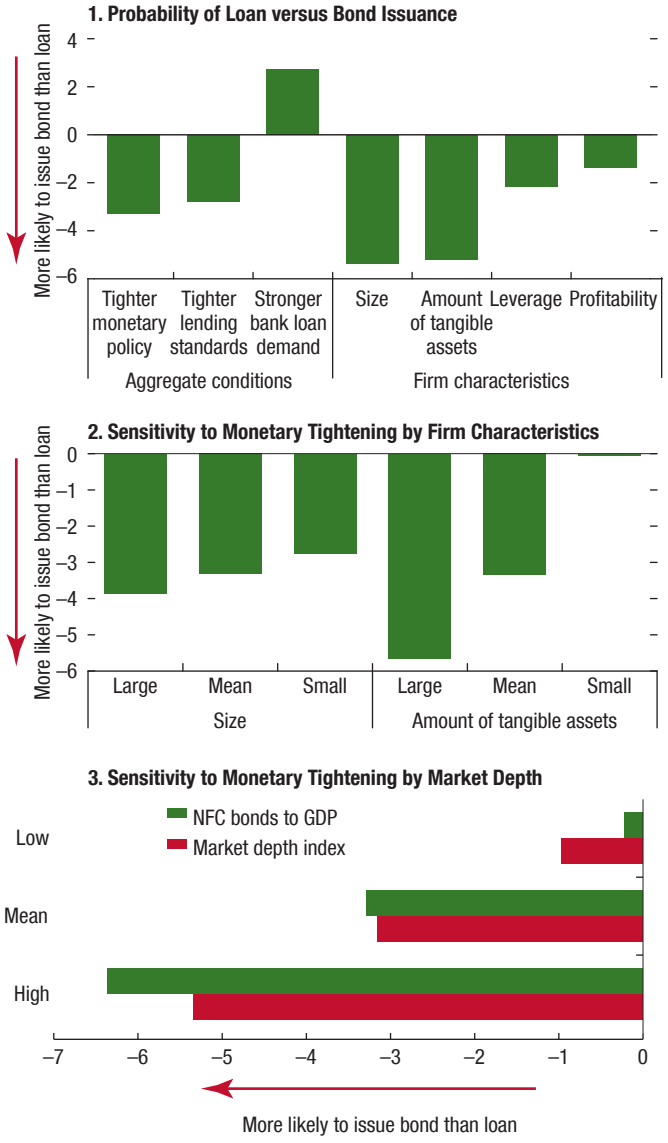
4. Change in Median Bank Financing, 2009–14
(Balanced panel; percentage points)



Sources: Dealogic; FactSet; IMF, World Economic Outlook database; Svirydzenka 2016; and IMF staff calculations.
Note: Firms' reliance on bank financing is computed as the ratio of loan liabilities to the sum of loan, note, and bond liabilities. In panel 2, the financial markets depth index (Svirydzenka 2016) takes into account the depth of equity and bond markets (including government, financial, and nonfinancial bond markets). In panel 3, quintiles are in ascending order by firm size, measured by total assets. Taiwan POC = Taiwan Province of China. See Annex 2.3 for details.

Figure 2.13. Bond Financing and Monetary Policy
(Percentage points)

The effect of monetary policy on the substitution between bank loans and bond issuance is stronger for firms that have more tangible assets and firms from countries with deeper financial markets.



Sources: Bank of England; Bank of Japan; Dealogic; European Central Bank; FactSet; Federal Reserve Board; IMF, World Economic Outlook database; Svirydzenka 2016; Thomson Reuters Datastream; and IMF staff calculations.
Note: Panel 1 shows the estimated response of the probability of a firm taking a loan instead of issuing a bond when each explanatory variable increases by one standard deviation (about 2 percentage points for the monetary policy measure). Panel 2 shows how the sensitivity to a one standard deviation tightening in monetary policy changes by firm characteristics (size and amount of tangible assets). Panel 3 shows how the sensitivity to a 1 percentage point tightening in monetary policy varies with market depth. Panels 1 and 2 are estimated using data for listed nonfinancial firms in Europe, Japan, and the United States during 1993 to 2015. Panel 3 is estimated for 2010 to 2015 using an unbalanced panel of nonfinancial firms in 23 advanced and emerging market economies. For countries using unconventional monetary policies, the monetary policy measure is based on a shadow policy rate. All estimates are significant at least at the 10 percent significance level. NFC = nonfinancial corporation. See Annex 2.3 for details.

assets can more easily be used as collateral. Finally, the formal analysis confirms that firms can more readily resort to bond financing when they are located in countries with deeper markets (Figure 2.13, panel 3).

Policy Discussion

Implications of the Increase in Nonbanks for Monetary Policy Implementation

Regardless of how effective monetary policy may be at the current juncture of very low interest rates, the growth in the nonbank financial sector around the world will have important implications for the conduct of monetary policy.[43] Although the nature of those implications is still not well understood, fears that monetary policy will become less effective because of nonbanks seem unfounded. First, the increasing role of the risk-taking channel through nonbanks may mean shorter transmission lags for monetary policy. Second, changes in the regulatory framework for nonbanks (in particular, efforts to close the regulatory gap with banks) are likely to affect the strength of monetary policy transmission. Third, because other financial intermediaries seem to react more to monetary policy actions, the dosage of such actions will need to be continuously recalibrated as the sector gains in importance.

To better calibrate their actions, monetary policymakers need to monitor the information provided by the balance sheets of key financial intermediaries. In light of the evidence of monetary policy transmission through the risk-taking channel, central banks should be mindful of the level and growth in leverage in financial institutions and of lending in short-term funding markets. Given the growth of the nonbank financial sector, the information contained in the balance sheets of nonbanks may be more useful than more traditional measures of monetary aggregates (Adrian and Shin 2011). Leverage among financial institutions has the potential to amplify the transmission of short-term interest movements to asset prices. The same is true for relative performance concerns among asset managers. Consequently, more than in

[43]It is also plausible that changes in the conduct of monetary policy since the financial crisis have facilitated the growth of nonbanks. For instance, the recent expansion of collateral frameworks to include certain assets made it easier for certain nonbank lenders, such as automobile lenders, to securitize their claims and expand their balance sheets.

the past, monetary policymakers need to monitor the behavior of investment funds, given their role as drivers of sharp fluctuations in risk premiums.

Better data on the activities of nonbanks are needed. Significant data gaps persist concerning the activities and exposures of nonbanks. For instance, most emerging market economies collect very limited data on nonbank balance sheets. The lack of data on the amount of financial intermediation by the nonbank sector may lead to the underestimation of both the level and growth of total credit, with implications for both monetary and prudential policies. There is also limited information on certain exposures, including to foreign exchange risk. The latter gap is especially significant, given the constraints that such exposures may impose on the conduct of monetary policy (Box 2.2).

The Impact of Monetary Policy on Financial Stability

Financial sector supervisors need to be mindful of the changing financial stability implications of monetary policy in light of the growing importance of nonbank lenders. Given that the risk-taking channel seems to be an increasingly important mechanism in driving the responses of financial intermediaries, monetary policy actions are likely to have stronger consequences for the soundness of the financial sector. This does not imply that monetary policy should pursue financial stability objectives (IMF 2015), but it does suggest the need for greater vigilance by prudential and regulatory authorities. It also underscores the need for further research to better understand the impact of monetary policy on risk taking by different financial institutions.

Conclusions and Policy Recommendations

Overall, the chapter finds that the growth of the nonbank financial sector has not weakened the impact of monetary policy on economic activity. The chapter's specific findings are that:

- Over the past 15 years, the transmission of monetary policy seems to have strengthened in many countries.[44] Transmission, on average, appears to be somewhat stronger in countries with larger nonbank sectors, but the differences are small.
- With the exception of finance companies, banks and nonbanks contract their balance sheets when monetary policy tightens. For the most part, nonbanks react more to monetary policy than do banks, but there are important country differences. Therefore, following a monetary policy contraction, a reduction in the supply of credit by one type of financial intermediary is likely to be accompanied by a similar reduction in total credit. Banks and nonbanks with easier access to funding reduce their balance sheets less, dampening the transmission of monetary policy.
- Changes in credit supply by banks remain important for real economic activity because following a monetary policy contraction, even very large nonfinancial firms have a limited ability to issue bonds in order to replace bank loans.
- The risk-taking channel, through changes in asset allocations, seems to play an important role in explaining the strengthening of the transmission of monetary policy. Changes in the asset allocations of funds also entail the potential for international monetary spillovers.

The chapter offers four main policy recommendations:

- *The conduct of monetary policy will need to continue to adapt to changes in the transmission mechanism as nonbank financial intermediation grows.* For example, as the relative importance of the risk-taking channel increases, the effects of monetary policy changes on the real economy may become more rapid and marked. At the same time, changes in nonbank regulation will also affect monetary policy transmission.
- *Monetary policymakers need to monitor the size and composition of key financial intermediaries' balance sheets.* This is important in order to assess changes in the risk appetite of financial institutions.
- *Policymakers need to be mindful of the changing financial stability implications of monetary policy.* Monetary policy actions are likely to have stronger consequences for financial soundness because they increasingly affect the risk-taking behavior of financial intermediaries. This suggests the need for greater vigilance by prudential and regulatory authorities.
- *Data provision on nonbank financial intermediaries needs to continue to be enhanced.* In particular, many emerging market economies should collect more data on nonbank balance sheets.

[44]The chapter did not attempt to ascertain the strength of monetary policy at the current juncture.

Additional research on the role of nonbanks is needed to better design monetary policy responses over the business cycle. Understanding the role of nonbanks in the transmission of monetary policy is important for the proper design and implementation of macroeconomic stabilization policies. Although the overall response to monetary expansions and contractions of financial intermediation by nonbanks is not qualitatively different from that of banks, important gaps remain in our knowledge of how monetary policy can act through nonbanks. In particular, more effort is needed to better understand the risk-taking channel of monetary policy and the role of asset managers.

Box 2.1. Monetary Policy and the Stock Returns of Banks and Nonbanks

Monetary policy influences output and prices indirectly and often with a lag, but its influence on asset prices is straightforward and immediate. This box finds that the stock prices of banks and nonbanks respond similarly to unconventional monetary policy surprises in the United States, consistent with the view that nonbanks are unlikely to weaken the transmission of monetary policy. The analysis also shows that, for the United States, financial intermediaries respond more to positive surprises.

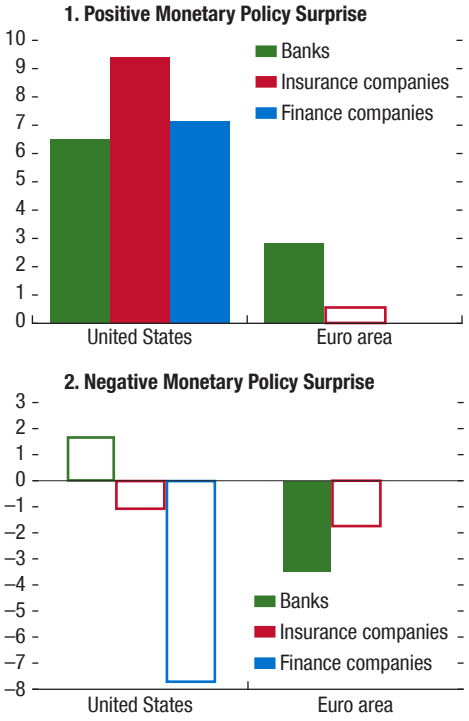
The reaction of the stock market to changes in monetary policy can provide useful insights into the transmission of monetary policy. Unlike balance sheets, stock prices are forward looking: A firm's stock price reflects the value of all its future expected cash flows discounted at an appropriate rate (the risk-free rate plus a risk premium).[1] Therefore, monetary policy surprises can increase stock prices either by improving the expectations about future cash flows, lowering the real risk-free rate, or decreasing the risk premium.

Should the stock prices of banks and nonbank financial intermediaries respond differently to monetary policy? Banks and nonbanks' stock prices may respond differently to monetary policy if they have differential access to debt markets, possibly because some businesses are more transparent than others. Different exposures to interest rate risk, different risk-taking incentives, and different exposure of their client bases to cyclical factors—namely to monetary policy—also affect the way these institutions' stock prices respond to monetary policy. The stock returns of firms that are smaller, have poorer credit ratings, are financially constrained, or belong to cyclical sectors such as technology or communications, are more sensitive to monetary policy (Ehrmann and Fratzscher 2004).

The impact of unconventional monetary policy announcements on equity returns in the United States does not seem to be significantly different between banks and nonbanks. Based on an event

Figure 2.1.1. Stock Price Responses to Unconventional Monetary Policy
(Percent)

In the United States, bank and nonbank stocks respond similarly to monetary policy surprises.



Sources: Bloomberg L.P.; and Thomson Reuters Datastream.
Note: The panels show the estimated response of stock prices (in excess of the aggregate market response) to unconventional monetary policy announcements between November 2008 and December 2013. The stock response is measured by the change in stock return on the day of a monetary policy announcement that cannot be explained by the change in the overall stock market return over the same period. The monetary policy surprise is based on yields for 10-year government bond futures in the United States and a spread between German and Spanish or Italian 10-year government bonds for the euro area. Sufficient data for finance companies are not available for the euro area. Solid bars represent responses that are significant at the 10 percent level.

This box was prepared by Luis Brandão-Marques and Garence Staraci.

[1]Stock prices react quickly to an unexpected monetary policy change because of their forward-looking nature (the expected component should already be incorporated into prices). Although monetary policy seems to affect aggregate stock market returns mostly through the risk premium, its effect on cash flows explains a significant portion of the effect on the cross-section of returns (Maio 2014). Hence, differences in responses by banks and nonbanks offer information about the expected effect of monetary policy on the current and future profitability of each sector.

Box 2.1 *(continued)*

study with daily data, nonbanks (insurance companies and finance companies) and banks tend to respond more to monetary policy than the market average (Figure 2.1.1).[2] There is a considerable degree of asymmetry in the responses to positive or negative monetary surprises. In the United States, responses are stronger for positive monetary policy surprises; by contrast, in the euro area, the stocks of financial institutions are more responsive to negative surprises. Nonbanks tend to have slightly stronger responses than banks but the differences are small and, in general, not significantly different from a statistical perspective. However, in the euro area, banks respond more than insurance companies do to monetary policy surprises.

Overall, the evidence presented here is consistent with the view that nonbanks are unlikely to weaken the transmission of monetary policy. The analysis shows that the stocks of nonbanks and banks react similarly to positive monetary policy surprises. In addition, because finance companies also seem to benefit from monetary expansions to a greater extent than the rest of the market, the results of this analysis suggest that the substitution between banks and finance companies is limited. Therefore, it is plausible that the heightened reaction of financial sector stock prices to accommodative monetary policy signals an expectation of higher future profits and an expansion of balance sheets for the entire financial sector.

[2]The event study controls for market expectations by identifying the surprise component of policy announcements as the change in long-term government bond futures prices (or yields) around the time of policy announcements. The stock price response is measured on a daily basis because the novelty of unconventional policies may mean that it takes time for a policy shock to be properly reflected in asset returns. The time frame considered is November 2008 to December 2013. During this period, there were 47 monetary policy announcements in the United States and 63 in Europe (euro area). Under the term "announcement," the study also includes monetary policy committee meetings with no significant announcement because such decisions can sometimes be considered surprises by the market. The results presented here, albeit using a different method, confirm the findings of Chodorow-Reich 2014 for the United States.

Box 2.2. Exchange Rate Volatility, Monetary Policy, and Nonbanks

This box discusses the effects of monetary policy on financial institutions through changes in exchange rates. For the case of emerging markets, it uncovers the constraints posed by financial structures on monetary policy when the central bank targets the exchange rate.

The exchange rate channel of monetary policy does not work homogeneously across the financial system; financial firms in emerging market economies, on average, seem more exposed to foreign currency changes. Exchange rate changes may affect banks and nonbanks differently, depending on their balance sheet exposures, and their financial and operational ("natural") hedges. Net foreign exchange exposures are indirectly estimated for listed financial firms using the sensitivity of their stock returns to changes in trade-weighted exchange rates.[1] The estimated coefficients (Figure 2.2.1) highlight the different effects that exchange rate variations may have on banks and nonbanks. In the United States, Europe (excluding the United Kingdom), and emerging market economies, the returns of bank stocks are more negatively affected than those of nonbanks following a currency depreciation. Furthermore, the stock returns of emerging market financial institutions are more sensitive to exchange rates than are their counterparts in advanced economies.

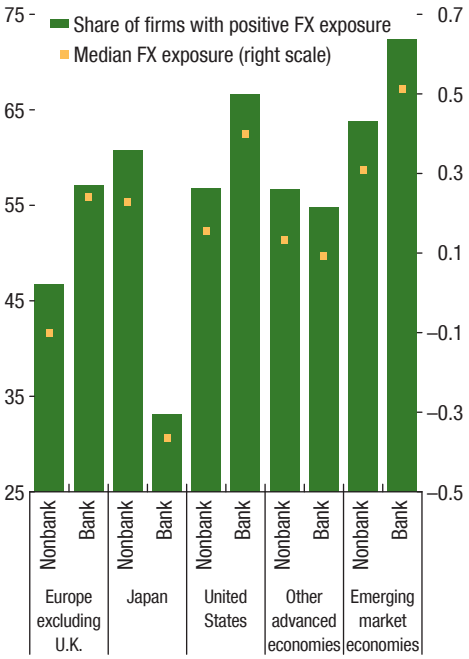
Central banks in emerging market economies may be inclined to avoid large exchange rate fluctuations,

This box was prepared by Nicolás Arregui and Nicolás Magud.

[1]See Adler and Dumas 1984; and Bartram and Bodnar 2007.

Figure 2.2.1. Sensitivity of Financial Firms to Exchange Rate Changes, 1995–2016
(Percent)

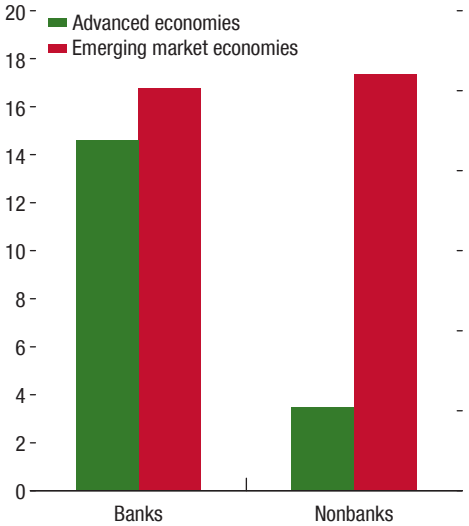
Returns of banks and nonbanks are more sensitive to exchange rate fluctuations in emerging market economies.



Sources: IMF, International Financial Statistics database; Thomson Reuters Datastream; and IMF staff calculations.
Note: Emerging market economies = Brazil, Chile, China, Colombia, Czech Republic, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Philippines, Poland, Russia, South Africa, Taiwan Province of China, Thailand, Turkey. Other advanced economies = Australia, Canada, Hong Kong SAR, New Zealand, Singapore, United Kingdom. The figure shows the estimated response of expected stock returns to a 1 percentage point appreciation in the trade-weighted nominal exchange rate. The estimates are based on an augmented capital asset pricing model and a sample of listed financial firms in 23 advanced economies and 19 emerging market economies from 1995 to 2015. FX = foreign exchange.

Figure 2.2.2. Foreign Currency Liabilities of Banks and Nonbanks, 2001–14
(Percent of total liabilities)

Nonbanks in emerging market economies have a significantly higher fraction of their debt in foreign currency than in advanced economies.



Sources: IMF, Monetary and Financial Statistics database; and IMF staff calculations.
Note: The figure shows average foreign currency liabilities in percent of total liabilities owed by banks and nonbanks (other financial intermediaries) in emerging market economies and advanced economies. The difference between the average of nonbank foreign currency liabilities in advanced economies and emerging market economies is statistically significant at least at the 10 percent level.

Box 2.2 *(continued)*

given the presence of significant foreign exchange exposures among financial intermediaries. The foreign-exchange-denominated liabilities of nonbanks are significantly larger in emerging market economies than in advanced economies (Figure 2.2.2). Central banks tend to intervene in foreign currency markets, limiting exchange rate volatility, in order to mitigate financial instability and adverse effects on investment—especially during episodes of depreciation. In contrast, advanced economies generally welcome a depreciation of their domestic currency because of its expansionary effect—by stimulating exports and reducing imports. Furthermore, in less-developed financial markets, hedging against currency risk is limited, increasing banks' and nonbanks' vulnerability to exchange rate fluctuations.

Contrary to banks, nonbank financial intermediaries can neither receive liquidity financing from the central bank, nor do they have access to a lender of last resort. Thus, the fragility of nonbanks to large and unexpected oscillations in exchange rates is potentially greater than that of banks and can constrain monetary policy in emerging market economies.

Annex 2.1. Aggregate Vector Autoregression Analysis

Changes over Time in the Transmission of Monetary Policy

The estimates of the response of GDP to a monetary policy change presented in Figure 2.2 are based on a vector autoregression (VAR) estimated separately for two periods: 1980 through 1999, and 2000 through the first quarter of 2016. The responses are estimated using a four-lag VAR model of the level of real GDP, the GDP deflator, the nominal effective exchange rate (all in logarithms), and a monetary policy interest rate or close substitute.[45] For the euro area, Japan, the United Kingdom, and the United States, the study uses a shadow policy rate after the third quarter of 2008 to take into account the effects of unconventional monetary policy (sourced from Krippner 2016 for Japan and from Wu and Xia 2016 for the rest). The data are quarterly and seasonally adjusted, when needed. The responses are drawn from Cholesky decompositions under the assumption that interest rates move last and real GDP moves first. All standard errors are estimated using a nonparametric bootstrap and 200 replications.

The estimates of the change in the transmission of monetary policy are robust to alternative specifications and measures of monetary policy changes. A three-variable VAR that excludes the nominal effective exchange rate and a five-variable VAR that uses real household consumption and business investment, in addition to real GDP, prices, and the interest rate, produce qualitatively similar results (Annex Figure 2.1.1). For the case of the United States, the results are also robust to using the same specification as Boivin and Giannoni 2006—that is, estimating a VAR of detrended log real GDP, inflation (the first difference of the logarithm of the GDP deflator), and the nominal interest rate. In addition, also for the United States, the results are robust to using Gertler and Karadi's (2015) high-frequency identification measure of monetary policy, graciously provided by Peter Karadi.

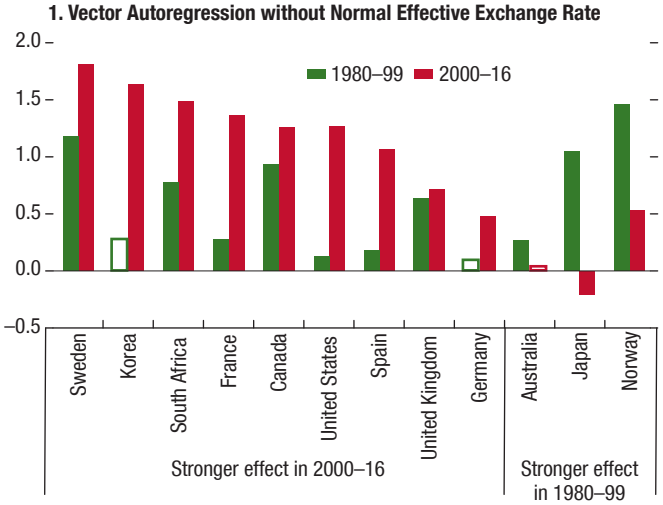
The Transmission of Monetary Policy According to the Size of the Nonbank Financial Sector

The cross-country study of the transmission of monetary policy according to size of the nonbank financial sector is based on a panel VAR of output, prices, the exchange rate, and a measure of monetary policy. Output is measured as the level of real GDP, prices are the level of the GDP deflator, and the exchange rate is the nominal effective exchange rate (all in logarithms). Monetary policy is measured with a monetary-policy-related interest rate (usually a central bank discount rate

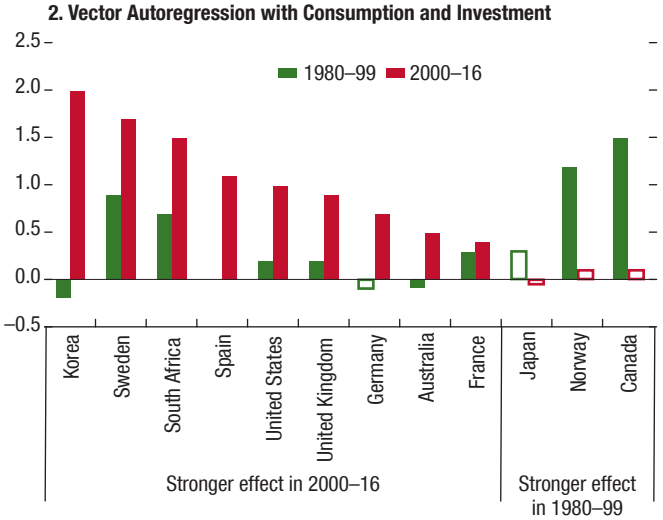
[45]The VAR for Germany includes a dummy for the reunification (1991:Q1). There is also statistical evidence of cointegration relationships, which strengthen the case for estimating the VAR in levels.

Annex Figure 2.1.1. Trends in the Transmission of Monetary Policy—Robustness

The exclusion of the nominal effective exchange rate does not significantly change the response of real GDP to a monetary policy rate cut.



Neither does the inclusion of real household consumption and real business investment.



Sources: Krippner 2016; Organisation for Economic Co-operation and Development; Wu and Xia 2016; and IMF staff estimates.
Note: Solid bars mean that the responses are statistically significant using 68 percent confidence intervals.

or a short-term money market rate). As in the previous analysis, policy rates are adjusted for unconventional monetary policy with the use of shadow policy rates. The total sample consists of 44 countries and uses quarterly data from 1998 to 2015. The sample is split into four groups based on whether their economies have developed (24 countries) or emerging markets (20 countries) and on whether the absolute size of their nonbank financial sector is large or small.[46] The size of the nonbank sector is the sum of corporate bonds outstanding and credit extended to the private sector by nonbank financial intermediaries, as measured by the World Bank's Global Financial Development Database for 2002–13.

The results are robust to the use of alternative estimation methods and definitions of the importance of the nonbank financial sector. The VAR, which yields the results in Figure 2.6, is estimated with four lags using Pesaran, Shin, and Smith's (1999) mean group estimator, which is consistent in the presence of dynamic heterogeneity. The results are broadly the same if the VAR is estimated in first differences, if it excludes the exchange rate, or if it includes the logarithms of investment or M3—a measure of money supply—instead. The panel VAR is also estimated using a least-squares dummy variable estimator, but the results are similar.[47] The results are robust to splitting the sample according to the size of the nonbank sector relative to the size of the banking sector, but only for economies with developed financial markets. In most cases, the differences in the strength of the transmission of monetary policy are small and not statistically significant.

The Transmission of Monetary Policy and the Financial Sector in Select Countries

The single-country VAR study uses claims of three types of financial institutions on private nonfinancial firms and households. Claims are obtained from financial accounts data of six countries. Although the availability of disaggregated data differs across countries, the other types of claims, such as government and foreign bonds as well as interbank loans, are excluded to a large extent. Book values, which are immune to valuation effects, are used for the United States. For the other countries, book values are estimated by accumulating flows to the extent possible.[48]

The VAR uses six variables: the natural logarithms of real GDP, of the GDP deflator, and of real claims of banks, of insurance companies and pension funds, and of other financial intermediaries, and the nominal short-term interest rate.[49] The lag length is four, which is standard for quarterly data. Seasonal dummies are included because the claims are not seasonally adjusted. For the United States, a shadow interest rate estimated by Ichiue and Ueno (2016), instead of the short-term rate, is used.[50] The monetary policy shock is identified using the Cholesky decomposition with the interest rate ordered last.[51] All standard errors are estimated using a bootstrap and 200 replications.[52] The estimates are robust to various possible sources of misspecification, including: (1) adjusting the sample to exclude the crisis and postcrisis period from the estimation, and (2) for the United States (a) using other available measures of monetary policy such as the three-month Treasury bill rate and the measures from Gertler and Karadi (2015) and Romer and Romer (2004); (b) including investment in the VAR; (c) separating mortgage-backed securities from total assets owned by the financial sector; and (d) changing the ordering of the shadow policy rate in the identification of the impulse responses.

The study of the risk-taking channel in the United States presented in Figure 2.8 uses the same VAR

[46]That is, for each type of economy—developed or emerging market—the sample is ranked by size of the nonbank financial sector and divided in half. This procedure yields 12 developed market economies and 10 emerging market economies with a large nonbank financial sector and the same for those with a small nonbank financial sector.

[47]The sample is sufficiently long (72 quarters) and a generalized method of moments estimator is not necessary.

[48]The estimated book value is normalized so that this equals the corresponding stock at the earliest date. If a negative value is obtained, the book values are shifted upward in parallel fashion so that the minimum value equals one-tenth of the maximum value.

[49]The study uses logarithms of levels instead of the growth rates in order to avoid dropping valuable information about the long-term relationship between variables (Sims 1980). See Enders 2010, 396–97, as well.

[50]Ichiue and Ueno (2016) use survey forecasts of macroeconomic variables to estimate the shadow rate. The estimated shadow rate largely followed Wu and Xia's (2016) estimate until 2014. The results using Wu and Xia's shadow rate for the United States are similar.

[51]The average of daily interest rates during the last month of the quarter is used for Korea while the end-of-quarter rate is used for the other countries. The results of the United States are broadly robust to using Gertler and Karadi's (2015) monetary policy shocks.

[52]The data period is 1988:Q2–2015:Q3 for Australia, 1989:Q4–2015:Q4 for Canada, 2002:Q4–15:Q4 for Korea, 1991:Q3–2015:Q4 for South Africa, 1987:Q1–2008:Q4 for the United Kingdom, and 1983:Q1–2015:Q4 for the United States. The data from 2009 are not used for the United Kingdom because the financial accounts data for banks include the central bank, which could seriously distort the results.

representation augmented by measures of risk taking in the equity and bond markets. In particular, the VAR in Figure 2.8 includes a measure of the equity risk premium calculated by Absolute Strategy Research (available from Thomson Reuters Datastream) and Gilchrist and Zakrajšek's (2012) excess bond premium (http://people.bu.edu/sgilchri/Data/data.htm), which are ordered last. The variance decompositions presented in panels 3 and 4 of Figure 2.8 are based on forecast-errors at the 16-quarter horizon.

Annex 2.2. Microanalysis of the Behavior of Financial Firms

Estimating the Transmission of Monetary Policy from Financial Intermediaries' Balance Sheet Data

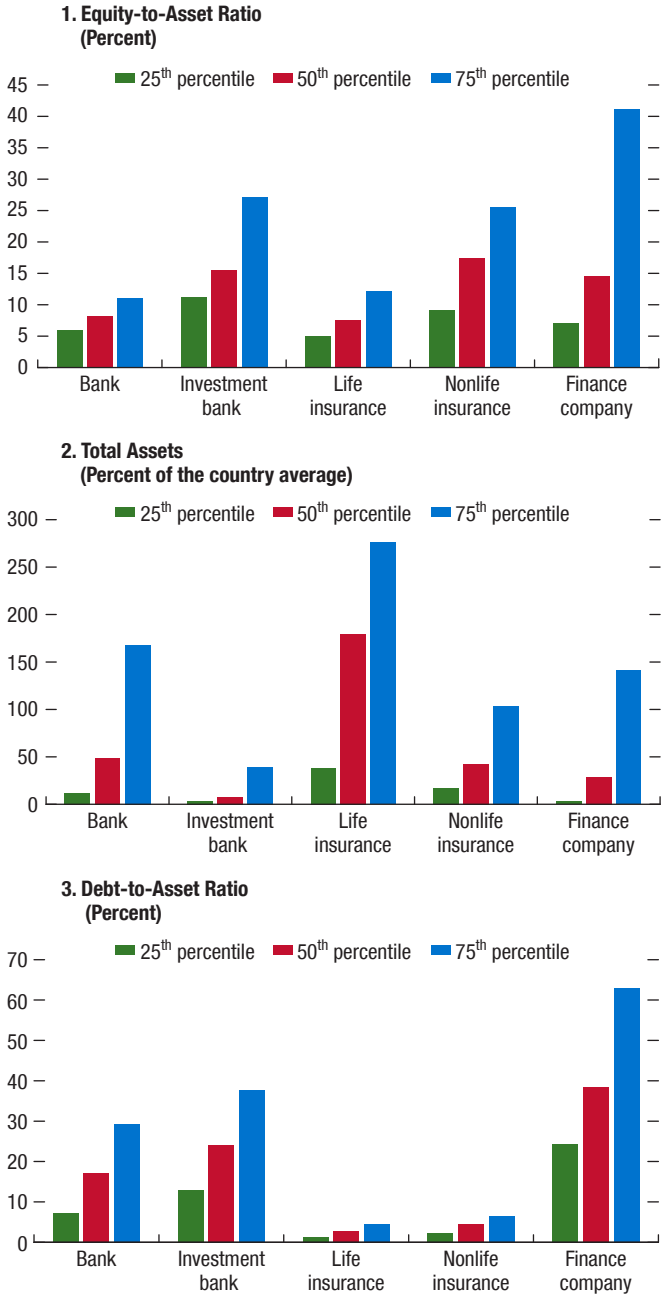
The analysis on the firm-level responses of financial intermediaries to monetary policy changes (Figures 2.9 and 2.10) uses a sample of financial firms from several advanced economies and two emerging market economies. The study uses balance sheet data for 368 publicly listed financial firms from Austria, Belgium, Brazil, Canada, Germany, Finland, Ireland, Italy, Japan, Korea, Mexico, the Netherlands, Portugal, Spain, Sweden, and the United States. Data on total assets at book value for financial companies come from Worldscope via Thomson-Reuters Datastream. Data on the monetary policy rate are nominal policy interest rates or shadow short rate estimates from Krippner 2016. The coverage goes from 1998 to 2015 and is at the quarterly frequency, but coverage by firm varies. The summary statistics are shown in Annex Figure 2.2.1.

The analysis uses the local projection method of Jordà (2005) and Teulings and Zubanov (2014) to estimate the impulse response function of firm assets to a monetary policy shock. Each h step-ahead impulse response is given by β_j^h for each sector j, from the following regression:

$$
\begin{aligned}
L_{it+h} = \alpha_i &+ \sum_{j\in\{sectors\}} \beta_j^h \cdot \varepsilon_t^P \cdot I_{j,i} \\
&+ \sum_{r=1}^{R} \left\{ \sum_{j\in\{sectors\}} \delta_{1j,r}^h \varepsilon_{t-r}^P \cdot I_{j,i} + \delta_{2,r}^h X_{t-r} \right\} \\
&+ \sum_{r=1}^{R} \delta_l^h \cdot Y_{it-r} \\
&+ \sum_{k=0}^{h-1} \left\{ \sum_{j\in\{sectors\}} \gamma_{1k}^h \cdot \varepsilon_{t+h-k}^P \cdot I_{j,i} + \gamma_{2,k}^h \cdot X_{t+h-k} \right\} \\
&+ \eta_{it+h}, \qquad \text{(A2.2.1)}
\end{aligned}
$$

in which L_{it} is the natural logarithm of real total assets owned by financial institution i, ε_t^P is a monetary pol-

Annex Figure 2.2.1. Summary Statistics



Sources: Thomson Reuters Datastream; and IMF staff calculations.
Note: The figure shows the quartiles of each variable, using data for a total of 368 publicly listed financial firms from Austria, Belgium, Brazil, Canada, Germany, Finland, Ireland, Italy, Japan, Korea, Mexico, the Netherlands, Portugal, Spain, Sweden, and the United States from 1998:Q1 to 2015:Q4. For each variable, we first take firm-level medians, and then industry-level medians of the firm-level medians, in order to avoid the overrepresentation of firms with many observations.

icy shock,[53] and for firms from outside of the United States, X_{t+h-k} is the U.S. monetary policy shock (to account for the cross-border effects of U.S. monetary policy). To assist with the identification of the response of financial firms' assets to monetary policy changes, the regression is extended to include interactions with firm-level characteristics. In this case, the conditional impulse response is given by $\beta^h_{1,j} + \beta^{h,z}_{2,j} \cdot z_{i,t-1}$ from the following equation:

$$
\begin{aligned}
L_{it+h} = {} & \alpha_i + \sum_{j\in\{sectors\}} \left\{ \beta^h_{1,j} \cdot \varepsilon^P_t \cdot I_{j,i} + \beta^{h,z}_{2,j} \varepsilon^P_t \cdot I_{j,i} \cdot z_{i,t-1} \right\} \\
& + \sum_{r=1}^{R} \delta^h_1 Y_{it-r} \\
& + \sum_{r=1}^{R} \left[\sum_{j\in\{sectors\}} \right. \\
& \left. \left\{ \delta^h_{1,j} \cdot \varepsilon^P_{t-r} \cdot I_{j,i} + \delta^{h,z}_{2,j} \varepsilon^P_{t-r} \cdot I_{j,i} \cdot z_{i,t-r-1} \right\} + \delta^h_{3,r} X_{t-r} \right] \\
& + \sum_{k=0}^{h-1} \left[\sum_{j\in\{sectors\}} \right. \\
& \left. \left\{ \left(\gamma^h_{1,k} \cdot \varepsilon^P_{t+h-k} \cdot I_{j,i} + \gamma^h_{2,r} \cdot \varepsilon^P_{t+h-k} \cdot I_{j,i} \cdot z_{i,t+h-k-1} \right) \right\} \right. \\
& \left. + \gamma^h_{3,r} X_{t+h-k} \right] + \eta_{it+h}, \qquad \text{(A2.2.2)}
\end{aligned}
$$

in which z_i is a conditioning firm-level variable such as the log of total assets, the equity-to-asset ratio, or the wholesale funding ratio (the ratio of nondeposit debt liabilities to total liabilities). The inference is based on robust standard errors according to Driscoll and Kraay (1998).

The Risk-Taking Channel of Monetary Policy through Mutual Funds

The analyses use monthly data on global mutual funds domiciled in the United States, from 2004 to 2015. The analysis of the response of bond funds in terms of high-yield or long-maturity bonds is based on data from Lipper's Global Mutual Fund Holdings database and covers, at each month, the 50 largest portfolios by total net assets size. The analysis of the response of country allocations of global equity and bonds uses data from EPFR Global on 267 and 30 funds, respectively.

[53]The monetary policy measure is the orthogonal innovation of the nominal monetary policy rate derived from a three-way VAR and identified using a Cholesky ordering. The VAR includes real GDP (in logs), the GDP deflator (in logs), and a policy rate, and is estimated country by country. For some countries, namely the United States, the VAR is extended to include a measure of financial stress (for instance, Gilchrist and Zakrajšek [2012] excess bond premium) but the resulting measure of monetary policy behaves similarly. For robustness, the study also uses the Gertler and Karadi (2015) data based on a high-frequency identification approach, for the United States, with similar results.

The analysis of the response of mutual funds to monetary policy changes consists of several exercises that estimated the fund-level reallocation of portfolios toward riskier assets. The analysis uses the following generic specification:

$$
Alloc^{risky}_{i,t} - Alloc^{safe}_{i,t} = \alpha_i + \beta \Delta MP_t + \gamma R_t + \varepsilon_{i,t}, \quad \text{(A2.2.3)}
$$

where *Alloc* is the percentage of total assets that portfolio *i* has allocated, at month *t*, to risky or safe assets. Specifically, *risky* includes, for bond funds, high-yield bonds (ratings lower than BBB) and longer-maturity bonds (in excess of five years), and *safe* is its complement. In addition, for both bond and equity funds, *risky* can also mean the portfolio weight of investments in countries with speculative-grade sovereign credit ratings. *MP* is Wu and Xia's (2016) shadow policy rate and R_t is the difference between the return of the risky and safe asset classes.[54] The coefficient of interest is β. The results are robust to the inclusion of the portfolio's lagged return as an additional control.

Annex 2.3. Microanalysis of Borrower Behavior

The analysis uses data on bond and syndicated loan borrowings from Dealogic combined with firm-level characteristics (balance sheet and income statement data) obtained from Thomson Reuters Datastream. The analysis focuses on firms that have issued at least one bond and one syndicated loan since 1993, and excludes financial and government-related firms. The focus is on borrowing in each firm's domestic market. That is, the study excludes bonds and syndicated loan deals outside a firm's country of risk, as reported by Dealogic. Public firms typically comply with certain reporting requirements and are larger than nonpublic firms, and are therefore better suited to access bond markets. Data availability determines the country coverage, which includes Japan, the United States, and

[54]For global equity country-level investments, the study uses as *R* the difference between monthly (percentage) returns of the MSCI-G7 and Emerging Market Indices. For global bond funds' country-level allocations, it uses the difference between monthly (percentage) returns of the Citigroup Broad Investment Grade Bond Index and the JP Morgan EMBI Global Total Return Index. For bond fund allocations by credit quality of the investments, the analysis uses the difference between monthly returns of the Citigroup Broad Investment Grade Bond Index and the Bank of America High Yield Corporate Master II index. Finally, for bond fund allocations by maturity of the investments, it uses the difference between the monthly returns of Bank of America Corporate Bond Indexes of one to three years and more than 15 years.

a group of European countries (France, Germany, Italy, Netherlands, Spain, United Kingdom).

The study uses two groups of aggregate variables b to capture the firm's willingness to substitute between bank and market financing. First, data from surveys of senior loan officers are collected from the respective central banks (and the European Central Bank). In particular, the analysis focuses on banks' reported tightening in lending standards or perceived stronger demand for bank loans as reported in those surveys.[55] Second, the stance of monetary policy is measured by the deviation of monetary policy (as measured by shadow policy rates) from target. Monetary policy targets are determined by estimating contemporaneous Taylor rules until the global financial crisis.

The analysis relies on a linear probability model to estimate the firms' choice between (syndicated) loan and bond financing when bank lending conditions change. Following Becker and Ivashina (2014), the analysis excludes firm/quarter observations when no new debt is issued (either in the form of bonds or syndicated loans). That is, the inference is based on firms that have positive demand for external funds. Specifically, given the binary variable D_{it},

$$\begin{cases} D_{i,t} = 1 \text{ if firm } i \text{ obtained a loan at } t, \\ D_{i,t} = 0 \text{ if firm } i \text{ issued a bond at } t, \end{cases} \quad \text{(A2.3.1)}$$

the following model is estimated by ordinary least squares (OLS) with errors clustered by firm/quarter and firm fixed effects:

$$D_{it} = \alpha_i + \beta b_{t-1} + \gamma\, FirmCharac_{it-1} + \delta b_{t-1}\, FirmCharac_{it-1} + u_{it}, \quad \text{(A2.3.2)}$$

using data at the quarterly frequency.[56] The inclusion of fixed effects implies that firm averages are not used for identification, and a β coefficient different from zero would be obtained only to the extent that firms significantly substitute between the two sources of financing. As mentioned, the focus is on firms that have issued at least one bond and one syndicated loan over the sample period. The model includes quarterly dummies, and a crisis and a post-crisis dummy.

The main results are robust to estimating the model separately for Japan, the United States, and the European countries; using standard errors clustered at the industry/quarter level; estimating the model only until the global financial crisis (2008); and computing the deviation from target in a variety of ways.[57] Finally, an analogous exercise is conducted using an unbalanced panel of firms in 23 advanced and emerging market economies from 2010 to 2015 (Figure 2.13, panel 3). The binary dependent variable is defined as one if there is a quarterly increase in a firm's loan liabilities and a decrease in its note and bond liabilities, and zero if the opposite is true. Firm-level data were obtained from FactSet.

[55]The United Kingdom started conducting its credit conditions survey only in 2007. The study therefore considers an additional version that assigns European Central Bank aggregates (dating back to 2003) to all European countries in the sample.

[56]Multiple bond or loan issuances in one quarter are counted as one. Firm-quarter observations with issuance of both loans and bonds are excluded.

[57]The study estimates three different versions using contemporaneous inflation, and real GDP growth, real GDP deviation from a Hodrick-Prescott trend, or real GDP deviation from a cubic polynomial trend. Additionally, it considers the rule proposed by Taylor (1993).

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CHAPTER 3

CORPORATE GOVERNANCE, INVESTOR PROTECTION, AND FINANCIAL STABILITY IN EMERGING MARKETS

Summary

Emerging market economies have become more financially integrated with the rest of the world, allowing greater access to capital but also exposing them to financial shocks. With this increased integration, have institutional and legal frameworks improved accordingly, helping these economies to be more resilient in the face of a more volatile external environment?

This chapter focuses on the interrelatedness of corporate governance, investor protection, and financial stability across emerging market economies. Corporate governance and investor protection encompass rules and practices at both the country and firm level and deal with ways in which suppliers of financing to corporations ensure that they get a return on their investment. Past financial crises across major emerging market economies underscored how corporate governance deficiencies can contribute to financial instability.

The chapter finds that corporate governance and investor protection have generally improved in emerging market economies over the past two decades. The progress is apparent in both firm- and country-level indicators. Even so, there are important differences across emerging market economies, and there is room for further improvement.

The analysis supports the notion that stronger corporate governance and investor protection frameworks enhance the resilience of emerging market economies to global financial shocks. The chapter develops new firm-level indices of governance in emerging market economies and employs novel empirical approaches. The results show that corporate governance improvements foster deeper and more liquid capital markets, allowing them to absorb shocks better. Corporate governance improvements also enhance stock market efficiency, thereby making equity prices less sensitive to external shocks and less prone to crashes. For example, moving from the lower to the upper end of the country- and firm-level governance indices reduces the impact of global shocks by up to 50 percent for emerging market firms, on average. Emerging market economies with better corporate governance and investor protections generally have stronger corporate balance sheets. In particular, better-governed firms typically display lower short-term debt ratios and default probabilities and are able to borrow at longer maturities. This reduces their vulnerability to dry-ups in funding, enhancing financial stability.

The financial stability benefits associated with improved corporate governance strengthen the case for further reform. Although there is no single model, good corporate governance frameworks have some common characteristics. Accordingly, this chapter makes the following policy recommendations:

- All emerging market economies should continue to reform their legal, regulatory, and institutional frameworks to foster the effectiveness and enforceability of corporate governance regimes.
- Most emerging market economies should continue to bolster the rights of outside investors, in particular minority shareholders.
- Bringing disclosure requirements fully in line with international best practice is needed in many emerging market economies. Promoting greater board independence is also likely to yield benefits.

Introduction

With greater financial integration and the development of local markets, the financial landscape across emerging market economies has changed dramatically over the past two decades. Has institutional progress—including corporate governance and investor protection—kept pace, thereby potentially bolstering their resilience to external shocks? Or do the recent strains in some emerging markets and the accompanying volatility in net capital flows hint at more widespread challenges? The importance of this question is highlighted by a series of financial crises across major emerging markets during the late 1990s, when weak corporate governance was seen as contributing to global financial instability. The Asian financial crisis is a notable example. More recently, during the global financial crisis and the 2013 taper tantrum, emerging market economies with lower corporate governance scores experienced more extreme capital outflows. This year, in emerging market economies with lower corporate governance standards, equity price falls were relatively larger in the wake of Brexit, the June 2016 U.K. referendum result in favor of leaving the European Union (Figure 3.1). These episodes of financial stress in emerging market economies point to the role weak corporate governance may play in exacerbating vulnerabilities.

Theory suggests that weak corporate governance and investor protection can undermine financial stability by heightening vulnerability to external shocks. Corporate governance and investor protection deal with ways in which suppliers of financing to corporations ensure that they get a return on their investment (Shleifer and Vishny 1997). Both concepts encompass firm- and country-level dimensions, including rules protecting minority shareholders, disclosure provisions and practices, the role and structure of the board, and compensation structures.

- Governance deficiencies can allow corporate insiders (managers, controlling shareholders) to expropriate the assets of outside investors (creditors, minority shareholders) by diverting resources for their personal use or by committing funds to unprofitable projects that provide private benefits (Djankov and others 2008b). These problems may quickly gain economy-wide importance in the presence of an adverse aggregate shock. For example, Johnson and others (2000) argue that weaker corporate governance frameworks in some emerging markets were associated with significantly more expropriation of cash and tangible assets by managers during the Asian crisis, which in turn exacerbated capital outflows and the attendant currency depreciations and stock price collapses.
- Lack of corporate transparency may increase financial volatility (Figure 3.2). When global financial conditions are benign, investors are more likely to channel funds into companies and markets that feature higher returns but are less easy to understand (Brandão-Marques, Gelos, and Melgar 2013). During more turbulent times, these investors are likely to retrench first by reducing their exposure to these relatively opaque assets. As a result, less transparent markets may be more prone to boom-bust cycles. Likewise, when opacity interacts with weak corporate governance, controlling shareholders

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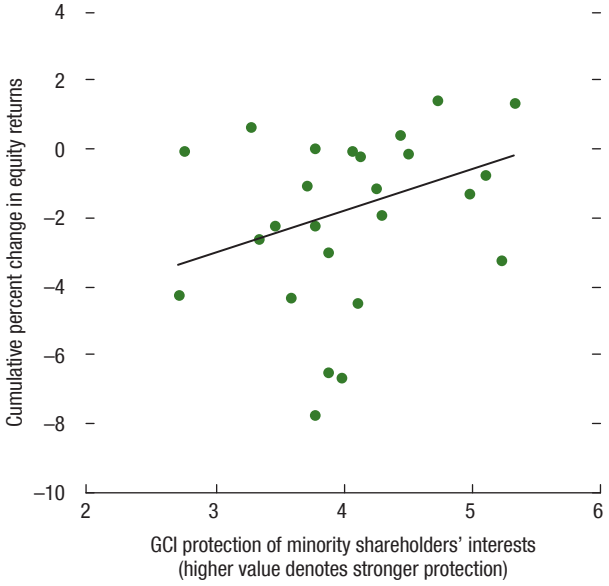
Figure 3.1. Corporate Governance and Equity Returns
(Cumulative changes in dollar returns during Brexit)

Countries with lower corporate governance scores experienced sharper equity return declines after the Brexit vote.



Sources: Thomson Reuters Datastream; World Economic Forum, Global Competitiveness Indicators (GCI) database; and IMF staff calculations.
Note: Cumulative change in equity returns during Brexit corresponds to the equity price movements from June 23 to 29, 2016. Dollar returns are calculated using MSCI price indices and are adjusted by controlling for the public debt-to-GDP ratio and the current account deficit to GDP. Brexit = June 2016 U.K. referendum result in favor of leaving the European Union.

may manipulate reported earnings concealing good and bad news, and individual stock prices may not properly reflect the firm's fundamentals. This can cause stock markets to move together more than warranted by fundamentals and potentially increase the risk of a financial market crash (Morck, Yeung, and Yu 2000; Jin and Myers 2006).

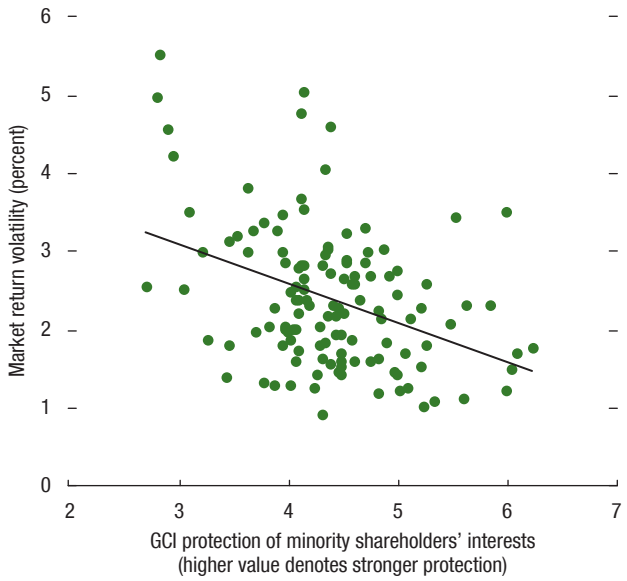
- In contrast, it has been argued that by safeguarding investor rights, better corporate governance helps promote deeper and more liquid capital markets, thereby bolstering financial systems' resilience to external shocks (see Chapter 2 of the April 2014 and October 2015 issues of the *Global Financial Stability Report* [GFSR]).

This interplay of corporate governance with exposure to global financial conditions is of particular relevance for emerging market economies. In general, corporate governance issues are also of great importance for advanced economies. For example, citing the role of banks at the outset of the global financial crisis, Chapter 3 of the October 2014 GFSR examined the relationship between the corporate governance of banks and their risk-taking behavior, mainly in advanced economies. In contrast, this chapter assesses governance aspects of particular importance to emerging market economies and their relationship to these countries' exposure to external financial shocks. In particular, given emerging market economies' relatively weaker institutions, their lower degree of financial market development, and their greater sensitivity to global financial conditions, the link between corporate governance and financial stability is of special relevance for them. Overall, however, empirical evidence on the relationship between corporate governance, investor protection, and financial stability is scarce.

Deficiencies in corporate governance and investor protection may play a role in elevating corporate fragility, but few studies have examined these connections. The quality of corporate governance influences not only the access to and the composition of financing, but also firms' cost of capital, solvency, profitability, and valuations.[1] Outside investors may be willing to provide financing to weakly governed companies only at short maturities or high rates. High short-term debt associated with weaker governance frameworks could compromise financial stability, especially if it is pervasive throughout the corporate sector. Overall, corporate governance and investor protection may affect corporate vulnerabilities in more complex and potentially ambiguous ways. Surprisingly, there is scarce empirical research on the links between corporate governance and financial stability—either at the country[2] or at the firm level[3]—that

Figure 3.2. Corporate Governance and Volatility of Stock Market Returns in Emerging Market Economies
(Market return volatility against minority shareholder protection)

Countries with weaker corporate governance frameworks tend to have more volatile stock returns.



Sources: Bloomberg L.P.; Thomson Reuters Datastream; World Economic Forum, Global Competitiveness Indicators (GCI) database; and IMF staff calculations.
Note: Other corporate governance indices yield a similar picture. Market return volatility is the standard deviation of weekly returns. Sample includes annual observations for 18 emerging market economies between 2010 and 2014 (country-year observations).

[1]See, for example, Gompers, Ishii, and Metrick 2003; Aggarwal and others 2009; and Chen, Chen, and Wei 2009.

[2]At the country level, most of the literature emphasizes the importance of a robust legal framework for strong capital market development and ultimately economic growth (La Porta and others 1997, 1998; Djankov and others 2008b). Gelos and Wei (2005) show that during turbulent times, mutual funds tend to flee to a greater degree from less transparent countries (including those with more opaque corporate sectors).

[3]At the firm level, most of the evidence pertains to advanced economies and explores the link between corporate governance and valuation. Firm-level evidence for emerging markets is fragmented, in part because most studies have focused on individual countries, reflecting the scarcity of comparable cross-country micro panel data on corporate governance. Many studies consider a few countries at most (for a survey, see Claessens and Yurtoglu 2013) or cover only a particular year (see, for example, Klapper and Love 2004).

is comprehensive and includes a broad set of emerging market economies. Likewise, studies on the link between firm-level governance and corporate capital structure, solvency, and crash risk are rare.[4]

This chapter attempts to fill these gaps by addressing the following questions:

- How has corporate governance evolved in emerging market economies, sectors, and nonfinancial firms over the past two decades?
- Are emerging market economies with better corporate governance frameworks less exposed to global financial shocks?
- What is the role of corporate governance and investor protection in reducing corporate fragility? For example, is poor governance associated with higher short-term debt ratios? Is there evidence that better legal frameworks and institutions mitigate the adverse consequences of weaker corporate governance?

To address these questions, the chapter explores the links between corporate governance and key firm- and country-level dimensions of financial stability. First, it develops new firm-level indices of governance in emerging market economies. It then uses these firm-level indices as well as country-level information on governance, combined with other data, to pursue novel empirical approaches. The analysis focuses on dimensions of corporate governance that are of particular relevance for the nonfinancial corporate sector across emerging market economies. The new firm-level index is mainly designed to enable comparisons across firms, and the chapter does not present its country-level averages. For the country-level measures of governance, the analysis relies on data from other institutions. The results are broadly robust to the use of alternative country-level indices of corporate governance, and the overall conclusions do not rely heavily on any single country-level corporate governance index.

The main results of the chapter are as follows:

- Corporate governance in emerging market economies has broadly improved over the past two decades, but large differences across these economies remain, and there is considerable scope for progress.
- Emerging market economies with stronger corporate governance and investor protection frameworks tend to be more resilient to global financial shocks. Improving corporate governance and investor protection help develop deeper and more liquid financial markets, thereby fostering financial stability.
- Moreover, equity prices in firms with governance deficiencies tend to move in tandem, are more sensitive to external financial shocks, and are more susceptible to crash risk. For example, moving from the lower to the upper end of the country- and firm-level governance indices reduces the impact of global shocks by about 20 percent for emerging market economies and 50 percent for emerging market firms on average. Overall, the economic importance of these effects is considerable in terms of increasing the resilience of emerging markets to shocks.
- Better corporate governance and investor protections are associated with stronger corporate balance sheets. These features are linked to lower short-term debt ratios, lower default probabilities, and the ability to borrow at longer maturities.
- In line with these results, firms and countries characterized by weaker corporate governance have been hit harder during recent periods of financial market turbulence.
- The results are generally robust to a variety of methods designed to isolate the effect of corporate governance vis-à-vis other factors and to help establish causality.

In sum, improvements in corporate governance and investor protection across emerging market economies have helped bolster the resilience of their financial systems. Such improvements are analogous to macroprudential policies in the sense that they help enhance the resilience of financial systems. They help reduce the amplitude of asset price swings and the probability of market crashes. This implies that reform efforts should continue on both fronts. Some common elements of good corporate governance are described in the Principles of Corporate Governance issued by the Group of Twenty (G20) and the Organisation for Economic Co-operation and Development (OECD). Guided by the empirical results and these broad principles, this chapter makes the following policy recommendations:

- Countries should continue to strengthen legal, regulatory, and institutional frameworks to promote the

[4]The closest study is by Faccio, Lang, and Young (2010), who focus more on the link between corporate control and leverage for a handful of advanced and emerging market economies in east Asia and western Europe. Chen, Chen, and Wei (2009) look into the cost of capital, using data from 2001.

effectiveness and enforceability of corporate governance regimes.
- Most emerging market economies should continue to bolster the rights of outside investors, in particular minority shareholders.
- Many emerging market economies should bring disclosure requirements fully in line with best international practice.
- Greater board independence could also bring benefits.

Nexus between Corporate Governance, Investor Protection, and Financial Stability

After defining corporate governance and investor protection, this conceptual section discusses the potential links with financial stability and reviews the drivers of corporate governance reform.

Corporate governance and investor protection have some elements in common. Country-level definitions of corporate governance typically center on regulations, such as listing requirements, that govern equity investments in publicly listed firms. Firm-level or internal governance mechanisms are those that operate within the firm and deal with the role of the board and its structure, managers' compensation, and the firm's disclosure policy, as well as the specific rights of shareholders. Investor protection is a more general notion and pertains to how outside investors—minority shareholders and creditors—are protected against expropriation of their assets by insiders (controlling shareholders, management), how well all investors are protected against expropriation from the state, and how their rights are enforced in practice.[5] Corporate governance and investor protection deal with ways in which suppliers of finance to corporations (shareholders, creditors) assure themselves of getting a return on their investment (Shleifer and Vishny 1997). Corporate governance and investor protection are part of, and their effectiveness is partly determined by, the larger institutional setting in which firms operate, including the quality of public policy and the strength of the judicial system.

[5]Government leaders can use the power of the state to expropriate investors by actions ranging from outright confiscation to regulations that favor their constituencies and include redistributive taxes (Stulz 2005).

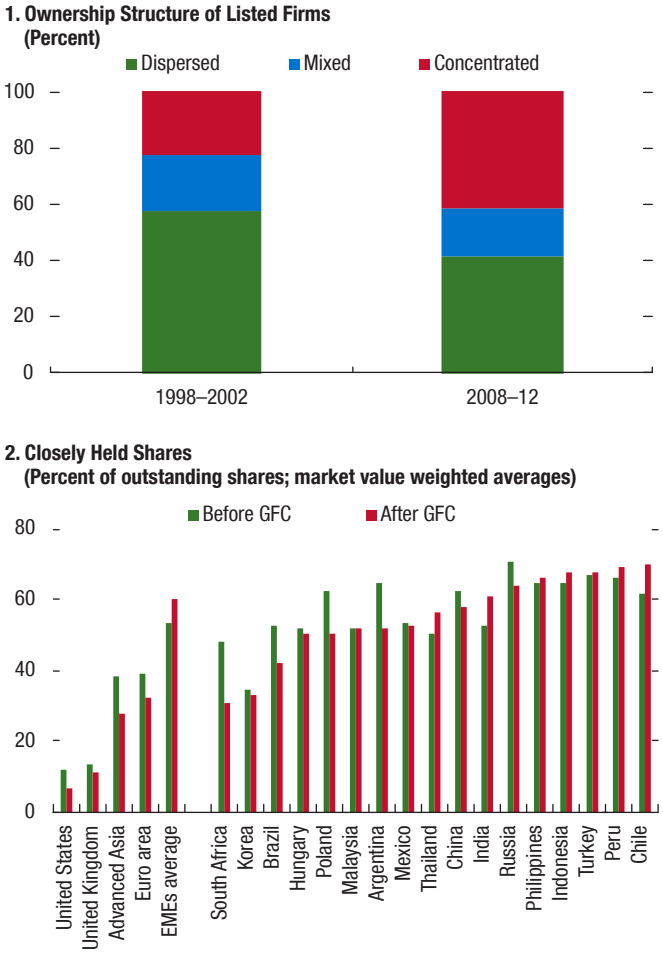
In advanced economies, the traditional focus of corporate governance has been on potential conflicts of interest between shareholders and managers. Difficulty in monitoring management's actions heightens the risk of managers not always acting in the best interest of shareholders (Jensen and Meckling 1976; Shleifer and Vishny 1989). The two typical concerns in the literature are that, from the shareholder's perspective, managers may take on too little risk (forgoing profitable investment opportunities), or they may overinvest in less profitable business lines (engaging in empire building to increase managers' power).

Aligning the interests of managers and majority shareholders does not, however, necessarily protect the interests of creditors, outsider shareholders, or even society at large. Shareholders have limited liability, which means that they are shielded from losses suffered by creditors on debt-financed investment projects; however, they receive all the gains from increased company value when such projects are successful. Thus, shareholders and managers have an incentive to engage in shifting risk toward the firm's creditors by using creditors' money to gamble on risky projects. This problem is worsened in the presence of explicit or implicit government guarantees on the debt (for example, too-big-to-fail issues), particularly if debt markets do not work well and fail to exert a disciplining role. Similarly, if governance mechanisms are weak, controlling shareholders can expropriate minority shareholders in a variety of ways, such as by transferring profits to other companies controlled by majority shareholders (Claessens and others 1999).

Moreover, the relative importance of corporate governance challenges in emerging market economies differs from that in advanced economies.
- The rules, regulations, and laws governing creditor and shareholder rights are only as good as their enforcement. Hence, the tendency for judicial systems to be weaker in emerging markets is the focus of much concern in this context (La Porta and others 1997, 1998).
- The predominance of controlling shareholders is another distinctive aspect of emerging market economies, where large corporations very often have controlling owners, typically wealthy families (Morck, Wolfenzon, and Yeung 2005). Between 2002 and 2012, the average share of global market capitalization nearly doubled, from 22 percent to 41

Figure 3.3. Ownership Structure and Closely Held Shares

The share of countries with concentrated ownership and firms with closely held shares has risen.



Sources: Organisation for Economic Co-operation and Development, Corporate Governance Factbook (2015; panel 1); Thomson Reuters Datastream (panel 2); and IMF staff calculations.
Note: Shares of market capitalization of country groups with different ownership structures are shown in panel 1. Economies included in the dispersed ownership category are Australia, the United Kingdom, and the United States. Economies included in the mixed ownership category are Canada, Germany, Japan, the Netherlands, and Switzerland. Other economies included in the concentrated ownership category are selected major emerging market economies. Closely held shares = shares held by insiders (for example, officers, directors and their immediate families, individuals with more than 5 percent of the outstanding shares) or held by other companies, except those held in a fiduciary capacity; EMEs = emerging market economies; GFC = global financial crisis.

percent, for countries where controlling shareholders are the norm (Figure 3.3, panel 1).

- Moreover, in emerging market economies, where business groups often dominate the corporate sector, control is reinforced through mechanisms such as cross-shareholdings, multiple classes of shares with different voting rights, and pyramidal ownership structures (Oman, Fries, and Buiter 2003).[6] The proportion of closely held shares (which encompass cross-shareholdings) is substantially higher in emerging market economies (Figure 3.3, panel 2).[7] This suggests that the protection of minority shareholder rights matters even more in these countries.[8]

Corporate governance codes can help mitigate these problems. Indeed, the purpose of corporate governance

[6]A pyramid exists when one firm at the top holds a dominant equity share in and thereby controls one or more other firms, each of which in turn has a dominant equity share in additional firms (and so on). Corporate insiders who control the firm at the top of the pyramid (often a holding company) can thus control entire groups of firms (and massive corporate assets) with very little direct equity ownership in the firms lower down the pyramid.

[7]State-owned enterprises (SOEs) are common in emerging market economies and face distinct governance challenges (Box 3.2). The OECD (2015) sets out internationally agreed standards aimed at making SOEs operate with similar levels of efficiency, transparency, and accountability as private enterprises adhering to good practices, as well as ensuring that their competition with private companies takes place on a level playing field. Although a thorough investigation of SOEs is beyond the scope of this chapter (in part because of data limitations), many empirical exercises take them into account either by including an SOE indicator variable (reported when relevant) or via firm fixed effects terms (which capture time-invariant firm-specific factors).

[8]Put differently, the corporate landscape and prevailing ownership structures affect the nature of the agency problems between managers and outside shareholders, and among shareholders. When ownership is diffuse, as is typical in the United States and in the United Kingdom, key agency problems largely stem from the conflicts of interest between outside shareholders and managers. In these settings, providing management with proper incentives to act in the interest of outside shareholders is typically key. In contrast, when ownership is concentrated, it is much easier for the controlling owner to closely monitor management. Instead, the main conflicts of interest there arise between controlling shareholders and minority shareholders (and other outside investors), highlighting the importance of safeguarding minority investor rights. The protection of minority shareholders' interests covers various aspects to minimize expropriation by corporate insiders such as (1) access to internal corporate documents or immediate and periodic disclosure of related-party transactions, (2) shareholders' ability to sue and hold interested directors liable (for prejudicial related-party transactions) and available legal remedies (such as fines and imprisonment), and (3) governance safeguards protecting shareholders from undue board control and entrenchment as well as shareholders' rights and role in major corporate decisions. See Djankov and others 2008b for further details.

includes the maximization of firms' efficiency and profitability by motivating corporate insiders to act in the interest of all investors and limiting abuse of their power over corporate resources. Traditionally, governance mechanisms attempt to align managerial incentives with the interests of the shareholders through the use of bonuses and stock options. A board of directors responsible for monitoring managerial behavior can also exert control on behalf of shareholders.[9] For emerging market economies, key measures include limits on the use of devices such as shares with different voting rights, cross-shareholdings, and pyramidal corporate ownership structures, as well as high disclosure requirements and accounting standards, and their enforcement.

How Can Corporate Governance and Investor Protection Affect Financial Stability?

Improvements in corporate governance and investor protection can promote the development of larger and more liquid capital markets and thereby strengthen the resilience of the financial system. For example, by lowering expropriation risk and increasing transparency, better corporate governance can reassure investors and contribute to the development of stock markets (Djankov and others 2008b), and improvements in debt enforcement can help develop bond markets (Djankov and others 2008a). Similarly, better corporate governance and investor protection, by reducing information asymmetries, should encourage trading activity and lower search costs and thereby improve market liquidity. Larger and more liquid markets, in turn, have been shown to improve emerging markets' resilience to global financial shocks (see Chapter 2 of the April 2014 GFSR).

Corporate transparency can affect financial volatility:

- At the firm level, bad corporate governance practices, including opaque disclosure regimes, make it costlier for outside investors to acquire information about individual stocks. For instance, in an attempt to conceal expropriation, insiders can manipulate earnings statements, thereby discouraging informed trading, hindering price discovery, and reducing market efficiency. Under these circumstances, because stock prices do not fully reflect firm fundamentals, they are likely to become more synchronized with market-wide fluctuations. Moreover, firm-specific shocks may have systemic implications because they can result in contagion to the rest of the market.[10]
- When global financial conditions are favorable, investors may be more prone to take on unknown risks and therefore more likely to channel funds into asset classes whose characteristics are more opaque (Brandão-Marques, Gelos, and Melgar 2013). During periods of elevated financial stress, however, these investors face more scrutiny and tend to reduce exposures to those assets. As a result, opaque markets may be more prone to boom-bust cycles.[11]

Corporate governance and investor protection deficiencies may also play a role in encouraging excessive leverage and tilting financing toward shorter-term debt, with implications for overall financial stability.

- The link between corporate governance and capital structure (for example, leverage) is ambiguous, owing to various confounding effects, as pointed out in the literature (for instance, Berger, Ofek, and Yermack 1997; John and Senbet 1998; John and Litov 2008). The presence of controlling shareholders in emerging market economies, for example, introduces a bias toward debt. These shareholders do not want to dilute their control through equity issuance, but since demand for the company's debt is also likely to be low (for fear of risk shifting), the ultimate outcome is unclear. Similarly, related lending across firms within the same company group may increase the share of debt financing (La Porta, Lopez-de-Silanes, and Zamarripa 2003).[12]
- Theoretical predictions regarding the composition of debt are more clear cut. Specifically, inefficient judicial systems or shortcomings in insolvency regimes may hinder the timely recovery of assets, including collateral, after liquidation. Therefore, creditors may prefer short-term debt that gives them a choice between rolling it over and getting out if necessary

[9]Investor activism, takeovers, and leveraged buyouts are other mechanisms that also keep a tight rein on management, but are more relevant in the context of some advanced economies. See Tirole 2006 for further details.

[10]Albuquerque and Wang (2008) develop a theoretical model predicting that countries with weaker investor protection display higher stock return volatility. Morck, Yeung, and Yu (2000) and Jin and Myers (2006) find that stock returns move closely with the market in countries with weak investor protection and opaque corporate disclosure regimes. Shleifer and Vishny (1997) show that reduced informed trading can aggravate the effect of negative shocks on prices.

[11]On the other hand, increasing disclosure and corporate transparency lowers implicit market barriers, potentially inducing higher comovement of emerging and advanced markets.

[12]Related lending is an example of a related-party transaction.

(Tirole 2006), which makes recipient countries more vulnerable.[13] Likewise, short-term debt may be preferred because predatory actions by the state can lead to bankruptcy, making such actions costlier for political leaders (Stulz 2005).

Drivers of Corporate Governance Reform

An important force working in favor of governance reform is the growing role of institutional investors as suppliers of external funding amidst greater financial globalization. Both international and domestic institutional investors (for example, local pension funds) are moving the process of reform forward. Regarding the former, Aggarwal and others (2011) find that foreign institutional investors based in countries with better minority shareholder rights promote firm-level governance improvements in countries outside the United States. Likewise, with a focus on advanced economies, Albuquerque and others (2013) report that cross-border mergers and acquisitions are associated with improvements in governance and valuation of the target firms.

Similarly, the growing demand for external financing by emerging market firms is also promoting better corporate governance. Firms can issue bonds or list abroad (cross-listing), which subjects them to higher corporate governance and disclosure standards. However, companies with access to international capital markets are more likely to obtain financing at more favorable terms, so they are more motivated to adopt better governance practices. Firms that adopted International Accounting Standards—which are well known and reliable—have been able not only to attract a large pool of investors, but also to lower their costs of capital (Chan, Covrig, and Ng 2009). Likewise, firms can adapt to weaker institutional environments by adopting voluntary corporate governance measures, such as hiring more reputable auditors.

Despite the overall benefits, countries and firms do not always reform their corporate governance frameworks. This is partly because reforms are multifaceted and require a combination of legal, regulatory, and market measures, which are challenging to implement. A more important reason, however, lies in the value of rents political and other insiders extract under the status quo. For example, Claessens, Feijen, and Laeven (2008) show that stocks of emerging market firms that contributed to (subsequently elected) political candidates had higher returns after elections and that these firms were later able to access bank financing more readily. Likewise, the reluctance of entrenched insiders to reform is due largely to the rents they would forfeit. For instance, controlling shareholders who reap more private benefits from control are more reluctant to cross-list their firms on a U.S. exchange (Doidge, Karolyi, and Stulz 2004). This suggests that wealth structures may need to change to bring about significant corporate governance reform, especially in emerging market economies where wealth is particularly concentrated. Lastly, corporate governance has aspects of a public good to the extent that externalities are involved; for example, individual firms will not internalize any benefits enhanced governance may have for economy-wide financial stability.

In response to such challenges to reform, the OECD has developed the Principles of Corporate Governance. These Principles serve as globally recognized benchmarks for assessing and improving corporate governance. The Principles have been adopted as one of the Financial Stability Board's key standards for sound financial systems.

The Evolving Nature of Corporate Governance and Investor Protection

This section documents a general improvement in corporate governance and investor protection frameworks over the past two decades in many emerging market economies, as confirmed by both country- and firm-level indicators.

Over the past two decades, many emerging market economies have reformed parts of their corporate governance systems (Box 3.1).[14] In some cases, major changes occurred in the aftermath of crises, including an overhaul of capital market laws (Black and others 2001). Specific initiatives include the formation of audit committees, requiring a minimum number of independent directors (thereby strengthening the role of the board), and certification of financial statements and internal controls by the chief executive officer/chief financial officer, as well as the introduction of mandatory cumulative voting in director elections, which further empowers shareholders (Claessens and Yurtoglu 2013).[15]

[13]Likewise, because short-term debt comes up for frequent renewal, it can be a powerful instrument to monitor and discipline management (an idea related to Jensen 1986). In fact, Anginer and others (2015) find that corporate governance reforms that strengthen shareholder rights are associated with lower short-term debt ratios.

[14]These trends are in line with those found by De Nicolo, Laeven, and Ueda (2008).

[15]Cumulative voting is a type of voting system that helps strengthen the ability of minority shareholders to elect a director. This method

Reflecting these reform efforts, corporate governance improvements have been broad based across emerging market economies. Despite these achievements, however, on average, emerging market economies still have scope to improve (Figures 3.4 and 3.5). These trends are based on various measures of minority shareholder protection and corporate transparency. A few additional points are noteworthy. First, there is quite a bit of heterogeneity across emerging market economies. Several have corporate governance scores higher than those in advanced economies. Second, corporate governance is difficult to quantify, and despite efforts to reflect the views of survey respondents and experts, the various measures are accompanied by margins of error. Nonetheless, these series still permit meaningful comparisons across countries and over time.[16]

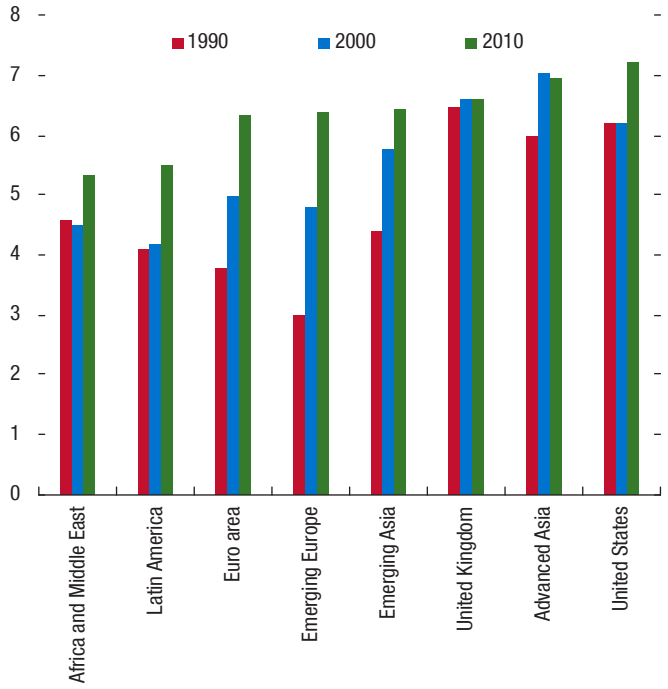
When it comes to measures of legal frameworks and enforcement, the developments are more mixed (Figure 3.5). Again, the heterogeneity in rankings across emerging market economies is noteworthy. Although some emerging market economies score well with regard to corporate governance, they rank lower in terms of property rights and the efficiency of their legal frameworks.

A New Firm-Level Corporate Governance Index for Emerging Market Economies

This chapter develops new firm-level indices of governance for a panel of emerging market economies. An index is constructed using firm-specific governance attributes sourced from the ASSET4 database.[17] These 71 attributes cover various aspects, including board structure and composition, compensation and disclosure policies, and shareholder rights, and are chosen to reflect the main governance challenges confronting emerging market firms.[18] The attributes are split into three subcategories to construct subindices focusing on the role of the board,

Figure 3.4. Minority Shareholder Protection
(Index, higher value denotes stronger protection)

Corporate governance has improved appreciably in emerging market economies in the past two decades.



Sources: Guillén and Capron 2016; and IMF staff calculations.
Note: Africa and Middle East sample includes Egypt, Jordan, Lebanon, Nigeria, Oman, South Africa, and the United Arab Emirates. Latin America includes Argentina, Brazil, Chile, Colombia, Costa Rica, El Salvador, Guatemala, Mexico, Peru, and Venezuela. Emerging Asia includes China, India, Indonesia, Korea, Malaysia, Philippines, Thailand, and Vietnam. Euro area sample includes founding members except Ireland owing to data limitations. Emerging Europe includes Bulgaria, Czech Republic, Latvia, Lithuania, Poland, Slovenia, and Turkey. Advanced Asia includes Australia, Hong Kong SAR, Japan, New Zealand, and Singapore.

allows shareholders to cast all of their votes for a single nominee for the board of directors when the company has multiple openings on its board.

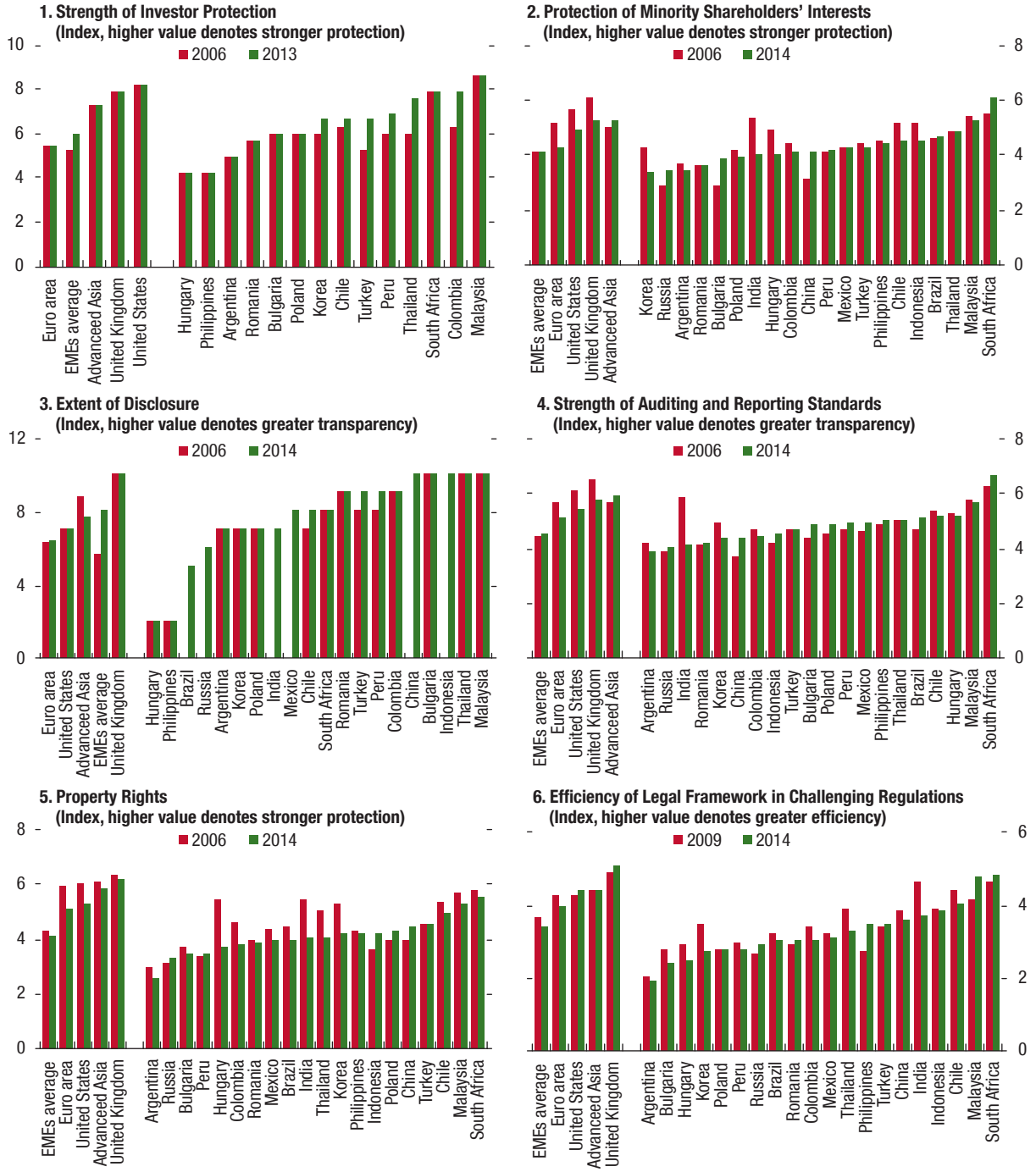
[16]The measures of country-level corporate governance and transparency used in this chapter capture specific aspects of institutional quality that are distinct from mere proxies of economic development. The average correlation between per capita GDP and the credit-to-GDP ratio (measures of economic and financial development) with various country-level measures of minority shareholder protection, corporate transparency, strength of legal institutions, and the rule of law, for example, are 2 percent and 8 percent, respectively, across emerging market economies. The highest correlation is between per capita GDP and the rule of law (54 percent) and is an outlier. Correlations with credit-to-GDP are substantially lower. Likewise, the overall conclusions of the chapter do not rely heavily on any single country-level measure of corporate governance.

[17]Available in the Thomson Reuters Datastream database.

[18]Examples of specific attributes used include the percentage of independent board members as reported by a company (board subindex); whether the company has a performance-oriented compensation policy (compensation subindex); or whether the company has a policy to apply the one-share, one-vote principle in the context of the shareholder rights index. The index assigns a value of 1 to governance attributes if the firm satisfies a criterion, and 0 otherwise. For comparability with past studies (for example, Gompers, Ishii, and Metrick 2003; Aggarwal and others 2009; Albuquerque and others 2013), the index is additive and is expressed in percent: if a firm hypothetically satisfied all criteria, it would have a score of 100 percent for a particular year. In contrast to other indices (which focus on the United States or other advanced economies), the index developed in this chapter does not emphasize attributes pertaining to antitakeover measures because such issues are less relevant in emerging market economies, given, among other factors, the prevalence of controlling shareholders (Bebchuk and Hamdani 2009).

Figure 3.5. Country-Level Corporate Governance and Investor Protection

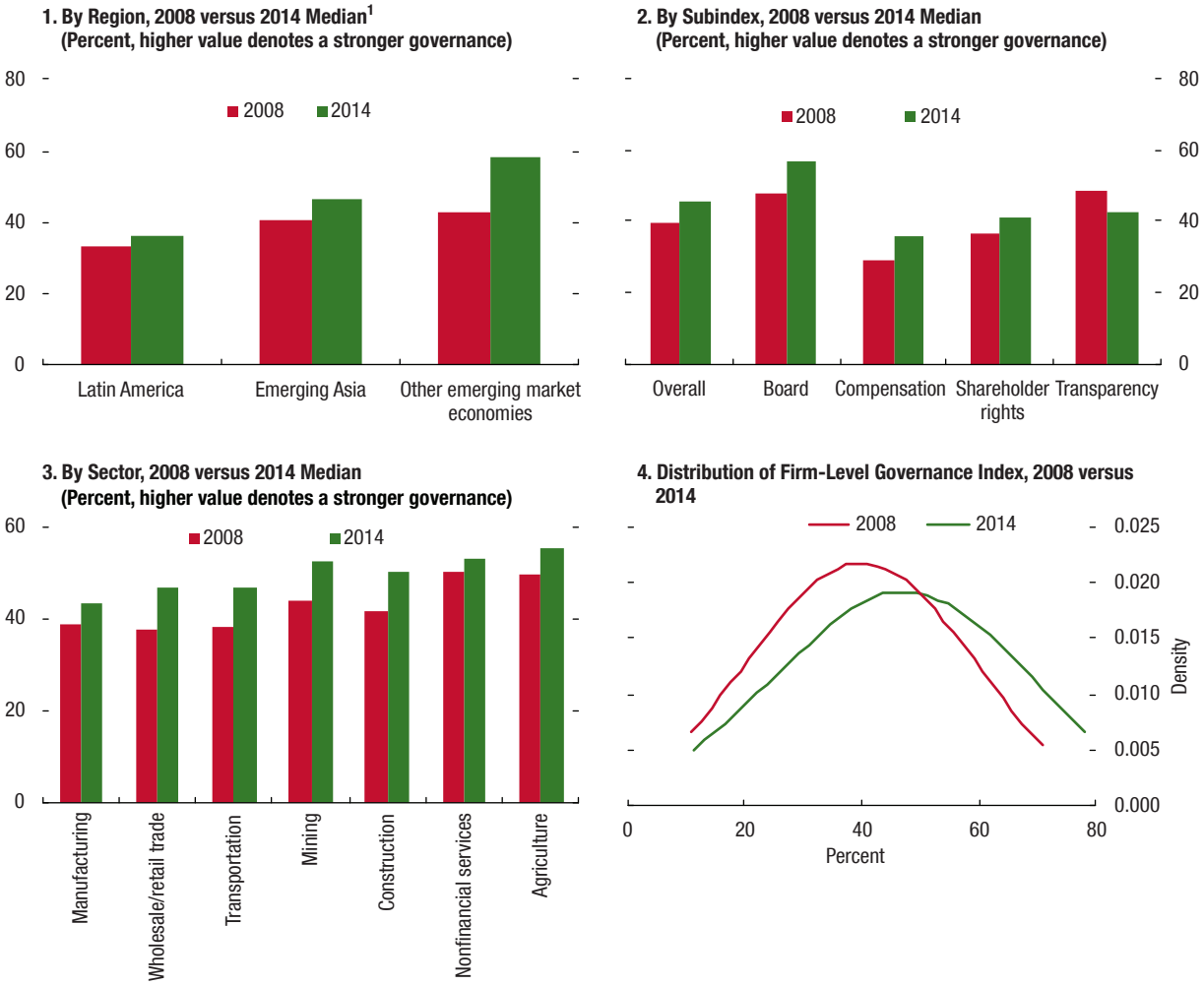
In emerging market economies, corporate governance and investor protection have generally improved.



Sources: World Bank, Doing Business database (panels 1 and 3); World Economic Forum, Global Competitiveness Indicators database (panels 2, 4, 5, and 6); and IMF staff calculations.
Note: The observations for the United States in panels 1 and 3 are based on indices for New York City, due to data limitations. EMEs = emerging market economies.

Figure 3.6. Emerging Market Firm-Level Governance Index

Corporate governance has generally improved across emerging market economies, sectors, and firms, based on a new firm-level governance index for emerging market economies.



Sources: Thomson Reuters Datastream; and IMF staff calculations.
Note: A higher value of the firm-level governance index denotes better governance. Panels 1, 2, and 3 are based on the median firm-level governance index in countries with more than 15 firms.
[1]Latin America includes Brazil, Chile, and Mexico. Emerging Asia includes China, India, Indonesia, Korea, Malaysia, and Thailand. Other emerging market economies include Poland, Russia, South Africa, and Turkey.

compensation practices, and the rights of shareholders. A transparency subindex is also developed, using various attributes across these subcategories. The overall firm-specific index combines these elements and reveals detailed insights into corporate governance patterns for a sample of well over 600 listed nonfinancial firms across 25 emerging market economies (comprising an unbalanced panel of well over 3,000 observations from 2008 to 2014).

In line with country-level trends, governance across emerging market firms has generally improved in recent years (Figure 3.6). This improvement is seen across all major sectors and for the subindices, with the exception of the transparency subindex, which shows a decline. Again, some qualification is in order. First, although the distribution of governance scores improves on average (as indicated by the rightward shift), there is notable variation in governance across

Table 3.1. Firm-Level Governance and Firm Characteristics

	ADR[1]	Other		SOE[2]	Other	
Governance Overall Index	49.8	45.1	*	45.3	46.8	
Board	61.3	56.4	*	58.7	58.7	
Compensation	41.9	34.1	*	32.6	35.8	
Shareholder Rights	43.3	40.6	*	39.8	41.8	*
Transparency	45.0	42.6		42.1	43.4	

	Closely Held Shares[3]	Other		Low Financial Dependence[4]	High Financial Dependence[4]	
Governance Overall Index	42.2	48.4	*	42.5	47.2	*
Board	52.2	60.5	*	53.1	58.1	*
Compensation	30.8	38.6	*	32.6	40.3	*
Shareholder Rights	39.2	42.4	*	37.8	40.5	*
Transparency	37.3	46.4	*	43.0	51.5	*

Sources: Bloomberg L.P.; Thomson Reuters Datastream; and IMF staff calculations.

Note: Asterisk denotes a statistically significant difference of at least 10 percent.

[1] ADR = American depository receipts.

[2] SOE = state-owned enterprises.

[3] Firms with above 10 percent closely held shares.

[4] High (low) financially dependent firms are in the top (bottom) quartile of the index developed by Rajan and Zingales (1998).

firms in general, but also within countries. Second, because of lack of data, the firm-level governance index does not cover all listed firms in a country.[19] Therefore, sample selection may be an issue for some countries—but the index is nevertheless comparable across firms, which is how it is primarily used in this chapter. At the same time, although some emerging market economies have high-quality institutions in general, specific aspects of their corporate governance frameworks may compare less favorably.

Better-governed firms appear to share some characteristics. Emerging market equities that trade on U.S. stock exchanges through American depository receipts (ADRs) tend to have higher firm-level governance scores (Table 3.1).[20] This may reflect the fact that listing in the United States reduces the extent to which controlling shareholders can engage in expropriation (Doidge, Karolyi, and Stulz 2004); at the same time, better-governed firms may find it easier to issue ADRs. Likewise, firms that are more dependent on external financing also appear better governed.[21] Taken together, interactions with foreign investors from advanced economies with stronger shareholder protection seem to play a role in promoting governance improvements in emerging market economies (Aggarwal and others 2011; Albuquerque and others 2013). In general, firms with a significant fraction of closely held shares and state-owned enterprises (SOEs) tend to have lower governance scores (Box 3.2).[22]

In line with the literature, governance as measured by this new index is positively associated with valuation. Firms with higher governance scores tend to have higher valuations (Figure 3.7). This finding is corroborated when country-level measures of corporate governance are used. Furthermore, formal regression analysis indicates that a higher score in the overall index, or in three of the subindices (board, compensation, transparency), results in higher firm-level valuations (Figure 3.8).[23]

[19]Regarding the representativeness of the firm-level governance index, the median stock market capitalization of the listed nonfinancial emerging market firms in the sample is close to 60 percent of their respective country's (nonfinancial) stock market capitalization.

[20]An American depositary receipt (ADR) is a negotiable certificate issued by a U.S. bank representing a specified number of shares in a foreign stock traded on a U.S. exchange.

[21]Dependence on external finance is measured by the index developed by Rajan and Zingales (1998).

[22]Figure 3.3 shows that closely held shares increase in the period following the global financial crisis relative to before the crisis, whereas Figure 3.6 illustrates an improvement in firm-level governance after the global financial crisis.

[23]Tobin's Q (market-to-book assets ratio) and sector-adjusted Q are both considered. Results are robust to a variety of specifications (including instrumental variables approaches), fixed effects, and error clustering.

These results are quite robust and consistent with the literature, underscoring the utility of the index.[24]

Corporate Governance, Investor Protection, and Financial Stability

This section presents evidence suggesting that emerging market economies with stronger corporate governance and investor protection frameworks tend to have stronger corporate balance sheets and show greater resilience to global financial shocks.

Corporate Governance, Investor Protection, and Financial Resilience

Corporate Governance and Capital Market Development

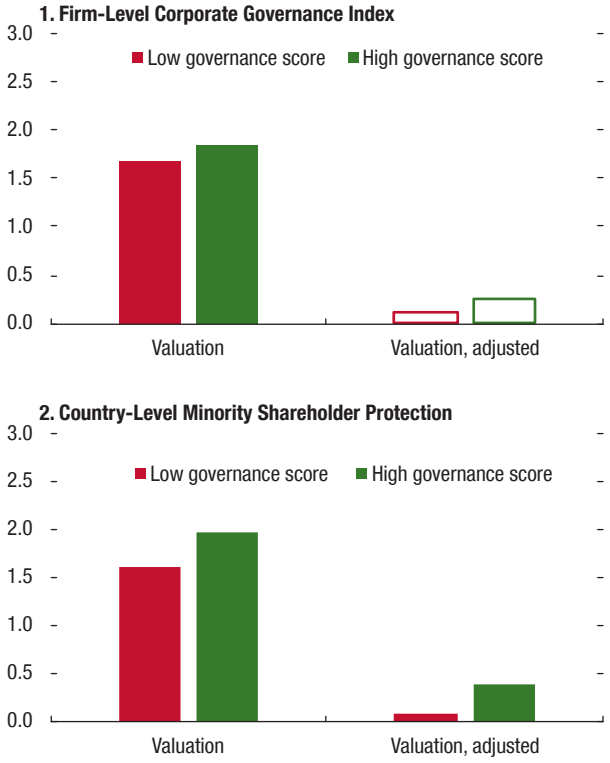
Evidence suggests that stronger corporate governance and investor protection frameworks foster resilience to external shocks by promoting the development of capital markets. Previous research has shown that differences in legal protection of investors across countries shape investor confidence in markets and consequently financial market development.[25] Updated econometric evidence based on a large set of countries reaffirms these findings, underscoring the role sound corporate governance and transparency can play in fostering the development of stock and bond markets (Table 3.2).[26] For example, the results show a robust positive statistical relationship between corporate governance and stock market capitalization. Greater market development, in turn, is associated with greater resilience to shocks (see Chapter 2 of the April 2014 GFSR).

Corporate Governance and Market Liquidity

Better corporate governance helps improve market liquidity, and thus its resilience. By reducing the potential for information asymmetries between corporate insiders and outside investors (which insiders may use to their advantage), better corporate governance and investor protection should encourage trading and thereby improve market liquidity. Regression analysis based on a set of emerging market economies indicates that improving the protection of minority shareholders is indeed associated with higher stock market liquidity (Figure 3.9).[27] An emerging market economy can raise

Figure 3.7. Corporate Governance and Firm-Level Valuation
(Ratio; average)

Firms with stronger corporate governance frameworks tend to have higher valuations.



Sources: Thomson Reuters Datastream; World Economic Forum, Global Competitiveness Indicators database; and IMF staff calculations.
Note: Results are robust to other country-level governance measures such as strength of investor protection. High (low) governance score denotes top (bottom) quartile and tertile of the firm- and country-level governance measures, respectively. Firm-level governance and protection of minority shareholders' interests indices are used. Bars with a solid fill denote a statistically significant difference at least at the 10 percent level. Valuation = Tobin's Q (market-to-book assets ratio); valuation, adjusted = Tobin's Q in excess of firm's sector median.

[24]The average governance of other firms in the same industry and country is used as an instrument (see Aggarwal and others 2009) in the instrumental variables (IV) regressions (where weak exogeneity tests confirm the usefulness of the instrument). The larger size of the IV may reflect that higher (future) growth prospects (as measured by Q) imply more resources to be expropriated, thus suppressing good governance.

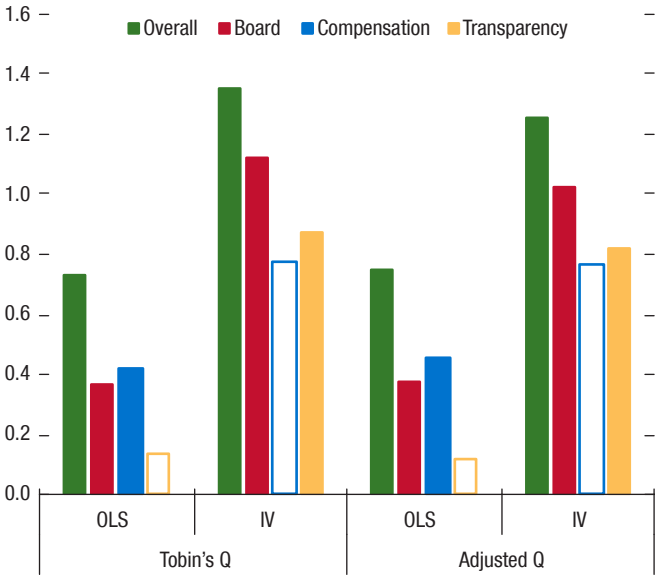
[25]See, for example, Shleifer and Vishny 1997 and La Porta and others 1998.

[26]Specifically, the chapter combines approaches as in, for example, Djankov and others 2008b and Beck, Demirgüç-Kunt, and Levine 2010, in which indicators of market depth and development are linked to measures of corporate governance and corporate transparency.

[27]This section extends Brandão-Marques (forthcoming), which uses a panel of 23 emerging market economies during 2003–14. The (inverse) Amihud 2002 measure of market liquidity (a proxy for the price impact of a trade) is regressed against a measure of minority shareholder protection, as well as against other controls (such as volatility, market depth, macroeconomic and overall institutional environment, and global investor risk appetite).

Figure 3.8. Firm-Level Governance and Valuation
(Percentage points)

Better firm-level governance is associated with higher corporate valuations.



Sources: Thomson Reuters Datastream; and IMF staff calculations.
Note: The figure depicts the sensitivity of Tobin's Q to firm-level governance. The empirical analysis also controls for macroeconomic factors (IV) and country-time fixed effects. Solid bars denote statistical significance at least at 10 percent level. See Annex 3.1 for further details. Tobin's Q = firm's market-to-book assets ratio; adjusted Q = Q in excess of the firm's sector median; OLS = pooled ordinary least squares regression; IV = instrumental variables regression (where the instrument is the average governance of other firms in the same sector and country).

market liquidity by about 15 percent on average by moving from the lower to the upper quartile of the minority shareholder protection index. The results are robust to the inclusion of other aspects of institutional quality and market characteristics.

Equity Price Volatility, Comovement, and Crash Risk—What Role for Corporate Governance?

Weaker country-level corporate governance frameworks are associated with less efficient stock markets and more comovement among stocks. The variation in individual stock returns is decomposed into its firm-specific and market-wide components. If the latter component plays a greater role, it indicates that the firm's equity price moves predominantly in tandem with the market.[28] A higher degree of synchronicity of individual stock returns could reflect either that country factors are dominant in investors' minds or that equity prices are driven more by cross-firm contagion and noise trader activity than by changes in firm-level fundamentals.[29] For

[28]The liquidity of stocks may be affected by the degree of price comovement with the market. On the one hand, trading activities based on firm-specific information could raise the liquidity of the stock. On the other hand, greater comovement with the market may be associated with higher liquidity because it reduces the need for market makers to learn about individual stocks (Chan, Hameed, and Kang 2013).

[29]Country-level risk factors should in principle be diversifiable in integrated global financial markets. See Hsin and Liao 2003.

Table 3.2. Corporate Governance, Investor Protection, and Capital Market Development

		Stock Market		Bond Market	
		Capitalization	Total Value Traded	Private Capitalization	Public Capitalization
All Countries[1]	Minority shareholder rights protection	+++	+++	++	+++
	Corporate transparency	+++	+++	++	+++
	Rule of law/property rights	+++	++	++	+++
Major EMEs	Minority shareholder rights protection	+++	+	++	+++
	Corporate transparency	+++		++	+++
	Rule of law/property rights	+++	+	++	+++

Sources: Guillén and Capron 2016; World Bank, Doing Business database, World Governance Indicators database, and Financial Development and Structure database; World Economic Forum, Global Competitiveness Indicators database; and IMF staff calculations.

Note: The table summarizes over 450 regressions whereby measures of corporate governance (minority investor protection), transparency, rule of law, and property rights are linked to indicators of capital market development including stock market capitalization and total value traded as well as private and public bond market capitalization in percent of GDP. One, two, and three plus signs are used to indicate a positive and statistical relationship, robustness to other indicators of, for example, minority shareholder protection, and robustness to endogeneity based on instrumental variables regressions (using legal origin as an instrument). EMEs = emerging market economies.

[1] Includes advanced and emerging market economies.

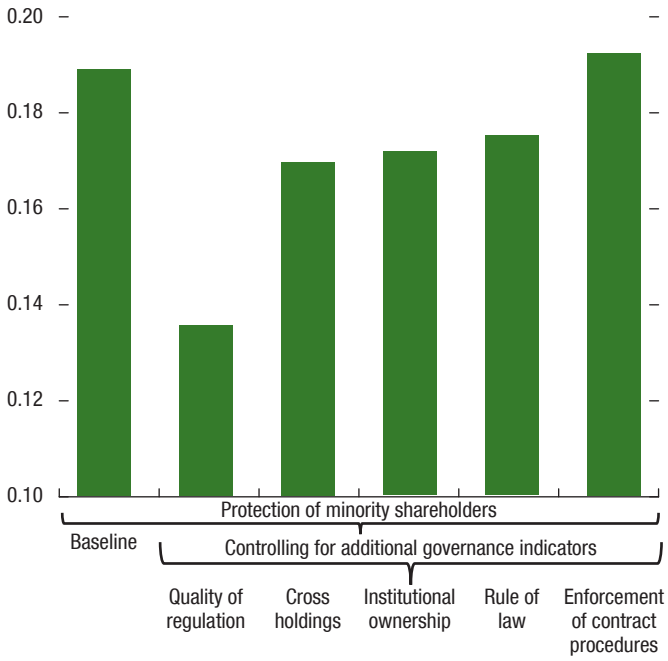
instance, in less transparent markets, insiders can more readily manipulate earnings (possibly to conceal expropriation of outside investors); as a result, price fluctuations say less about firm fundamentals and are thereby more synchronized with the market (Jin and Myers 2006). Indeed, econometric analysis confirms previous findings on the negative relationship between country-level governance scores and stock market comovement (Figure 3.10, panel 1) (Morck, Yeung, and Yu 2000). Likewise, at the firm level, novel econometric evidence reveals that better-governed emerging market firms are less synchronized with the market (Figure 3.10, panel 2).[30] This suggests that equity prices for better-governed and more transparent emerging market firms reflect fundamentals more accurately, helping enhance overall stock market efficiency and resilience.[31]

Reassuringly, the synchronicity of firm stock returns in emerging market economies has been declining over the past 15 years, suggesting improved market efficiency (Figure 3.11). In comparison, stock return synchronicity in advanced economies has stagnated at a lower level, so that the gap between advanced and emerging market economies has been narrowing (Morck, Yeung, and Yu 2013). This may reflect, in part, the fact that corporate governance (including disclosure policies) and investor protection have generally improved across emerging market economies, reaffirming some of the earlier findings.[32]

The empirical analysis also reveals that better governance is associated with lower crash risk in stock returns. If controlling shareholders or managers can keep a portion of a firm's cash flow and hide firm-specific information, it will lead not only to higher comovement with the market but also potentially to higher crash risk. For example, crashes can occur when insiders, who usually conceal information about firm-level fundamentals, are faced with absorbing too much firm-specific bad news and decide to give up, releasing the news (Jin and Myers 2006). At the market level, if investors cannot distinguish well between idiosyncratic and aggregate shocks, the risk that an idiosyncratic shock will spread to the market rises. Regression analysis confirms that emerging market economies and firms with weaker governance are more prone to extreme stock price drops (Figure 3.12). By helping better align price movements with fundamentals, better governance (such as stronger minority shareholder

Figure 3.9. Corporate Governance and Market Liquidity
(Percent)

Better corporate governance helps improve market liquidity.



Sources: Brandão-Marques (forthcoming); FactSet database; IMF, International Financial Statistics database and World Economic Outlook database; Thomson Reuters Datastream; World Economic Forum, Global Competitiveness Indicators (GCI) database; World Bank, Worldwide Governance Indicators database; and IMF staff calculations.
Note: The figure shows the sensitivity of market liquidity to minority shareholder protection (GCI), with and without additional governance controls. The empirical analysis also controls for market capitalization, equity price volatility, GDP growth, inflation, country fixed effects, and country-time trends.

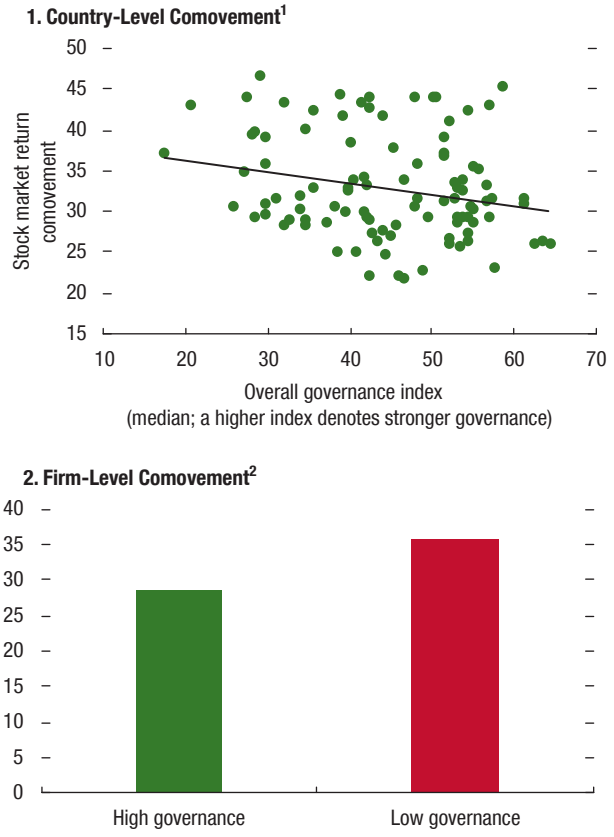
[30]Hutton, Marcus, and Tehranian (2009) find that transparency of financial statements at the firm level lowers synchronization with the market in a sample of U.S. firms. Morck, Yeung, and Yu (2000) and Jin and Myers (2006) find that lower synchronization is associated with higher investor protection and corporate transparency at the country level.

[31]State-owned enterprises appear to be associated with higher synchronization values even after controlling for size, leverage, profitability, and, for example, firm-level governance, which may reflect weak implementation of governance codes. Furthermore, the comovement regressions are robust to the inclusion of country-level governance measures.

[32]While, in principle, other factors may explain the decline in synchronicity, the literature so far has consistently found that corporate governance aspects are its most important determinants; therefore, it is unlikely that the decline is driven by other forces (Hutton, Marcus, and Tehranian 2009; Ferreira and Laux 2007). In particular, the share of each sector in the index has remained relatively constant.

Figure 3.10. Stock Return Comovement
(Percent)

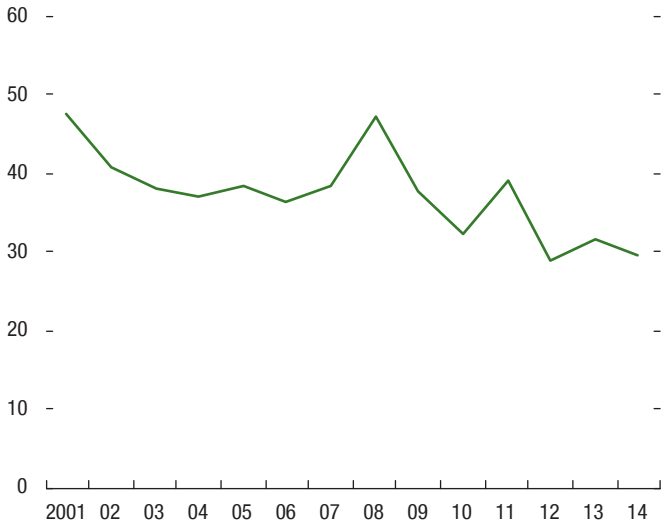
Better-governed and more transparent emerging market economy firms are less synchronized with the stock market, and their equity prices reflect business fundamentals more accurately.



Sources: Bloomberg L.P.; Thomson Reuters Datastream; World Economic Forum, Global Competitiveness Indicators database; and IMF staff calculations.
Note: Using other country-level governance indices, such as the Guillen-Capron minority shareholder rights protection index or the strength of minority investor protection strength (World Bank), yields similar pictures. Stock return comovement is measured by the R^2 of the regression of weekly stock returns on market factors.
[1]Overall governance index is the median of all firms in a given country. Market return volatility is measured by the standard deviation of weekly returns. The sample includes annual observations for 18 emerging market economies between 2010 and 2014 (country-year observations).
[2]High governance = firm governance above 75th percentile; low governance = firm governance below 25th percentile. The empirical analysis also controls for size, leverage, return on equity, state-owned enterprises, and American depository receipts. Results are robust to controlling for country and time fixed effects, and to the use of the firm-level transparency subindex. See Annex 3.2 for further details.

Figure 3.11. Stock Return Comovement (R^2) over Time
(Percent)

The synchronicity of equity prices in emerging market economies has declined.



Sources: Bloomberg L.P.; Thomson Reuters Datastream; and IMF staff calculations.
Note: Stock return comovement is measured by R^2 of the regression of weekly stock returns on market factors.

rights and better transparency regimes) can help lessen investor overreaction to negative shocks and thereby foster financial stability.[33]

Corporate Governance and Global Financial Shocks

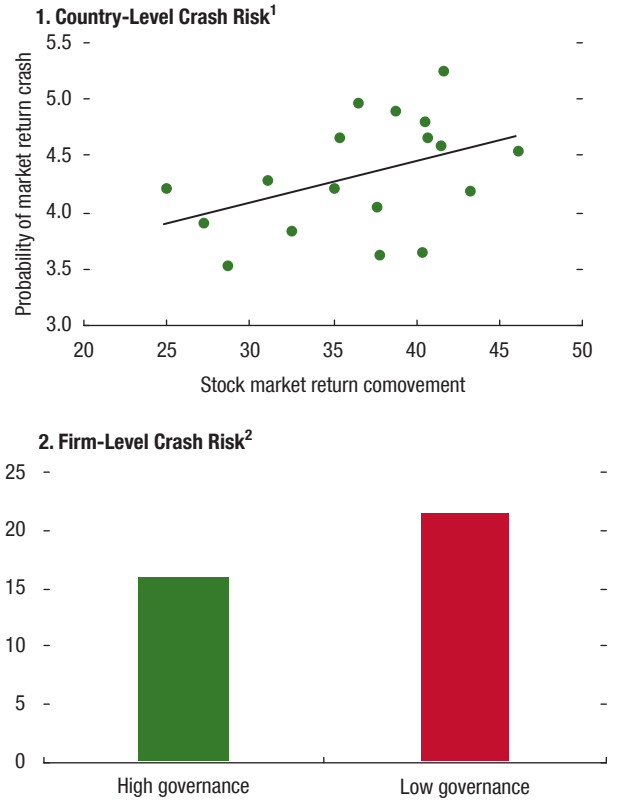
Poorly governed firms experienced sharper equity price declines during episodes of market turmoil. Event studies focus on the global financial crisis, the 2013 taper tantrum, the January 2016 stock market crash, and, most recently, Brexit.[34] Two groups of companies are considered: those that at the outset of the events were in the top and bottom third of the distribution of the firm-level governance index. For each of these cases, indices for both groups are constructed using

[33]Instrumental variables are not used in the literature on comovement (R^2) and crash risk; firm-level governance may be endogenous to average returns of firms (that is, first moments), but is generally considered exogenous in the case of higher moments (for example, comovement or skewness) of stock prices.

[34]The dates of these events are September 15, 2008 (global financial crisis); May 22, 2013 (taper tantrum); January 6, 2016 (suspension of trading after the drop in the Chinese stock market, which reverberated globally across major asset markets—see Chapter 2 of the April 2016 GFSR for further details); and June 24, 2016 (Brexit).

Figure 3.12. Crash Risk
(Percent)

Emerging market economies and firms with weaker governance are more prone to stock price crashes. Better governance fosters financial stability by helping to better align price movements with fundamentals and reduce the risk of extreme price drops.



Sources: Bloomberg L.P.; Thomson Reuters Datastream; World Economic Forum, Global Competitiveness Indicators database; and IMF staff calculations.
Note: Using other country-level governance indices, such as the Guillen-Capron minority shareholder rights protection index or the strength of minority investor protection strength (World Bank), yields similar pictures.
[1]Stock return comovement is measured by the R^2 of the regression of weekly stock returns on market factors. Crash risk is the probability of the weekly market return falling below the 5th percentile for each country under a normal distribution.
[2]High governance = firm governance above 75th percentile; low governance = firm governance below 25th percentile. The empirical analysis also controls for the size, leverage, return on equity, state-owned enterprises, and American depository receipts. Results are robust to controlling for country and time fixed effects. Firm-level crashes are defined as occurrences of firm-specific residual returns falling in the 2.5 percent lower tail of a normal distribution. See Annex 3.2 for further details.

firm equity returns after adjusting for their countries' market returns.[35] The difference in the equity dynamics is quite stark across the two groups: on average, equity prices fell sharply for the firms with weaker governance, whereas firms with better governance fared better (Figure 3.13).

More generally, evidence also suggests that better corporate governance and transparency can systematically help shield emerging market economies and firms from global financial shocks. Augmented capital asset pricing models relating equity returns to measures of corporate governance and changes in risk aversion in global financial centers are estimated at the country and firm levels. Changes in the Chicago Board Options Exchange Volatility Index (VIX) are the main proxy for such global shocks.[36] The regression results indicate that emerging market economies and firms that safeguard the rights of shareholders to a greater extent tend to be less sensitive to global financial shocks (Figure 3.14). In fact, moving from the lower to the upper end of the country- and firm-level governance indices reduces the impact of the VIX by about 20 percent and 50 percent on average for emerging market economies and firms, respectively.[37] The larger firm-level dampening effect may partly reflect the fact that the firm-level index captures several aspects of governance (such as the role of the board, disclosure policies, and the rights of all shareholders), whereas the country-level measure captures mainly one dimension (protection of minority shareholder interests). Further country-level evidence (not shown) indicates that enhanced minority shareholder protections also dampen the impact of global financial shocks on bond spreads, but to a lesser extent (about 10 percent).

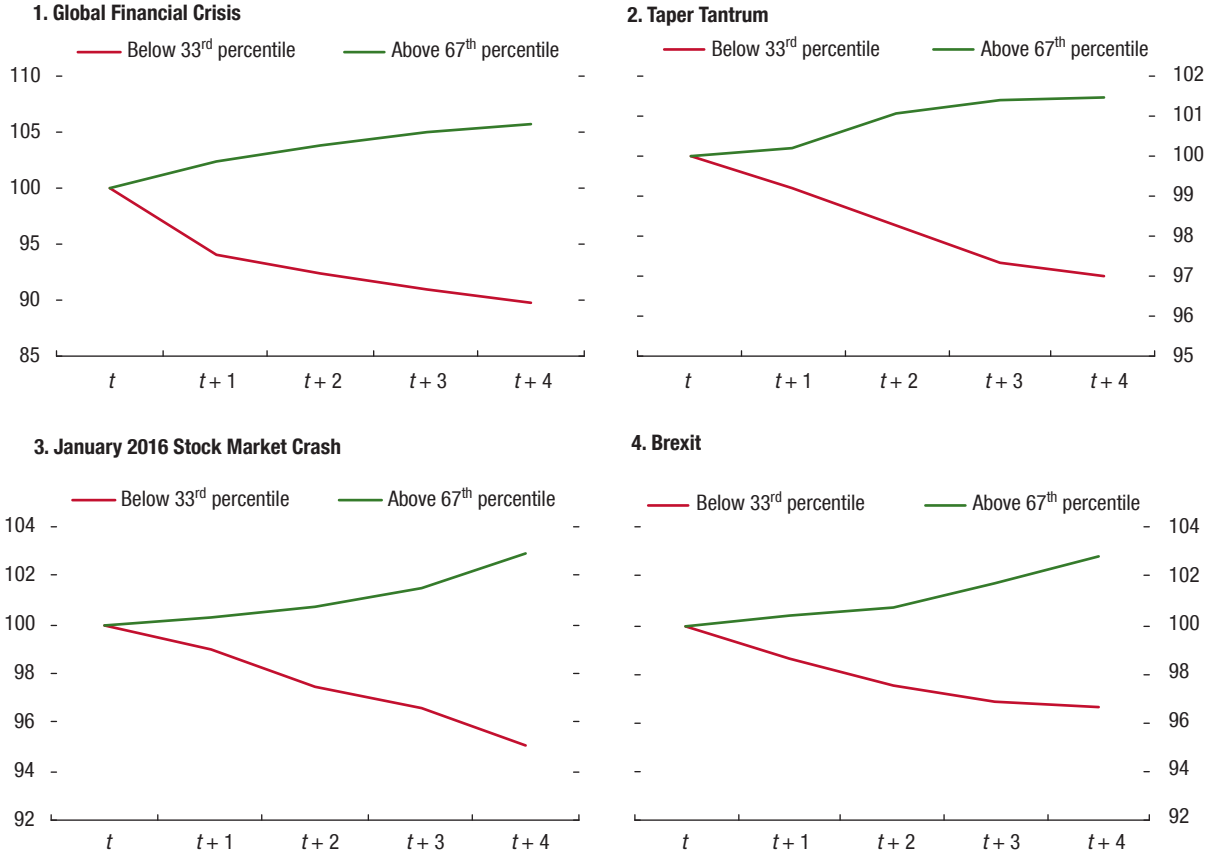
[35]The adjusted returns are residuals from a capital asset pricing model, and thereby account for common country-specific developments; results are robust if unadjusted indices are used.

[36]The hypothesis is that stronger governance frameworks can help dampen the transmission of global financial shocks (Annex 3.3). Opposite effects are also conceivable a priori. For example, firms in which the interests of shareholders and management are better aligned may take on more risk, including higher exposure to global financial conditions. Moreover, better-governed firms may have better access to global financing sources, exposing them more to fluctuations in financial conditions in advanced economies. The country-level analysis follows Brandão-Marques, Gelos, and Melgar (2013) and focuses on corporate governance along with corporate transparency.

[37]Specifically, in the case of the firm-level regressions, a one standard deviation shock (to the change in the VIX, corresponding to about 15 percentage points) lowers firm returns by about ½ percentage point. However, this impact declines to roughly ¼ percentage point for firms that move from the 25th to the 75th percentile of the governance distribution. Similar results are obtained when the global financial crisis or various banking, currency, and debt crises (based on Laeven and Valencia 2012) are used instead of the change in the VIX.

Figure 3.13. Event Study: Firm-Level Governance and Equity Returns
(Index; t = 100)

In response to external shocks, stock prices of firms with weaker governance fared much worse than firms with better governance.



Sources: Bloomberg L.P.; Thomson Reuters Datastream; and IMF staff calculations.
Note: Indices were constructed using firm equity returns adjusted for the market return (adjusted returns are residuals from a capital asset pricing model). The *y*-axis shows the equity market index, where 100 corresponds to the index one trading day before the event. Below 33rd percentile denotes firms in the bottom tertile of the firm-level governance index (overall index); above 67th percentile denotes firms in the top tertile of the firm-level governance index. *t* (time) = the day before the event; *t* + 1 = day of the event. The day of the event (*t* + 1) = September 15, 2008, in panel 1; May 22, 2013, in panel 2; January 6, 2016, in panel 3; and June 24, 2016, in panel 4. Brexit = June 2016 U.K. referendum result in favor of leaving the European Union.

Governance and Corporate Fragility

Corporate fragility can be of systemic relevance if it is widespread. This section explores the link between firm-level balance sheet indicators and corporate governance at the firm and country levels.

Stylized Facts

Stronger corporate governance and investor protection regimes are associated with stronger balance sheets. As discussed earlier, the relationship between governance and financial soundness is not a priori obvious (for example, companies that act in their shareholders' interest may be expected to take on more risk). A first look at the data suggests the following:

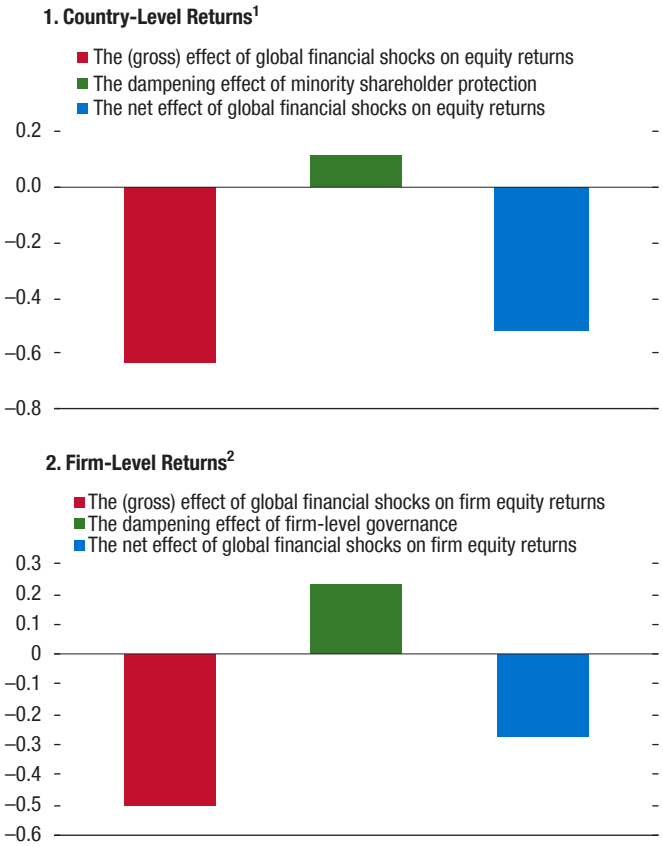
- Better-governed firms and those in countries with better governance outperform their peers in terms of profitability and liquidity (Figure 3.15).
- Likewise, such firms are characterized by sounder capital structures: their leverage and short-term debt ratios are lower.[38]

[38]Conceivably, better financial performance may induce better governance, not vice versa, motivating robustness checks of the econometric estimations using instrumental variables.

Figure 3.14. Impact of Global Financial Shocks on Equity Returns

(Percentage points)

Emerging market economies and firms that safeguard the rights of shareholders to a greater extent tend to be less sensitive to global financial shocks.

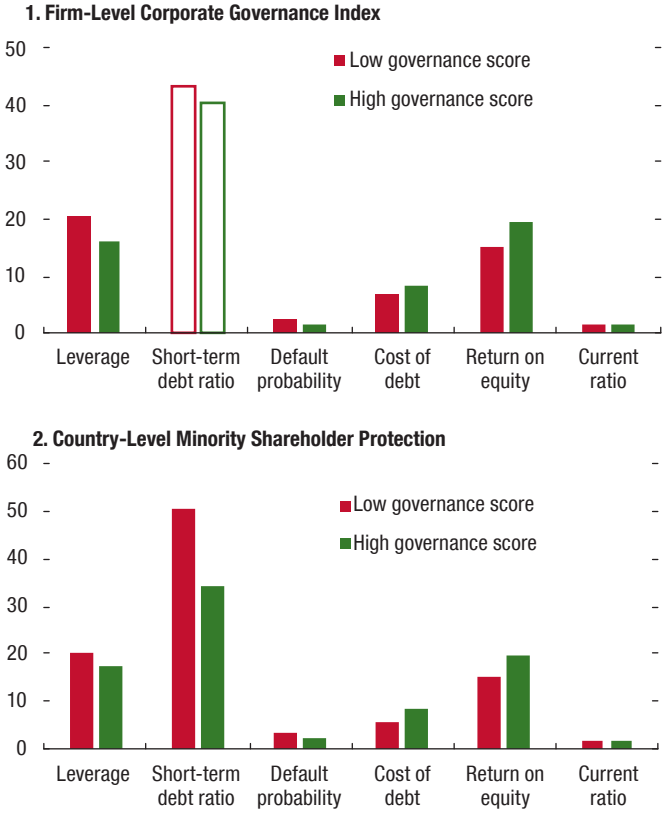


Sources: Bloomberg L.P.; Thomson Reuters Datastream; World Economic Forum, Global Competitiveness Indicators database; and IMF staff calculations.
Note: The dampening effects measure the impact of moving from the lower quartile to the upper quartile of the country- and firm-level governance distributions. VIX = Chicago Board Options Exchange Volatility Index.
[1]The standardized coefficients are statistically significant at least at the 10 percent level and depict the sensitivity of country-level returns to the change in the VIX (proxy for global financial shocks, standard deviation 13 percent). The empirical analysis controls for country fixed effects, Standard and Poor's sovereign credit rating, macroeconomic factors, trade and financial connectedness, and their interaction with the VIX, and U.S. stock market returns.
[2]The standardized coefficients are statistically significant at the 10 percent level (in fact, all are significant at the 1 percent level) and depict the sensitivity of firm-level returns to the change in the VIX. The change in the VIX is the proxy for global financial shocks (standard deviation 15 percent), the standard deviation of the firm-level governance index (overall index) is 8 percent. The empirical analysis controls for country-level returns, firm fixed effects, country-time fixed effects, sector-time fixed effects, and time fixed effects. Results are also robust to controlling for indicators of competition and concentration measures as well as country-level indices of corporate governance. See Annex 3.3 for further details.

Figure 3.15. Corporate Governance and Selected Balance Sheet Indicators

(Percent; average)

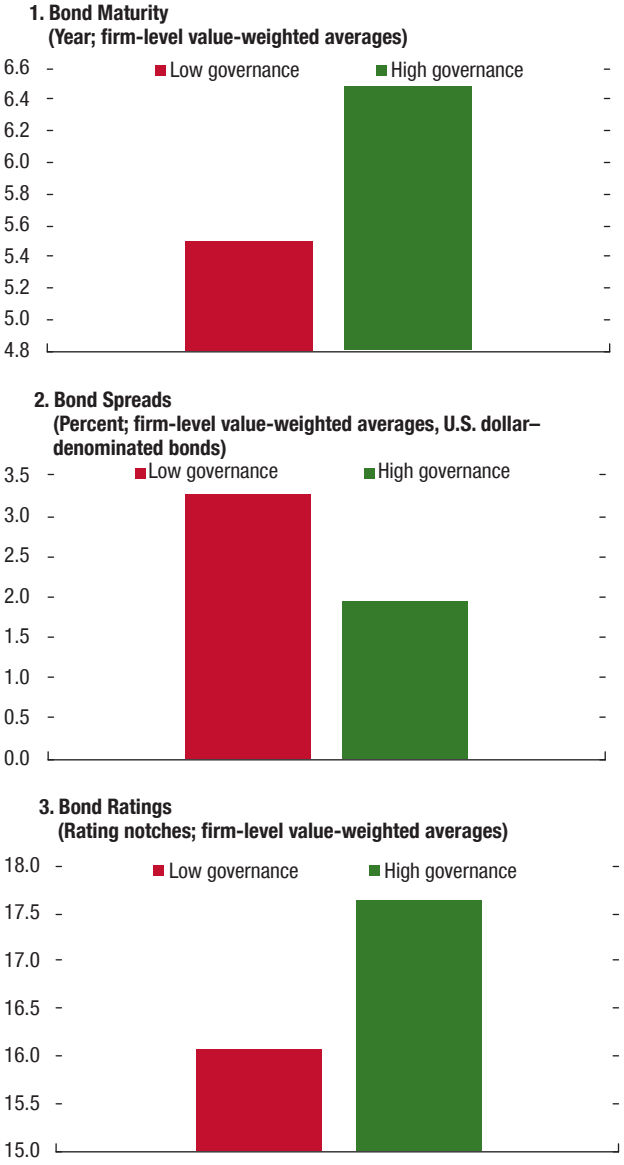
Better-governed firms and those in countries with better governance outperform their peers in terms of profitability and liquidity, and such firms are characterized by sounder capital structures.



Sources: Dealogic; Thomson Reuters Datastream; World Economic Forum, Global Competitiveness Indicators database (GCI); and IMF staff calculations.
Note: For firm-level comparisons, low and high corporate governance scores refer to the bottom and top quartile, respectively. For country-level comparisons, low and high corporate governance scores refer to bottom and top tertile, respectively. Default probability is based on the Black-Scholes-Merton model. Results are robust to other country-level governance measures such as a measure of strength of investor protection (GCI). Solid bars denote a statistically significant difference at least at the 10 percent level. Leverage = total debt to market asset ratio; short-term debt = portion of debt payable within one year, including current portion of long-term debt; cost of debt = average implied interest rate; return on equity = net income before preferred dividends to common equity; current ratio = current assets to current liabilities.

Figure 3.16. Firm-Level Governance and the Bond Market

Better-governed firms that tapped bond markets were able to borrow at longer maturities and had higher credit ratings and lower spreads.



Sources: Bloomberg L.P.; Dealogic; Thomson Reuters Datastream; and IMF staff calculations.
Note: Bond maturity = maturity at issuance; bond rating = issuer's S&P credit rating; bond spread = spreads vis-à-vis the U.S. Treasury bonds with similar maturity; high governance = firm governance above 75th percentile; low governance = firm governance below 25th percentile.

- Better-governed firms that tapped bond markets were able to borrow at longer maturities and had higher credit ratings and lower spreads (Figure 3.16).

Econometric Analysis

More formal analysis shows that various dimensions of governance quality are positively associated with solvency indicators. In particular, the econometric analysis shows that higher values of the governance subindices are associated with lower short-term debt ratios (Figure 3.17, panel 1). This suggests that even limited governance reforms can enhance corporate solvency (and, while not shown, other indicators as well, including profitability). For example, provisions that increase the effectiveness of the board, such as a greater share of independent directors, are likely to result in lower short-term debt ratios.[39] Furthermore, complementary analysis indicates that after leverage, asset tangibility, and valuation, firm-level governance is the most important factor explaining the variation of the corporate short-term debt ratio across firms, followed by other firm- and country-level characteristics, including economic fundamentals, financial development, and, for example, property rights (Figure 3.17, panel 3). Additional analysis shows that firms with greater transparency are associated with lower default probabilities.[40]

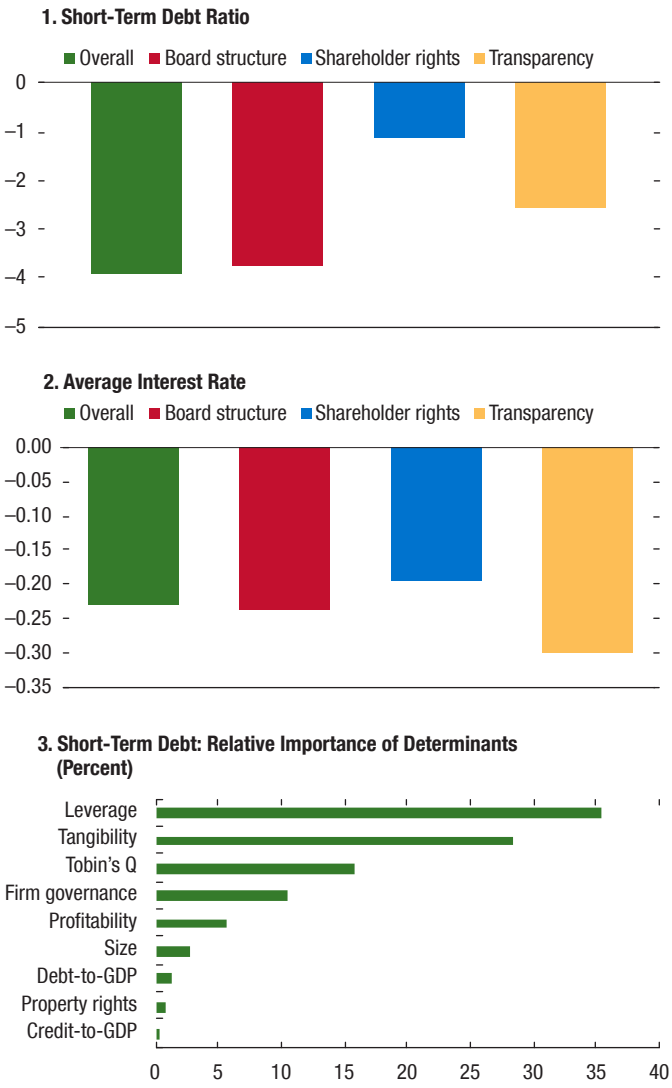
Stronger country-level corporate governance frameworks appear to play an even greater role than firm-level governance in determining short-term debt ratios (Figure 3.18). This finding hints at the importance of good country-level corporate governance regimes, including by encouraging and enforcing firm-level governance initiatives.

[39]Interestingly, governance and leverage are positively correlated. This may reflect the fact that governance improvements assure creditors that they will get a fair return on their investments, thereby improving firms' access to debt financing.

[40]Specifically, instrumental variables analysis suggests that an increase in firm-level transparency results in a lower probability of corporate default, although the relationship is not statistically significant for all firm-level corporate governance indices.

Figure 3.17. Firm-Level Governance and Solvency
(Percentage points)

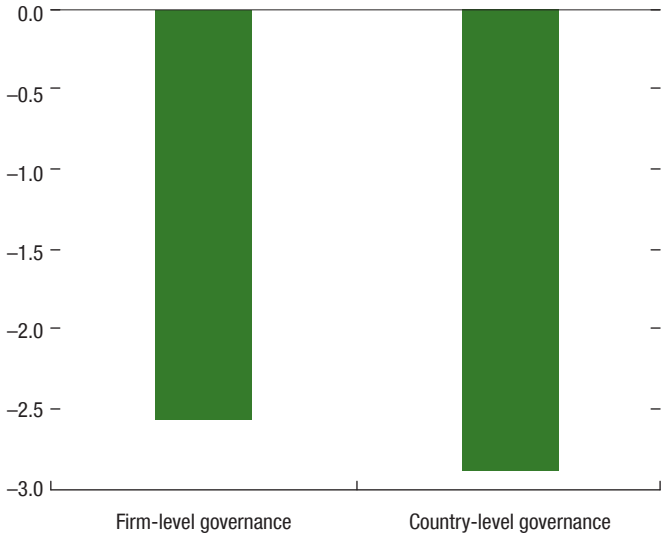
Various dimensions of the quality of governance are positively associated with corporate solvency.



Sources: Thomson Reuters Datastream; and IMF staff calculations.
Note: Short-term debt ratio = short-term debt to total debt; average interest rate = interest expense to total debt. Bars show the effects of a one standard deviation increase in each governance metric on the short-term debt ratio (panel 1) and average interest rate (panel 2). The standard deviation of the overall firm governance index is 13.3 percentage points. Coefficients estimated using pooled ordinary least squares; errors clustered at the country level; all firm characteristics are lagged. The empirical analysis also controls for the size, profitability, tangibility, valuation, leverage, debt-to-GDP, credit-to-GDP, country fixed effects, sector fixed effects, and time fixed effects. Results are robust to the use of different firm-level governance subindices and to the inclusion of other governance and institutional quality measures such as rule of law, protection of minority shareholders' interests, or strength of investor protection index. See Annex 3.1 for further details.

Figure 3.18. Country-Level and Firm-Level Governance and Short-Term Debt
(Percent)

Improved country-level corporate governance frameworks appear to play an even greater role than firm-level governance in determining short-term debt ratios.



Sources: Dealogic; Thomson Reuters Datastream; World Economic Forum, Global Competitiveness Indicators database; and IMF staff calculations.
Note: The figure depicts the sensitivity of short-term debt ratio to firm- and country-level measures of corporate governance. Country-level governance is proxied by the World Economic Forum Global Competitiveness Index (GCI) protection of minority shareholders' interest index; firm-level governance is measured using the overall index developed in this chapter. The empirical analysis also controls for the size, profitability, tangibility, valuation, leverage, macroeconomic factors, and firm fixed effects. Results are robust to the use of other country-level governance indices such as the World Bank index of the protection of minority shareholders. See Annex 3.1 for further details.

Conclusions and Policy Implications

This chapter has presented new evidence on the nexus between corporate governance, investor protection, and financial stability across emerging market economies. It has documented how corporate governance enhancements promote deeper, more liquid, and more efficient capital markets, thereby increasing resilience to global financial shocks and decreasing the likelihood of stock price crashes. Furthermore, it has shown that emerging market economies with better corporate governance and investor protections tend to have stronger corporate balance sheets, as reflected in lower short-term debt ratios, lower default probabilities, and the ability to borrow at longer maturities. These issues matter for overall financial stability.

Many emerging market economies have made notable strides in improving their corporate governance and investor protection frameworks. These improvements are visible both in country-level and firm-level measures. They have occurred across sectors and firms. Nevertheless, there is quite a bit of heterogeneity across emerging market economies. Although on average, emerging market economies still have scope to improve, several of them feature corporate governance scores higher than those in advanced economies.

These broad-based improvements in corporate governance and investor protections across emerging market economies over the past two decades have served to enhance the resilience of their financial systems. Nevertheless, the financial stability benefits of corporate governance highlighted in this chapter strengthen the case for further reforms. In general, countries should strive to adopt the G20/OECD Principles of Corporate Governance. However, even limited governance reforms in specific areas can help.

Emerging market economies should continue with reforms that strengthen the consistency, clarity, and enforceability of the legal and regulatory requirements affecting corporate governance practices. The effectiveness of insolvency frameworks and the enforcement of creditor rights require strengthening, in some cases. Better domestic and international cooperation among regulators and enhanced power, resources, and independence for securities commissions would further strengthen countries' corporate governance structures.

Most emerging market economies should further reinforce shareholder rights, especially for minority shareholders. In general, reforms prioritizing the protection of outside investors, both foreign and domestic, should continue. In particular, the protection of minority shareholders could be advanced by improving redress and ensuring a greater say in board selection, as well as by strengthening rules on related-party transactions, changes in controlling shareholders, and shareholder meetings. In this regard, amendments to company law and further legal clarification may be needed. Such reforms would address some of most important conflicts of interest at the firm level in emerging market economies.

Many emerging market economies should strive to bring disclosure requirements fully in line with best international practices. Specifically, disclosure with respect to related-party transactions, board member information, (beneficial) ownership, control, and group structures could be improved in many countries.[41] Requiring companies to disclose compliance should also be considered. Increasing the securities regulator's resources and capabilities would do much to ensure compliance. Likewise, countries should continue to move toward full adoption of international accounting standards. Greater transparency would enhance the supervision of financial conglomerates and company groups with a presence across many emerging market economies.

Many emerging market economies could benefit from greater board independence and effectiveness. This could be facilitated by expanding board member powers in company law, revising the corporate governance code, or enhancing listing requirements. Likewise, separation of the role of the chief executive officer and the chair of the board should be considered. Critically, emerging market economies that have not yet done so should seriously consider mandatory independent committees to audit the boards of all listed companies. Indeed, audit committees are now obligatory in most countries around the world.

[41]A beneficial owner is a legal person who is entitled to enjoy the economic rights stemming from the ownership, although the ownership has been registered in the name of someone else (the legal owner).

Box 3.1. Examples of Corporate Governance Reforms in Selected Emerging Market Economies

Since the global financial crisis, many emerging market economies have continued reforming their corporate governance frameworks. This box presents a few recent examples from selected emerging market economies.[1]

Some of the most wide-ranging reforms have involved countries' corporate governance codes. For instance, the 2014 Russian Code of Corporate Governance was a comprehensive update of the 2002 Code and includes initiatives to further strengthen disclosure policies and the rights of shareholders. As with other new and extensive reform initiatives, the priority now is full implementation of the updated Russian Code. Likewise, the Malaysian Code on Corporate Governance was amended in 2012 and includes significant provisions on investor protection. Although adherence to the Code is voluntary, listed firms are required to explain the extent of their compliance to the regulator. Compliance in some areas, such as separation of the board chair and chief executive officer, has clearly improved in recent years. An earlier example is the creation of the Novo Mercado corporate governance tiers on the Brazilian stock exchange in 2000—with their higher standards for corporate governance and minority shareholder protection, which are voluntarily adopted in addition to legal requirements—which has resulted in major changes in the equity market.

Many emerging market economies have also improved their corporate transparency frameworks. By 2014 Korea had increased the level of transparency expected from companies regarding managerial compensation. Earlier reforms in Morocco and Peru allow minority shareholders to request access to corporate documents that are not confidential. India and Kazakhstan now require greater disclosure of board member conflicts of interest. Higher standards of accountability for company directors are now mandatory in Vietnam.

Several countries have introduced reforms that better regulate related-party transactions. Related-party transactions are common in the business marketplace. The inherent special relationship between the parties involved may, however, lead to conflicts of interest between corporate insiders and outside investors, requiring regulation. Accordingly, Albania, Kazakhstan, and the United Arab Emirates, for example, strengthened minority investor protections by introducing legal requirements for immediate disclosure of related-party transactions. In Korea, Peru, and Slovenia, measures regulating the approval of related-party transactions and/or making it easier to sue directors when such transactions are prejudicial were introduced. Similar reforms were implemented in India and Nigeria. More recently, emerging market economies, such as Egypt and Lithuania, reinforced their corporate governance frameworks by barring subsidiaries from acquiring shares issued by their parent company.

The author of this box is Selim Elekdag.

[1]For further details, see selected World Bank *Corporate Governance Reports on the Observance of Standards and Codes* and various issues of the World Bank *Doing Business* reports.

Box 3.2. Strengthening Corporate Governance for State-Owned Enterprises in China

Chinese state-owned enterprises (SOEs) face corporate governance challenges that contribute to resource misallocation and financial stability risks. Building on the recently announced SOE reform, decisive implementation is key. Measures should focus on hardening budget constraints, restructuring highly indebted SOEs, and introducing greater competition to state-dominated sectors.

State-owned enterprises face increasing challenges of low efficiency and resource misallocation. In China, SOEs continue to play an important role despite their declining share in the economy. Their total assets account for near 180 percent of GDP, much higher than in other major emerging market economies (Figure 3.2.1, panel 1). But SOEs in China appear less efficient than private enterprises, with rising leverage and weak profitability, raising concern about financial stability and the sustainability of growth (Figure 3.2.1, panel 2). Improving efficiency through measures to strengthen corporate governance is a critical part of SOE reforms.

Empirical evidence supports the notion that Chinese SOEs face corporate governance challenges. While the state as a shareholder can assert positive influence on corporate governance, such as stricter monitoring and auditing (Chen, Firth, and Xu 2009), China's SOEs face corporate governance challenges including the lack of disciplining factors such as possible takeovers or bankruptcies, likely increasing the cost of equity for firms (Ferreira and Laux 2007).[1] Other challenges include possible undue political influence and the pursuit of social objectives that are beyond minority shareholders' interests (Shleifer and Vishny 1994). Preliminary evidence indicates that stock prices of nonfinancial SOEs are more synchronized with the market and reflect less firm-specific information, likely raising the cost of equity (Figure 3.2.2, panel 1). Government implicit guarantees and preferential access to debt finance also contribute to moral hazard and SOEs' overreliance on debt (Figure 3.2.2, panel 2). All of these factors pose potential obstacles for the ongoing ownership reform efforts of SOEs to attract private sector participation.

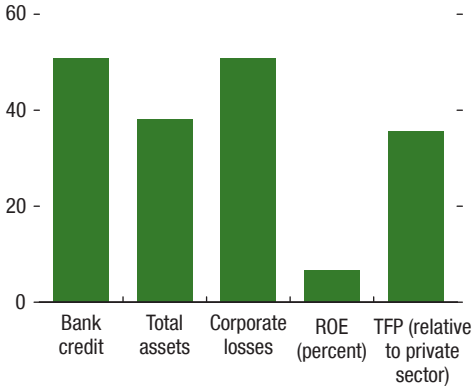
Figure 3.2.1. Selected Emerging Market Economies: State-Owned Enterprises

State-owned enterprises play a more important role in the Chinese economy than in other major emerging market economies. Chinese SOEs have recently had weaker profitability relative to private firms.

1. Key Indicators of SOEs[1]
(Percent of GDP)

Country	Sales revenue	Net profit	Asset	Market value	Share in the top 10 firms
China	35	3	176	45	91
Brazil	12	2	51	18	50
India	16	4	75	22	59
Indonesia	3	0	19	12	69
Russia	16	3	64	28	81
South Africa	2	2	3	1	2

2. SOEs in China Dominate and Operate Less Efficiently[2]
(Percent of total unless otherwise stated)



Sources: CEIC Data Company Ltd.; Kowalski and others 2013; Ministry of Finance; National Bureau of Statistics of China; People's Bank of China; WIND database; and IMF staff calculations.
Note: ROE = return on equity; SOE = state-owned enterprise; TFP = total factor productivity.
[1]As of end-2015 for China and end-2010 for rest of the economies.
[2]The time frame for bank credit and TFP is average of 2011–15; total assets, corporate losses, and ROE are as of end-2015.

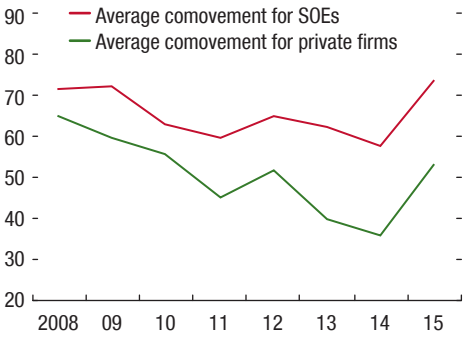
The authors of this box are Alan Xiaochen Feng and W. Raphael Lam.

[1]Ferreira and Laux (2007) show that takeover provisions reduce the information content of idiosyncratic components in the stock price.

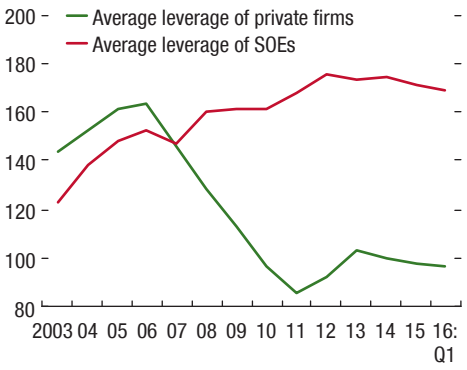
Box 3.2 *(continued)*

Figure 3.2.2. Leverage and Equity Price Comovement of State-Owned Enterprises in China
(Percent)

1. Stock Price Comovement[1]



2. Leverage Ratios of SOEs and Private Firms in China



Sources: Bloomberg L.P.; Thomson Reuters Datastream; WIND database; and IMF staff calculations.
Note: SOEs = state-owned enterprises.
[1]Stock price comovement is R^2 of the regression of weekly equity returns on market and industry factors.

SOE reforms should therefore focus on overcoming these corporate governance challenges. Key principles include aligning incentives of managers and controlling and minority shareholders, maintaining an arm's length relation between management and the board of directors, and eliminating noncore objectives (such as social functions) of SOEs. Greater corporate transparency and board independence would allow minority shareholders to fully exercise their rights.

While the authorities have announced reform elements, specifics still need to be defined and decisive implementation will be critical. Current reform plans include classifying SOEs into commercial (strategic or competitive) and social-function SOEs, and repositioning the state as a capital investor rather than the operator (IMF 2016).[2] While some of the current reform measures are more closely aligned with international good practices, there are still ambiguities, especially about the ultimate role of the state in SOEs' major decisions. It is critical that the SOE reforms focus on hardening SOEs' budget constraints by phasing out implicit guarantees, restructuring highly indebted SOEs by triaging debt, letting nonviable firms exit, and introducing greater competition to state-dominated sectors (Lam and Schipke forthcoming). These reforms would strengthen SOEs' corporate governance, which in turn will improve efficiency and resource allocation.

[2]For example, implicit government subsidies in borrowing costs combined with the too-big-to-fail problem make SOEs prone to issue debt and have high leverage (DeWenter and Malatesta 2001).

Annex 3.1. Emerging Market Corporate Fundamentals and Governance[42]

Using more than 600 nonfinancial firms for 25 emerging market economies during 2007–14 (over 3,000 observations), regressions link valuation, short-term debt, average interest rate (cost of debt), and leverage with the firm-level governance measure developed in the chapter. In the case of valuation (Tobin's Q proxied with the market-to-book assets ratio),[43] the baseline specification is

$$Q_{isc,t} = \beta FGOV_{isc,t-1} + \gamma_1 FIRM_{isc,t-1} + \gamma_2 MACRO_{c,t} + \varphi OTHER + \epsilon_{isc,t}, \quad \text{(A3.1.1)}$$

in which i, s, c, and t denote firm, sector, country, and time, respectively. *FGOV* is one of the firm-level governance indices (overall index; or board structure, shareholder rights, compensation policy, or transparency subindices). *FIRM* includes lagged measures of firm size, profitability, leverage, cash, capital expense, and research and development ratios. *MACRO* refers to country-level controls such as the credit-to-GDP ratio, the debt-to-GDP ratio, real GDP, inflation, rule of law, or the current account deficit as a percentage of GDP. The pooled ordinary least squares and instrumental variables regressions (in which the instrument is the average governance of other firms in the same industry and country)[44] include country, sector, and time fixed effects terms (*OTHER*); standard errors are clustered at the country level (Annex Table 3.1.1).

When the short-term-to-total-debt ratio (STD) is considered, the regression model is

$$STD_{isc,t} = \beta FGOV_{isc,t-1} + \gamma_1 FIRM_{isc,t-1} + \gamma_2 MACRO_{c,t} + \varphi OTHER + \epsilon_{isc,t}, \quad \text{(A3.1.2)}$$

in which *FIRM* includes firm-level measures of size, profitability, tangibility, and valuation; the other controls are the same as those discussed previously.[45] Complementary exercises add the interaction between the firm- and country-level measures of corporate governance (strength of minority shareholder protection) and country-level measures of enforcement (such as the rule of law).

Using a variety of specifications, robustness exercises confirm the results from the baseline regressions. For example, coefficients were estimated with panel data models while controlling for firm and sector time fixed effects (and errors clustered at the country level).

[42]The author of this annex is Adrian Alter.

[43]As an alternative measure, the adjusted valuation, in which the firm's sector average valuation is subtracted from its valuation, is considered as the dependent variable.

[44]*F*-statistics of the weak exogeneity tests exceed 10 and confirm the usefulness of the instrument.

[45]Similar firm characteristics are used when the dependent variable is leverage, interest rate, or default probability. In addition, when interest rate and default probability are considered as dependent variables, the set of firm regressors is augmented by the leverage ratio.

Annex 3.2. Analysis of Firm-Level Stock Price Comovement and Crash Risk[46]

The analysis on stock price comovement and crash risk is conducted in two steps. In the first step, firm-level stock returns are decomposed into market-wide and firm-specific components. Following Jin and Myers (2006), for each emerging market firm in the sample, the analysis considers

$$r_{it} = \alpha_i + \beta_{1i} r_{c,t} + \gamma_{1i}(r_{US,t} + X_{c,t}) + \beta_{2i} r_{c,t-1} + \gamma_{2i}(r_{US,t-1} + X_{c,t-1}) + \beta_{3i} r_{c,t+1} + \gamma_{3i}(r_{US,t+1} + X_{c,t+1}) + \epsilon_{it}, \quad \text{(A3.2.1)}$$

in which r_{it} is the weekly return of firm i, $r_{c,t}$ is the domestic market return, $r_{US,t}$ is the U.S. market return, and $X_{c,t}$ is the change in exchange rate of domestic currency against the U.S. dollar. This set of regressions is repeated for each year between 2008 and 2014.

The second step investigates the relationship between the computed stock price comovement, as well as crashes and the corporate governance indices, following Hutton, Marcus, and Tehranian (2009). Stock price comovement is measured using the logistically transformed *R*-squared from regressions in the first step and considered in the following analysis:

$$\pi_{it} = \delta_1 GOV_{it} + \delta_2 X_{i,t-1} + \eta_t + \xi_c + \epsilon_{it}, \quad \text{(A3.2.2)}$$

in which π_{it} is defined as $\ln[R^2/(1-R^2)]$, in which R^2 is the *R*-squared from equation (A3.2.1), GOV_{it} is the firm-level governance index, η_t and ξ_c are the year and country fixed effects, and $X_{i,t-1}$ includes firm control variables such as (logged) total assets, leverage, return on equity (ROE), and the indicators for whether the firm uses American depository receipts and is a state-owned enterprise (Annex Table 3.2.1). Similar estimates are found using the alternative Fama-MacBeth method that involves running a set of cross-sectional regressions for each year. For crash risk, the following

[46]The author of this annex is Alan Xiaochen Feng.

Annex Table 3.1.1. Firm Governance and Fundamentals: Selected Regressions

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	**Valuation**		**Short-Term Debt**		**Interest Rate**	
Regression Type	OLS	IV	OLS	IV	OLS	IV
Firm Governance						
Overall Index	0.00728***	0.0135**				
	(0.00184)	(0.00576)				
Shareholder Rights Index			–0.104*	–1.136*		
			(0.0587)	(0.662)		
Transparency Index					–0.0137***	0.278
					(0.00509)	(0.439)
Firm-Level Controls						
Total Assets (log)	–0.270***	–0.152***	–4.133***	–3.480***	–0.199**	–0.499
	(0.0193)	(0.0300)	(0.514)	(0.793)	(0.0886)	(0.708)
Profitability	0.0853***	0.0787***	–0.0795	–0.0552	0.00165	0.0383
	(0.00433)	(0.00715)	(0.104)	(0.155)	(0.0182)	(0.0596)
Leverage	–0.000379	0.00370*			–0.0129**	0.000394
	(0.00122)	(0.00190)			(0.00624)	(0.0161)
Cash Ratio	0.0168***	0.0115**				
	(0.00412)	(0.00544)				
Investment Ratio	0.00788***	0.0152***				
	(0.00229)	(0.00331)				
R&D Ratio	0.0567**	0.0935***				
	(0.0279)	(0.0316)				
Tangibility			–0.263***	–0.316***	–0.0138***	0.000730
			(0.0288)	(0.0621)	(0.00448)	(0.0183)
Tobin's Q			1.557**	0.609	0.0410	–0.245
			(0.711)	(1.000)	(0.123)	(0.371)
Country-level Controls						
Private Credit (percent of GDP)		-0.00656***		0.239***		–0.0174
		(0.00150)		(0.0523)		(0.0869)
Government Debt (percent of GDP)		–0.00301		0.356***		–0.0333
		(0.00341)		(0.106)		(0.0634)
Current Account Balance (percent of GDP)		0.166***		2.666**		–3.222
		(0.0271)		(1.114)		(2.159)
Inflation		0.00771		–0.365*		–0.0134
		(0.00749)		(0.196)		(0.120)
Real GDP		–0.0407***		0.922***		–0.107
		(0.0122)		(0.347)		(0.273)
Rule of Law		0.218*		–8.551**		–3.275
		(0.116)		(4.174)		(2.795)
Constant	5.043***	2.187***	178.0***	65.60**	25.34***	23.24**
	(0.427)	(0.459)	(13.58)	(27.11)	(1.967)	(11.32)
Observations	3,186	2,362	3,075	2,275	3,044	2,253
R^2	0.642	0.647	0.361	0.295	0.285	0.464
Time*Country FE	Yes	No	Yes	No	Yes	No

Source: IMF staff estimates.

Note: OLS refers to pooled ordinary least squares estimates; IV refers to instrumental variable estimates. All firm-specific regressors are lagged. Sector- and country-fixed effects are included in all regressions. Robust standard errors are reported. R&D = research and development; FE = fixed effects.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Annex Table 3.2.1. Firm-Level Stock Price Comovement and Crash Risk

	Stock Price Comovement				Crash Risk		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Firm-Level Overall Governance	–0.134***	–0.097***	–0.073***		–0.140***	–0.113**	–0.0744*
	(0.021)	(0.027)	(0.020)		(0.039)	(0.054)	(0.041)
Firm-Level Transparency				–0.082***			
				(0.027)			
Size	0.028***	0.026***	0.027***	0.024***	–0.01	–0.007	–0.011
	(0.007)	(0.008)	(0.007)	(0.006)	(0.014)	(0.037)	(0.015)
Leverage	0.006***	-0.002	0.007***	–0.001	0.001	–0.001	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.003)
Return on Equity	0.001	0.0001	–0.001	–0.002**	0.002	0.002	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
ADR	0.066	–0.164***	–0.044	–0.267***	0.230***	0.342***	0.085
	(0.045)	(0.051)	(0.043)	(0.047)	(0.085)	(0.102)	(0.089)
SOE	0.425***	0.244***	0.294***	0.151	0.029	0.026	–0.521**
	(0.122)	(0.119)	(0.116)	(0.111)	(0.203)	(0.216)	(0.247)
Observations	3,035	3,035	3,035	3,035	3,027	3,027	3,027
Country FE	No	Yes	No	Yes	No	Yes	No
Year FE	No	No	Yes	Yes	No	No	Yes
R^2	0.05	0.16	0.15	0.26	0.01	0.05	0.02

Source: IMF staff estimates.

Note: ADR = American depository receipts; SOE = state-owned enterprises; FE = fixed effects.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

logit regression of stock return crashes on firm-level governance indices was performed:

$$Prob(Crash = 1 | GOV_{it}, X_{i,t-1}) = \Phi^{-1}(\delta_1 GOV_{it} + \delta_2 X_{i,t-1}), \quad \text{(A3.2.3)}$$

in which crashes are defined as occurrences of firm-specific residual returns from equation (A3.2.1) that fall in the lower 2.5 percent tail of a normal distribution, and $X_{i,t-1}$ includes the same set of firm control variables as in equation (A3.2.2). Function Φ is the logit function.

Annex 3.3. Estimating the Impact of Global Financial Shocks on Firm Equity Returns[47]

The impact of global financial shocks on firms' equity returns is estimated for a sample of more than 600 firms in 25 emerging market economies during 2008–14 at weekly frequency (see Annex Table 3.4.1. for data sources and country coverage). The specification is an augmented capital asset pricing model, which includes country-level returns, changes in the Chicago Board Options Exchange Volatility Index (VIX), and firm-level governance and its interaction term with the changes in the VIX index:

$$r_{i,s,c,t} = \alpha + \beta r_{c,t} + \gamma_1 \Delta VIX_t + \gamma_2 GOV_{s,t} + \gamma_3 \Delta VIX_t^* GOV_{s,t} + \delta_i + \delta_{c,t} + \delta_{s,t} + \tau_t + \epsilon_{i,s,c,t}, \quad \text{(A3.3.1)}$$

in which

- $r_{i,s,c,t}$ is the weekly equity return of firm i;
- $r_{c,t}$ is the country-level equity return corresponding to country c;
- ΔVIX_t is the changes in the VIX, a proxy for global financial shocks (changes in global risk aversion);
- $GOV_{s,t}$ is the overall firm-level governance index (that is, the overall index);
- $\Delta VIX_t^* GOV_{s,t}$ is the interaction term that captures how governance influences the transmission of global financial shocks to equity returns; and
- $\delta_i, \delta_{c,t}, \delta_{s,t}, \tau_t$ are firm, country-time, sector-time, and time quarterly fixed effects terms, respectively.

Various additional specifications for robustness are also estimated, controlling for firm-level controls, including the share of foreign sales in total sales, American depository receipts firms, and concentra-

[47]The author of this annex is Dulani Seneviratne.

Annex Table 3.3.1. Global Financial Shocks and Firm Equity Returns

Dependent Variable: $Return_{i,s,c,t}$	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$Return_{c,t}$	0.602***	0.602***	0.602***	0.603***	0.604***	0.638***	0.652***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Gov_{s,t}$	0.001	0.001	0.001	0.001	0.001	0.001	0.002
	(0.627)	(0.991)	(0.830)	(0.627)	(0.611)	(0.682)	(0.518)
ΔVIX_t	–0.035***	–0.035***	–0.037***	–0.037***	–0.045***		
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		
ΔVIX * Gov	0.035***	0.035**	0.032***	0.032***	0.025**		
	(0.000)	(0.017)	(0.001)	(0.001)	(0.011)		
ΔVIX * Share of Foreign Sales			0.013***				
			(0.000)				
$Share\ of\ Foreign\ Sales_{i,s,c,t}$			–0.003***				
			(0.007)				
ΔVIX * Herfindahl–Hirschman Index				1.955***			
				(0.000)			
$Herfindahl–Hirschman\ Index_{i,s,c,t}$				–0.53**			
				(0.020)			
ΔVIX * 4-Firm Concentration Ratio					0.026***		
					(0.000)		
$Four\text{-}Firm\ Concentration\ Ratio_{i,s,c,t}$					–0.002		
					(0.581)		
Crisis Dummy						–3.088*	
						(0.061)	
Crisis Dummy * Gov						0.081**	
						(0.043)	
GFC Dummy * Gov							0.012***
							(0.007)
GFC Dummy							–0.513***
							(0.003)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector-Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Standard Errors	Robust	DK	Robust	Robust	Robust	Robust	Robust
Observations	214,283	214,283	212,128	214,283	214,283	214,283	204,239
R^2	0.186		0.186	0.186	0.186	0.183	0.178

Source: IMF staff estimates.

Note: Robust *p*-values in parentheses. Panel 2 in Figure 3.14 uses standardized values of specification (1). Crisis dummy corresponds to various banking, currency, and debt crises (based on Laeven and Valencia 2012); GFC dummy corresponds to the global financial crisis. DK = Driscoll-Kraay standard errors; VIX = Chicago Board Options Exchange Volatility Index; FE = fixed effects.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

tion (both through the Herfindahl-Hirschman Index and the four-firm concentration ratio) and through changing the fixed effects structure and using Driscoll-Kraay standard errors (Annex Table 3.3.1). The results remained robust in all specifications, with both ΔVIX_t and the interaction term preserving significance at the 5 percent level in most cases.

Annex 3.4. Data Sources and Country Coverage

This annex provides the data sources of the firm-level, country-level, global variables, and the sample coverage of economies used in this chapter (Annex Table 3.4.1). The set of emerging market economies includes past and current emerging market economies as well as some frontier economies.

Annex Table 3.4.1. Data Sources[1,2,3,4,5,6]

Variable	Description	Source
Firm-Level Variables		
Governance Variables		
Overall Index		IMF; ASSET4
Board Subindex		IMF; ASSET4
Compensation Subindex		IMF; ASSET4
Shareholder Rights Subindex		IMF; ASSET4
Transparency Subindex		IMF; ASSET4
Other Firm-Level Variables		
Tobin's Q	The sum of market value of equity and book value of debt divided by total assets	Worldscope
Return on Equity	Net income divided by shareholders' equity	Worldscope
Leverage	Total debt divided by market value of assets	Worldscope
Cash Ratio	The sum of cash and cash equivalents divided by total assets	Worldscope
Current Ratio	Current assets to current liabilities	Worldscope
Capital Investment	Capital expenses to total assets	Worldscope
Foreign Sales	The ratio of foreign sales to total sales	Worldscope
Size	Total assets in logarithmic terms	Worldscope
Short-Term Debt	Portion of debt payable within one year including current portion of long-term debt	Worldscope
Equity Returns (local currency)	Log difference of the equity indices	Bloomberg L.P.
American Depository Receipts (ADR)	ADR indicates companies that have American depository receipts trading on a U.S. exchange.	Worldscope
Bond Rating	Issuer's S&P credit rating	Bloomberg L.P., Dealogic
Bond Yield	Yield at issuance	Bloomberg L.P., Dealogic
Bond Maturity	Maturity at issuance	Bloomberg L.P., Dealogic
External Financing Dependence	Rajan and Zingales (1998) index measures dependence on external finance as a firm's capital expenditures minus cash flow from operations divided by capital expenditures, sector average.	Worldscope
State-Owned Enterprises		Worldscope
Country-Level Variables		
Governance Variables		
Protection of Minority Shareholders' Interests	Extent to which the interests of minority shareholders are protected by the legal system.	World Economic Forum, GCI
G-C Minority Shareholder's Protection	The degree of minority shareholders' protection	Guillén and Capron 2016
Strength of Investor Protection Index	Protection of minority investors from conflicts of interest and shareholders' rights in corporate governance	World Bank, Doing Business
Extent of Shareholder Rights Index	Shareholders' rights and role in major corporate decisions	World Bank, Doing Business
Extent of Disclosure Index	Transparency of related-party transactions	World Bank, Doing Business
Property Rights	Protection of property rights, including financial assets	World Economic Forum, GCI
Efficiency of Legal Framework in Challenging Regulations	Ease of challenging government actions and/or regulations through the legal system	World Economic Forum, GCI
Strength of Auditing and Reporting Standards	Strength of financial auditing and reporting standards	World Economic Forum, GCI
Government Effectiveness	Reflects perceptions of the quality of public services and policies and the credibility of the government's commitment to such policies	World Bank, World Governance Indicators
Regulatory Quality	Reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development	World Bank, World Governance Indicators

(continued)

Annex Table 3.4.1. Data Sources (continued)

Variable	Description	Source
Rule of Law	Reflects perceptions on the quality of contract enforcement, property rights, the police, the courts, and the likelihood of crime and violence	World Bank, World Governance Indicators
Other Country-Level Variables		
Corporate Spread	JPMorgan CEMBI Broad	Bloomberg L.P.
Sovereign Spread	JPMorgan EMBI Global	Bloomberg L.P.
Exchange Rate	National currency per U.S. dollar	Bloomberg L.P.
Equity Returns (local currency)	Log difference of the equity indices	Bloomberg L.P.
S&P Sovereign Risk Rating	Standard and Poor's Rating & Outlook	Bloomberg L.P.
Capital Flows	The previous year's average of total flows (purchases plus sales) of foreign securities between U.S. investor and domestic investor (TIC data)	United States Department of the Treasury
Trade Flows	The previous year's average of total trade (imports plus exports) originating in each country in the sample with the U.S.	IMF, Directions of Trade database
Real GDP	Year-over-year growth of GDP, constant prices	IMF, World Economic Outlook database
Inflation	Year-over-year growth of the consumer price index	IMF, World Economic Outlook database
Current Account Balance	Current account balance in percent of GDP	IMF, World Economic Outlook database
Government Debt	General government gross debt in percent of GDP	IMF, World Economic Outlook database
Private Credit	Claims on private sector in percent of GDP	IMF, International Financial Statistics database
Global-Level Variables		
VIX	Chicago Board Options Exchange Market Volatility Index	Bloomberg L.P.

Source: IMF staff.

Note: ASSET 4 is provided by Thomson Reuters. CEMBI = Corporate Emerging Markets Bond Index; EMBI = Emerging Markets Bond Index; G-C = Guillén and Capron; GCI = Global Competitiveness Indicators; S&P = Standard and Poor's; TIC = Treasury International Capital; VIX = Chicago Board Options Exchange Volatility Index.

[1] Emerging market economies covered in the country-level capital market development analysis are Argentina, Bahrain, Brazil, Bulgaria, Chile, China, Colombia, Croatia, Hungary, India, Indonesia, Jordan, Kazakhstan, Kuwait, Lebanon, Lithuania, Malaysia, Mauritius, Mexico, Morocco, Nigeria, Oman, Pakistan, Peru, the Philippines, Poland, Qatar, Romania, Saudi Arabia, Serbia, South Africa, Sri Lanka, Thailand, Turkey, Ukraine, and the United Arab Emirates.

[2] Firm-level fundamentals analysis is based on the firms in Brazil, Chile, China, Colombia, Egypt, Hungary, India, Indonesia, Kazakhstan, Korea, Kuwait, Malaysia, Mexico, Morocco, the Philippines, Poland, Qatar, Russia, Saudi Arabia, South Africa, Sri Lanka, Thailand, Turkey, Ukraine, and the United Arab Emirates.

[3] Country-level volatility and comovement analyses cover Brazil, Chile, China, Colombia, Egypt, Hungary, India, Indonesia, Malaysia, Mexico, the Philippines, Poland, Russia, South Africa, Sri Lanka, Thailand, Turkey, and the United Arab Emirates, while the firm-level comovement and crash risk analyses include Kuwait, Morocco, and Qatar in addition to the above set of economies.

[4] Firm-level equity return analysis and the event studies are based on the firms in Brazil, Chile, China, Colombia, Egypt, Hungary, India, Indonesia, Kazakhstan, Korea, Kuwait, Malaysia, Mexico, Morocco, the Philippines, Poland, Qatar, Russia, Saudi Arabia, South Africa, Sri Lanka, Thailand, Turkey, Ukraine, and the United Arab Emirates.

[5] Country-level equity return and bond spread analyses cover Argentina, Brazil, Chile, China, Colombia, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Morocco, Pakistan, Peru, the Philippines, Poland, South Africa, Thailand, and Turkey.

[6] Country-level market liquidity analysis is based on the same coverage as in Brandão-Marques (forthcoming).

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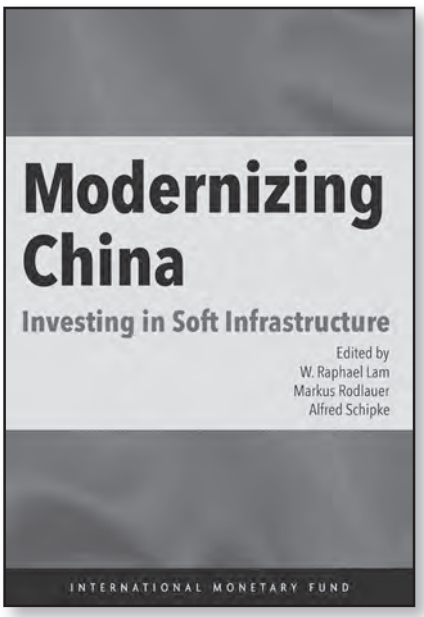

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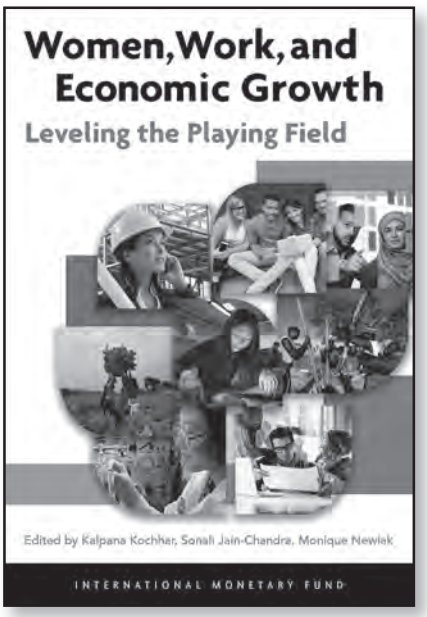

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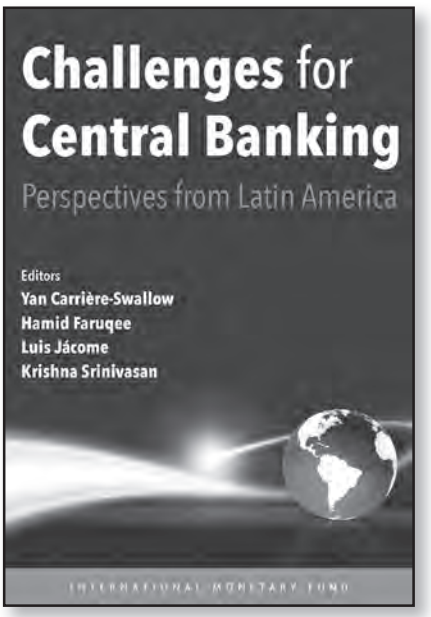

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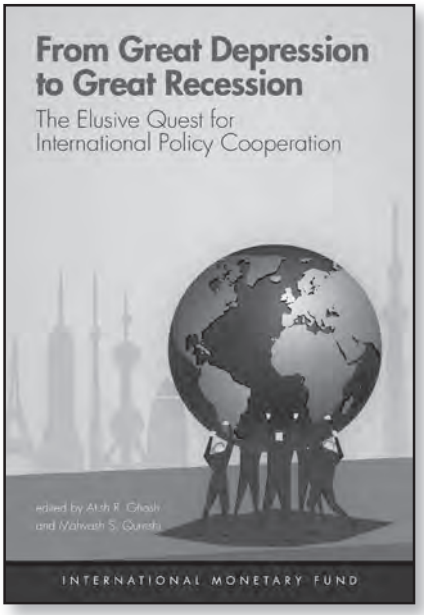

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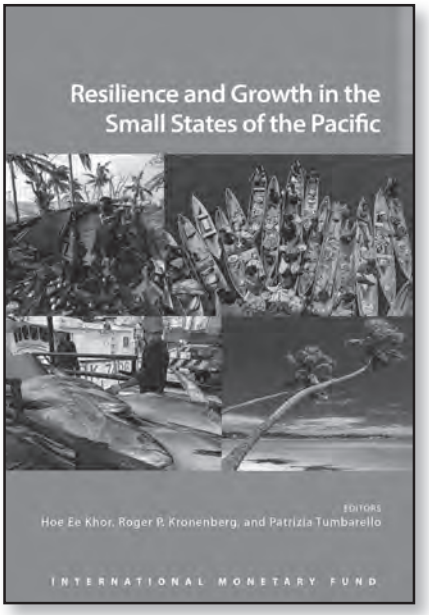

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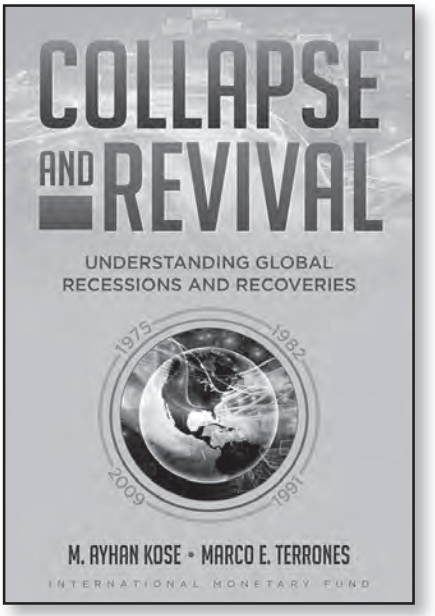

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